Anatolica 32, 71-151. doi: 10.2143/ANA.32.0.2012554

ANATOLICA XXXII, 2006

THE UPPER TIGRIS ARCHAEOLOGICAL RESEARCH PROJECT (UTARP) – A Preliminary Report from the 2003 and 2004 Field Seasons at Kenan Tepe[1]

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INTRODUCTION

After three seasons of excavation at the site of Kenan Tepe, members of the Upper Tigris Archaeological Research Project (UTARP) conducted an intensive study season during the summer of 2003.[3] The 2003 study season was meant to allow us concentrated time, not only to process our existing data and prepare it for publication, but also to plan research strategies for future field seasons. The 2003 study season was followed by a fourth season of excavation during the summer of 2004.[4] The 2004 field season was meant to act as a foundation for a more focused excavation strategy that will be implemented in the second phase of our research at Kenan Tepe. For this reason we focused on several key questions that would shape our future direction. To implement this strategy, UTARP team members conducted eight operations in four areas of the site and began a remote sensing survey. What follows is a preliminary report of the research carried out during the 2003 and 2004 field seasons.

Kenan Tepe is a multi-period mound located on the north bank of the Tigris River approximately 15 kilometers east of the modern town of Bismil (figure 1). As noted in

[1] We would like to thank the Turkish Ministry of Culture and Tourism for granting us permission to conduct this research. We would also like to thank our Turkish government representatives, Melek Çanga (2003) and Ömür Tufan (2004). As always Necdet İnal of the Diyarbakır Museum was instrumental in his assistance to the project. The 2003 and 2004 field seasons were conducted with generous support from the United States National Endowment for the Humanities, the Curtiss T. and Mary G. Brennan Foundation, the University of Utah and the University of Southern California.

[2] Bradley Parker compiled and edited this article. He also researched and composed the introduction and conclusion (excluding the paragraphs on remote sensing) and the summaries of trenches D5, D8, D9, E2 and I2. Lynn Dodd is responsible for the section on the Ubaid ceramics. The section on remote sensing, as well as the summary of those data offered in the conclusion, is the work of Andrew Creekmore. Elizabeth Healey contributed the section on the lithics. The section on trench F1 is the work of Catherine Painter.

[3] Our team during the 2003 study season included Bradley Parker (Project Director, University of Utah), Lynn Swartz Dodd (University of Southern California), Andrew Creekmore (Northwestern University), Eleanor Moseman (Bryn Mawr College), Elizabeth Healey (University of Manchester), Kathryn Smith (University of Utah), Sibel Torpil (Bilkent University), and Bariş Üzel (Ege University). Our Turkish government representative was Melek Çanga.

[4] Project participants included Bradley Parker (Project Director, University of Utah), Lynn Swartz Dodd (University of Southern California), Andrew Creekmore (Northwestern University), Diana Backus, Emily Ogle (University of Southern California), Melissa Eppihimer (Harvard University), Nick Luby (University College, London), Catherine Painter (University of California at Berkeley), Jennifer Henecke (Boston University), Bariş Üzel (Ege University, Turkey), Sibel Torpil (Bilkent University, Turkey) and Eser Karaca (Ege University, Turkey). Our Turkish government representative was Ömür Tufan.

our previous reports, Kenan Tepe is composed of a high mound that rises 32 meters above the surrounding landscape, and a lower town that extends to the east and northeast of the main mound.[5] In our previous reports, we have suggested that the overall size of the visibly mounded area at Kenan Tepe measures approximately 6 hectares. We are now able to revise this estimate based on excavation and more comprehensive mapping begun in 2004. Using the remote sensing grid as a guide, we reached the following conclusions. The area of visible mounding, which includes spurs to the northeast, east and south of the main mound contains one hundred and thirty 20 x 20 meter grid squares equaling a total of 5.2 hectares. However, excavations in the areas directly south and west of Kenan Tepe's main mound (in parts of areas H and I) suggest that cultural remains in parts of these areas consist of erosional debris. Taking these data into consideration we estimate that occupational layers exist in only between 100 and 110 of the 20 x 20 meter squares in our mapping grid. Thus we must revise our maximum site size estimates to between 4.0 and 4.4 hectares. For the purposes of research we have divided the site into areas. Using the remote sensing grid as a guideline to estimate the total size of the areas that we know from excavation to have accumulated through cultural processes rather than erosion, we reach the following totals: Area F: 16 grids = 0.64 ha.; Area G: 29 grids = 1.16 ha.; Area H: 9 grids = 0.36 ha.; high mound (areas A, B, C and D): 51 grids = 2.08 ha. Adding these figures suggests that the total occupied area at Kenan Tepe is approximately 4.24 hectares.

Archaeological research between 2000 and 2004 has shown that Kenan Tepe was occupied during five broad periods: the Late Ubaid period, the Late Chalcolithic period, the beginning of the Early Bronze Age, the Middle Bronze Age and the Early Iron Age. During the medieval period a cemetery was dug into the top of the high mound.

THE 2003 STUDY SEASON

The goal of the study season, which took place between June 20th and July 25th, 2003, was threefold. Our first and primary objective was to process as much of the material excavated during our previous three seasons as possible. To this end, Lynn Dodd and Bradley Parker analyzed ceramics from all primary and most secondary contexts and continued to refine the Kenan Tepe ceramic typology; Andrew Creekmore processed the ceramics from the lower town; Elizabeth Healey analyzed the lithics from all primary and some secondary contexts; and Eleanor Moseman completed our small finds catalog. Bariş Üzel, Bradley Parker and Lynn Dodd drew over 500 sherds while Kathryn Smith photographed all drawn ceramics and small finds. Our second goal was to iron out several stratigraphic issues that had arisen during our off-season discussions of the site. To do so, Andrew Creekmore completed his analysis of the stratigraphy of the lower town, Bradley Parker and Eleanor Moseman researched the stratigraphy of the step trench, and Lynn

[5] For a more in-depth description of the site and its morphology see Parker *et al.* 2003a; Parker, Creekmore and Dodd 2004 and Parker and Dodd 2005.

Dodd and Bradley Parker analyzed the stratigraphy of Area D. Our third goal was to integrate these and other data into the project database. Kathryn Smith, Sibel Torpil and Bariş Üzel were instrumental in aiding us in this endeavor. Sibel Torpil also took charge of reorganizing the project depot.

EXCAVATIONS IN 2004

The 2004 field season, which took place between June 29th and July 29th, 2004, marked a turning point for the Upper Tigris Archaeological Research Project (UTARP). With the first phase of the project completed after a study season during the summer of 2003 and a number of reports and synthetic articles either published or forthcoming, we shifted our research to two key periods that have the most potential to have a substantial impact on the field of Near Eastern archaeology. This second and final phase of the project, which will take place between 2005 and 2008, will thus focus on the Ubaid and Late Chalcolithic remains at Kenan Tepe.[6] The 2004 field season was therefore meant to be an exploratory season focused on specific culture-history questions that would guide our problem-oriented research for the coming, and possibly final, phase of the project. These questions are:

1) What is the extent of Ubaid and Late Chalcolithic settlements at Kenan Tepe? And more specifically, does Ubaid and Late Chalcolithic occupation continue under Kenan Tepe's main mound?

2) What is the chronology of the Ubaid and Late Chalcolithic settlements? Is occupation at Kenan Tepe restricted to specific phases of these periods or is there a sequence of development at the site?

3) And finally, what kind of data can we hope to obtain through remote sensing at Kenan Tepe?

To address these questions, members of the Upper Tigris Archaeological Research Project (UTARP) opened four new trenches (trenches D8, D9, I2 and G4 [figure 2]), continued excavation in four existing trenches (trenches D5, E2, F1 and F7) and began a remote sensing survey during the 2004 field season.

[6] This course of action has been made possible by two multi-year grants. The first, from the Curtiss T. and Mary G. Brennan Foundation and greatly augmented by matching funds from the University of Utah, is underwriting three seasons of field research and one semester of further analysis of Kenan Tepe's Ubaid period remains. The second grant, from the United States National Endowment for the Humanities, is funding the project's infrastructure and research into the Late Chalcolithic period at Kenan Tepe over the same three-year period.

TRENCH SUMMARIES[7]

Area D Trench 5

During the 2002 field season, research on the Ubaid period concentrated on the domestic structure identified in previous seasons in trench D5 (hereafter referred to as *Ubaid Structure 1* [figure 3]). This house, which was partially contained within the south baulk of the trench, consisted of several mud brick walls demarcating two small rooms and separating them from a well-preserved outside work surface that was cut by a relatively large Late Chalcolithic oven or kiln. At least one of the rooms had plastered earthen surfaces. A large and well-preserved outside surface that abutted the north wall of the house contained numerous artifacts and other domestic debris *in situ* (see Parker and Dodd 2005 and figure 3). Although complete plans of these rooms were not obtained since only a small part of *Ubaid Structure 1* was contained within the trench, the small size of the exposed sections of these rooms suggests that they served as small basement chambers whose primary purpose was to elevate wooden living surfaces. Parallels for this type of construction can be found at several sites in Syria and Iraq (Hammade and Yamazaki 1995; Huot 1989; Jasim 1989; Nishiaki 1999). Although this hypothesis has yet to be tested, our hope is that further excavation will help us determine the function of these rooms.

Research in trench D5 during the 2004 field season had two main objectives. The first was to complete the excavation of *Ubaid Structure 1*, and the second was to excavate the levels below this structure to see if it rested atop earlier domestic architecture. We began by removing what remained of *Ubaid Structure 1* and then continued to excavate into the layers beneath it. The layers below this building were characterized by packed fill with only a few small pieces of what may have been earlier floors and walls. This suggests either that *Ubaid Structure 1* was the first and only Ubaid period structure to be constructed on this part of the mound, or that whatever structure or structures may have existed prior to this building were leveled during its construction. Although the contexts directly below this building did not yield coherent architecture, these sealed contexts did produce a small corpus of Ubaid ceramics (see below) and an obsidian arrowhead. A preliminary analysis of these ceramics suggests that they match very closely those discovered within and above *Ubaid Structure 1*. Although obsidian flakes were recovered in and directly above primary Ubaid contexts surrounding *Ubaid Structure 1*, the above-mentioned arrowhead is the first such artifact of this kind discovered at Kenan Tepe.

After removing a substantial amount of fill from below *Ubaid Structure 1* it became clear that this house was not founded upon earlier Ubaid architecture, or if it was, preservation is such that no remains could be recovered. To test the depth of this deposit we excavated a 1 x 1 meter sounding in the southwestern corner of trench D5. This sounding continued for 1.3 meters. It produced small amounts of ceramics and other

[7] The excavation of trenches D5, D8 and D9 was financed by the Curtiss T. and Mary G. Brennan Foundation. We would like to offer special thanks to Curtiss Brennan for his support.

cultural debris (although not in large quantities). No architecture was detected either in plan or in section although the presence of several ash lenses suggests that this space was utilized for a considerable length of time before the construction of *Ubaid Structure 1*. Although our sample is admittedly very small, we have noted a complete absence of fine ware ceramics and a very high proportion of rough ware ceramics in the sounding. There are several possible explanations for this. This distribution may be due to issues of recovery or preservation. However, this difference may also be chronological. Our current hypothesis is that in the earliest phase of occupation at Kenan Tepe, before the construction of *Ubaid Structure 1*, is characterized by a predominance of rough ware ceramics. Further research will be needed to test this hypothesis.

The removal of what remained of *Ubaid Structure 1* included the excavation of a large oven or kiln (L5126) in the central eastern portion of the trench (figures 3 and 4). This feature had originally been dated to the Ubaid period because it appeared to be abutting a surface directly outside *Ubaid Structure 1*. However, excavation during the 2004 field season showed conclusively that this feature dates to the Late Chalcolithic.

An analysis of the stratigraphy of trenches D5 and D9 (see below) revealed that during the Ubaid and Late Chalcolithic periods, Kenan Tepe's main mound was considerably smaller than it is presently. The data suggest that several meters of debris eroded from the top of the main mound some time in the third millennium. This very rough dating is based on the fact that Late Chalcolithic remains, such as the feature under discussion, cut directly into Ubaid period levels. They are then covered by considerable debris measuring as much as 2 meters. Slightly further up slope from trench D5 (in trenches D4, D6 and D7 [figure 2]), this debris layer is overlain by the second millennium street described in our previous reports (Parker and Dodd 2003; Parker *et al.* 2003a). Similar erosion debris was encountered in our step trench in Area A (Parker and Dodd 2003). Excavations during the 2004 field season revealed a clear line of demarcation between the intact Ubaid and Late Chalcolithic levels and the disturbed erosional debris. This line cut directly across both trenches from the northwestern corner of trench D5 to the southeastern corner of trench D9 (figure 3).

The stratigraphic data suggest that during the Late Chalcolithic period the inhabitants of Kenan Tepe cut several niches into the side of Kenan Tepe's main mound to form protected level surfaces for the construction of pyrotechnic facilities. Examination of four such features has led us to the conclusion that these were ovens used for baking and cooking, rather than kilns used for firing and/or smelting. This hypothesis is based on the fact that no wasters or slag have yet been recovered in or around these features, leading us to believe that they were not used for ceramic or metal production. It should further be noted that two pyrotechnic facilities excavated in Late Chalcolithic contexts in Area F are directly associated with domestic architecture and debris. A few small domestic artifacts were also discovered in association with one of the pyrotechnic facilities in Area D (L22+) including a stopper (D.9.20.11), and a loom weight (D.9.20. 4). Burnt clay pieces with smoothed concave surfaces were discovered in association with the same feature (D.9.20.12). We assume that these are the remains of earthen pot stands that were subjected to repeated contact with heated ceramic vessels. And finally,

ethnographic parallels consisting of ovens remarkably similar to those excavated at Kenan Tepe (see below), suggest that these types of facilities were probably loci of domestic production. Thus, until such time as contrary evidence becomes available, we will refer to these features as ovens.

Two Late Chalcolithic ovens were excavated in Area D during the 2004 field season: L5126+ in trench D5, and L22+ in trench D9 (figures 4 and 6, and see below). In both cases, hollowing out niches to create space for the construction of these ovens cut into the preexisting Ubaid strata. Excavations during the 2002 and 2004 seasons suggest that mud bricks were used to brace the vertical section created by at least one of these niches. Since bricks were placed against what was probably a freshly cut section, it initially appeared that the Ubaid surface outside *Ubaid Structure 1* was bonded to the bricks used to brace the section against which the oven was built. This led to our initial confusion over the stratigraphic position of this feature. It is now clear that construction associated with the installation of oven L5126+ cut into Ubaid levels. Ceramics excavated in and around this feature confirm that it dates to the Late Chalcolithic period (figures 11 and 12). Unfortunately, only a very limited number of ceramic sherds were recovered from in and around this feature and thus without carbon tests, we cannot further refine its dating. However, obvious parallels can be made with other Late Chalcolithic ovens excavated in several other excavation units at Kenan Tepe including trenches F1, F4 (Parker *et al.* 2003a) and D9 (for description see the discussion of trench D9).

Visible remains of oven L5126+ included a circle of mud bricks that lined the vertical section of the protective niche (figures 3 and 4). Within the niche, the oven itself was composed of a separately produced beehive-shaped tanoor-style domed core (see below for a more complete description of oven construction). An arch of mud bricks was placed inside the oven. We are uncertain whether or not mud bricks were packed around the exterior of oven L5126+ as was the case with a similar oven excavated in the neighboring trench (D9 L22+). However, it does appear that a coating of pisé was applied to the oven's exterior.

Area D Trench 8

In order to broaden our exposure of the Ubaid period house discovered in trench D5 (*Ubaid Structure 1*), UTARP team members opened two new trenches – D8 and D9 (trench D9 is described in the next section). Trench D8 is a 5 x 10 meter unit located directly south of trench D5 and east of trench D6 (figure 2). Since trench D8 began at the same level on the slope of the mound as trench D5, we knew that it would take at least two field seasons to reach Ubaid contexts, which lie as much as 2.5 meters below ground surface. As expected this trench immediately produced early second millennium remains. The discovery of contexts dating to the early second millennium in trench D8 is not, however, insignificant. Since trench D8 lies down-slope from trenches D4 and D6 where significant early second millennium architecture was excavated in previous seasons (Parker and Dodd 2003, 2005), these data suggest either that there was a considerable accumulation of debris during the early second millennium in this area (over 2 meters) or

that the early second millennium architecture was terraced into the side of Kenan Tepe's main mound. Although our suspicion has always been that terracing played a significant role in the horizontal location of remains from various periods at Kenan Tepe, early second millennium architecture discovered in trench D8 appears to underlie remains excavated in previous seasons in trenches D4 and D6. This suggests that the early second millennium contexts excavated in trench D8 may represent an earlier phase of occupation. Data from trench D8 also highlight the drastic effect that erosion has had on the site.

Excavation in trench D8 yielded parts of at least two structures. The first is likely represented by a small section of a thick wall (L17 measuring 1 meter in width) that entered trench D8 from the southernmost portion of the east baulk (figure 5). Only 1.3 meters of the length of this wall was preserved. A second smaller wall (L23) and associated surface (L32) entered the trench from the east baulk approximately 4 meters north of wall L17. It is not clear whether wall L24, surface L32 and wall L17 originally belonged to the same structure. We assume this architecture belongs to one or more structures the bulk of which is located east of trench D8 in the layers that lie between 1.5 and 2 meters underneath the second millennium street excavated in the neighboring up-slope excavation unit (trench D6).

In the northeastern portion of the trench UTARP team members uncovered the southwestern corner of a second large structure. It consisted of a large wall (L14) that measured nearly 2 meters in width. This wall entered the trench from the north baulk proceeding 2.2 meters before cornering into the east baulk (figure 5). Wall L14 is associated with a cobbled surface (L9) protruding into the trench from the north and west baulks. We assume this surface represents a street or pathway that was located west and outside the structure partially demarcated by wall L14. These remains dramatically illustrate the effect that erosion has had on this, and presumably other, sites in the Upper Tigris River region. Judging from the width of wall L14 it is safe to say that the building of which it was a part was relatively large. However, all that remains of this building is its southwestern corner. The rest of this structure, which presumably measured several meters on a side, is lost to erosion. These data not only suggest that during the early second millennium B.C. Kenan Tepe's main mound was considerably larger than it is today, but also that considerable erosional processes have removed several meters of cultural deposits.

Area D Trench 9

Trench D9 is located directly east and down-slope from trench D5 (figure 2). Because of the morphology and slope of Kenan Tepe's main mound, the dimensions of this trench were limited to 6 x 4 meters. Although our initial goal was to broaden our exposure of the Ubaid levels, excavation quickly revealed that any Ubaid period remains that may have existed in this area were destroyed by a Late Chalcolithic oven (L22+, figure 6) very similar to that excavated in trench D5 (above).

The unusual preservation of this oven allows a relatively detailed description of the method and order of its construction. The installation of this feature began with the

leveling of a space in the slope of Kenan Tepe's main mound. Like the oven excavated in the neighboring trench D5, this oven was located just inside the erosional line that marked the ancient edge of the mound (see above). A level surface was created by digging a niche into the slope of the hill. This niche probably provided some protection from the prevailing winds which, at least in modern times, tend to blow from the southwest. Unlike the oven in trench D5, we do not have evidence that mud bricks were used to brace the vertical section created by digging the niche. Debris was thrown downhill, packed and covered with a layer of mud bricks, thus creating a relatively level surface in the steep slope of the mound. This surface was probably about 3 meters in diameter. It was identified in excavation as packed earth and brick with numerous flat-lying pot sherds and other cultural debris.

The core of the oven was composed of a separately constructed beehive-shaped clay dome very similar to those still used in many parts of Turkey today. Modern oven cores are made and sold by specialists. Using a mixture of clay and cow dung, these artisans fashion oven cores by building up about 20 centimeters of the structure at a time. Once a portion of the core is in place, it is allowed to dry in the sun until hard before another 20 centimeters or so of clay is attached. A large opening is left in the top of the core and a small hole is made near its base. Although the full height of our Late Chalcolithic example was probably not preserved, a large venting hole undoubtedly existed at the top of the dome. The dome core was placed over four mud bricks that were set within the oven, probably to elevate fuel and allow air circulation. Mud bricks measuring 25 x 25 x 20 cm were then packed around the dome. Most of the oven was covered with one row of bricks, although the bottom two courses appear to have been two rows thick. Finally, this brick lining was covered with a thick coat of pisé. The result was a large beehive-shaped structure measuring 1.4 meters in diameter at its base. It was preserved to a height of 80 centimeters.

Numerous ethnographic parallels can be found in villages and towns all across southeastern Turkey (figure 7), where such ovens may serve the needs of several households. Since these facilities are basically communal, they are usually located in a make-shift shelter on the side of a street or alley. Modern neighborhood ovens are constructed in a very similar fashion to those excavated at Kenan Tepe. They are composed of a separately produced clay core that is covered with mud bricks and packed with pisé. These ovens are generally used for baking bread, although it is not uncommon to find them used for various activities related to cooking. Modern ovens are loaded from the top. Bread dough is stuck to the interior wall until baked. A small opening at the bottom is used to insert fuel and remove ash. Baking and cooking is done exclusively by women.

No clearly definable openings were discovered in oven L22+ although part of this structure was contained in the south baulk and thus it is possible that either, an opening may exist on the south side of this feature, or preservation did not allow us to identify such an opening. In any case, there must have been some sort of access to the lower portion of the kiln to facilitate inserting fuel and extracting ash. The fact that no side

openings for baking, cooking or other activities were discovered during excavation suggests that this was, like its modern parallels, top-loading.

Area E Trench 2

During the year 2000 field season, UTARP team members opened a 2 x 2 meter sounding in an area of modern disturbance on the eastern slopes of the high mound (trench E1, now renamed E2, see figure 2). At approximately 1.55 meters below ground surface, we reached levels containing a large collection of Ubaid period ceramics (Parker *et al.* 2002b). We were finally able to revisit this trench in 2004.

In order to broaden our exposure to these levels we widened the trench to 5.5 x 3.5 meters and renamed it trench E2.[8] This trench thus included the original sounding which, after cleaning the eroded baulks, measured 2.5 x 2.5 meters, and an expanded excavation area to the southwest of the original sounding, which measured approximately 3 x 3.5 meters. To minimize the height of the baulk directly over the northern section of the original sounding we also broadened the trench by 1 meter. Like the trenches in Area D discussed above, trench E2 is located on the steep slopes of Kenan Tepe's main mound. Thus the northern corners of the trench are considerably higher than the southern corners. For this reason, trench E2 is a good gage of the overall stratigraphy of Kenan Tepe's main mound. In broad terms, the stratigraphy of trench E2 can be divided into 4 levels dating to the early second millennium (level 1), the first half of the Early Bronze Age (level 2), the Late Chalcolithic period (level 3) and the Ubaid period (level 4).

Just below ground surface in the highest elevations of the northeast corner of trench E2 (L2+), we encountered at least four thick surfaces made up of multiple layers of ceramics and other debris (level 1), dated by a large corpus of red brown wash ware ceramics to the early second millennium B.C. (Parker and Dodd 2003). Part of what we believe to be the same surface was also visible, although at slightly lower elevation, in the west baulk and in the southwestern corner (L7) of trench E2. The similarity of these remains with the street identified in trenches D4, D6 and D7 (Parker and Dodd 2005), leads us to believe that this is, in fact, part of the same street, which, judging from the position of these surfaces in trench E2, turns and inclines as it follows the curvature of the site through Area E to the southern flanks of Kenan Tepe's main mound.

The layers below the second millennium street (level 2), which were excavated in the western extension of trench E2, are characterized by numerous large walls. Two factors complicate the interpretation of these remains. First, since trench E2 is located on the edge of the mound, inevitably any architecture identified in this area is likely to be the eroded edges of structures that protrude into this trench from deep within the mound. Second, excavation clearly shows that this area was subject to several phases of rebuilding. The ceramic corpus, although largely from insecure contexts, shows marked

[8] The dimensions and orientation of this trench were dictated by the size of the modern disturbance and by the slope of the mound. However, for ease of reference we will discuss this trench as if it were oriented to the cardinal directions.

similarities (with very little mixing with later material) to the early Bronze Age material excavated on other parts of the site including areas A and F. A large wall (L35) measuring 1.4 meters in width was identified running from the northeast corner of the trench into its western baulk (almost directly below the second millennium street). Two smaller walls (L37 and L38) intersect wall L35 from the south. Our working hypothesis is that the large wall (L35) may represent either a small portion of a fortification or retaining wall similar to those identified in trenches A2, A8 and C5 (Parker and Dodd 2005) or the southern edge of a large building. The smaller walls, L37 and L38, may belong either to structures that were later built up against the outside of this wall or they may be part of a protruding tower or other feature associated with this wall.

Although a handful of Late Chalcolithic ceramics were identified both in the fill surrounding the walls discussed above and in the original sounding, only very limited primary contexts that can be securely dated to the Late Chalcolithic period have been excavated in trench E2. Our assumption is that further excavation in the western portion of the trench below the Early Bronze Age (level 2) walls will reveal earlier (level 3) occupation.

After straightening the sections and clearing out debris from the original Area E sounding, this part of the trench immediately began to produce Ubaid period material. The primary Ubaid contexts consisted of a mud brick wall (L33) that crossed the trench from its south to west baulks. The supra-surface and surface contexts (L25+) north of this wall produced a significant amount of domestic debris including various types of Ubaid ceramics (see below), animal bones, chert, large amounts of obsidian, a spindle whorl or loom weight (E.2.18.11), a grindstone (E.2.12.5) and a hearth (L23). The soil in this area was characterized by a significant amount of ash and carbon. A small area southwest of wall L33 was also excavated. This context, designated L21, contained no artifacts and the soil color was significantly lighter than L25. Although this sample is admittedly very small, it nevertheless shows that Area E was the locus of significant domestic activities during the Ubaid period. We can not yet say whether L25 represents an inside or outside surface. However, in trench D5 a similar context yielding similar categories of domestic debris (Parker and Dodd 2005) has been shown to be an outside work area while inside surfaces were almost free of debris. These data would support the hypothesis that L25 was also an outside work area and that wall L33 represents the northern wall of an Ubaid domestic structure.

Area F Trench 1

Area F is located northeast of Kenan Tepe's main mound on a flat terrace approximately 23 meters above the Tigris River (figure 2). Work in this trench has spanned four seasons (2000, 2001, 2002) culminating in 2004 when we reached virgin soil at a depth of approximately 3.17 meters below ground surface.

The main goal of excavation in trench F1 during the 2004 field season was to acquire a complete sequence of the Late Chalcolithic occupation at Kenan Tepe by bringing this trench to virgin soil. We also hoped to further examine the various cobble

surfaces that were left unexplored at the end of the 2002 field season and, in doing so, illuminate the Late Chalcolithic period architecture or features present in the deepest strata of this trench. Excavation revealed that contexts located in the northeast corner and southern end of this unit included several superimposed surfaces (L1109, L1116, and L1117) composed of tightly-packed pebbles and crushed pottery. Stone grinders, pestles, and a large amount of animal bone (including teeth and jaw bones) found on and embedded within the surfaces suggest that food preparation or butchering activities took place on or near these surfaces. Numerous lithics, specifically obsidian debitage and flakes, were also recovered from surface contexts. Most notably two tripartite flint blades with serrated edges (L1117 KT1 and KT2) were discovered side by side *in situ* within the lowest superimposed pebble surface in the southern end of the trench. Worked stone needle fragments, a loom weight and several tiny shell beads further suggest that domestic activities, specifically cloth production, garment manufacture, and possibly jewelry assembly, took place in this area. These interpretations concur with data from several adjacent trenches (trenches F4, F5 and F7) where similar evidence of local domestic production has also been discovered (Parker *et al.* 2002a, 2002b, 2003a, 2003b; Parker and Dodd 2005).

Below these surfaces UTARP team members discovered a series of shallow subsurface fills (L1121, L1125) whose eastern edges were bordered by a narrow arching strip of light ashy inclusion. The excavation of several fill layers in the southeast corner of the trench revealed that this fill sealed a semi-circular ash pit (L1130) that cut 50 cm into virgin soil (a light yellowish brown fine clay fill with limestone inclusions). This pit contained copious amounts of carbon, ash and ceramic remains. After excavation soil subdivisions composed of alternating dark brown and ash layers were visible in the east and south sections. Charred bone and a quadruped animal figurine (L1131 KT4) were also discovered in the ashy adjacent fill.

Although the relationship between the pit (L1130), the basal level surface (L1117) in trench F1, and features previously unearthed at the same or similar elevations in the neighboring trench F4 is not entirely clear, we hypothesize that pit L1130 is a northern extension of ash and carbon residue from a large circular oven (L4009, L4027) excavated in the northwest corner of trench F4 during the 2000 and 2001 seasons (Parker *et al.* 2002a, 2003a; Parker and Dodd 2004). The location of this pit, which lies less than half a meter from the oven excavated in trench F4, and its elevation, which corresponds directly to the same oven, strongly support this hypothesis. The fact that both the F4 oven and the F1 ash pit are dug into virgin soil further strengthens this argument.

During excavation surface L1117 extended east at a 35- to 40-degree downward slope before ending abruptly just short of the southeast corner of the pit. Examination of the south baulk profile suggests that this surface may have abutted the top of the pit, although poor preservation on the surface's eastern edge (perhaps due to activities around the oven) make a direct connection between these features tentative. Likewise, none of the surfaces, pit or oven were found to be directly connected with the only mud brick wall to be uncovered at the very base of the trench. This wall (L1123), composed of a single course of seven to eight bricks bonded by mud plaster mortar, emerged perpendicular

from the north baulk and continued south for approximately 3 meters, terminating before reaching the compacted pebble surfaces along the southern baulk. Despite the fact that no physical connection between these features was detected archaeologically, we believe that this wall, along with the adjacent surfaces and pit, and the oven in the neighboring trench, are all depositionally associated.

The completion of excavations in trench F1 has helped to clarify the chronology of occupation in the lower town by providing a full stratigraphic sequence for the Late Chalcolithic period (LC 3-5; 3600-3100 B.C. [Rothman 2001]) as reflected in a single composite section drawing of the eastern baulk (figure 8). As discussed in greater detail elsewhere,[9] the Late Chalcolithic in Area F has been subdivided into seven stratigraphic phases (LC Levels 1-7), which can be briefly annotated here:

LC Level 1: Intrusive pit burials dating anywhere between the Early Bronze Age and Islamic Period.

LC Level 2: Cobblestone surfaces (F1, F2, F7), small ovens (F2, F8), and stone installations (F8).

LC Level 3: Round pits (F7 and F8), mud brick wall (F7), ash deposits (F9) and fill layers (F1).

LC Level 4: Debris from collapsed wall (F1 [Parker *et al.* 2003a, 2003b]) atop thin burn layer.

LC Level 5: Mud brick walls with associated earthen and cobblestone surfaces (F1).

LC Level 6: Cultural debris from pits and large oven (F4).

LC Level 7: Mud brick lined oven (F4).[10]

The compacted pebble surfaces excavated in the 2004 season correspond to the bottom of Level 5 and the whole of Level 6 (previously only recorded in trench F4). If we accept that pit L1130 in the southeast corner of F1 is associated with the oven from F4, or even if it is a separate installation in and of itself, then Level 7 is also present in trench F1. These data suggest that, unlike trench F4 where Levels 1 through 5 were removed as eroded slope deposits, trench F1 contains stratified excavation of all seven levels (figure 5). This trench will thus give vital insight into long-term occupation in this area over the entire latter half of the fourth millennium B.C. The association between the lowest levels of trenches F1 and F4 is also important for identifying activities that were carried out around the oven in F4. The compacted pebble surfaces excavated at the bottom of F1 are the first definitive domestic contexts to be tentatively associated with the oven (L4009, L4027) in F4. Furthermore, the fact that there are several superimposed layers that were

[9] See "Area F" in Parker *et al.* 2003a. Adjustments to Levels 4-7 are in Parker and Dodd 2005. An in depth analysis of the stratigraphic sequence will be published by A. Creekmore in a final report of these data that is currently in preparation.

[10] 2-sigma calibrated carbon dates taken from inside this feature are: 3350-2910 Cal BC (KT4061), 3360-3030 Cal BC (KT4157), 3630-3570 Cal BC (KT 4229) and 3660-3620 Cal BC (KT4253 [see Table 2 in Parker *et al.* 2003a]).

uncovered in 2004 and 2002 in trench F1 suggests ongoing use of this area. We anticipate further evidence to be drawn from other trenches in Area F, namely F2, F7, and F9, whose continued excavation will hopefully give us comparative results.

The lowest levels of trench F1 yielded local Anatolian Late Chalcolithic ceramics that complement the corpus previously excavated in this and surrounding trenches (see Parker *et al.* 2002a, 2002b, 2003a, 2003b; Parker and Dodd 2005 for reports on trenches F4 and F5). Common among this corpus are medium to large open bowls with plain rims (figure 9 J and M-S), hemispherical or carinated cups with rounded bead rims (figure 9 F, H, I, K and L), globular pots with everted rims (figure 9 B), necked jars with everted rims and round or oval bodies (figure 9 C and G), and several hammerhead-like bowls (figure 10 A-F).

Most of the ceramics in the Late Chalcolithic corpus are chaff tempered with fine micaceous and calcareous grit. Surfaces are often a buff, although some examples are chaff-faced (figure 9 A; figure 10 B, F). Both horizontal and vertical burnishing are common on exterior surfaces and occasionally this type of surface treatment is evident on interior surfaces, especially on open forms. Slip, wash and other surface treatments are rare. These data agree well with preliminary assessments of the Late Chalcolithic ceramics from other Area F trenches where only a few painted and reserve slip examples have been recorded to date. It should also be noted that there is a direct correspondence between the ceramics recovered in the lowest levels of trench F1 during the 2004 field season and those previously excavated from Levels 6 and 7 in trench F4 (Parker *et al.* 2003a: figure 12).

During the 2004 field season a group of ceramics was also recovered from contexts outside of Area F. In trench D9 an oven (L8) and adjacent fill (L20) provided a small cross-section of local Anatolian Late Chalcolithic diagnostic forms that are typologically similar to forms found in Area F. These include flat bases with grit and medium chaff tempers (figure 11 A, D, E and G), hemispherical and/or carinated bowls with rounded beaded rim (figure 11 F, G and L), simple-rimmed jars (figure 12 I-K), hammerhead-like bowls (figure 12 B, C and D), and incurved rim bowls and cooking pots (figure 11 I; figure 12 A). A straight spout example from trench D9 (figure 11 B) is similar to spouts on vessels from Hassek (Hoh 1981: Abb. 10: 1, 2, Abb. 22: 4, 5). A full profile example of a triangular shaped bowl with string cut base and heavy wheel striations recovered from the baulk inside the Late Chalcolithic oven in Trench D9 is closely paralleled at Hacınebi (Stein *et al.* 1996: figure 22 G).

The ceramics recovered from Levels 5-7 in trench F1 and the Late Chalcolithic examples from L8 and L20 in trench D9 have parallels at several sites including: Arslantepe VII (Frangipane 2000: figure 2: 6, 14, 26; figure 3: 6), Hacınebi A and B1 (Pearce 2000: figures. 3 a, d, figure 5 c, figure 7 b, e, i, figure 8 b, c, figure 9 a, e; Stein *et al.* 1996 figure 22 g), Hamman et-Turkman Period V A and B (Akkermans 1988a: Pl. 99: 20, 26, Pl. 100: 30, 37, Pl. 101: 43, Pl. 103: 68, Pl. 104: 79, Pl. 107: 97, 98), Hassek Late Chalcolithic levels (Hoh 1981: Abb. 8: 10, Abb. 9: 6, Abb. 10: 1, 2, Abb. 11: 5, 2, Abb. 17: 1, Abb. 22: 4, 5; Hoh 1984: Abb. 13: 9, Abb. 10: 6, 9), Korucutepe Phases A-B, strata I-XXIX and XXX-XLIV (Brandt 1978: Pl. 103: 14, 21, 22), Kurban VI (Algaze 1990:

Ware Group I: Pls. 17: J, 18: E, 20: I, 21: G; Ware Group II: Pls. 28: E, 29: E, 31: D, J, 37: E, I), and Leilan V (Schwartz 1988: Figure 57: 1, 2; Fig 58: 1, 8, 10, 12; Fig 61: 2).

Area I Trench 2

In an effort to determine the overall size of the Ubaid and Late Chalcolithic occupations that may lie beneath the main mound at Kenan Tepe, UTARP team members opened a 4 x 1 meter exploratory trench on the southern slopes of Kenan Tepe's main mound (figure 2). This trench was excavated in two steps. The first consisted of the northern 2 meters of the trench and the second consisted of the southern 2 meters of the trench. Both of these steps were excavated to approximately 2 meters below ground surface and later a 1 x 1 meter sounding was excavated in the first step another 2.5 meters. The data from this trench consisted almost entirely of ceramic material belonging to the early second millennium. No Ubaid or Late Chalcolithic ceramics were found and surprisingly little evidence of architecture was uncovered. These data show that the Ubaid and Late Chalcolithic settlements do not extend under Kenan Tepe's main mound. This combined with other data gathered over several seasons of field research at the site suggest that the Ubaid settlement is restricted to an area of no more that 1 ha. on the eastern slopes of Kenan Tepe's main mound – what was at the time a low natural hill. Although this site expanded considerably in the Late Chalcolithic period when occupation spread into the lower town, we have no evidence that this expansion included either the southern slopes of the main mound or the terraces south of the site.

The Ubaid Ceramics

This section focuses on the results of research on the Ubaid period ceramic assemblage unearthed at Kenan Tepe. It includes ceramics that were studied by Lynn Dodd and Bradley Parker during the 2003 study season and the 2004 excavation season, with some reference to recently excavated material where required for clarity or adequate characterization of the assemblage. This section has two goals. The first is to provide an overview of the typological categories used in the analysis of the Ubaid ceramics at Kenan Tepe.[11] The second is to situate Kenan Tepe's Ubaid ceramic corpus relative to other Ubaid period sites, especially those located to the southeast and southwest.[12] Ceramic research during the 2003 and 2004 field seasons aimed at capturing preliminary ceramic distribution and characterization information from all key excavated loci in order to refine our understanding of the assemblage which was preliminarily described in 2001

11 For the 2003 study season UTARP team member Peter Cobb designed a new pottery-reading data-entry front-end for the UTARP Information System (UIS) database. This greatly facilitated typological categorization of the ceramics. Improvements were also made to this data entry tool for the 2004 excavation season. Peter Cobb also designed a data-entry front-end for our typology recording system. For a preliminary discussion of the UIS database, see Parker et al. 2003a:143-5.

[12] Due to the expansion of Ubaid exposures in the 2005 excavation season, future reports will have the benefit of a much larger sample. Future reports will address the relationship of Kenan Tepe's ceramic corpus to other known Ubaid sites, including those to the north, which are not included in this report.

and 2002 on the basis of restricted horizontal exposures and a sounding (Parker and Dodd 2004; Dodd *et al.* 2005).[13] We especially hoped to define variation within and the distribution of vessel shapes which we believe may fall into functional categories. These categories include jars with necks and open deep basins (possibly used for storage or mixing); jars with wide mouths, short rims and occasional lugs (which might be interpreted as cooking pots); bowls, cups and deep platters (which might have been used for serving and eating).

The three broad type characterization (TC) categories (vessel shape, surface treatment and fabric) tracked in the UTARP Information System database (UIS) are described and illustrated in this section.[14] A special emphasis is placed on the ceramics excavated in trenches D5 and E2 (above).

Fabrics

All four of the fabric groups identified in our earlier report (Parker and Dodd 2005:72) were found to be present in the ceramics examined during the 2003 and 2004 field seasons. For the purpose of analysis and tracking, these four fabric groups have been designated Kenan Tepe fabric type characteristics 91 through 94 (TC 91-94).

The first and roughest quality fabric is fabric type characteristic 91. Fabric TC 91 is a poor quality, relatively low-fired fabric and temper combination that we refer to as "Ubaid rough ware." Ubaid rough ware has large chaff and some calcareous grit temper and breaks in a very angular fashion. Occasionally pebble-sized temper is visible. Sherds of this fabric usually have a black core.

Although not as rough as fabric TC 91, Kenan Tepe fabric type characteristic 92, what we refer to as "Ubaid course ware" is also fairly rough. Normally, fabric TC 92 has fine grit and medium to large chaff temper. Brown fabric colors predominate. Fabric TC 92 is often burnished on the exterior and frequently has fire marks. We hypothesize that fabric TC 92 was primarily used to construct vessels for cooking and heating.

Two fine ware fabrics have been identified in the Kenan Tepe corpus. The first is Kenan Tepe fabric type characteristic 93. Fabric TC 93, referred to as "Ubaid medium ware," generally has fine grit and medium to large chaff temper. Some vessels are chaff impressed. Thicker regions may have a black core. The fabric is usually fairly well-levigated and compact and exhibits straight, small grained breaks. This is a distinct

[13] Key loci vary in definition, but generally speaking a key locus is a secure or sealed context, ideally from a primary deposit. Material from key loci is selected for closer analysis, drawing and photography during ceramic processing. Since some of the material analyzed during the 2004 excavation season remained to be drawn and photographed during the 2005 season, a number of the conclusions outlined here should be considered preliminary until such time as additional research can be completed.

[14] We have discussed our ceramic terminology elsewhere (Parker and Dodd 2003). For the sake of clarity we will briefly repeat those definitions here. Three attribute sets are being tracked during the analysis of the ceramics from Kenan Tepe. These include: surface treatment, form, and fabric. We refer to these attribute sets as type characteristics (TC). By surface treatment we mean any purposeful manipulation of the surface of a vessel including slip, wash, paint, incisions, impressions, smoothing, burnishing, or plastic applications. Form refers to a vessel's physical shape. Fabric is an aggregate term used to describe the texture, color and treatment of the material from which a vessel was made.

difference in comparison with fabric TC 93 and fabric TC 94, which exhibit much more angular breaks. There are occasional examples that have inclusions of pebble-sized grit but this is an exception to the general character of the fabric (see figure 17 B). A range of vessels from very large jars to small cups have been recorded in fabric TC 93 although the predominant vessel forms are open bowls and platters, incurved rim bowls, and angled rim jars.[15]

The finest fabric identified in the Kenan Tepe corpus is fabric type characteristic 94. Fabric TC 94 is referred to in the Kenan Tepe typology as "Ubaid fine ware." This fabric normally has fine calcareous grit and fine to medium chaff temper, is low to medium fired and exhibits straight fine grained breaks. Normally no black core is evident. This fabric is most frequently used to construct small bowls and cups and occasionally small, fine jars.

In functional terms, the four fabrics may be more conveniently summarized as comprising two broader groups based on the vessel shapes in which they are found. The two rougher fabrics (fabric type characteristics 91 and 92) constitute one group and the two finer fabrics (fabric type characteristics 93 and 94) constitute the other group. Almost without exception, the fine flared rim cups, open deep bowls, and incurved rim bowls are composed of one of the two finer fabrics (fabric TC 93 and 94). Almost without exception, the globular jars with small tapering rims and everted rim jars are composed of the two rougher fabrics (fabric TC 91 and 92). Fine ware fabrics were generally used to construct what we refer to as angled rim jars (figure 13 C and E; figure 17 H and G) and open serving vessels while the coarser fabrics were used for vessels whose mouths are smaller than their bodies' widest point but which do not have angled rims. Blackening is most frequently found on vessels made of fabric TC 91 and TC 92. Blackened examples of vessels made of the two finer fabrics (fabrics TC 93 and TC 94) have yet to be found. These data suggest that vessels made of fine fabrics (fabric TC 91 and TC 92) were used for serving and display while those made of rough wares (fabric TC 93 and TC 94) were used in the context of cooking or heating or were exposed to smoke blackening for some other reason (for example, figure 19 E is blackened on the interior).

The only Ubaid period overfired sherds or wasters found at Kenan Tepe thus far are composed of fine fabrics (see for example figure 19 A). There are no examples of overfired sherds or wasters among the two coarser fabrics. One explanation for the lack of coarse wasters is that the two coarser fabrics were not manufactured on or near the excavated contexts. Alternatively, they may have been fired with better heat control. In either case, the presence of fine fabric wasters suggests that small-scale pottery making was carried out in or around the Ubaid period structures and outside surfaces excavated at Kenan Tepe. Only one overfired sherd was painted, suggesting that domestic craft

[15] An instance of a large jar fashioned of fabric TC 93 is D.8.89.4.1, which has an everted rim and a diameter that is among the largest of Kenan Tepe's jars at 46 cm. Another large jar with fabric TC 93 is illustrated on figure 13 C.

production may have focused on unpainted vessels (bowls and medium jars) made of the two finer fabrics.[16]

The character of Ubaid kiln structures is known from sites such as Tell Abada (Jasim 1985:53) and Tell al-'Abr (Hammade and Yamazaki 1995:7) where industrial-scale pottery production was carried out. However, other pot-firing certainly took place on a smaller scale in domestic contexts. Firing may occur in a pit with a temporary cap under which both the fuel and the pots are placed. Such an installation would leave few traces, aside from a pit with ash debris in and around it and wasters from misfired or overfired pots. These tell-tale signs were used to infer the presence of large pottery kiln sites at al-'Ubaid and Eridu even in the absence of excavated kiln structures (Moore 2002). A candidate for such a small-scale, and possibly domestic, firing installation at Kenan Tepe was excavated in trench D8. A pit (D8 L58) was associated with a surface (D8 L52) on which several broken *in situ* pots were discovered. Warped, misfired pot sherds made of fabric TC 93 (D8.58.1.1 for example) were found in the pit and a cone of ash extended from it.

Vessel Forms

Form refers to the vessel's physical shape and we will use the terms form and shape interchangeably. This type characteristic set is often defined by a specific or unusual trait such as a carination or a particular rim shape. The most common Ubaid shapes are flaring rim cups and small bowls, deep platters, deep bowls or open basin jars, angled rim jars, and globular body jars that occur in various fabrics, with various surface treatments and in various sizes. A summary of the most common shapes follows.

Shape TC 91 is a hole-mouth deep bowl or jar (figure 22 C). The rim is often beveled so that it slants toward the inside of the vessel. Alternatively, the rim may be articulated with a slight beading or tiny lip on its exterior side.

Shape TC 92 (figure 13 B and D; figure 20 A, C and E) is a round or ovoid pot or jar whose body may be globular or bag-shaped and which has a short everted rim that is often pinched and tapering. The rim is usually not set at a defined angle to the body but curves outward without a sharp angle. The rim finishing can be slightly uneven, perhaps due to the handmade finishing of a fairly coarse fabric. This form has been recorded in a range of vessel sizes. Many of the pots in this category are fashioned of the rougher fabrics. Some examples are burnished and a number of examples are blackened. Two examples have unpierced lugs attached to the body of the vessel. A single very small jar at Kenan Tepe is painted (figure 14 E). No incised shape TC 92 jars have been recorded.

Shape TC 93 (figure 14 E; figure 17 G, H and I; figure 20 D) is a jar whose rim has a sharper angle of connection to the body of the pot than is the case for shape TC 92. We use the term angled rim jar as a convenient means of distinguishing shape TC 93 jars from shape TC 92 jars because these jars generally have a more elongated rim that is connected to the shoulder at a more acute angle. They also generally have more sharply

[16] Examples include an overfired vessel D8.58.1.2 and a vitrified vessel E2.18.3.1 (not illustrated).

articulated rim/neck joins than do the shape TC 92 jars. No entire profile of a shape TC 93 jar has yet been reconstructed, but it is likely that these ovoid pots have flat or possibly slightly rounded bases. The distance between shoulder and lip of the rim usually is between 3 and 8 cm. Unlike shape TC 92 jars, angled rim jars tend to be made from the two finer fabrics. None of the shape TC 93 vessels recorded have blackened surfaces, although some are painted. Painted designs on these jars tend to be horizontal bands around the rim, neck and shoulder. Occasionally, where the body is preserved there may also be bands around the body and looping lines often appear (small or large) as an added motif.

Shape TC 94 includes a range of hemispherical open bowls or cups whose sides do not curve inward at the rim (figure 15 F, G and H; figure 16 A, B and D; figure 18 E-I).

Shape TC 95 is an open jar or deep basin jar (figure 22 H). This shape type characteristic is usually identified by the presence of a sharply-everted, horizontal rim that is occasionally rounded or pinched. The body wall descends at a near vertical angle immediately below the rim. Since no complete profiles have yet been reconstructed, we are not sure what base shape is associated with these vessels. At Ziyadeh similar forms, which are referred to as "ledge-rim basins," occur throughout the Ubaid 4 sequence (Arzt 2001:116). Deep open jars or basins also occur at Tepe Gawra in XIIA and XII (Tobler 1950). No directly comparable examples are published from Hammam et-Turkman. Tell Abada has variants of this form throughout its Ubaid 1-3 sequence. Clear parallels also exist at Tell Madhur (Roaf 1989:110).

Shape TC 96 (figure 22 F) is a shallow open bowl. Normally this shape is wider than it is deep. Shape TC 96 is less often painted than is the case with other bowls. Instead this shape type characteristic often exhibits scraping on the exterior surface (figure 22 F). This surface treatment is also known from Levels 2 and 3 at Tell al-'Abr, where scraped bottoms appear on open bowls, inturned and hole-mouth bowls, and deep bowls (Hammade and Yamazaki 1995:5). Examples at Kenan Tepe that exhibit this surface treatment include inturned bowls and and holemouth pots (figure 22 A and C).

Shape TC 97 designates a vessel base that is either flat (figure 14 H) or slightly rounded (figure 14 I).

A few ring bases have been identified in the Ubaid levels at Kenan Tepe (figure 22 D). This shape has been designated shape type characteristc 98. At Ziyadeh only three ring bases were found in levels 13, 14, and 16. At Tepe Gawra, ring bases occur first in level XIII and become more common in levels XIIA and XII (Tobler 1950: 140, 146, #106). Ring bases infrequently appear in the Hammam IV sequence (Akkermans 1988b: 118) and occur more often in Tell al-'Abr (Hammade and Koike 1992). A raised base attributed to the Ubaid 2/3 phase was found in Tell Songor C. This base supported a cup with a triangle motif at the rim and horizontal stripes around the body (Fujii 1981; Jasim 1985: figure 285:6). The Tell Songor example has a very similar decorative motif to a cup with no preserved base that was found at Kenan Tepe in pit D8.58 (sherd D.8.58.8.7). It should also be noted that at Tell Madhur each size-category of bowls included one bowl set atop a ring base (Roaf 1989).

Shape TC 99 is an incurving rim bowl (figure 18 C; figure 22 A).

Shape TC 101 is a tripod base (figure 22 E). This base is not a base, *per se*, but actually is a collection of three individually attached legs. The single example found at Kenan Tepe supports a bowl that was associated with a burial. In this case, the vessel and its legs are still attached. Because such bases are made of individual tapering legs that attach separately to the bottom of the vessel, it is possible that other examples have not been recognized because the legs and the vessel have become detached. None of the other examples of this bowl shape thus far analyzed have legs or leg attachment scars. Possible vessel legs were identified at Ziyadeh, but there too their occurrence is rare (Arzt 2001).

In summary, two different shapes of closed vessels are common in the Ubaid levels at Kenan Tepe. The first category of jars has a tendency toward taller rims that join the body at a defined angle (figure 17 H). Shape TC 93 jars are made in fine and medium fabrics (fabric TC 93 and TC 94). The second category of closed vessels is globular jars (shape TC 92). Rim heights, jar size, and degrees of rim eversion vary. Most of these jars have a bag or globular body shape (for the range, see figure 14 E and I; figure 18 B; figure 20 A). There are four common open shapes in Kenan Tepe's Ubaid levels. These are a wide shallow bowl that sometimes has a scraped exterior (figure 18 D; figure 19 N); a category of bowls that subsumes bell-shaped cups (figure 15 F, G and H; figure 18 E, F and G), small open bowls (figure 15 A-E; figure 16 A, B and D) and deep open basins or deep bowl-like jars (figure 22 H). Lenticular jars, which are characteristic of Ubaid 3 assemblages, have not been found at Kenan Tepe.

Surface Treatments

During the 2003 and 2004 field seasons, decorative treatments were categorized in the Kenan Tepe ceramic typology in the following ways: incised designs were designated surface treatment TC 90; bichrome painted designs were designated surface treatment TC 91; burnishing was designated surface treatment TC 92; paint on a slip-covered fabric was designated surface treatment TC 93; and paint on an untreated fabric was designated surface treatment TC 94.

Surface treatment TC 90 (incised designs) is not common in the Kenan Tepe corpus. Nevertheless, three kinds of incised designs are so far attested. In the first case, circular incisions were made by dragging a reed or similar plant-sourced tool around a vessel prior to firing so that the incision itself is marked by striations left by the reed or plant fibers (figure 19 E). In the second case a multiple line comb like incision was etched into the vessel exterior before firing (figure 13 F; figure 19 E). The third incising technique is dimpling (not illustrated). Dimpling is created by using the end of a thin object, such as a reed, to make oblique punctures in the surface of a vessel prior to firing (figure 19 I). Decorative treatments such as these appear at most late Ubaid sites where vessels bearing this type of surface treatment are classified as either incised or impressed wares. However, the practice of incising vessels was much more common in southern and central Ubaid sites. It appears that the potters at Kenan Tepe may have been familiar with the practice of surface texturing but were not inclined to invest the more considerable labor that would be required to achieve some of the more elaborate surface effects that are known at other sites such as Tell Abada (Jasim 1985: plate 9b); Hammam et-Turkman

(Akkermans 1988a; 1988b), Tepe Gawra (Tobler 1950; Rothman 2002; Rothman and Blackman 2003) and Tell Madhur (Roaf 1989). At Tell Madhur necked jars were often incised. At Kenan Tepe, most of the incised sherds belong to angled rim jars (figure 19 E and K; figure 13 F). It is noteworthy that the particular realizations of textured surfaces that were used at Kenan Tepe require the least sophisticated tool repertoire of all the impressed or incised pottery known in the Ubaid (compare with examples shown in Rothman and Blackman 2003).

Bichrome decoration (surface treatment type characteristic 91) is extremely rare in the sample analyzed thus far at Kenan Tepe. In figure 19 A, the undulating line is executed in a redder paint than the horizontal bands. The contrast between colors is not dramatic so that it is possible that this could have been a firing effect rather than a difference in chemical composition of the paints. If this is true, then the bichrome effect on the sherd described above is the result of firing a single paint that was applied with variation in either brush stroke breadth, weight of stroke, or paint thickness, which led to different hues during a single firing.

Burnishing (surface treatment type characteristic 92) is normally somewhat patchy and it is more common for burnishing to occur on fabric TC 91 and fabric TC 92 (the coarser fabrics) than on fabric TC 93 and fabric TC 94 (the finer fabrics). There are very few instances when careful burnishing has been applied to an Ubaid vessel at Kenan Tepe. One of the more carefully burnished vessels is the black tripod-base bowl described above (figure 22 E). Otherwise, the rare exceptions of a fine burnish are body sherds slipped in a red color.

A handful of red-slipped and burnished sherds have been discovered at Kenan Tepe although they are extremely rare. The few red-slipped and burnished sherds that have been recovered are small and extremely worn suggesting that these examples may originate in an earlier stratum (cf. Leenders 1989). Similar pottery is known from Gawra level XIII (#185 [brown fabric with red burnished slip]), Brak (Oates 1987: 170) and at Choga Mami and Ras al Amiya. At these last two sites the chaff tempered fabric is red slipped on both the exterior and interior surfaces and many examples are burnished (Oates 1982:258; 1969:139; Stronach 1961:121-2). They are unusual in Hammam et-Turkman IV and occur in small numbers at Tell Ziyadeh throughout the sequence, increasing in level 13 and later (i.e. Late Ubaid [Arzt 2001:110]).

Surface treatment TC 93 designates paint applied on a light-colored slip. As research progressed, it became clear that there were very few instances when vessels were truly slipped prior to painting. Even when a thin, cream-colored layer was found on the exterior or interior surfaces of a darker-colored fabric, normally we could not be certain that the vessel was slipped (Arzt 2001). Differential firing conditions can cause a vessel to have cream-colored areas while other parts of the same vessel are another color, such as orange, grey-green, or red-brown. A jar sherd (not illustrated, D.10.6.1.4) has been fired in this manner, so that it appears to have a cream slipped beneath some portions of the painted motifs and is unslipped beneath other portions. At present, it is not possible to determine whether an intentional decorative effect was being sought, that is, whether the Ubaid potters were deliberately manipulating the surface colors through controlled firing.

Surface treatment TC 94 (paint on an untreated fabric) is the most common decorative technique in the sample excavated at Kenan Tepe thus far. It is achieved through the contrast between a dark paint and an orange, brown, gray, greenish, red or cream fabric onto which the paint is applied. Paint colors range from black (5Y 2.5/1) and dark grays (10YR 3/2; 10YR 4/1; 7.5YR 4/1) to purplish or reddish-browns (2.5YR 3/2; 5YR 4/4; 7.5YR 5/2; 7.5YR 5/3; 7.5YR 3/4; 7.5YR 3/2; 7.5R 3/1; 7.5R 3/2; 10R 3/2). The paint colors recorded at Kenan Tepe are similar to the range found at Tell Madhur (including black and sometimes brown or red). Overall, black and grey paints are the most common at Kenan Tepe. Red and purplish hues are more common from *Ubaid Structure 1* (trench D5). Whether this results from differential paint composition or different firing practices remains to be determined. Jasim (1985:160) suggests that red is an underfired version of black. If this is the case, then the potters at Kenan Tepe more frequently underfired their pots in the period when *Ubaid Structure 1* was occupied than they did in the subsequent strata.

There is far more unpainted pottery than painted pottery in the Ubaid levels at Kenan Tepe. Within certain vessel classes there is a greater likelihood of paint occurring (on bowls, for example), but overall painting is present only on a minority of vessels. At Tell Madhur, the excavator noted that shallow bowls and large deep bowls tend not to be painted (Roaf 1989:106). This is generally the case with vessels at Kenan Tepe, and most especially with the shallow bowls. At Tell Madhur the ratio of painted pottery to unpainted pottery is high; painted pottery comprises a smaller portion of the ceramic assemblage than is the case in earlier Ubaid sites (Roaf 1982; Moon and Roaf 1984). Note that at Hammam et-Turkman, a site which is as distant from the core Ubaid traditions in the south, as Kenan Tepe is, the proportion of painted pottery is small throughout the entire Ubaid sequence (Hammam et-Turkman IV A-D) and declines through time from a high of 17.6% to a low of 2.4% (Akkermans 1988b:112). At Tell al-'Abr, pottery from the later levels (levels 2 and 3) is plainer than earlier strata and forms show less variety (Hammade and Yamazaki 1995:5). Painted sherds are also in the minority at Warka in the post-Eridu Terminal Ubaid levels (Oates 1983:262). At Tell al-'Abr on the upper Euphrates, only 15% of the excavated Ubaid assemblage was painted. At Tepe Gawra, although most of the sherds that were kept by the excavators were painted (88%), Rothman's survey of whole vessels saved by the excavators showed that 88% were not painted (Rothman 2002:55). These data suggest that there is a general decline in the dominance of the painted ceramic tradition at the end of the Ubaid period. The percentage of painted pottery has not been quantified yet for Kenan Tepe but a qualitative impression based on our preliminary analysis indicates the painted component of the ceramic corpus is more significant at Kenan Tepe than at, for example, Hammam et-Turkman. In spite of this, painted pottery does not dominate the assemblage.

The clearest pattern noted between different classes of type characteristics at Kenan Tepe is the restriction of painted decoration to the two finest wares. No painted examples composed of fabrics TC 91 or TC 92 have yet been found. Instead, all painted decoration appears either on TC 91 (Ubaid medium ware) or TC 92 (Ubaid fine ware).

This is a point of contrast with some southern sites, such as Tell Madhur, where simple globular jars are sometimes painted (Roaf 1989:112).

The corpus of Ubaid period ceramics thus far excavated at Kenan Tepe is closely paralleled at Hammam et-Turkman level IV B and IV C. In particular, the decorative schemes on bowls and angled rim jars from Kenan Tepe and from Hammam et-Turkman IV C share a propensity for broadly executed designs and at both sites, solid black fields of paint are not common (Akkermans 1988b:117; figure 5: 57, 58). Other good comparisons with the Hammam et-Turkman level IV material include figure 4: 47, which is similar to an angled rim jar associated with *Ubaid Structure 1* (figure 17 H). An unpainted jar found at Hammam et-Turkman is directly paralleled by a very large, angled rim jar (diameter=46 cm), found at Kenan Tepe (figure 22 G). The fabric and shape of this vessel is also paralleled by smaller jars found at Hammam et-Turkman (such as Akkermans 1988b figure 10:154; diameter = 25 cm).

Decorative motifs exhibited on Ubaid ceramics excavated at Kenan Tepe fit well within the range of the late Ubaid decorative repertoire known from sites such as 'Oueili and Hammam et-Turkman. For example, figure 18 F is a small cup that is decorated with hatching like that found on a range of shapes at 'Oueili in level Obeid 4 (pottery number S.135 from Huot 1989:35 figure 17 for example). The color range of the paint is also similar to that found in Obeid level 4 at 'Oueili where purple-brown to deep black hard, matte paints are common (compare with descriptions in Huot 1989:36). The net or intersecting lines motif (figure 18 F) is paralleled by a cup from Hammam et-Turkman IVB, although greater control and precision in execution causes the space between the lines to be more regular on the Hammam et-Turkman example (Akkermans 1988b: figure 4:45). A larger bowl from Hammam et-Turkman level IVA (figure 2: 7) has the uneven spacing seen on the small Kenan Tepe cup.

A fairly common motif on jars from Kenan Tepe is horizontal bands and loose wavy lines that undulate near the rim. Examples of this motif are illustrated in figure 17 H and figure 22 B. This motif is paralleled by material from level IVB at Hammam et-Turkman (Akkermans 1988b: figure 4:47). Pendant loops hanging from a line at the rim are also a common decorative motif at Kenan Tepe, especially in bowls. This motif is also found at Ziyadeh in level 14 (Arzt 2001: figure 3-52), which is attributed to the LC 1 or "terminal Ubaid" period (equivalent to Hammam IVD [Akkermans 1988a]).

Decorative motifs that are not common in the sample excavated so far at Kenan Tepe include: dots in diamonds paralleled at Ziyadeh (Arzt 2001: level 4 figure 3-18 #7) and identified in the Mandali surveys (Oates 1968 plate IX: 19); stacked triangles (figure 18 I) paralleled at Ziyadeh in a context equivalent to Tepe Gawra XIII (Arzt 2001: level 5 see figure 3-24); opposing elongated triangles above multiple thin horizontal bands paralleled at Hammam et-Turkman in level IV C (Akkermans 1988b: figure 5:64); triangles with horizontal lines around the rims of cups (figure 21 C) known from Tell Songor C (Jasim 1985: figure 254: 6; cf. Fujii 1981) and Hammam et-Turkman level IVA (figure 2:7 and figure 2:19); undulating lines bounded by two thin horizontal bands set within two larger horizontal stripes (figure 19 A) paralleled at Hammam et-Turkman level IVD (Akkermans 1988b figure 6:75); triangles with hatching below the vessel neck

(figure 17 J) which occurs in Tepe Gawra XIIA; "x" shapes within a square void (figure 19 C) paralleled in level XII at Tepe Gawra (Tobler 1950: figure 246); and intersecting lines that form diamonds which are infilled with dots and bounded by a register of thin bands (figure 21 E) paralleled in level XII at Tepe Gawra (Tobler 1950: figure 269). Sprig ware has not been identified at Kenan Tepe, although a single sherd has a painted design that may be a more elaborate version of this motif (figure 21 A).

A jar at Madhur has a painted herringbone motif on its shoulder (Roaf 1989:115) and this same motif appears on a body sherd from Kenan Tepe (figure 19 F). Tell Kashkashok provides a parallel for the circular motif that resembles exaggerated caprid horns with a dot in the center of the unclosed double circle. This motif appears on a very thin-walled bowl at Tell Kashkashok (Cluzan *et al.* 1993:76), however its color and execution are similar to Kenan Tepe's late Ubaid example (figure 16 A). A middle Ubaid example is noted in Ziyadeh level 5, which is considered contemporary with Hammam IVC (Arzt 2001 figure 3-25 #117). This long-lived motif occurs also in Ziyadeh level 14 (equivalent to Hammam et-Turkman IVD or terminal Ubaid). The four best parallels for the Kenan Tepe example are from level 14 at Ziyadeh (Arzt 2001 figure 3-48 see #242-245). The negative circular motif (figure 16 F, G and H) was also found in Ziyadeh in level 14 (figure 3-47 #237).

At Hammam et-Turkman the painted pottery has clear connections to the Ubaid traditions, but the plain wares are unlike southern Ubaid plain wares (Akkermans 1988b). The opposite appears to be true at Kenan Tepe, where plain wares, such as unpainted cook pots and bowls, are similar to the plain wares found in more southerly sites like Madhur or Ziyadeh. However, unlike the sites in the Hamrin (Jasim 1985) or the southern alluvium (such as 'Ubaid, Eridu XII and later, Ras Al-Amiya, or 'Oueili) there are no bent clay nails (mullers), no stamp seals, and few clay balls found thus far in the excavations of the Ubaid levels at Kenan Tepe. The architectural features and the pottery assemblage anchor Kenan Tepe's relationship to traditions known at other sites, but with respect to the full range of small finds, the sample excavated thus far at Kenan Tepe is different in these respects. Like the situation at Hammam et-Turkman, we appear to be dealing with a subset of the total range of Ubaid material culture (Akkermans 1988b:112) and we might best characterize Kenan Tepe as a northern Ubaid-related site with late Ubaid-related pottery.

Discussion

During the 2003 and 2004 field seasons we made considerable progress in the characterization of Kenan Tepe's Ubaid period ceramic corpus. Although still preliminary, these data allow us to make some initial comparisons between Kenan Tepe and other Ubaid period sites.

The Ubaid corpus at Kenan Tepe shows the strongest affinities with Ziyadeh and Tepe Gawra. However, the parallels from Tepe Gawra include both Str. XIII and Str. XIIA and XII, a period that spans the end of the Ubaid and the earliest Chalcolithic (LC1), including a break in time between two occupations (Rothman 2001). There are also some parallels to what has been described as Ubaid 4 pottery. Ziyadeh's Ubaid 4

pottery is approximately similar to Gawra XIII, Leilan VIb, and Hammam et-Turkman IVC (Arzt 2001). Some motifs are similar between Gawra XIII and Kenan Tepe's Ubaid material, but the better correlation for Kenan Tepe's Ubaid corpus is with Ziyadeh level 14, Hammam et-Turkman IVD and Tepe Gawra XII, where numerous shapes and decorative motifs common at Kenan Tepe are represented. The ceramic assemblage at Kenan Tepe has a few similarities to examples known in Ubaid 3 tradition. A greater degree of similarity exists between Kenan Tepe and those sites with the latest Ubaid occupations, including Ubaid 4/Ubaid transitional such as Tell Ziyadeh levels 14 and higher, Hammam et-Turkman level IV, Tell Madhur, Tepe Gawra XII, XIIa (and to a much lesser extent XIII). These correlations suggest that Kenan Tepe's Ubaid period occupation dates to the end of the Ubaid sequence, including Terminal Ubaid/LC 1 (using Rothman's [2002:56] designations).

Many of these sites that show strong ceramic parallels with the Kenan Tepe corpus are dated somewhat later in absolute terms (see discussion of C14 dates in Parker and Dodd 2005:90). Abada II has yielded radiocarbon dates of 4670 +/-70 B.C. calibrated but stylistically it is attributed to the Ubaid 2-3 periods. Ziyadeh's phase III (immediately post-Ubaid) has yielded dates with a combined range of 4460 B.C. to 4330 B.C. (Wright and Rupley 2001:98). Tell Madhur produced dates of 4470 +/- 80 B.C. calibrated (Roaf 1982:43) and stylistically its pottery is attributed to the Ubaid 4 period. Kenan Tepe has produced dates of ca. 4650 B.C. calibrated (Parker and Dodd 2005:72). Stylistically its pottery is most strongly associated with Ubaid 4/5 or terminal Ubaid or LC1 period. Ubaid 4 dates from 'Oueili are between 5300 and 4600 calibrated B.C. (Valladas *et al.* 1996; Arzt 2001:108). Perhaps as the length of phases within the Ubaid period are discussed and revised, these discrepancies will be addressed.

Taken together with carbon dates, this preliminary analysis of the ceramic data from Kenan Tepe supports the hypothesis that Kenan Tepe was part of a settlement dispersal in the mid-fifth millennium B.C. At this time, people making Ubaid and Ubaid-related ceramics established small communities in Syria, southeastern Turkey, northern Iraq and Iran. This trend may also have seen the establishment of at least seventeen other very small (less than 3-4 ha.) village sites in the river valleys of the Upper Tigris, Garzan, Batman, and Cizre (Algaze *et al.* 1991) including Yenici Yani (Bernbeck, *et al.* 2004), Salat Tepe (Ökse 2004:635); Giricano (Schachner and Schachner 2003); Türbe Höyük (Velibeyoğlu *et al.* 2002: 838, figures 13-15), although in all of these cases the precise dating of these sites is not known. Other Anatolian sites that should be included in the larger network of Ubaid or Ubaid-related sites include Değirmentepe (Esin 1983; 1994), Norşuntepe and more than a dozen others (see Gürdil 2005:36-38).

Lithics

This section summarizes the results of research carried out on 581 chipped stone artifacts that were recovered from primary contexts during the 2004 field season. The majority of these artifacts (443) come from Ubaid contexts; the remainder are from Late Chalcolithic, Early Bronze Age and Middle Bronze Age contexts. Both flint and obsidian

were used as raw materials in all four of these periods. Artifacts made of obsidian comprise about 35% in the Ubaid levels and 28% in the other contexts. The types present are summarized in Table 1.

		Flint							Obsidian					
Area	Context	Cores and struck nodules	Flakes	Blades	Indet frags	Formal retouch	Hammerstones	**Total**	Cores	Blades	Flakes	indet	Formal retouch	**Total**
D	?	1	14	1	4			**21**	1	2	7			**10**
E	?	1	10	1	2	1		**15**	1	1	8			**10**
F	?	3	30		1	1		**36**			4		1	**5**
G	?							**0**			2			**2**
D	Chalco		11		3			**14**	1	2	3			**6**
D & E	E/MBA		5		2			**7**			2			**2**
Sub total non Ubaid		**5**	**70**	**2**	**12**	**2**		**93**	**3**	**5**	**26**		**1**	**35**
D	Ubaid	3	139		4	4		**150**		16	39	1	2	**58**
E	Ubaid	4	117	3	3	7		**134**	5	7	82			**94**
Total Ubaid		**7**	**256**	**3**	**7**	**11**		**284**	**5**	**23**	**121**	**1**	**2**	**150**

Table 1

Raw Materials

The inhabitants of Kenan Tepe used flint of various colors. Opaque matt flint of light-grey or grey-brown, which tends to become pinkish when heated, is most common. The occasional piece of more translucent flint is also present. To judge from the cortex most flint seems to have derived from river cobbles, although occasional pieces with fresher cortex were also noted. The majority if not all of the flint is likely to have been acquired locally.

Obsidian, on the other hand, does not occur locally, the nearest sources being at Bingol and Nemrut Dağ over 100 kilometres to the north or north east. Several pieces have remnants of the outer surface present suggesting that obsidian reached the site in a relatively unprepared state. When viewed under transmitted light a variety of colors are present: black and green predominate, accounting for 56% of the Ubaid sample and 36% of the sample from other periods. Some of the black obsidian is very coarse and thus may be from the outer part of the nodule. This observation is supported by the fact that about half of the pieces from the Ubaid levels in trench E2 have cortex on them. The remaining

8% of the sample includes transparent brown and grey colors and there are a few pieces of reddish obsidian. The green obsidian almost certainly originated from the peralkaline sources at Nemrut Dağ or Bingol, and it is probable that the black and translucent brown obsidians come from the calcalkaline source at Bingol (Healey 2000). This, however, needs to be confirmed through geochemical analysis.

Flint Technology

There are seven flint cores and struck nodules from Ubaid contexts and four from other contexts. None are particularly regularly worked and often amount to little more than struck or tested nodules. Part of the apparently non-systematic working of the cobbles may be due to the shape of the parent nodule and the stage of reduction when discarded, as some of the flakes have regular scarring patterns on their dorsal surfaces suggesting that more regular reduction was also practiced (Healey forthcoming).

The removals consist almost entirely of broad flakes and those of blade-like proportions are unusual. Only three true blades are present. Over 60% of the flakes are complete; they tend to be squat – the majority falling between 40 and 60 mm (39%) in length with 27% being longer than this and 31% between 20 and 30 mm. In the Ubaid levels over 42% have cortex on the dorsal surface. There is a slight difference in proportions of examples with cortex between areas D5 and E2: D5 having only 33.8% with cortex, whereas in trench E2, 52% of the flakes have cortex on them. A more detailed technological analysis will be carried out on the complete Ubaid assemblage. This will include material from other field seasons, but at this stage it may be worth noting that many of the flakes show resolved bulbs of percussion and ring cracks, both of which are indicative of hard hammer flaking.

Modification

Modified artifacts are rare accounting for just over 3% of the assemblage. The following types were present.

Type	Ubaid levels	LC, EB and MB
Glossed	4	
Piercers	2	1
Scrapers	2	
Denticulate		1
Worn edges	1	1
Other retouch	1	1
Hammerstones	1	1
Chopper	1	

Table 2

In addition several of the flakes have chipped edges, which, apart from one regularly flaked piece, is probably due to post-depositional damage rather than to use.

Glossed pieces. There are three blade-like pieces with gloss along one edge. These three examples are similar in overall shape (figure 23 A, B and C). In each case the distal end has been retouched and in two instances (figure 23 A and C) the proximal end has also been modified (one inversely). The gloss extends to the flake ridge on the dorsal surface and forms a narrower band on the bulbar face. The gloss does not extend for the entire length of the edge, stopping short of the proximal end, suggesting that the butt may have overlapped another element or have been encased in some sort of binding or haft. The fourth is a squat flake with a hinge fracture with gloss on the right edge (figure 23 D). Macroscopically visible gloss is often associated with cutting silica-rich vegetal material such as wheat, either as a sickle or in a threshing sledge. Although this is a like explanation for the presence of gloss, this theory needs to be verified through use-wear analysis.

Piercers. This is a heterogeneous group of objects consisting of pieces with retouch forming a point. The most pronounced point is on the side of a flake (figure 23 E). The point is off-set by retouch forming two opposed concave areas; the point itself has abrupt retouch. Two other examples (figure 23 F and G) are more blade-like and have retouch on their distal ends demarcating a point. A fourth artifact (figure 23 J) has minimal retouch forming a sharp spur (which could be fortuitous) and abrupt retouch along the left edge.

Scrapers and Denticulate. A large flake (figure 23 K) has abrupt retouch on its left side forming a convex and slightly denticulated edge. The rest of the flake is unworked. Figure 23 H is an end scraper with semi-abrupt retouch across its distal end and a straight contour. A third object has tentatively been included in this group. It is a fragment of a flake (D.9.16.2 #1 [not illustrated]) that has abrupt retouch around its perimeter, but forms an irregular shape. The denticulate (figure 23 I) is made of a fragment of a thick, cortical flake. The flake-scars are positioned adjacent to each other (i.e. they do not overlap as in scale-flaking) around approximately three-quarters of its circumference and form a denticulated edge.

Blades with worn edges. Fragments of two blades show a marked rounding on the edge. One (figure 23 L) is a fragment of a prismatic blade of brownish flint. The right edge is worn smooth, apparently from working some hard material as the edge is also chipped in some areas and not worn completely smooth. The other object (figure 23 M) has similar abrupt chipping and some rounding. Vertical striations across the thickness of the blade are visible on both pieces at 20x magnification.

Other retouch. One flake of blade-like proportions (figure 23 O) has abrupt retouch on its thicker, left edge as if forming a back; the right edge is convex in shape and has light chipping or retouch on in. A thick blade (figure 23 N) has minimal but regular light retouch on its left edge, which seems to be deliberate and so has been singled out from other pieces with chipped edges. Also included in this category is an unclassifiable fragment of a thick flake (E.2.22.4 #3 [not illustrated]), which has abrupt retouch on both sides and light minimal retouch or possibly damage on its considerably thinner distal end. Its superficial resemblance to deliberately retouched objects may be fortuitous as there are

many incipient cones of percussion on the surface of the flint suggesting that it may have been subjected to harsh treatment.

"Chopper". A thick flake of beige flint (not illustrated) has a bevelled right edge formed by some sort of percussive action or abrasion. The edge of the striking platform is also heavily abraded. Its function is unclear.

Hammerstones. Two cobbles have areas of abrasion on them, normally associated with hammerstones. One (E.2.25.7 #1 not illustrated) is an elongated cobble measuring some 65mm in length by 55mm in width. It is 50mm thick. This artifact is extensively abraded from some percussive action around most of the circumference and particularly so at the rounded ends. Part of the surface has some flake scars which may be an attempt to shape the object rather than indicative of use as a core. The other (E.2.22.2 #1 not illustrated) is fragmentary with abrasion on the outer rounded edge of the cobble. The rest is flaked but very unsystematically showing very short scars.

Obsidian

Obsidian is found in all contexts and accounts for 33% of the raw material represented in the sample with, as noted above, the majority coming from Ubaid contexts. It accounts for approximately 28% of the chipped stone artifacts from trench D5 and 62% from trench E2. Green obsidian is more ubiquitous in the D5 Ubaid contexts than it is in E2 Ubaid contexts where black obsidian accounts for 78% of the sample.

General Description. The artifacts of obsidian are mainly flakes, blades being relatively rare (15% of total) although they form a higher percentage in trench D5 (28%).[17] Whole blade cores are absent. The cores that have been recovered are small or fragmentary with flaking on all sides (figure 24 L and O). Other pieces show signs of having been struck on an anvil at least in their latter stages (i.e. with flake scars from opposing directions as in figure 24 J, K, M and N and are described as *piéces écaillé*). Sometimes it is difficult to distinguish between cores and flakes produced in this manner.

Over half of the obsidian flakes from trench E2 Ubaid contexts have some cortex on their dorsal surfaces whereas only three flakes from the trench D5 Ubaid contexts have cortex. The flakes from trench E2 are quite large measuring over 50mm in length (figure 24 P, Q and S) and one is an early stage flake some 60mm in length (figure 24 Q). The curvature of the cortical surface suggests that the nodule from which it was struck was at least 90mm in diameter.

Although several of the blades have light retouch along their edges examples from trench D5 (figure 24 C and G) are more deliberately retouched and slightly serrated. One thick blade-like piece (figure 24 E) has bifacial retouch along the right side forming a bevelled edge and inverse nibbling retouch on the other.

Blades with worn edges. A fragment of a prismatic blade of good quality green obsidian (figure 24 B) has one edge heavily worn or ground forming a bevel. Its ventral

[17] Blades and flakes are present in roughly equal proportions in the assemblage from D5 excavated up to 2002.

surface is also very scratched. Another blade, also of green obsidian (figure 24 A) has round or worn edges with vertical striations visible at x20 magnification.

Arrowheads. Two arrowheads were recovered. One is a small transverse arrowhead from trench F1 (Late Chalcolithic [figure 24 D]) made on a blade segment with its edges abruptly retouched. The other is a small stemmed or barbed arrowhead measuring 25 mm in length, 10 mm in width and 3.5 mm thick and weighing 2g (D.5.5190.27, figure 25) made from a piece of obsidian which appears to have cortex on both faces. It has been bifacially flaked over most of the surface forming a regular profile but leaving a small patch of cortex on both sides. The stem or barb is formed by a sharp angle on the lower third of the object.

Discussion

Chipped stone was found in most contexts, although in significant numbers only in the Ubaid levels. Thus the question of residuality, particularly in the Middle Bronze Age levels, must to be considered. The chipped stone assemblage provides conclusive evidence of stone working in the Ubaid and forms part of a growing body of evidence that chipped stone tools were a routine and necessary part of everyday life during the Ubaid period. The knapping is, however, expedient though the apparent crudity of the technology may have as much to do with the shape of the raw material as to the skill of the knapper. Obsidian was a numerically important raw material even though it had to be obtained from some distance away. There seems to be a difference in the way obsidian is used between areas D5 and E2, manifest in proportions present, color and technology. Obsidian also seems to have a significance for the Ubaid inhabitants of Kenan Tepe beyond the utilitarian, in that it is also made into bowls and beads (Parker and Dodd 2005: 72).

Remote Sensing Survey[18]

During the 2004 field season members of the Upper Tigris Archaeological Research Project (UTARP) began a remote sensing survey of Kenan Tepe.[19] The goals of this work were to evaluate the feasibility of conducting such a survey at the site, place remains discovered in excavation units into a broader context and guide placement of new trenches. We chose magnetometry because this method can quickly and inexpensively cover large areas and provide a good frame for additional remote sensing techniques such as resistivity. After collecting some initial sample data, we determined that the most efficient method for our purposes was to conduct our survey in 20 x 20 meter grids,

[18] The author would like to thank Drs. Geoff and Françoise Summers and the 2003 Kerkenes spring season team for training him in remote sensing, and for permitting him to use the Kerkenes lab at ODTU to reprocess the Kenan Tepe data with the latest software; Nurdan Çayırezmez for assistance in processing the data; Dr. Tim Matney and Ann Donkin for advice on data collection and processing methodologies and Dr. Roger Walker for advice on equipment maintenance. Of course, the author is singly responsible for the data collected, processed and presented here.

[19] We thank Hugh Elton and the staff of the British Institute of Archaeology at Ankara for generously loaning us their Fluxgate gradiometer.

collect eight samples per square meter, and walk in a zigzag pattern with 1-meter wide spacing between traverses.[20] In this first season of work, we collected data from three parts of the site: the northeastern part of the lower village (Area F [figure 2]), the summit of the tell (Areas A and B [figure 2]) and western slopes of the tell (Area C [figure 2]). Excluding grids repeated for test purposes, in total we collected 44 complete or partial grids, equivalent to approximately 1.76 hectares (figure 26).

Expectations

Magnetometry results are determined by the characteristics of the buried cultural remains, the soil, local geological conditions, data collection methodology, equipment, and data processing tools. For example, good results may be expected when stone architecture is close to the surface and its characteristics contrast with soil and geological conditions, or extensive burning magnetizes features (e.g., negative reading limestone walls contrasted with positive reading iron-rich soils, or high positive reading kilns; see for example the results from Titriş Höyük [Matney and Algaze 1995:36-37], Ziyaret Tepe [Matney and Rainville 2005:40-42, 65], Kerkenes [Summers and Summers 1998] and Al Rawda [Gondet and Castel 2004]). Yet, underlying geology, such as bedrock; site formation processes, such as burning; and modern features, including iron survey datums and irrigation pipes, also impact the data.[21] These factors must be considered when planning a remote sensing survey and interpreting the results.

In the lower village north and east of the tell (Areas F and G), excavations uncovered cobblestone surfaces, cobblestone features, small (ca. 1 meter diameter) clay ovens, simple pit burials, and thin mud brick walls without stone foundations within the first meter below the ground surface (Parker *et al.* 2003a). Given these characteristics, we did not expect to see unambiguous, clear results in the data from this area (i.e. complete architectural plans). Instead, we hoped to identify areas of intense burning, such as kilns or burned structures, or more substantial architecture than found in the excavations. In contrast, a sounding on the western slope of the tell, trench C5, revealed a large (at least 1 meter wide) mud brick wall just beneath the ground surface with deep foundations (Parker and Dodd 2005). From the small exposure, it was unclear if the wall was part of a building, or perhaps a retaining or defensive wall. We were optimistic that the wall's width and proximity to the ground surface would make it possible to trace this feature's extent with the magnetometry data. On the summit of the tell we expected mixed results. Here, trenches revealed fieldstone and mud brick features close to the surface, but they were cut by burials and some features graded into earlier remains due to erosion and rebuilding. Such tight layering and cutting of remains may make it difficult to trace architecture and features. Also, in several seasons of work on the tell, we traversed the

[20] For data collection we used a GeoScan FM-36 fluxgate gradiometer with "a nominal sensitivity of 0.1 nT at 10 samples/second" (Somers in Algaze et al. 1995:22-23). We processed and filtered all data with Geoplot 2.01 and 3.0 software.

[21] See for example the conditions and results at Ziyaret Tepe (Matney et al. 2003:198-200, 219-220) and at Kerkenes (http://www.metu.edu.tr/home/wwwkerk/kerk1/05remote/geophyss/index.html).

summit hundreds of times with wheelbarrows and vehicles and we stored our tools in this area. So much traffic no doubt deposited a fair amount of small nails or other metal pieces lost from tools. This metal debris, invisible but pressed into the surface of the site, may affect the clarity of the data in this area.

Collection conditions and geomorphology

During data collection, the weather was hot and dry.[22] Ground cover included sparse to thick dry grass, and prickly caper-bearing scrub brush.[23] Several soundings excavated between the 2000 and 2004 seasons, combined with eroded sections in the drainages to the north, east and south of the lower town, provide a profile of the geomorphology of Kenan Tepe. The archaeological deposits on the tell and the lower town overlay reddish brown clay with white, pebble-sized calcium carbonate inclusions[24] and layers of conglomerate deposited by ancient floods and shifts in the bed of the Tigris River.[25] The cultural deposits are between 3 and 4.5 meters thick between the tell and the eastern edge of the lower town, where the site is truncated by the Tigris, and at least twice as thick on the tell itself. Cultural deposits are thinner towards the northwestern part of the lower town, and in this area the sterile clay layers are missing. Here, archaeological remains lie directly on top of conglomerate.[26] In an exceptional case, cultural material in sounding G4 (figure 2) ended at fine greenish sand, perhaps marking the course of an ancient drainage. On the southern side of the tell (in Area I [figure 2]), soundings revealed over 4 meters of cultural material dating to the second millennium B.C. and later. We suspect that this material is accumulated erosion from the main mound but we cannot rule out the possibility that intact features exist in this area.

Results

Many potential features are visible in the data. In this report we focus on the features that are the most obvious and perhaps most significant. Additional processing using different filters and applications may reveal additional features.

Lower town

The most prominent features in the data from the lower town are the two long, dark (positive magnetic signal) linear features (figures 26 and 27). One begins in grid

[22] Data collection began by 6 am and continued until noon, sometimes continuing in the late afternoon. Fluctuations in the temperature over the course of the day required balancing the machine at least twice in the morning and again in the afternoon.

[23] We cleared the ground cover when it significantly interfered with our traverses but we did not completely scour the surface of all vegetation.

[24] Perhaps calcic xerosol? See Wilkinson 2004:29.

[25] Thanks to Professor Donald Sullivan for advice on the interpretation of Kenan Tepe geomorphology. For a summary of the sections and soundings, see Parker *et al.* 2003a:120-121.

[26] To determine the effect the conglomerate layers might have upon the magnetic signals in the lower town, we held the balanced gradiometer in proper orientation next to exposed conglomerate sections in the northern drainage. This test produced no notable readings; if anything, the readings taken on conglomerate were consistently negative (low magnetic signal).

block n630, e595 and continues southeast into block n590, e675.[27] The other one begins in n630, e675 and runs northeast to n690, e715. Modern plow scars appear as a loop and a zigzag which cross the second feature two times.[28] For the features themselves, there is no evidence of any modern disturbance or activity that could be responsible for their creation. A third linear feature appears to articulate with the first feature in block n650, e575, continue southeast to block n630, e635, with another linear feature branching north in the southeast corner of block n650, e615.

The most obvious interpretation for these linear features is that they are paths or streets whose black, positive reading derives from a paving of potsherds and/or the concentration of accumulated garbage consisting of pottery, ash and organic material. Alternatively, these features may derive from geological or geomorphological conditions. The latter interpretation for the first linear feature is strengthened when the remote sensing data is laid over the topographic map and we see that this feature leads directly to a drainage or gulley (figures 26 and 27). Perhaps the signals of this feature emanate from garbage that accumulated in a developing drainage due to erosion of the main mound and the lower town. Notably, excavation of trench F6 (figure 2) and inspection of the eastern slopes of Area H indicate that the gulley formed after the Late Chalcolithic settlement began in this area.

The data from Area F also reveal an intriguing square feature whose center point is located just northeast of the intersection at block n690, e735 (figures 26 and 27). This feature is oriented northeast to southwest, and measures roughly 20 meters on a side. It appears as a faint, white, negative signal and is characteristic of a thin feature made from low metallic stones like limestone. If the second linear feature is a path or street, then it leads right up to the western side of the square feature. Notably, the interior of the square feature is relatively quiet in terms of its signals. Its interior is mostly gray in the data, having a relatively neutral metallic charge when compared with the many dark black and light white readings that give a mottled appearance throughout the lower town. Another quiet space is located in the transition from grids n630, e655 to n650, e655. Plow scars obscure the eastern side of this quiet area, while its southern border is a dark linear feature and its western edge is a diagonal light linear feature. Perhaps this quiet spot is the location of another large square feature like that in the northeastern part of Area F.

Western slope of the tell

A strong bipolar (positive and negative) reading linear feature shows up in the data on the western slopes of the tell (figures 26 and 27). This feature begins in the northwest corner of grid n590, e495 and continues southwest across grid n590, e475 before disappearing into test trench C5. The feature is bisected east–west by two thin white lines that derive from the modern dirt road on the site. We know from trench C5

[27] For clarity and convenience, here we list only the last three digits of the actual coordinates, which run to six or seven digits (e.g. n4188565.691, e659570.83). Grid blocks are referred to by the coordinates of their southwest corner.

[28] Kenan Tepe is *not* used for farming and is not regularly plowed, but apparently some time in the not too distant past someone drove a plow in an irregular, wide loop across this area.

that this feature is a brick wall at least 1 meter wide preserved just below the ground surface. Curiously, the eastern side of this wall is packed with relatively pure clay, likely dug from a river or stream bed that nonetheless contains a few artifacts and some naturally occurring iron accretions. It is not clear why this feature gives a bipolar reading, but the contrast between the mudbricks and the clay fill to the east is probably causing this effect. The wall does not appear to corner anywhere within the data suggesting that unless it belongs to a very large building, it must be a retaining, terrace or circuit wall.

Ground truthing

Targeted excavations over features appearing in the remote sensing data are useful for assessing initial interpretations, guiding revised interpretations and evaluating the data collection methodology. When digging ground truthing trenches it is advisable to excavate perpendicular to the signal and at least 1 or 2 meters beyond the width of the signal to ensure you are crossing the feature with the trench. During the 2004 season, UTARP team members excavated three ground truthing trenches including: trench F18, crossing the northern part of the square feature in area F; trench G8, crossing the winding linear feature at n650, e625; and trench C6, crossing the northern end of the northeast to southwest linear feature that corresponds to a wall found previously in trench C5 (figures 2, 26 and 27). In each case, the trenches uncovered a feature that corresponded precisely to the feature in the remote sensing data. With that said, excepting the wall on the western slope of the main mound, the trenches did not answer all questions about interpretations of the data.

Trench F18. This trench is 1 meter east-west by 4 meters north-south, with southwest corner coordinates n698, e734 (figure 2 and 26). We dug this trench across the square feature identified in this area (figure 27). We began a topsoil locus (L1) that continued until we reached a surface (L2) and loose, reddish fill with white lime bits (L3). The surface was very compacted, being comprised of small cobblestones, pebbles and large Early Bronze Age jar pieces. We also found a complete sheep/goat mandible on the surface. In contrast, the northern 3 meters of the trench contained loose, reddish-brown soil with white lime inclusions. Such soil is characteristic of the sterile clay at the site but in L3 its looseness and rich Early Bronze Age artifacts indicate that it is redeposited material. This soil is also used for mud bricks; thus L3 may be eroded mudbrick walls or fill from earth moving activities. Surface L2 was about 10-15 centimeters thick and overlaid compact earth with some pebbles (L4) but nothing like the concentration of debris seen in L2.

We found surface L2 in exactly the spot where the remote sensing data showed a linear anomaly, and its north to south width matches that of the signal, but it hardly qualifies as a wall. Perhaps the remote sensing data derives from something buried deeper than the approximately 50 centimeters we were able to reach in this trench. Alternatively, L2 was compacted enough to register on the machine. How then do we explain its linear aspect? Perhaps L2 is a path, the foundation for an unpreserved mudbrick wall, or a drip line alongside a building with mudbrick walls. Now that we have confirmed its existence

and exact location, understanding this signal will require a wider east to west exposure that can follow the signal over its long axis.

Trench G8. This 1 meter east-west by 6 meter north-south trench is located in the heart of Area G, just north of sounding G4 and trench G6/7 in grid block n630, e615 (figures 2 and 26). We dug this trench across the linear feature that passes through this grid block (figure 27). We removed topsoil (L1) and immediately uncovered a loosly packed cobblestone surface (L2) covering a space about 1 x 1 meter exactly where the linear magnetic anomaly appeared. Yet the surface was not very substantial and it is unclear if it really follows the east-west path seen in the magnetic data or if we simply found part of a small surface fragment. We found a burial in the northern end of the trench. We removed L2 and excavated up to a meter below the ground surface without encountering any other features that could have caused the linear signal in the remote sensing data. Time did not permit expansion of the trench to the east or west to investigate the continuation of L2. The artifacts from this trench date to the late fourth or early third millennium B.C.

Trench C6. Trench C6 is 1 meter north-south by 10 meters east-west, located on the northwestern side of the tell where it begins to slope up from the valley to the top of the tell in grid blocks n590, e475 and e495 (figures 2 and 26). We dug this trench across the linear anomaly traced in figure 27. After removing topsoil and some fill in the eastern end of the trench, we identified a mudbrick wall made from a mix of grey, reddish brown and greenish bricks just like those in the wall found to the south in trench C5 in 2002. The wall runs southwest-northeast and contains "damp courses" of reeds or brush, evidenced by whitish reed impressions. We found these reeds in the eastern and western parts of the wall as exposed, and the reeds and brick seams consistently run southwest-northeast, confirming that we have not reached the western edge of the wall. We did uncover a significant seam about 3 meters from the western baulk but it seems that the wall continues west past this seam, as evidenced by continued bricks and reeds in appropriate orientation (not jumbled like collapse). We never found a clear western edge for the wall, and if this is accurate, then the wall is at least 6.5 meters wide. Instead of a western edge, the bricks continue down the hill towards the base of the main mound.

The eastern edge of the wall is clearly delineated by a large deposit of relatively pure clay like that found east of the wall in trench C5. As with the C5 clay, L5 contains small amounts of Early Bronze Age or Late Chalcolithic pottery, some animal bones and lithics. Local residents say that clay such as that found in L5 only occurs in a few places in the area, although it may derive from the Tigris River bed. Regardless, this clay was brought to the site for a special purpose – presumably to level the area and shore up the wall. If the wall connects to the one in C5, as it appears, then it may be a fortification wall, a terrace wall to prevent erosion, or a retaining wall for a massive filling operation.

CONCLUSION

Taken together the 2003 study season and the 2004 excavation season were a great success for the Upper Tigris Archaeological Research Project (UTARP). Research during the 2003 study season is not only paving the way for final publications of these data but it is also aiding us in focusing our future research agenda. The biggest success of the 2004 field season is the fact that we addressed and can now answer the research questions that we set out to explore at the beginning of the season. Combined this leads us to the following results:

Question 1:

What is the extent of Ubaid and Late Chalcolithic settlements at Kenan Tepe? And more specifically, does Ubaid and Late Chalcolithic occupation continue under Kenan Tepe's main mound?

In our previous reports we have suggested that Ubaid occupation at Kenan Tepe was probably restricted to the eastern portion of the main mound but left open the possibility that settlement from this early period stretched under the high mound. We also noted that Ubaid ceramics were discovered in a small exploratory trench at the southwestern edge of Area F (in trench F6 [figure 2]). We further suggested that settlement during the Late Chalcolithic period expanded into the lower town, but again, we left open the possibility that Late Chalcolithic remains were also buried under Kenan Tepe's main mound. An examination of the material from our original Area I sounding (trench I1 [figure 2]) in 2003 and the excavation of trench I2 in 2004 strongly support the theory that Kenan Tepe's Ubaid and Late Chalcolithic settlements *do not* continue under the Kenan Tepe's main mound. We can now much more confidently say that the Ubaid period site at Kenan Tepe is probably less than one hectare in total size and is restricted to the eastern slopes of Kenan Tepe's high mound. These findings are not a surprise. They are consistent both with Algaze's original assumptions based on his 1988, 1989 and 1990 surveys of the Tigris basin (Algaze 1989; Algaze *et al.* 1991) and with other surveys and excavations slightly further a field in northern Iraq (Akkermans 1989; Jasim 1985; Wilkinson and Tucker 1995, for example), and north Syria (Meijer 1986, for example) where Ubaid sites are usually not more than 2-3 hectares. What is surprising is the amount of erosional debris that has accumulated in this and in other parts of the site. Since most of this debris appears to belong to the early second millennium, one can only speculate how much of the second millennium site has been lost to natural processes.

We can also say with some confidence that the total size of Kenan Tepe's Late Chalcolithic settlement was considerably less than the site maximum of 4.4 hectares. Although Late Chalcolithic remains have been discovered on the eastern slopes of the high mound and in the bottom of our step trench, the only concrete evidence of Late Chalcolithic remains on other parts of Kenan Tepe's high mound date to the end of that sequence during the LC 5 period (Parker and Dodd 2005). Although the site does spread into the lower town much earlier (in the LC 4 period, see above) there is, as of yet, no evidence for LC 4 occupation on the western and southern portions of Kenan Tepe's main

mound. Although the nature of settlement between our Area F trenches and the main mound has yet to be fully explored, we suggest that occupation during the LC 4 period was concentrated between the eastern slopes of the high mound and the eastern portion of the lower town, an area of approximately 3 hectares.

Question 2:

What is the chronology of the Ubaid and Late Chalcolithic settlements? Is occupation at Kenan Tepe restricted to specific phases of these periods or is there a sequence of development at the site?

We explored the chronology of the Ubaid occupation at Kenan Tepe through processing of the ceramics from various areas (in 2003) and through the excavation of trenches D5 and E2 (in 2004). We found that in trench D5 there is a considerable amount of debris, including disarticulated remains of earlier surfaces and walls below the level of the Late Ubaid house we call *Ubaid Structure 1*. In fact, the construction of *Ubaid Structure 1* is likely responsible for this situation. The ceramics from both trench D5 and E2 are markedly different from the Late Ubaid material that we recovered from *Ubaid Structure 1* and we believe that these data reflect the material of an earlier phase of the Ubaid culture at Kenan Tepe. Thus the data suggest that the Ubaid settlement at Kenan Tepe *is not* restricted to a single phase of the Late Ubaid period but rather that the development of this settlement took place over considerable time.

Research during the 2003 and 2004 seasons has also helped to clarify the chronology of Late Chalcolithic occupation at Kenan Tepe. Analysis of our previous data from trench F1 in 2003 combined with excavations in trench F1 in 2004 have given us a complete ceramic sequence and directly connected stratigraphy from the LC 4 through the LC 5/EB 1 transition. Thus far, our earliest carbon dates from Area F come from the oven/kiln feature excavated during the 2001 field season (Parker *et. al.* 2003a:115 and Parker, Creekmore and Dodd 2004:552-553; 574). Since this feature was founded on virgin soil and is almost certainly connected to domestic contexts excavated in trench F1 in 2004, we can confidently say that occupation in the eastern portion of Kenan Tepe's lower town began somewhere around 3500 B.C. Whether or not earlier Late Chalcolithic contexts still remain to be discovered on Kenan Tepe's main mound or in other portions of the lower town is a question that will have to be addressed in future field seasons. Our latest carbon date, which was taken from a pit in trench F7, dates to the late LC 5 (F.7.7094.28: 2 sigma calibrated 3360-3020 B.C.). These data suggest that approximately 2 meters of occupational debris accumulated in Area F during the LC 4 and LC 5 periods. They also show that the cobbled surfaces and work areas in the highest levels in Area F belong to the late LC 5 or early EB 1.

The nature of the chronology of the Ubaid and Late Chalcolithic periods at Kenan Tepe is also illuminated by the absence of data. Our research thus far does not show a direct connection between our Late Ubaid remains, which are carbon dated to ca. 4700-4620 B.C. (Parker and Dodd 2005:72), and our earliest Late Chalcolithic occupation, which appears to have begun some time around 3500 B.C. (see above and Parker *et al.* 2003a:114-115). These data suggest that the spread of the so-called Late Northern Ubaid

cultural complex and the establishment of the communities of the Late Chalcolithic are, at least at Kenan Tepe, separate phenomena.

Question 3:

What kind of data can we hope to obtain through remote sensing at Kenan Tepe?

The remote sensing results from the 2004 season met our expectations. A few tantalizing features attracted our attention for ground truthing. In each case we found features exactly where the data indicated an anomaly, but further exposures are necessary to clearly tie the features to the data. The long linear features and the square feature in Area F are curious entities that so far seem to correspond to pavements or cultural debris packed into earth, pebble and cobblestone surfaces. Clear evidence of architecture in the lower town is lacking in the data from this area. In contrast, the brick wall on the western slope of the main mound is clearly evident in the data, where we can follow its path for over 20 meters. As magnetometry indicates, and ground truthing confirms, this wall is unusually wide and seems to run along the entire western edge of the main mound. In sum, magnetometry provided a first look at a large part of Kenan Tepe. Future work with different methods, as well as additional processing and study of the 2004 season's results will improve our understanding of the settlement structure and facilitate targeted excavations.

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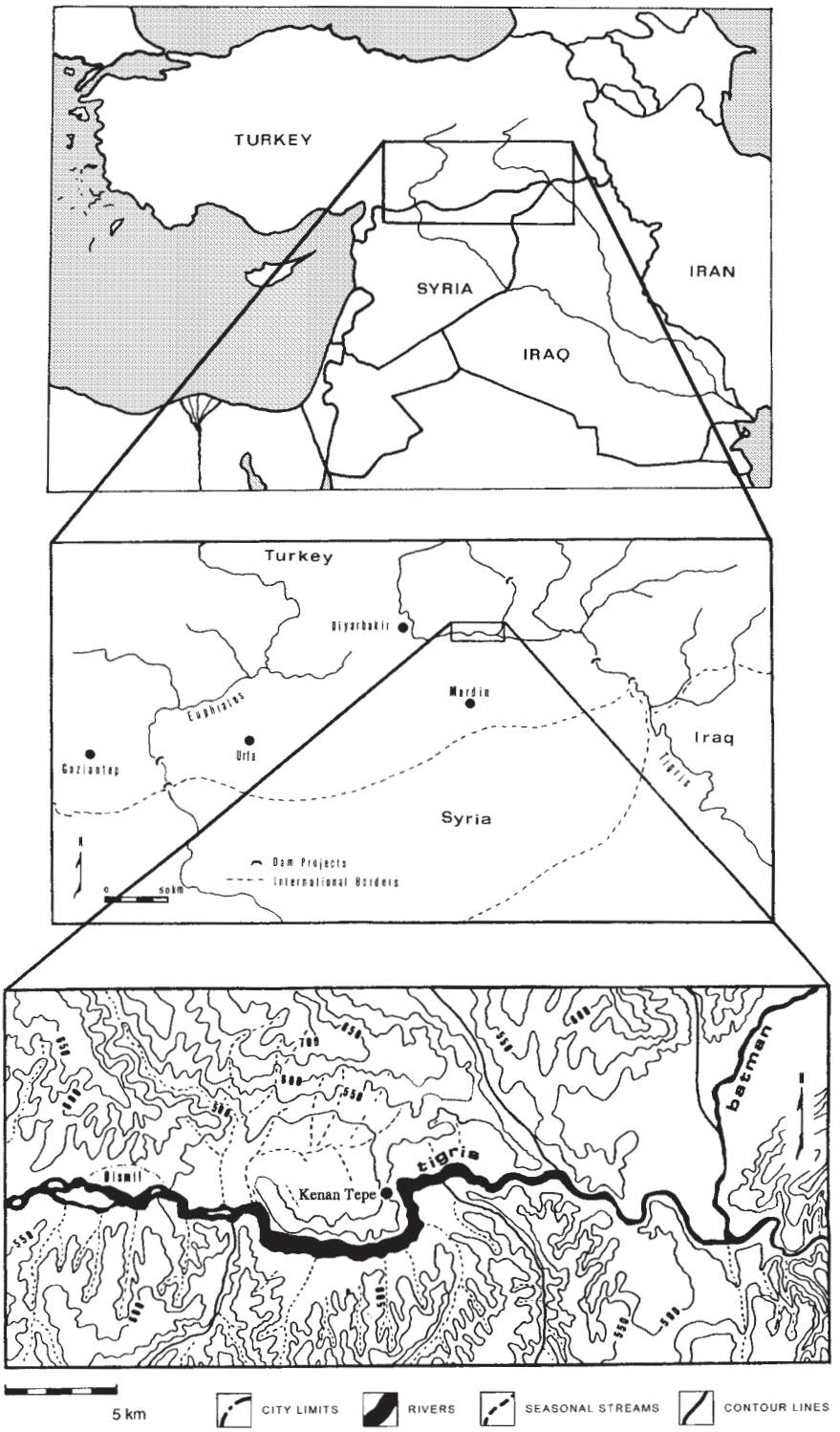


Fig. 1. Maps showing the location of Kenan Tepe in the Upper Tigris River region of southeastern Turkey.

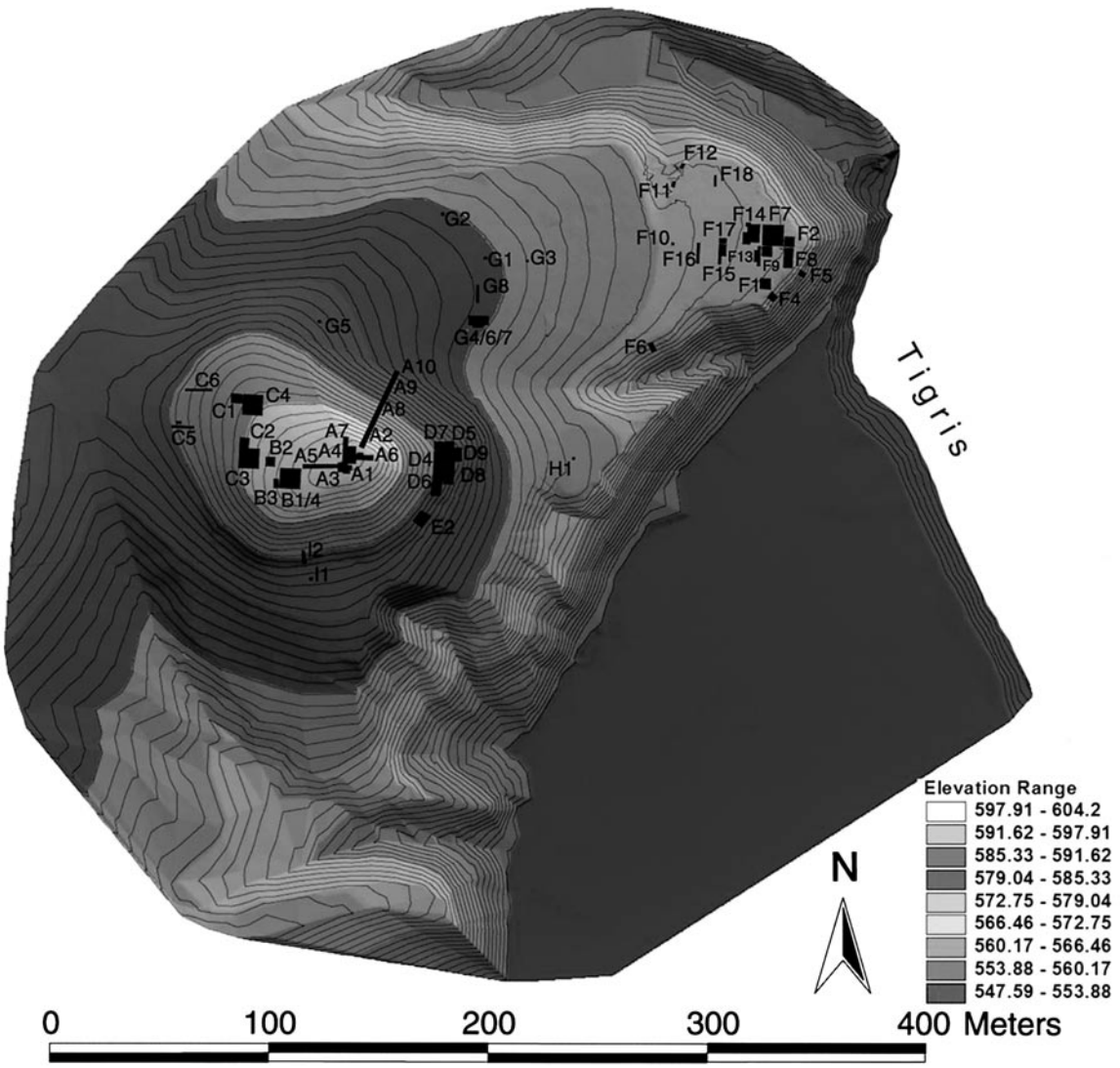


Fig. 2. Topographic map of Kenan Tepe and the surrounding landscape showing the location of excavations areas and trenches.

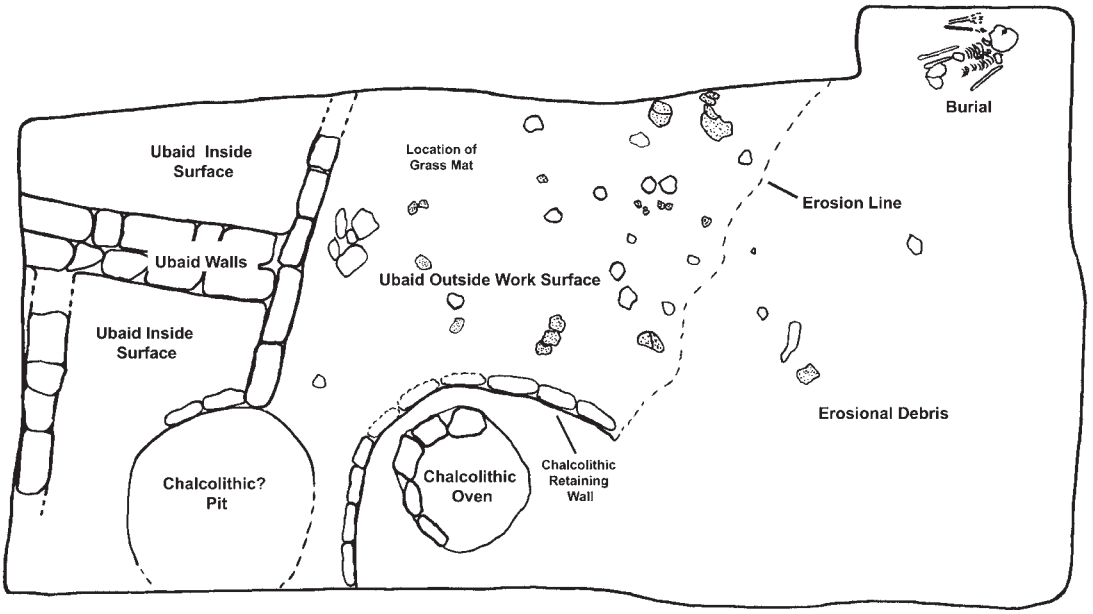


Fig. 3. Plan of trench D5 showing *Ubaid Structure 1* (in the far left portion of the trench) and surrounding contexts.

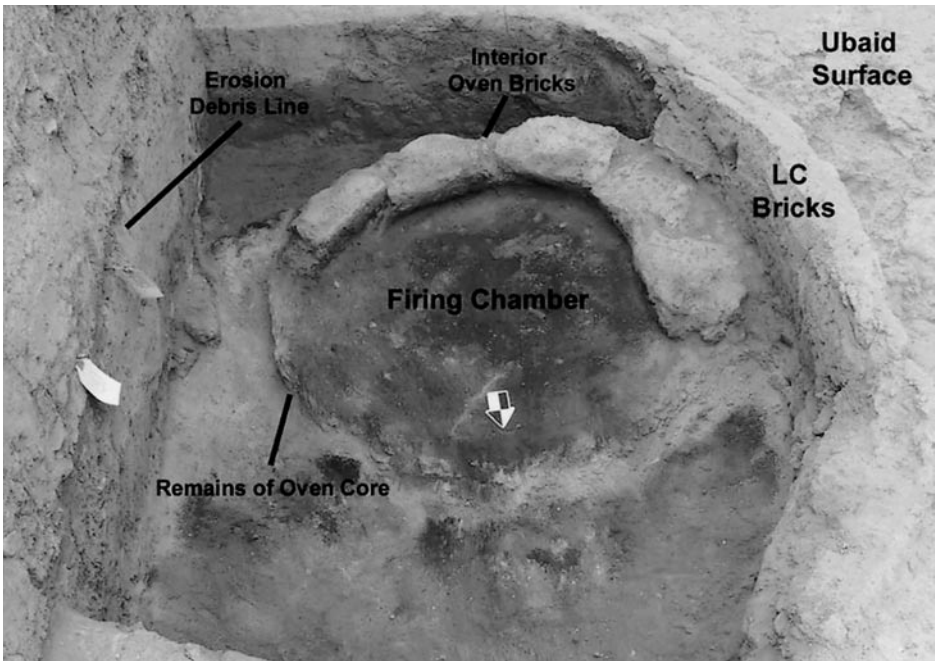


Fig. 4. Photo of Late Chalcolithic oven from trench D 5.

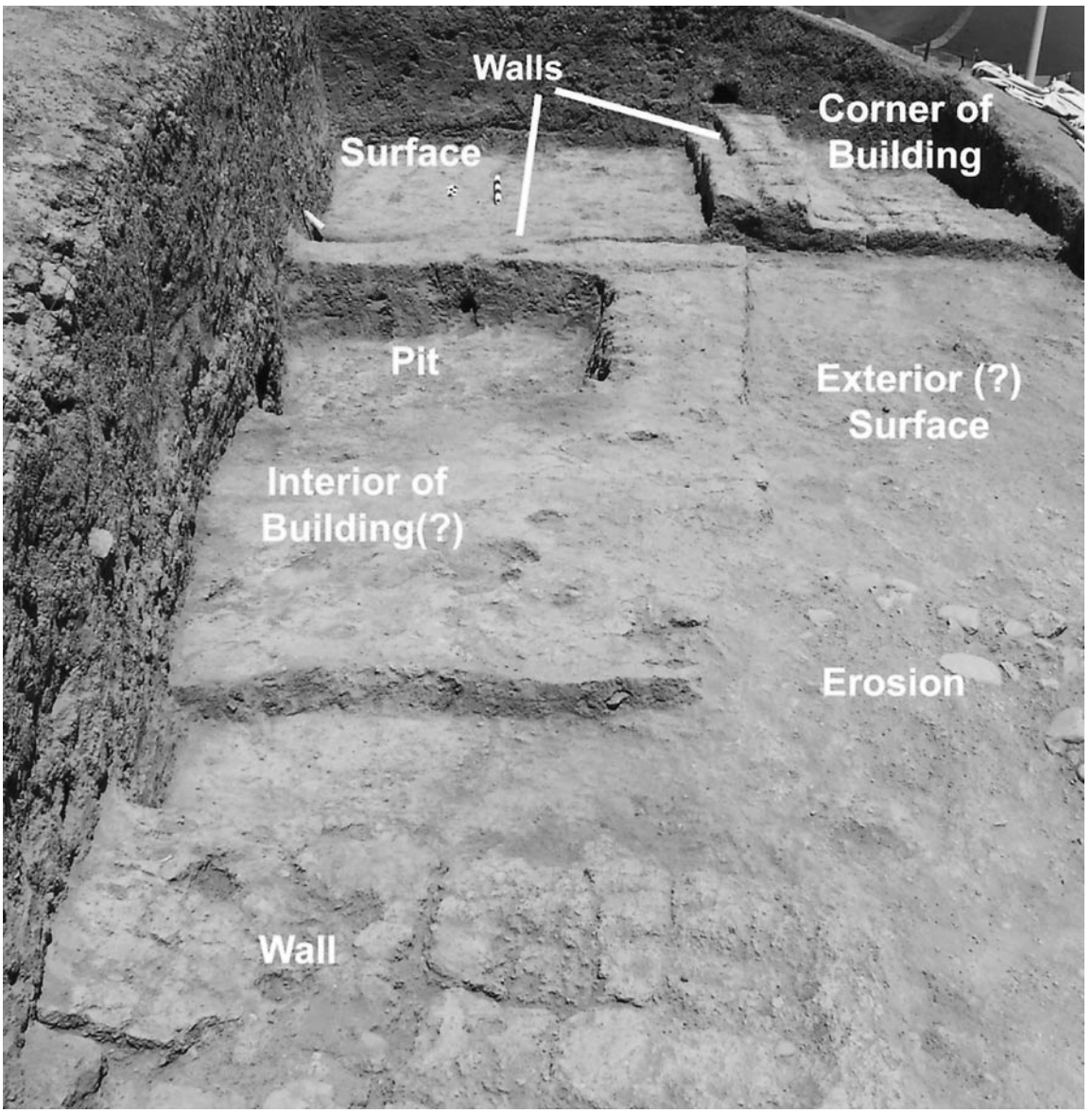


Fig. 5. View of trench D8 showing second millennium contexts.

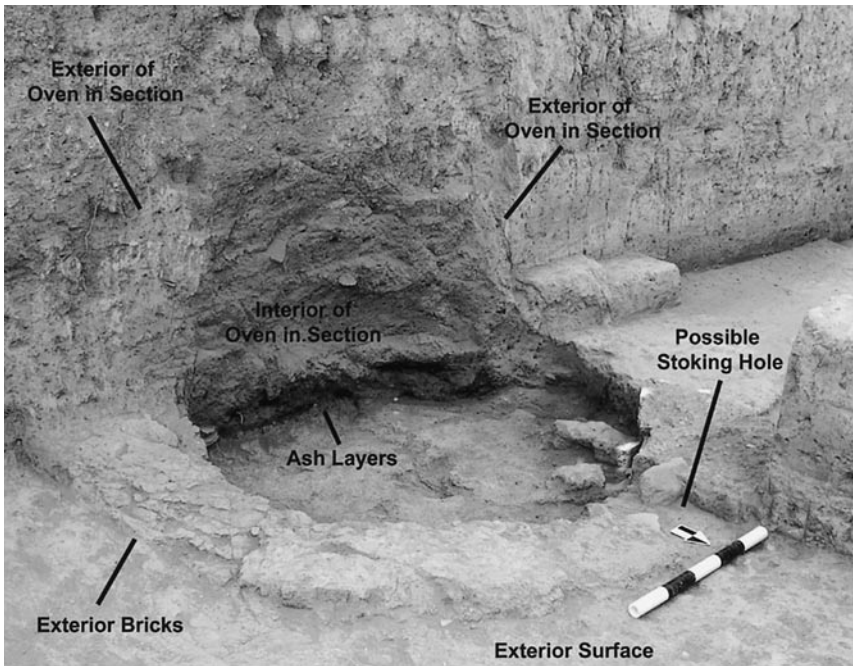


Fig. 6. View of Late Chalcolithic oven in trench D 9.

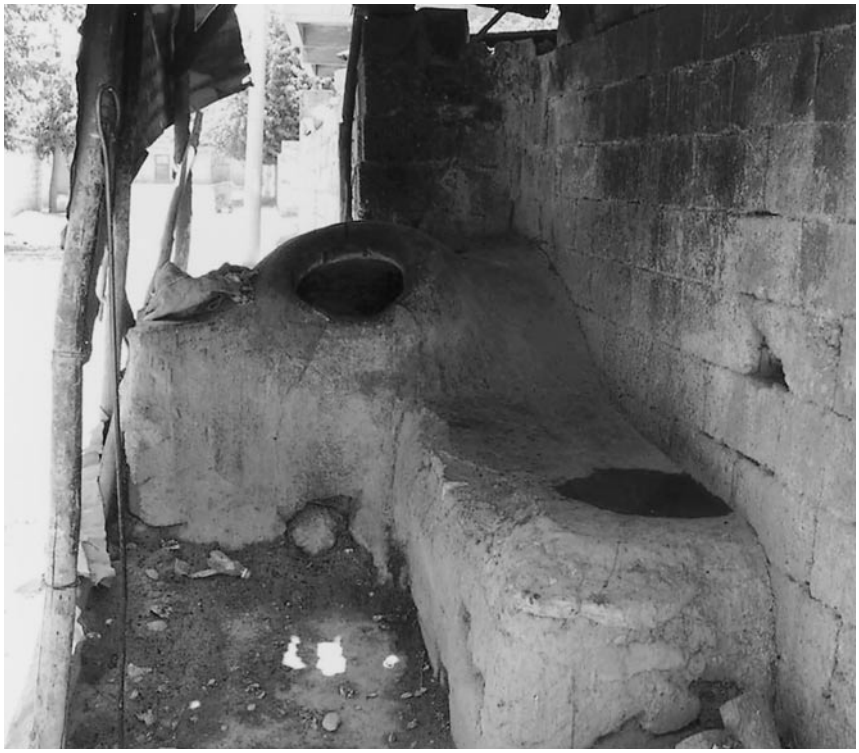
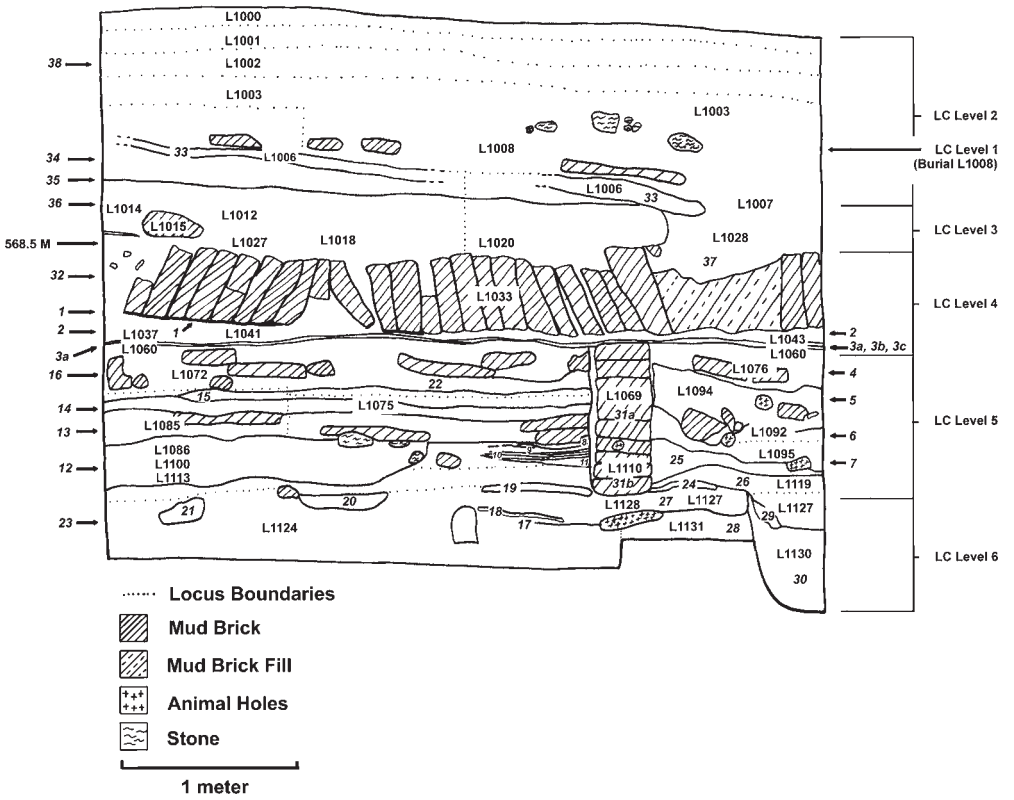


Fig. 7. View of modern oven.



1. Underside of bricks with heavy burning.
   a. Floor (10YR 6/4: light reddish brown)
   b. Ash layer (10YR 3/1: very dark gray)
2. Supra-floor fill (10YR 7/2: light gray)
3. Three superimposed layers
   a. Ash layer (2.5YR 5/1: black)
   b. Red layer (7.5YR 4/4: brown)
   c. White layer (7.5YR 8/1: white)
4. Fill with mud bricks
   a. Fill (5YR 7/2: pinkish gray)
   b. Bricks (7.5YR 6/4: light brown)
5. Ash with mud bricks (2.5YR 5/1: reddish gray)
6. Fill (10YR 6/2: light brownish gray)
7. Mud brick (10YR 7/3: very pale brown)
8. Stratigraphic layer (7.5YR 6/4: light brown)
9. Stratigraphic layer (5YR 4/6:yellowish red)
10. Series of thin stratigraphic layers
11. Stratigraphic layer (7.5YR 6/4:light brown)
12. Cobbles
13. Fill (7.5YR 7/1: light gray)
14. Mud brick (7.5YR 6/4: light brown)
15. Stratigraphic layer (7.5YR 7/2: pinkish gray)
16. Fill (7.5YR 7/2 pinkish gray)
17. Ash layer (2.5YR 5/1: reddish gray)
18 Stratigraphic layer (5YR 6/4 :yellowish red)
19. Stratigraphic layer (7.5YR 4/4 brown)
20. Ashy pit (7.5YR 7/1:light reddish brown)
21. Incusion (5YR 5/3: reddish brown)
22. Stratigraphic layer (7.5YR 5/3: brown)
23. Layered fill
24. Stratigraphic layer (7.5YR 4/4: brown)
25. Fill (10YR 7/3: very pale brown)
26. Ash
27. Fill (7.5YR 4/2: brown)
28. Fill (7.5YR 4/3: brown)
29. Fill
30. Pit with subdivisions of
    a. ash (Glay 1 4/n: dark gray)
    b. fine clay (7.5YR 6/4:dark brown)
31. Mud brick wall
    a. brick (7.5YR 6/4: light brown)
    b. brick (10YR 6/4: light brown)
32. Brick collapse (reddish and whitish bricks)
33. Cobble surface (L1006)
34. Fill
35. Cobble layer (L1009)
36. Mud brick debris
37. Mixed fill
38. Topsoil

Fig. 8. Trench F 1 east section.

Figure 9 descriptions

A. F1 L1130 KT8 #2: Reddish yellow exterior and interior surface (7.5YR 6/6). Strong brown fabric: (7.5YR 5/6). Abrupt transition to very dark grayish brown core (2.5YR 3/2). Large grit and large to medium chaff temper. Large chaff marks on exterior surface.

B. F1 L1115 KT1 #1: Brown exterior surface (7.5YR 4/3). Pale brown interior surface (10YR 6/3). Very dark gray fabric (7.5YR 3/1). Medium micaceous sand temper. Vertically burnished on exterior surface.

C. F1 L1116 KT7 #7: Yellowish brown exterior surface (10YR 4/5). Brown interior surface (10YR 5/3). Light brownish gray fabric (10YR 6/2) grading to grayish brown core (10YR 5/2). Large to medium grit temper. Horizontally burnished on exterior surface. Diameter uncertain.

D. F1 L1113 KT3 #1: Yellowish red exterior surface (5YR 5/6). Brown interior surface (7.5YR 5/3).Very dark gray fabric (2.5YR 3/1). Very fine micaceous grit temper with fine chaff. Diameter uncertain.

E. F1 L1116 KT7 #3: Brownish yellow exterior and interior surface (10YR 6/6). Strong brown fabric (7.5YR 5/6). Abrupt transition to greenish gray core (5/1 5G). Fine calcareous grit temper. Vertically burnished on exterior surface.

F. F1 L1130 KT8 #4: Light brown exterior surface (7.5YR 6/4). Reddish yellow interior surface (7.5YR 6/6). Reddish brown fabric (7.5YR 7/6). Fine grit temper.

G. F1 L1117 KT7 #1: Reddish yellow exterior surface (5YR 6/6). Reddish yellow interior surface and fabric (5YR 6/8). Abrupt transition to greenish black core (10Y 2.5/1). Large to fine grit and fine chaff temper. Horizontally burnished on interior surface.

H. F1 L1117 KT7 #2: Pink exterior surface (7.5YR 7/4). Light red interior surface (2.5YR 6/6). Yellowish red fabric (5YR 5/8). Very fine grit and chaff temper. Wash on exterior surface.

I. F1 L1116 KT2 #1: Reddish yellow exterior and interior surfaces (7.5YR 7/6). Strong brown fabric (7.5YR 5/8). Abruptly transition to dark grey core (10YR 4/1). Fine grit temper.

J. F1 L1116 KT7 #2: Reddish yellow exterior surface (7.5YR 7/6). Pink interior surface (7.5YR 7/4). Yellowish red fabric (5YR 5/8). Abrupt transition to reddish yellow core (7.5YR 6/6). Fine grit and medium chaff temper.

K. F1 L1116 KT7 #1: Reddish yellow exterior and interior surfaces and fabric (7.5YR 6/6). Abrupt transition to dark grey core (7.5YR 4/1). Medium micaceous grit and low levels of fine chaff temper.

L. F1 L1130 KT8 #5: Reddish yellow exterior and interior surface (7.5YR 6/6). Red fabric (2.5YR 5/8). Very fine grit temper.

M. F1 L1113 KT1 #2: Very pale brown exterior and interior surfaces (10YR 7/3). Reddish yellow fabric (5YR 6/6). Very fine micaceous grit temper.

N. F1 L1117 KT7 #9: Reddish yellow exterior surface and fabric (7.5YR 7/6). Light reddish brown interior surface (10YR 6/4). Abrupt transition to brown core (7.5YR 5/3). Very fine chaff temper.

O. F1 L1113 KT3 #2: Light brown exterior and interior surfaces (7.5YR 6/4). Strong brown fabric (7.5 5/6). Small amounts of very fine grit temper.

P. F1 L1113 KT1 #1: Light yellowish brown exterior and interior surfaces (10YR 6/4). Brown fabric (10YR 4/3). Very fine grit temper.

Q. F1 L1130 KT8 #3: Very pale brown exterior surface (10YR 8/4). Reddish yellow interior surface (5YR 7/8). Brownish yellow fabric (10YR 6/6) grading to reddish yellow core (5YR 6/8). Fine grit and chaff temper. Medium chaff marks and wash on exterior surface.

R. F1 L1116 KT7 #8: Black exterior surface (2.5YR 3/2). Very dark grayish brown interior surface (2.5YR 2.5/1). Very dark grayish brown fabric (2.5 YR 3/2) grading to black core (2.5 YR 2.5/1). Fine grit temper. Horizontally burnished on exterior surface.

S. F1 L1116 KT7 #6: Pale brown exterior surface (10YR 6/3). Light reddish brown interior surface (5YR 6/4). Reddish yellow fabric (7.5YR 6/6) grading to yellowish brown core (10YR 5/4). Medium grit temper.

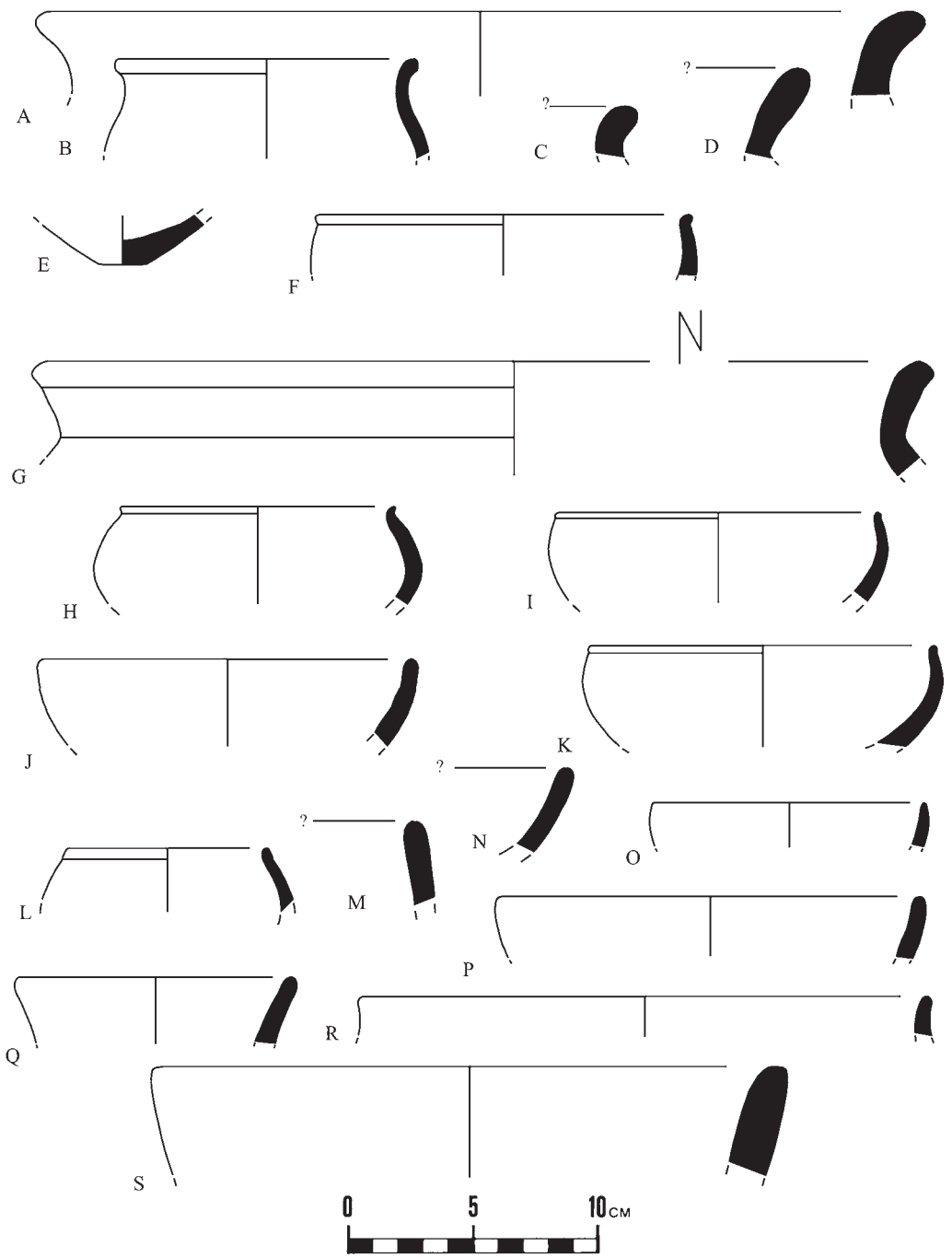


Fig. 9. Late Chalcolithic ceramics.

Figure 10 descriptions

A. F1.1117.7.3: Light brown exterior and interior surface (7.5YR 6/4). Reddish yellow fabric (7.5YR 6/6). Abrupt transition to grey core (10YR 5/1). Fine grit and very fine chaff temper.

B. F1.1117.7.4: Light brown exterior surface (7.5YR 6/4). Yellowish red interior surface (5YR 5/6). Red fabric (2.5YR 5/6). Abrupt transition to brown core (7.5YR 5/4). Fine grit and medium to large chaff temper. Wash and chaff impressions on the exterior surface.

C. F1.1117.7.5: Very pale brown exterior surface (10YR 7/3). Pink interior surface (7.5YR 8/4). Light brown fabric (7.5YR 6/4) grading to reddish brown core (7.5YR 7/6). Very fine chaff temper. Wash on exterior surface.

D. F1.1116.7.9: Yellowish brown exterior surface (10YR 5/4). Brown interior surface (7.5YR 5/4). Strong brown fabric (7.5YR 5/6). Abrupt transition to brown core (7.5YR 4/3). Fine chaff and grit temper.

E. F1.1117.7.6: Reddish yellow exterior surface (5YR 6/6). Light red interior surface (2.5YR 7/6). Strong brown fabric (7.5YR 5/6). Abrupt transition to dark grey core (7.5YR 4/1). Very fine grit temper with low levels of fine chaff.

F. F1.1116.7.10: Reddish yellow exterior surface (7.5YR 7/6). Reddish yellow interior surface and fabric (7.5YR 6/6) grading to reddish yellow core (5YR 6/8). Medium grit and low levels of fine chaff. Scattered chaff marks on exterior and interior surfaces.

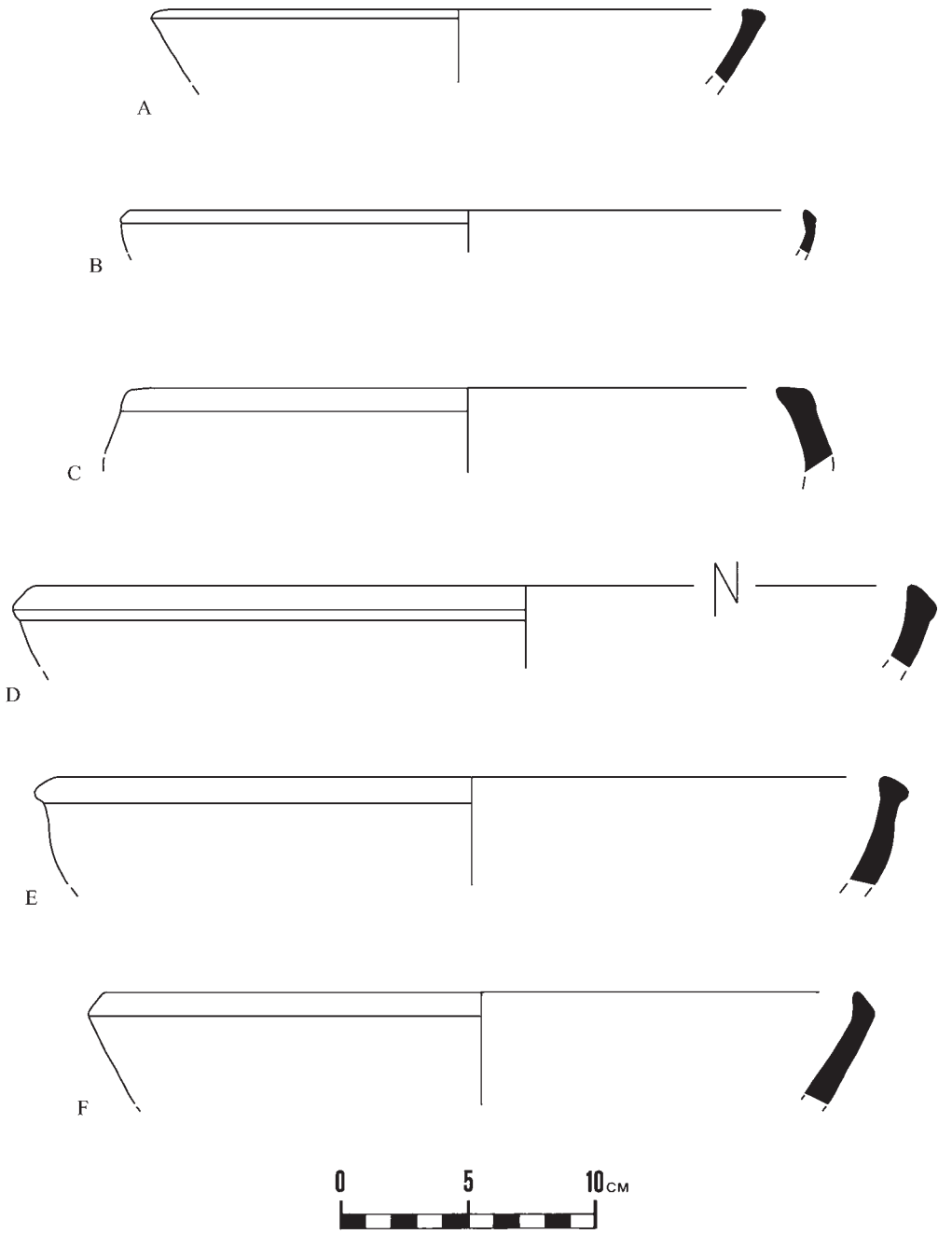


Fig. 10. Late Chalcolithic ceramics.

Figure 11 descriptions

A. D9 L20 KT7 #7: Reddish yellow exterior surface (7.5YR 6/6). Pink interior surface (7.5YR 7/4). Reddish yellow fabric (7.5YR 7/6) grading to light reddish brown core (5YR 6/4). Medium grit and fine chaff temper.

B. D9 L20 KT7 #4: Very dark gray exterior surface (7.5YR 3/1). Dark brown interior surface (7.5YR 3/2). Reddish yellow fabric (7.5YR 6/6). Fine grit and medium chaff temper. Diameter uncertain.

C. D9 L20 KT7 #6: Light brown exterior surface (7.5YR 6/4). Reddish yellow interior surface (5YR 6/6). Strong brown fabric (7.5YR 5/6). Very fine grit temper.

D. D9 L20 KT5 #1: Yellowish red exterior surface (5YR 5/6). Yellowish red interior surface and fabric (7.5YR 6/6). Fine sand and chaff temper.

E. D9 L8 KT16 #3: Brown exterior surface (7.5YR 4/2). Dark brown interior surface (7.5YR 3/2). Brown fabric (7.5YR 4/3) grading to dark grayish brown core (2.5YR 4/2). Large to medium grit temper. Medium chaff is densely marked on the exterior surface and in fabric. Exterior wash.

F. D9 L8 KT19 #1: Light reddish brown exterior and interior surface (2.5YR 6/3). Light reddish brown fabric (5YR 6/4). Very fine grit temper. String cut base and heavy wheel striations.

G. D9 L8 KT16 #1: Pale yellow exterior surface (2.5YR 7/3). Pale yellow interior surface (2.5YR 8/4). Light olive brown fabric (2.5YR 5/3). Large to fine grit and fine chaff temper.

H. D9 L8 KT16 #2: Pale yellow exterior and interior surfaces (2.5YR 8/3). Pale yellow fabric (2.5YR 7/3). Fine grit and medium chaff temper. Medium chaff impressions on exterior surface.

I. D9 L8 KT7 #4: Brown exterior surface (7.5YR 5/3). Brown interior surface (7.5YR 4/2). Brown fabric (7.5YR 5/4). Abrupt transition to brown core (10YR 5/3). Medium grit temper with few fine micaceous inclusions. Small amounts of fine chaff temper.

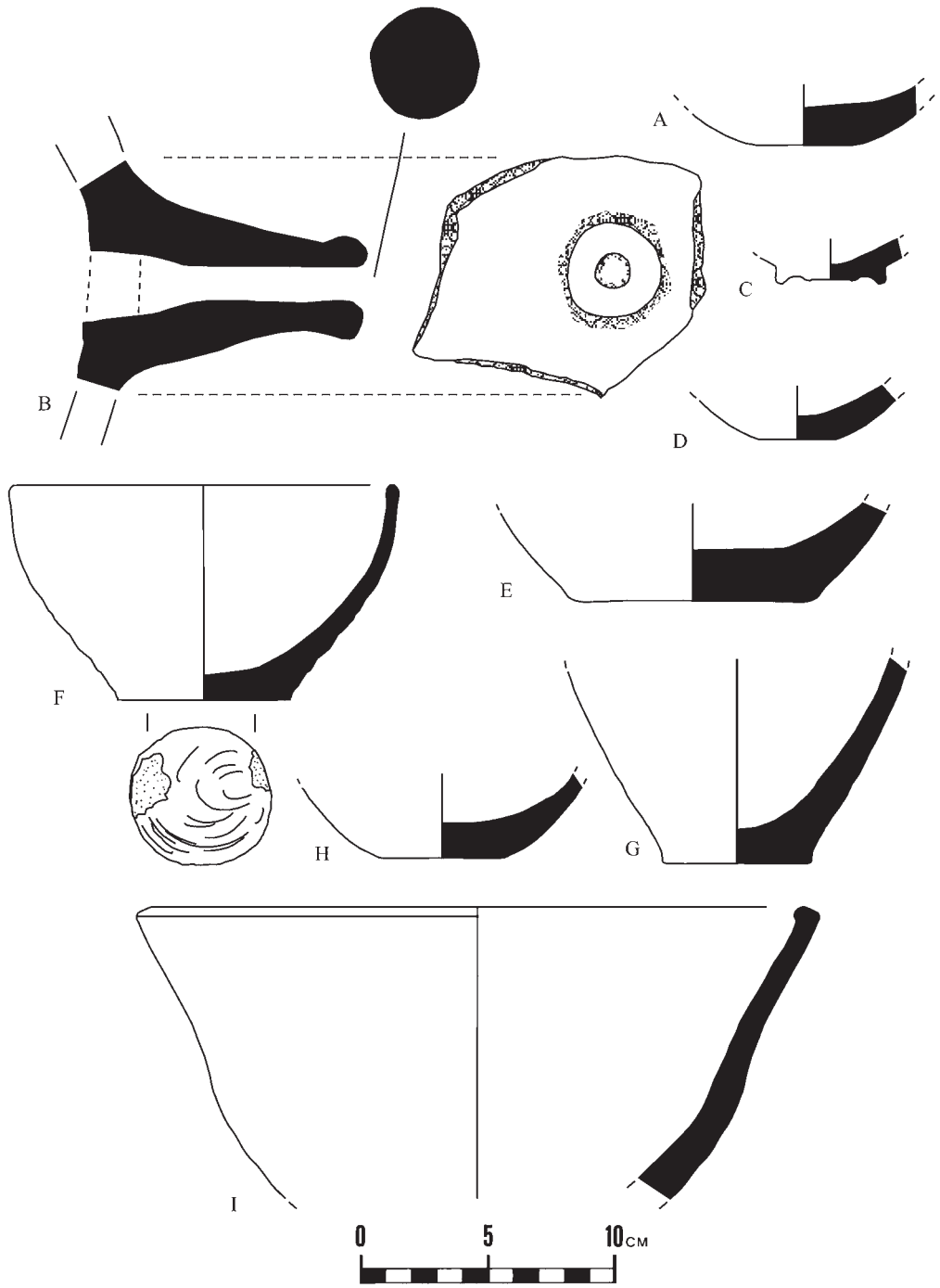


Fig. 11. Late Chalcolithic ceramics.

Figure 12 descriptions

A. D9 L20 KT5 #3: Light reddish brown exterior surface (5YR 6/4). Reddish yellow interior surface (5YR 6/6). Brown fabric (7.5YR 4/3). Abrupt transition to light brown core (7.5YR 6/3). Fine grit and chaff temper.

B. D9 L20 KT7 #1: Yellowish brown exterior surface and fabric (10YR 5/4). Light brown interior surface (7.5YR 6/4) grading to light olive brown (2.5YR 5/3). Medium grit and very fine chaff temper.

C. D9 L20 KT7 #2: Light yellowish brown exterior surface (10YR 6/4). Light brown interior surface (7.5YR 6/4). Yellowish brown fabric (10YR 5/4). Fine grit temper.

D. D9 L8 KT16 #4: Brownish yellow exterior surface (10YR 6/6). Yellowish brown interior surface (10YR 5/4). Strong brown fabric (7.5YR 5/6) grading to grayish brown core (2.5YR 5/2). Medium to very fine grit temper with some fine chaff. Large chaff impressions on exterior surface.

E. D9 L20 KT7 #5: Brown exterior surface (7.5YR 5/4). Brownish yellow interior surface (10YR 6/6). Brown fabric (7.5YR 4/3). Abrupt transition to light yellowish brown core (10YR 6/4). Medium to fine micaceous grit and medium to fine chaff temper. Blackened on exterior and interior surfaces. Bowl.

F. D9 L8 KT16 #6: Reddish yellow exterior and interior surfaces (5YR 6/6). Yellowish red fabric (5YR 5/8). Fine grit and very fine chaff temper. Haphazard horizontal burnishing on exterior surface. Manufacture groove below interior rim.

G. D9 L8 KT7 #3: Brown exterior surface (10YR 4/3). Brown interior surface (7.5YR 4/2). Dark grayish brown fabric (10YR 4/2). Fine grit temper.

H. D9 L20 KT5 #4: Brown exterior surface and fabric (7.5YR 4/4). Reddish brown interior surface (5YR 5/3). Medium angular grit and chaff temper. Painted decoration on exterior surface.

I. D9 L20 KT5 #2: Pink exterior surface (7.5YR 7/4). Light reddish brown interior surface and fabric (5YR 6/4). Fine rounded sand and chaff temper. Wheel incisions. Diameter uncertain.

J. D9 L8 KT7 #2: Yellowish red exterior and interior surfaces and fabric (5YR 5/6). Medium grit temper. Diameter uncertain.

K. D9 L8 KT7 #1: Light reddish brown exterior and interior surface (5YR 6/4). Light yellowish brown fabric (10YR 6/4) grading to light brownish gray core (10YR 6/2). Very fine grit and coarse chaff temper. Diameter uncertain.

L. D9 L20 KT7 #3: Light yellowish brown exterior and interior surfaces and fabric (10YR 6/4). Very fine grit and chaff temper.

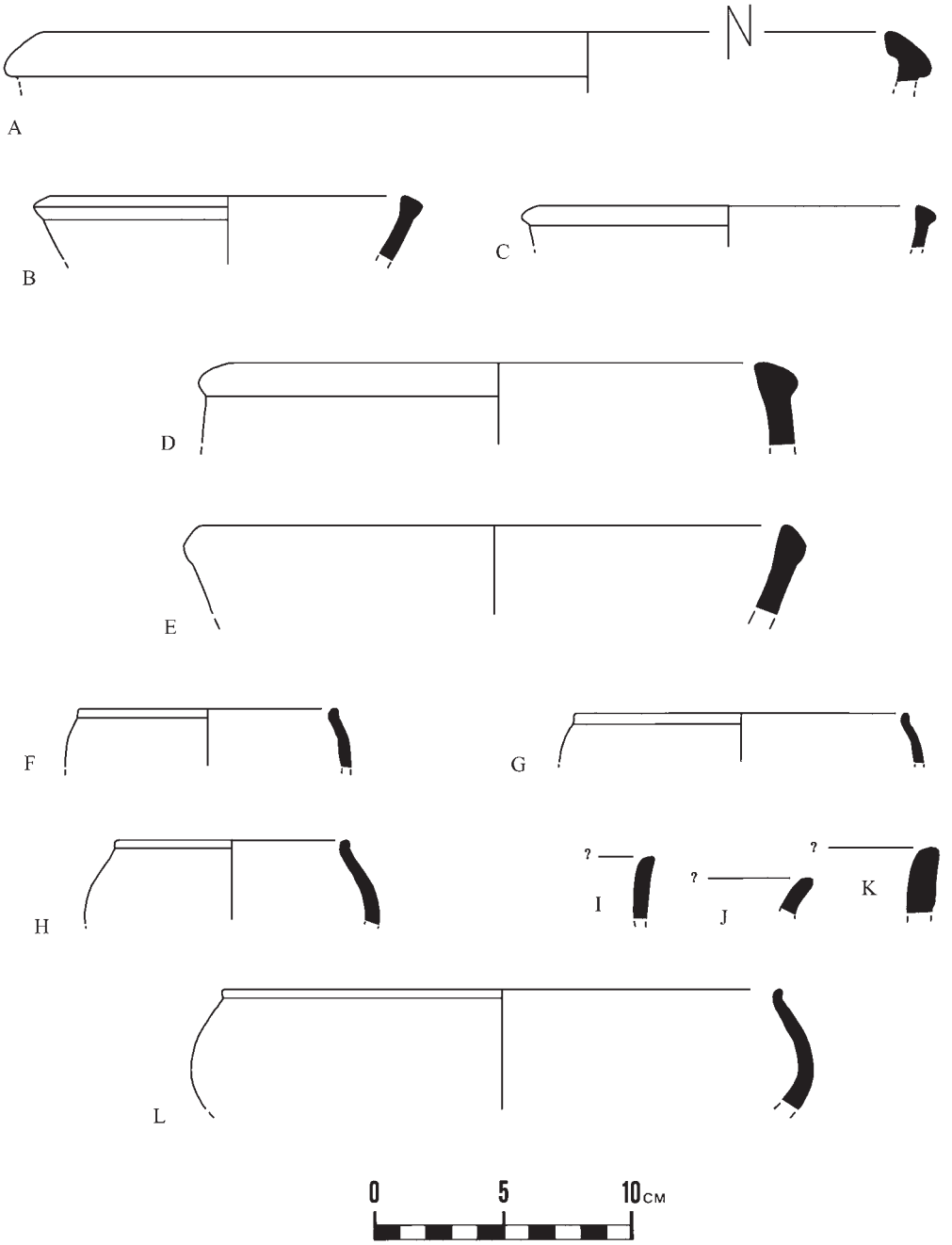


Fig. 12. Late Chalcolithic ceramics.

Figure 13 descriptions

A. D4 L5132 KT1 #1: Brown exterior surface (7.5YR 4/4). Strong brown core (7.5YR 5/8). Strong brown interior surface (7.5YR 4/6). Burnished interior and exterior surface. Fine grit and chaff temper.

B. D5 L5079 KT5554 #1: Brown exterior surface (10YR 5/3). Very dark grayish brown fabric (10YR 3/2) abruptly transitioning to a brown core (10YR 5/3). Dark grayish brown interior surface (2.5Y 4/2). Heavily blackened on the interior and exterior body. Large grit temper.

C. D5 L5132 KT1 #5: Red exterior surface (2.5YR 4/8). Yellowish red core (5YR 5/8). Red interior surface (2.5YR 5/8). Burnished interior and exterior surfaces. Medium size rounded grit and chaff temper. Diameter uncertain.

D. D5 L5094 KT11 #1: Weak red exterior surface (2.5 YR 4/2). Brown fabric (7.5 YR 4/2) grading to very dark grayish brown core (10 YR 3/2). Light reddish brown interior (2.5 YR 6/3). Coarse sandy grit temper.

E. E1 L1004 KT 1040 #9: Pink exterior surface (7.5YR 7/4) with dark reddish brown paint on exterior side of rim (5YR 3/2). Brown fabric (10YR 5/3) grading to grayish brown core (10YR 5/2). Light brown interior surface (7.5YR 6/3). Fine to medium grit temper. Diameter uncertain.

F. D5 L5079 KT5554 #2: Very pale brown exterior surface (10YR 7/3). Pink core (5YR 7/4). Very pale brown exterior surface (10YR 7/3). Dark reddish gray paint on exterior surface (7.5R 4/1). Five impressed bands across the shoulder to the base of the neck. Medium chaff temper with very fine white grit inclusions. Diameter uncertain.

G. D5 L5100 KT53 #1: Pale yellow exterior surface (2.5Y 8/2). Light gray core (2.5Y 7/2). Pale yellow interior surface (2.5Y 8/2). Brown paint on exterior surface (7.5R 5/2). Very fine grit temper.

H. E1 L1004 KT1040 #7: Reddish yellow exterior surface (7.5YR 7/6). Yellowish brown fabric (10YR 5/8) abruptly changing to dark gray core (10YR 4/1). Reddish yellow interior surface (7.5YR 7/6). Fine grit temper.

I. D5 L5146 KT6 #6: Dark gray exterior surface (5YR 4/1). Pink interior surface (7.5YR 7/4). Wash on interior surface. Dark gray paint (5YR 4/1) and fugitive pink paint (7.5YR 7/4). Fine grit temper. Diameter uncertain.

J. D5 L5146 KT6 #2: Light reddish brown exterior surface (2.5YR 7/4). Light brown fabric (7.5YR 6/3) grading to a red core (2.5YR 5/6). Light red interior surface (2.5YR 6/6). Fine chaff temper.

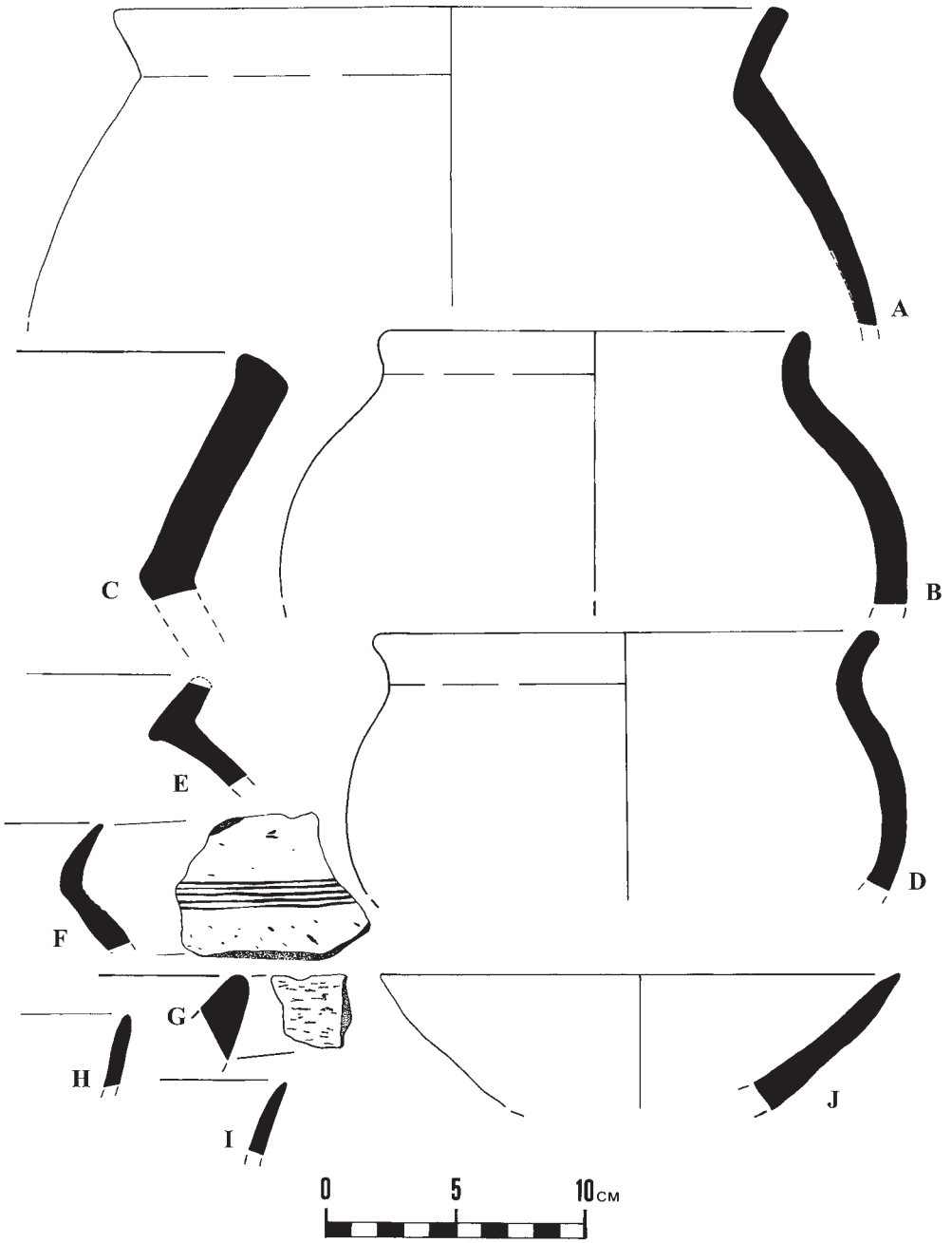


Fig. 13. Ubaid period ceramics.

Figure 14 descriptions

A. E1 L1004 KT1040 #8: Yellow burnished exterior surface (10YR 7/6). Yellowish brown fabric (10YR 5/8) abruptly changing to dark gray (10YR 4/1). Yellow burnished interior surface (10YR 7/6). Coarse grit temper.

B. D5 L5094 KT1 #4 and #5: Very pale brown exterior surface and core (10YR 8/3). Pink interior surface (5YR 7/4). Fine grit temper.

C. D5 L5094 KT41 #2: Light red exterior surface (2.5YR 6/6). Light red fabric (2.5YR 6/8) grading to a gray core (2.5Y 5/1). Light reddish brown interior surface (2.5YR 7/4). Fine chaff temper.

D. D5 L5100 KT50 #1: Pink (5YR 7/3) near lip grading to gray (5YR 5/1) on exterior body surface. Dark gray fabric (5YR 4/1) with an abrupt transition to a reddish gray core (5YR 5/2). Burnished interior and exterior surfaces. Exterior surface blackened by fire. Fine grit temper.

E. D5 L5117 KT7 #1: Light red exterior surface (2.5YR 6/6) grading to a reddish yellow core (5YR 6/6). Light brown interior surface (7.5YR 6/4). Weak red paint on the neck and slightly on the body (10R 4/2). Very fine grit temper.

F. D5 L5085 KT43 #1: Strainer. Light reddish brown exterior surface (2.5YR 6/4). Yellowish brown core (10YR 5/4). Light reddish brown interior surface (5YR 6/3). Impressions on exterior surface. Very fine grit temper.

G. D5 L5099 KT4 #1: Light gray exterior surface (10YR 7/2). Light gray core (10YR 7/2). Light gray interior surface (10YR 7/2). Very fine grit temper. Diameter uncertain.

H. D5 L5100 KT 53 #3: Flat bottom base. Very dark gray exterior surface (10YR 3/1) grading to a brown core (7.5YR 4/3). Brown interior surface (10YR 4/3). Burned on exterior surface. Very large white grit temper.

I. D5 L5132 KT1 #2: Light brown exterior surface (7.5YR 6/4) grading to a red core (10R 5/6). Light reddish brown interior surface (2.5YR 6/4). Burnished interior and exterior surfaces. Fine grit temper.

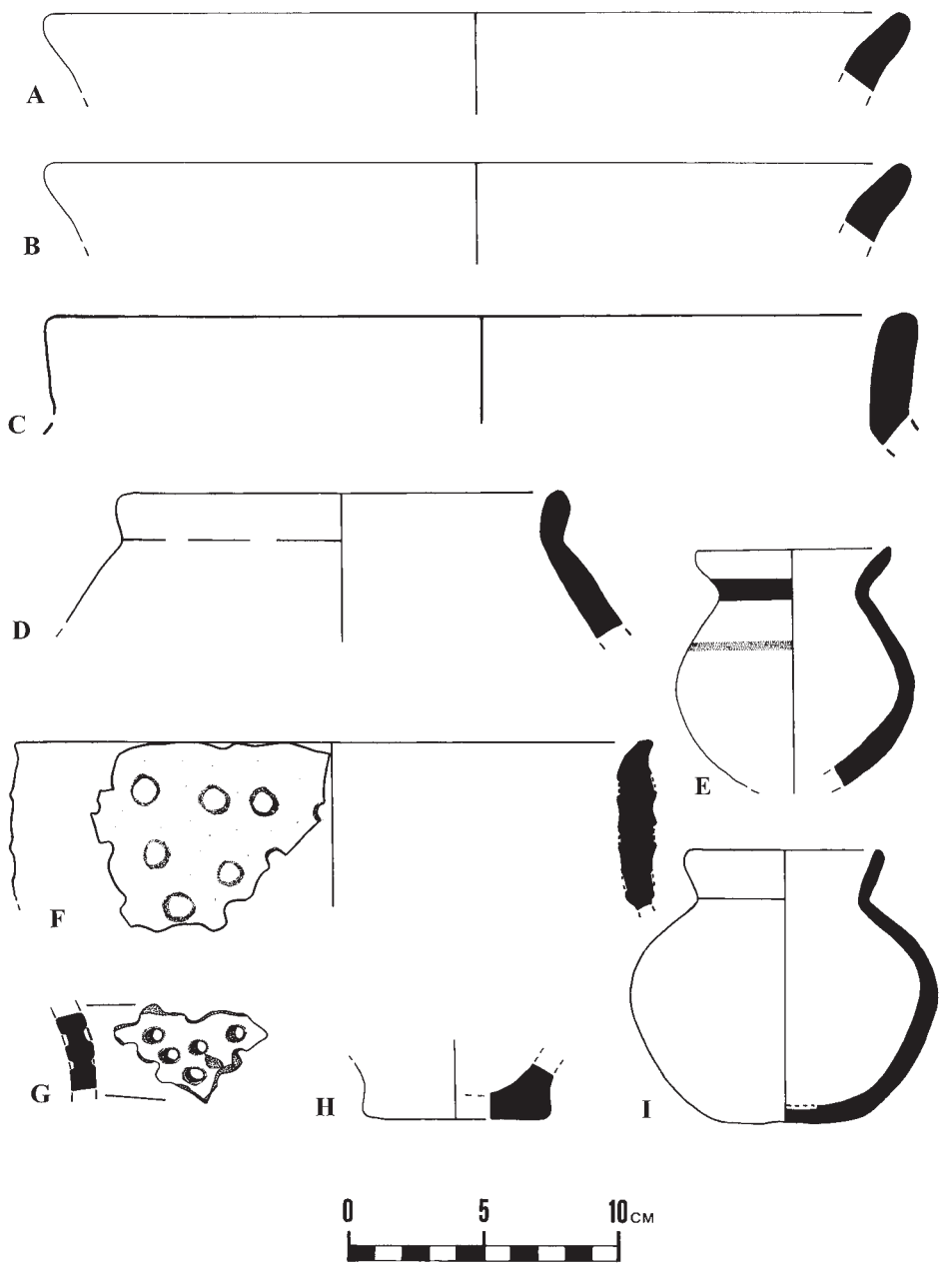


Fig. 14. Late Chalcolithic ceramics.

Figure 15 descriptions

A. E1 L1004 KT1040 #4: Yellow exterior surface (10YR 7/6). Yellowish brown core (10YR 5/4). Yellow interior surface (10YR 7/6). Fine to medium grit temper.

B. D5 L5094 KT1 #1: Pink exterior surface (7.5YR 7/4). Very dark gray fabric (7.5YR 3/1) with a light brown core (7.5YR 6/4). Pink interior surface (7.5YR 7/4). Fine grit and chaff temper.

C. E1 L1004 KT1040 #5: Yellow washed exterior surface (10YR 7/6). Yellowish brown fabric (10YR 5/8) abruptly changing to grayish brown (10YR 5/2). Yellow washed interior surface (10YR 5/8). Fine to medium grit and chaff temper.

D. D5 L5100 KT49 #1: Light red exterior surface (2.5YR 6/6). Gray fabric (5YR 5/1) with an abrupt transition to a reddish yellow core (5YR 6/6). Light red interior surface (2.5YR 6/6). Medium chaff temper.

E. E1 L1004 KT1040 #2: Reddish yellow smoothed exterior surface (7.5YR 7/6). Yellowish brown core (10YR 5/4). Reddish yellow interior surface (7.5YR 7/6). Fine grit and chaff temper. Diameter uncertain.

F. D5 L5029 KT5093 #3: Reddish yellow exterior surface (5YR 6/6). Reddish yellow core (5YR 6/6). Light reddish brown interior surface (5YR 6/4). Very fine grit temper.

G. D5 L5146 KT6 #5: Pink exterior surface (7.5YR 7/4). Pink interior surface (5YR 7/4). Striations visible on interior and exterior surfaces. Fine white grit temper.

H. E1 L1004 KT1040 #3: Reddish yellow exterior surface (7.5YR 7/6). Reddish yellow fabric (7.5YR 6/8) abruptly changing to gray core (7.5YR 5/1). Reddish yellow interior surface (7.5YR 7/6). Fine grit temper with chaff impressions on surfaces.

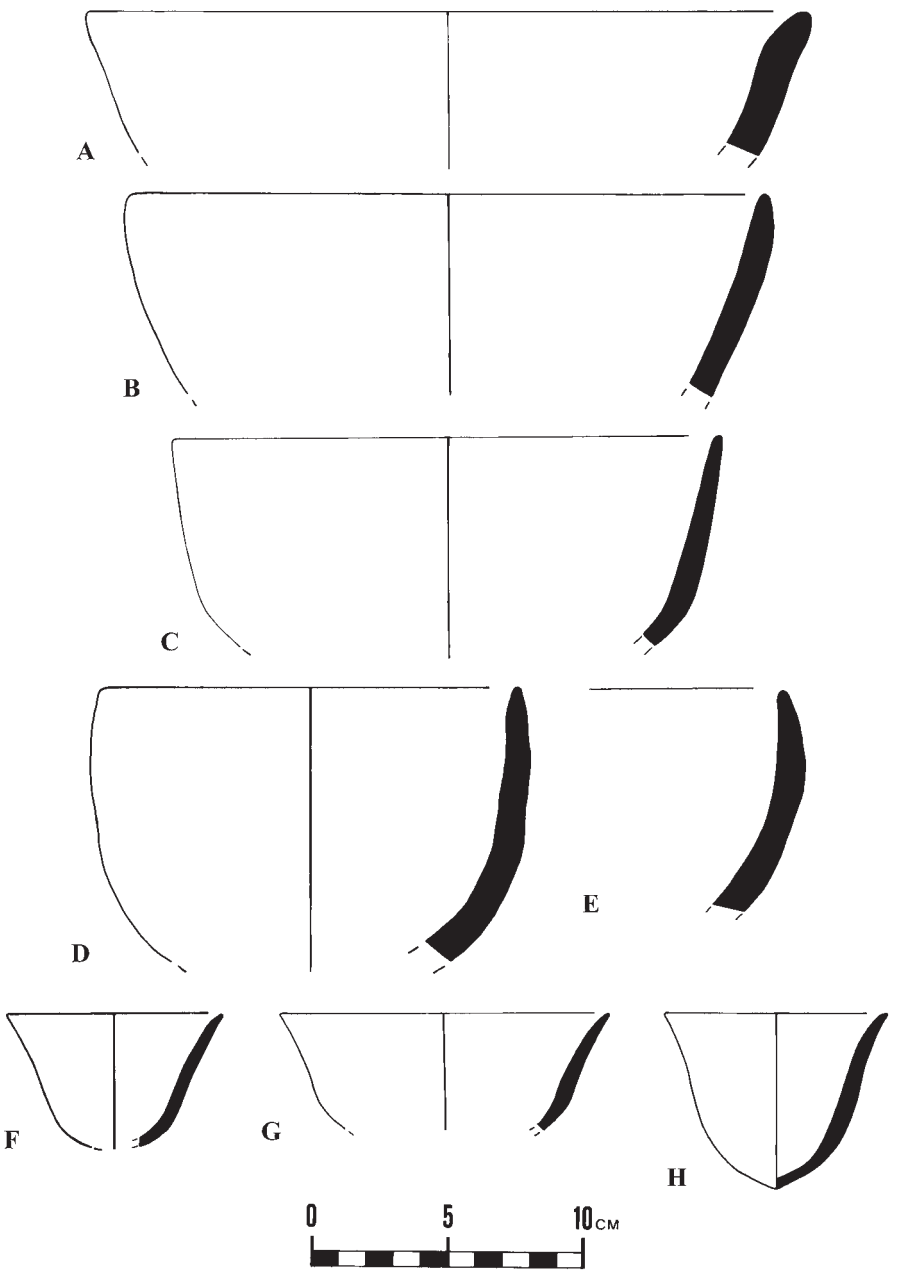


Fig. 15. Ubaid period ceramics.

Figure 16 descriptions

A. D5 L5146 KT6 #1: Dark gray surface (10YR 4/1). Reddish yellow fabric (7.5YR 6/6) abruptly transitioning to a black core (7.5YR 2.5/1). Large and fine grit temper.

B. D5 L5103 KT13 #1: Very pale brown exterior surface (10YR 8/4). Reddish yellow fabric (5YR 7/6) abruptly transitioning to a gray core (10YR 5/1). Dark brown paint on exterior and interior rim (7.5YR 3/3). Small to medium grit, including calcareous grit, and medium chaff temper.

C. D5 L5027 KT5211 #1: Light yellowish brown exterior surface (10YR 6/4). Reddish yellow fabric (7.5YR 6/6). Reddish yellow interior surface (7.5YR 6/6). Brown paint on exterior and interior rim (7.5YR 4/3). Fine grit and medium chaff temper.

D. D5 L5108 KT21 #1: Very pale brown exterior surface (10YR 8/3). Gray fabric (10YR 5/1) with an abrupt transition to a reddish yellow core (7.5YR 7/6). Gray interior surface (10YR 6/1). Dark brown paint on rim and exterior surface (7.5YR 3/2). Chaff impressions on interior and exterior surfaces. Medium chaff temper with some grit inclusions.

E. D5 L5079 KT5554 #4: Very pale brown exterior surface (10YR 7/4). Very pale brown core (10YR 7/4). Very pale brown interior surface (10YR 7/4). Dusky red paint on exterior surface (7.5R 3/2). Fine white grit temper with a few small air pockets. Diameter uncertain.

F. D5 L5079 KT5554 #5: Very pale brown exterior surface (10YR 7/4). Very pale brown core (10YR 7/4). Dusky red paint on exterior surface (7.5R 3/2). Fine small white grit temper. Diameter uncertain.

G. D5 L5094 KT1 #2: Very pale brown exterior surface (10YR 8/3). Very pale brown core (10YR 7/4). Pink interior surface (7.5YR 8/3). Dusky red paint on exterior surface (10R 3/2). Fine white grit temper. Diameter uncertain.

H. D5 L5079 KT5554 #3: Very pale brown exterior surface (10YR 7/4). Very pale brown core (10YR 7/4). Very pale brown interior surface (10YR 7/4). Dusky red paint on exterior surface (7.5R 3/2). Fine white grit temper with small air pockets on surfaces. Diameter uncertain.

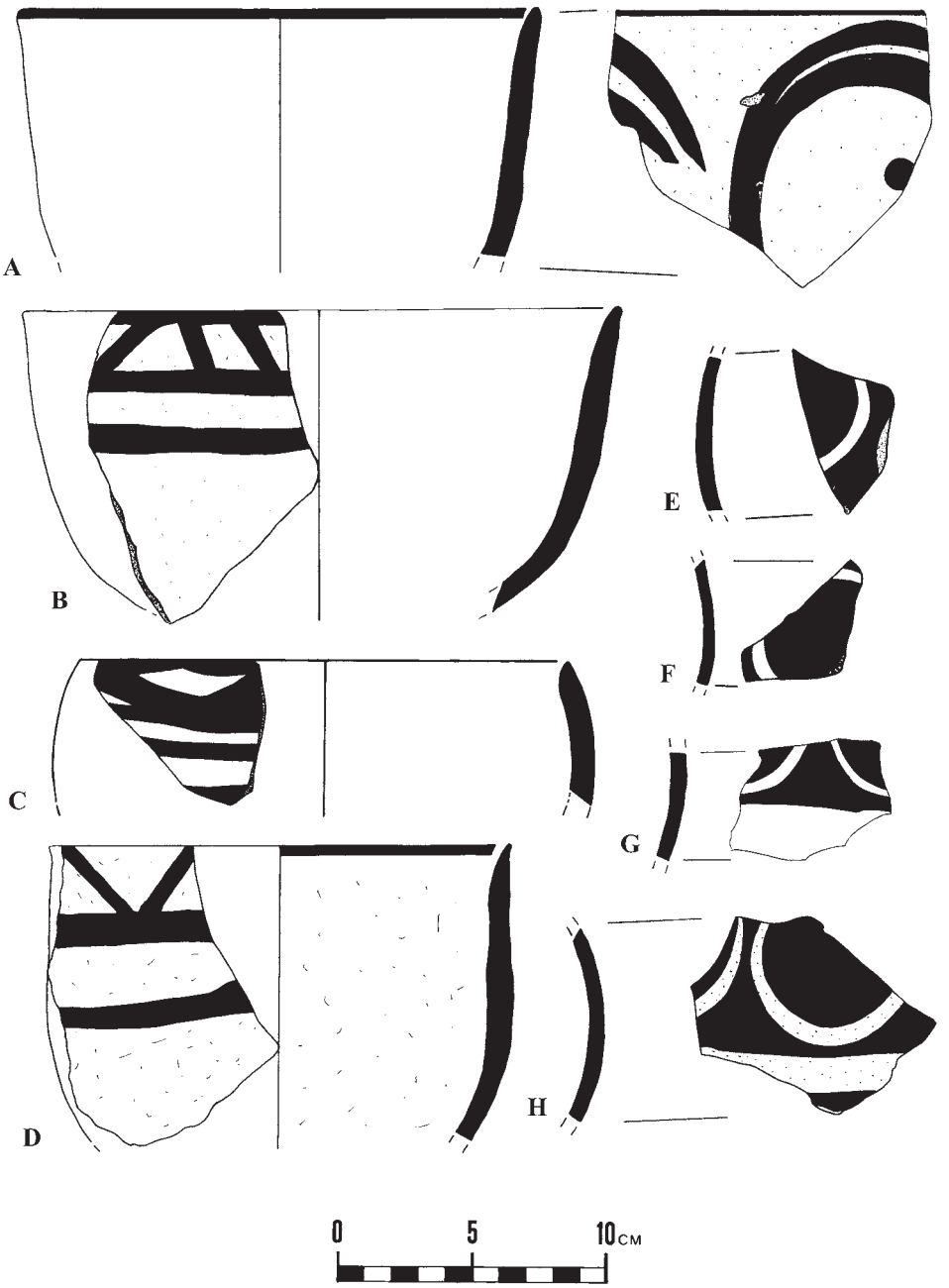


Fig. 16. Ubaid period ceramics.

Figure 17 descriptions

A. D5 L5029 KT5093 #1: Very pale brown exterior surface (2.5Y 8/3). Reddish yellow core (7.5YR 7/6). Pale yellow interior surface (10YR 8/4). Medium chaff temper. Dark brown paint (10YR 3/3).

B. D5 L5029 KT5093 #2: Pale yellow exterior surface (2.5Y 8/2). Very pale brown core (10YR 7/4). Pale yellow interior surface (2.5Y 8/2). Very dark grayish brown paint (10YR 3/2). Fine grit temper.

C. D5 L5094 KT21 #1: Pink exterior surface. Light red paint on exterior surface. Temper not noted.

D. D5 L5109 KT1 #1: Dusky red exterior surface (10R 3/2) grading to a very pale brown core (10YR 7/4). Pale yellow interior surface (2.5YR 8/3). Dark brown paint on exterior surface. Cream wash on interior surface. Fine grit temper.

E. D5 L5019 KT5136 #1: Dusky red exterior surface (10R 3/2) grading to a very pale brown core (10YR 7/4). Pale yellow interior surface (2.5YR 8/3). Dark brown paint on exterior surface. Cream wash on interior surface. Fine grit temper.

F. D5 L5039 KT5291 #2: Light red exterior surface (2.5YR 6/6). Light red fabric (2.5YR 6/6) changing to light gray core (10YR 7/1). Light red interior surface (2.5YR 7/6). Dark gray painted decoration (7.5YR 4/1). Fine grit temper.

G. D5 L5132 KT1 #3: Light gray exterior surface (2.5Y 7/2). Light yellowish brown core (10YR 6/4). Light brownish gray interior surface (2.5Y 6/2). Burnished interior and exterior surfaces. Wash on interior and exterior surfaces. Dark yellowish brown paint on exterior surfaces (10YR 3/4). Very fine chaff and grit temper.

H. D5 L5100 KT48 #1: Light reddish brown exterior surface (5YR 6/4). Yellowish red core (5YR 5/6). Yellowish red interior surface (5YR 5/6). Burnished interior and exterior surfaces. Incised and impressed decorations on exterior surface. Reddish brown paint on the rim, the neck, and probably on the body (5YR 4/4). Chaff temper.

I. D5 L5100 KT53 #1: Light red exterior surface. Exterior surface is painted reddish brown. Temper not noted.

J. D5 L5109 KT1 #2: Light red exterior surface (2.5YR 6/6) grading to a reddish yellow core (5YR 6/6). Light red interior surface (2.5YR 6/6). Burnished interior and exterior surfaces. Wash on the exterior surface. Reddish brown paint on the exterior surface (5YR 4/4). Fine grit and chaff temper. Diameter uncertain.

K. D5 L5132 KT1 #4: Very pale brown exterior surface (10YR 8/4). Very pale brown core (10YR 7/3). Pale yellow interior surface (2.5Y 7/4). Burnished on interior and exterior surfaces. Pale wash on exterior surface. Dark brown paint on exterior surface (7.5YR 3/4). Very fine grit and chaff temper. Diameter uncertain.

L. D5 L5094 KT41 #1: Very pale brown exterior surface (10YR 7/3). Right brown core (7.5YR 6/4). Pink interior surface (7.5YR 7/4). Very light cream wash on exterior surface. Dark reddish gray paint on exterior surface (7.5R 3/1). Fine chaff temper. Diameter uncertain.

Fig. 17. Ubaid period ceramics.

Figure 18 descriptions

A. D5 L5190 KT1 #4: Brown exterior surface (7.5YR 5/4). Dark grayish brown fabric (10YR 4/2) abruptly changing to a very dark gray core (10YR 3/1). Brown interior surface (7.5YR 5/4). Fine chaff temper.

B. D5 L5160 KT3 #5: Pink exterior surface (7.5YR 7/3). Gray to dark gray core (2.5Y 4.5/1). Yellowish brown interior surface (2.5Y 6/3). Fine to very large grit and medium chaff temper.

C. D5 L5160 KT3 #2: Pale yellow exterior surface (2.5Y 7/3). Light olive brown fabric (2.5Y 5/4) abruptly changing to a strong brown core (7.5YR 5/6). Pink interior surface. Fine grit and fine chaff temper.

D. D5 L5160 KT 3 #6: Light brown exterior surface (7.5YR 6/4). Strong brown fabric (7.5YR 5/6) grading to a dark grayish brown core (10YR 4/2). Brown interior surface (7.5YR 5/3). Fine and medium grit and fine chaff temper.

E. D5 L5160 KT3 #3: Yellowish red exterior surface (5YR 5/8). Red fabric (2.5YR 5/8). Yellowish red interior surface (5YR 5/8). Fine grit and few fine chaff temper.

F. D5 L5160 KT3 #10: Yellow exterior surface (2.5YR 7/6). Brown fabric (7.5YR 4/4) grading to a yellowish brown core (10YR 5/4). Very dark grayish cross hatched design painted on exterior surface (10YR 3/2). Very fine grit temper.

G. D5 L5190 KT1 #2: Reddish yellow exterior surface (5YR 6/8). Strong brown fabric (7.5YR 5/8). Reddish yellow interior surface (5YR 6/8). Dark reddish brown painted on exterior surface (5YR 3/2). Fine grit and fine chaff temper.

H. D5 L5169 KT2 #2: Yellowish brown exterior surface (10YR 6/4). Yellowish brown fabric (10YR 5/4) abruptly changing to a very dark gray core (10YR 3/1). Horizontal burnished on interior and exterior surfaces. 1g to fine grit temper.

I. D5 L5198 KT13 #1: Yellowish red exterior surface (5YR 5/6). Yellowish red fabric (5YR 5/6). Yellowish red interior surface (5YR 5/6). Red painted on exterior surface (10R 5/6). Very fine grit temper.

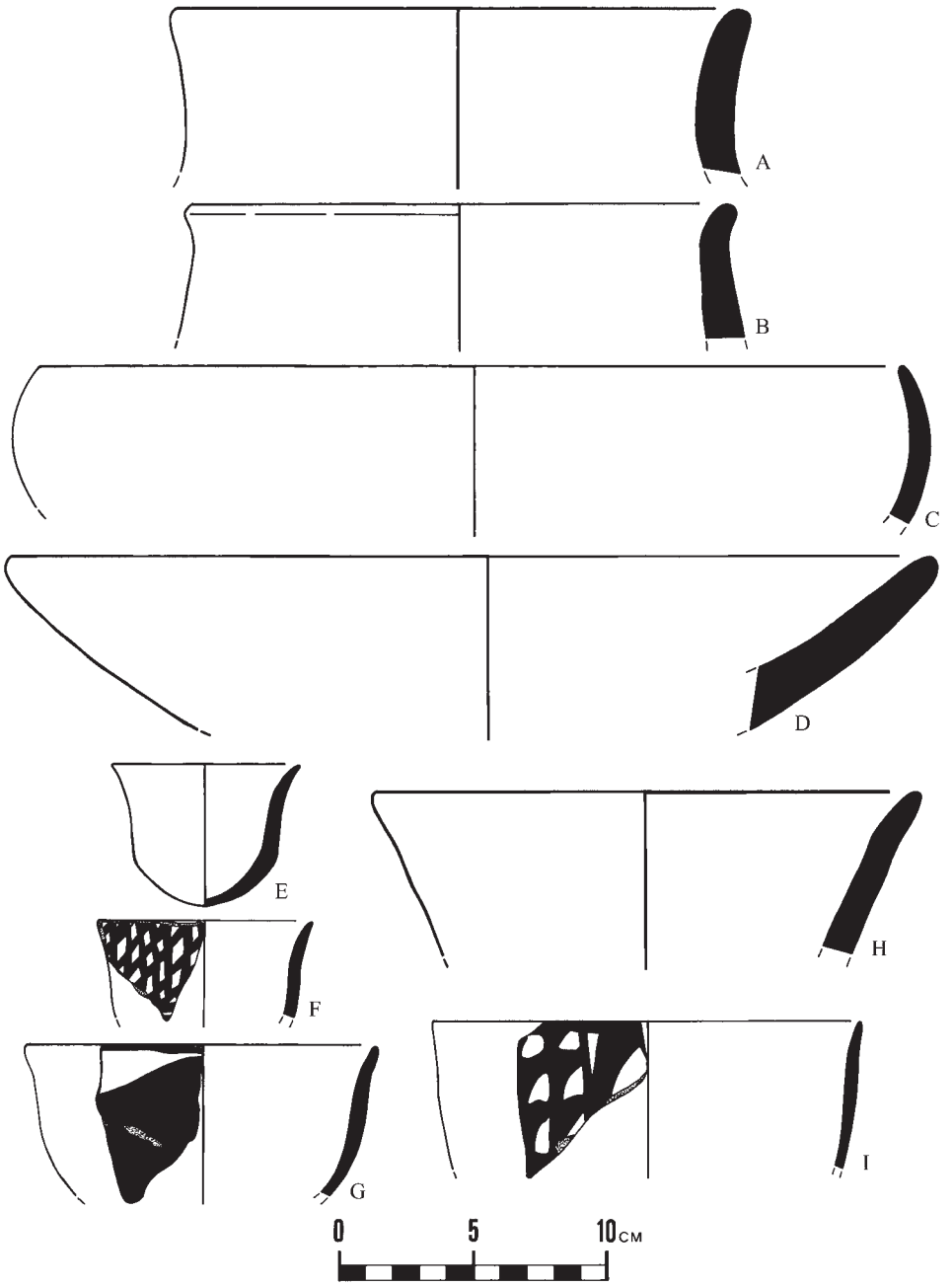


Fig. 18. Ubaid period ceramics.

Figure 19 descriptions

A. E2 L25 KT7 #2: Brown exterior surface (10YR 5/3). Black fabric (5Y 2.5/2). Brown interior surface. Three black bichrome bands painted on exterior surface (5Y 2.5/1), dusky red central band (10R 3/2). Fine micaceous grit temper.

B. E2 L25 KT10 #2: Light yellowish brown exterior surface (10YR 6/4). Very dark gray fabric (7.5YR 3/1). Light brown interior surface. Dark gray painted on exterior surface (10YR 4/1). Fine grit temper.

C. E2 L25 KT10 #5: Very pale brown exterior surface (10YR 7/3). Very dark gray fabric (2.5YR 3/1). Light brown interior surface (7.5YR 6/4). Brown painted on exterior surface (7.5YR 5/3). Medium and fine micaceous grit temper.

D. D5 L5190 KT1 #3: Yellowish red exterior surface (5YR 6/6). Strong brown fabric (7.5YR 5/6). Light reddish brown interior surface (5YR 6/4). Dusky red painted on exterior surface (2.5YR 3/2). Very fine grit and medium chaff temper.

E. E2 L24 KT3 #1: Light brown exterior surface (7.5YR 6/4). Reddish yellow fabric (7.5YR 6/6) abruptly changing to a light yellow brown core (2.5Y 6/3). Reddish yellow interior surface (7.5YR 6/6). Horizontal incised lines on exterior surface. Fine grit and fine chaff temper.

F. E2 L9 KT2 #7: Very pale brown exterior surface (10YR 8/4). Very pale brown fabric (10YR 8/3) grading to a light gray core (10YR 7/2). Dark brown painted design on exterior surface (7.5YR 3/2). Medium grit and medium chaff temper.

G. E2 L40 KT2 #9: Pink exterior surface (7.5YR 8/4). Red fabric (2.5YR 5/8) abruptly changing to a dark grayish brown core (10YR 4/2). Dusky red painted on exterior surface (10R 3/2). Wash on interior and exterior surfaces. Fine grit and medium chaff temper.

H. E2 L25 KT10 #7: Pale brown exterior surface (10YR 6/3). Strong brown fabric (7.5YR 6/4). Brown painted on exterior surface (7.5YR 5/2). Very fine grit and very fine micaceous temper.

I. E2 L25 KT10 #1: Very pale brown exterior surface (10YR 7/3). Strong brown fabric (7.5YR 5/6). Light brown interior surface (7.5YR 6/4). Impressed on exterior surface. Fine grit temper.

J. E2 L24 KT6 #4: Pale yellow exterior surface (2.5Y 7/3). Reddish yellow fabric (7.5YR 6/6) abruptly changing to a gray core (2.5Y 5/1). Pale yellow interior surface (2.5Y 7/3). Brown painted (7.5YR 5/2). Medium grit, coarse chaff and fine micaceous grit temper.

K. E2 L25 KT10 #6: Very pale brown exterior surface (10YR 7/4). Brown fabric (10YR 5/3). Light yellowish brown interior surface (10YR 6/4). Incised lines on exterior surface. Medium and coarse micaceous grit and coarse chaff temper.

L. E2 L24 KT6 #5: Pale yellow exterior surface (2.5Y 7/3). Reddish yellow fabric (7.5YR 6/6) abruptly changing to a gray core (2.5Y 5/1). Pale yellow interior surface (2.5Y 7/3). Brown painted on exterior surface (7.5YR 5/2). Fine and medium grit temper.

M. E2 L25 KT10 #4: Pale brown exterior surface (10YR 6/3). Very pale brown fabric (10YR 7/4). Pale brown interior surface (10YR 6/3). Brown painted on exterior surface. Fine grit temper.

N. E2 L25 KT7 #8: Pale yellow exterior surface (5Y 8/3). Yellowish brown fabric (10YR 5/4) grading to a dark grayish brown core (10YR 4/2). Pale yellow interior surface (2.5Y 7/4). Very dark grayish brown painted along the top of rim (10YR 3/2). Wash on exterior surface. Very few medium grit and fine chaff temper.

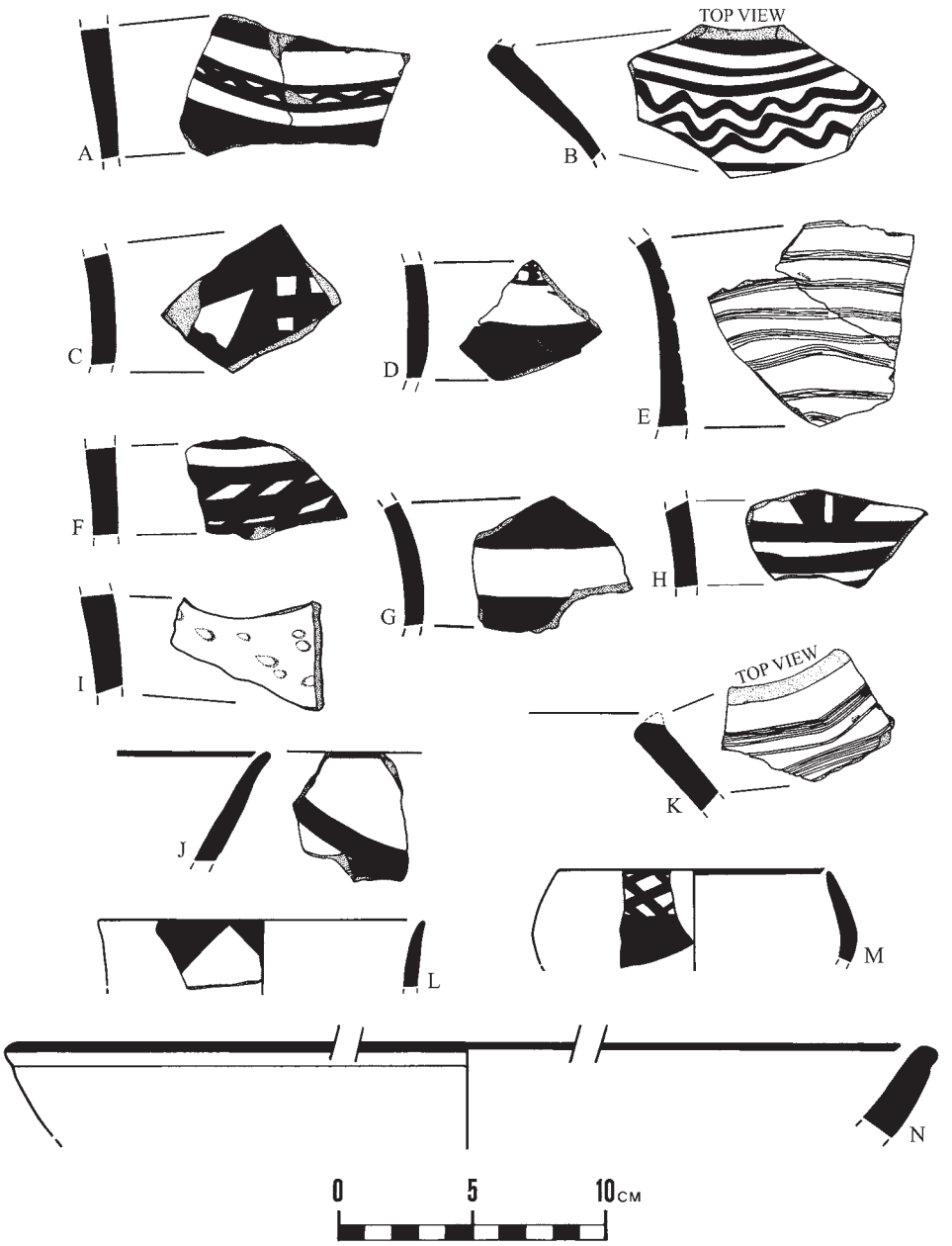


Fig. 19. Ubaid period ceramics.

Figure 20 descriptions

A. E2 L18 KT7 #1: Yellowish brown exterior surface (10YR 5/4). Light brown fabric (10YR 6/2) abruptly changing to a black core (5Y 2.5/1). Yellowish brown interior surface (10YR 5/4). Large quartz grit (pebble size) and very large chaff temper.

B. E2 L25 KT7 #7: Brown exterior surface (7.5YR 6/3). Strong brown fabric (7.5YR 5/6) abruptly changing to a dark gray core (5Y 4/1). Pink interior surface (7.5YR 7/4). Three incised lines on the exterior rim. Very fine grit and fine chaff temper.

C. E2 L16 KT15 #1: Light brown exterior surface (7.5YR 6/4). Light brown core (7.5YR 6/4). Light brown interior surface (7.5YR 6/4). Knob on rim. Fine grit and fine chaff temper.

D. E2 L18 KT 7 #2: Reddish yellow exterior surface (7.5YR 7/6). Reddish yellow fabric (7.5YR 7/6) abruptly changing to a dark grayish brown core (10YR 4/2). Burnished on interior and exterior surfaces. Fine grit and fine chaff temper.

E. E2 L18 KT7 #3: Light yellowish brown exterior surface (10YR 6/4). Light brown fabric (7.5YR 6/4) abruptly changing to a bluish black core (2.5/5 PB). Light yellowish brown interior surface (10YR 6/4). Horizontal burnished on interior and exterior surfaces. Small to large grit and chaff temper.

F. E2 L25 KT10 #3: Light reddish brown exterior surface (5YR 6/4). Light brown fabric (7.5YR 6/4) abruptly changing to a gray core (10YR 5/1). Medium grit temper.

G. E2 L24 KT3 #3: Yellowish brown exterior surface (10YR 6/4). Yellowish brown fabric (10YR 5/4) abruptly changing to a bluish black core (5B 2.5/1). Yellowish brown interior surface (10YR 5/4). Fine grit and few very fine chaff temper.

H. E2 L24 KT3 #2: Brown exterior surface (10YR 5/3). Brown fabric (7.5YR 4/2) abruptly changing to a very dark gray core (7.5YR 3/1). Yellowish brown interior surface (10YR 5/4). Horizontal scant burnished on interior and exterior surfaces. Very large grit and very large to medium chaff temper and chaff faced on exterior surface.

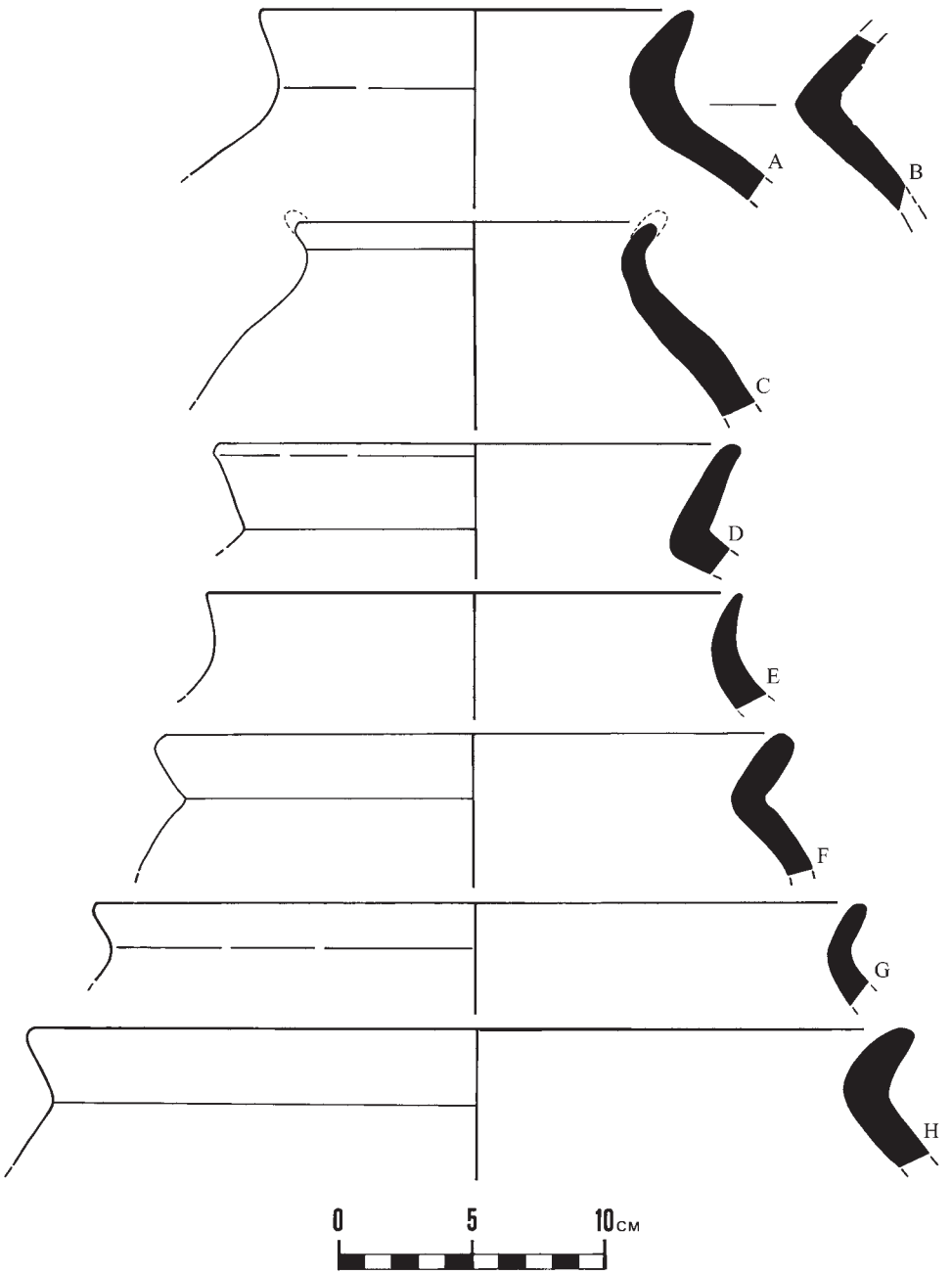


Fig. 20. Ubaid period ceramics.

Figure 21 descriptions

A. D5 L5011 KT5050 #1: Very dark gray exterior surface (2.5Y 6/2). Light olive brown fabric (2.5Y 5/3). Light brownish gray interior surface (2Y 3/1). Fine grit temper. Dark grayish brown (2.5Y 4/2) and dark gray paint (2.5YR 4/1) on exterior. Black paint on interior rim (2.5Y 2.5/1).

B. D8 L58 KT8 #7: Very pale brown exterior surface (10YR 7/4). Reddish yellow fabric (7.5YR 6/6). Pink interior surface (7.5YR 7/4). Fine grit temper. Brown paint (7.5YR 5/4).

C. E2 L24 KT6 #5: Pale yellow exterior surface (2.5Y 7/3). Reddish yellow fabric (7.5YR 6/6) abruptly transitioning to a gray core (2.5Y 5/1). Pale yellow interior surface (2.5Y 7/3). Fine and medium grit temper. Brown paint on exterior surface (7.5YR 5/2).

D. E2 L40 KT2 #6: Reddish yellow exterior surface and fabric (7.5YR 6/6) abruptly transitioning to a brown core (7.5YR 5/2). Reddish yellow interior surface (10YR 7/4). Medium and fine grit and fine chaff temper. Dusky red paint on exterior (2.5YR 3/2).

E. E2 L40 KT2 #8: Reddish yellow exterior and interior surfaces and fabric (5YR 7/6) with an abrupt transition to a very pale brown core (10YR 7/4). Large and medium grit and fine chaff temper. Dark brown paint (7.5YR 3/2).

F. D10 L7 KT2 #1: Pink exterior surface (5YR 7/3). Pinkish gray interior surface (5YR 7.2). Fine chaff temper. Scraped on exterior.

G. D8 L58 KT1 #2: Pink exterior surface (7.5YR 8/4). Reddish yellow fabric (7.5YR 6/6) abruptly changing to very dark gray core (7.5YR 3/1). Reddish yellow interior surface (7.5YR 7/6). Fine to large micaceous grit and chaff temper. Chaff faced. Dark brown paint (7.5 YR 3/2).

H. D8 L110 KT1 #1: Pale red exterior surface (10R 7/4). Light reddish brown fabric (2.5YR 6/4). Light reddish brown interior surface (2.5YR 6/4). Very fine grit temper. Reddish brown paint (5YR 4/3).

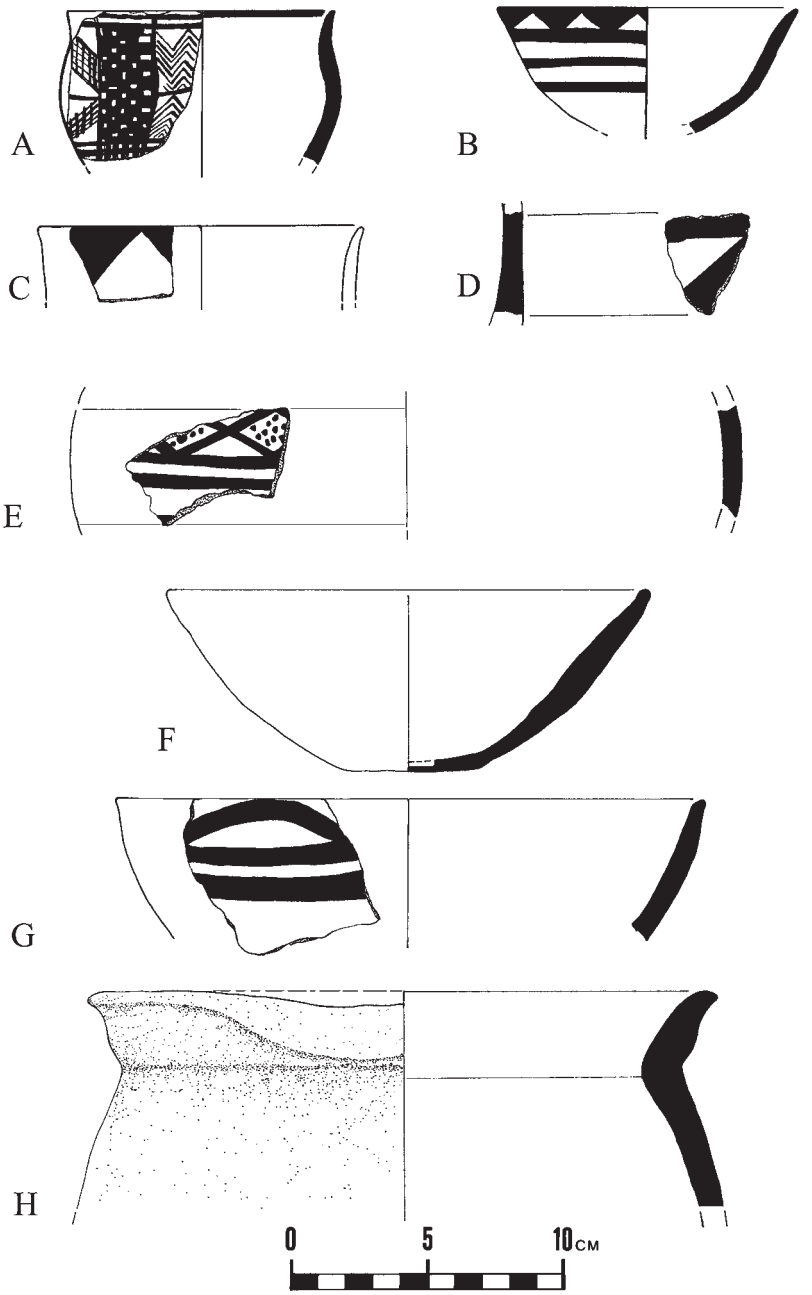


Fig. 21. Ubaid period ceramics.

Figure 22 descriptions

A. E2 L94 KT6 #2: Pale yellow exterior surface (2.5YR 7/3). Pale brown fabric (10YR 6/3). Very pale brown interior surface (10YR 7/3). Very fine grit temper. Scraped on exterior.

B. D8 L70 KT4 #3: Light brown exterior surface (7.5YR 6/4). Strong brown fabric (7.5YR 5/3) grading to a dark gray core (2.5Y 4/1). Brown interior surface (7.5YR 5/3). Fine micaceous grit temper. Dark brown (7.5YR 3/2) paint.

C. D5 L5203 KT1 #3: Very dark gray exterior surface (7.5YR 3/1). Very dark gray fabric (7.5YR 3/1). Gray interior surface (7.5YR 5/1). Medium grit temper with some large grit inclusions. Chaff faced. Burned and scraped on exterior.

D. D5 L5160 KT3 #9: Pink exterior surface (7.5YR 7/3). Pink interior surface (7.5YR 7/3). Brown core (7.5YR 5/4). Medium and fine grit, few fine chaff temper.

E. D8 L70 KT1 #1: Black exterior and interior surfaces (2.5Y 2.5/1). Fine and medium grit temper.

F. E2 L25 KT7 #6: Pink exterior surface (7.5YR 7/3). Reddish yellow fabric (7.5YR 6/8) abruptly transitioning to a very dark gray core (7.5YR 3/1). Pink interior surface (7.5YR 7/4). Fine grit and fine chaff temper.

G. D8 L89 KT4 # 1: Light brown exterior and interior surfaces (7.5YR 6/3). Reddish yellow fabric (5YR 6/6) grading to a gray core (5YR 6/1). Very fine chaff and grit temper.

H. E2 L25 KT8 #2: Light gray exterior and interior surfaces (2.5YR 7/2). Light gray core (2.5YR 7/2). Very fine chaff and grit temper.

I. E2 L25 KT10 #6: Light yellowish brown exterior surface (10YR 6/4). Brown fabric (10YR 5/3) abruptly changing to black core (7.5YR 2.5/1). Fine and medium grit temper.

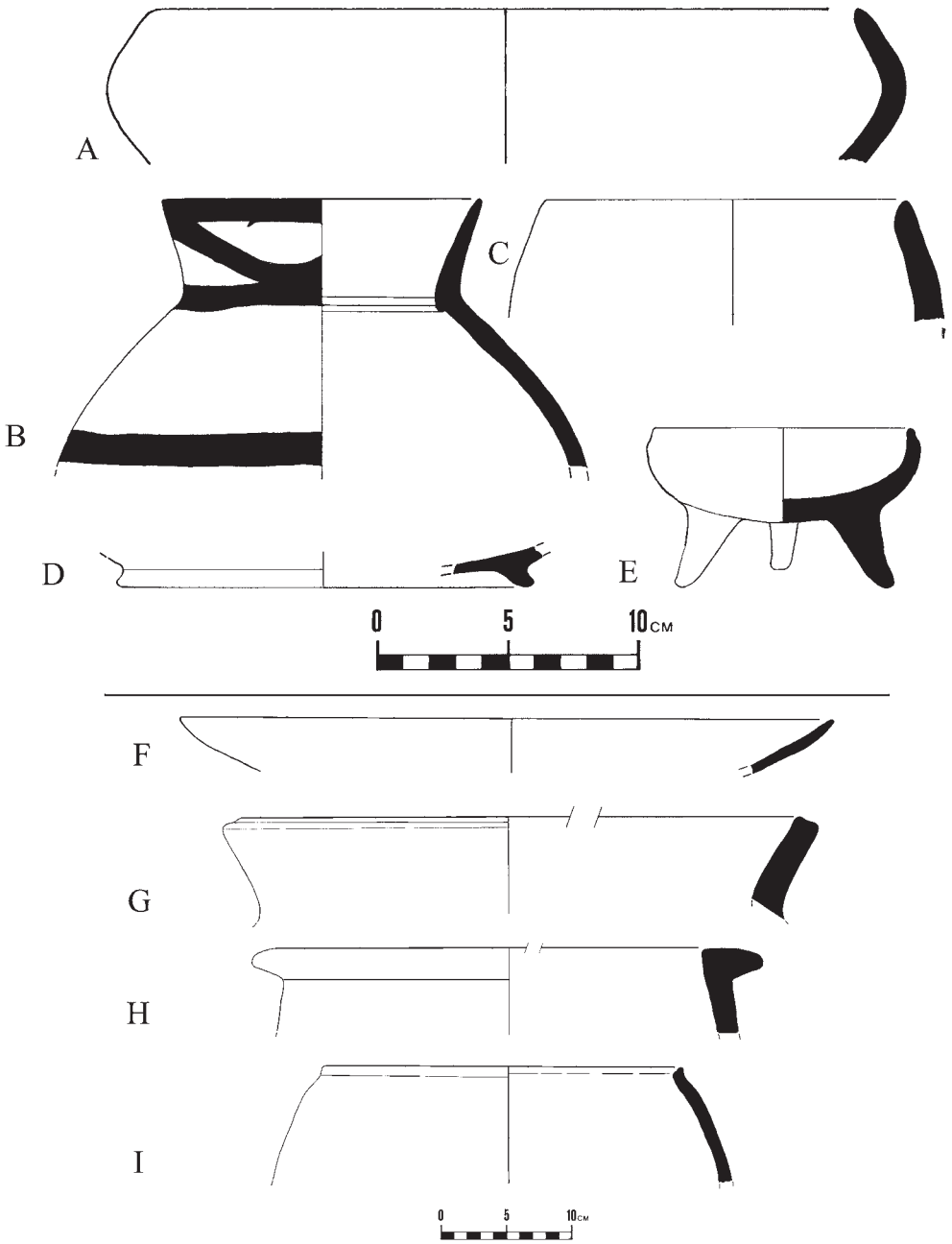


Fig. 22. Ubaid period ceramics.

Figure 23 descriptions

A. E2 L25 KT18 #1: Blade-like flake, both ends truncated. Gloss on right edge that extends to flake ridge on dorsal surface and wide band on ventral. Light brown flint.

B. E2 L24 KT10 #1: Blade-like flake with faceted butt. Distal end truncated (slightly concave). Gloss on right edge that extends to flake ridge on dorsal surface and wide band on ventral. Light brown flint.

C. D5 L5169 KT8 #1: Blade-like flake, both ends truncated (proximal inversely). Gloss on both faces of right edge which is also chipped and slightly rounded. Light pinkish-beige opaque flint (subjected to heat?). Reddish cortex.

D. D5 L5190 KT26 #1: Flake with dihedral striking platform and terminating in hinge fracture. Gloss on right edge (damaged) to ridge on dorsal surface and wide band on ventral. Light orange-brown flint.

E. E2 L24 KT2 #1: Piercer on broken flake of grey flint; stained area on left side and cortex. Point is prounced and formed by abrupt scaled retouch in concave area of right side and on broken area; some spalling on ventral surface at tip.

F. E2 L25 KT17 #1: Piercer on broken blade-like flake. Short point formed by abrupt retouch on both sides at distal end. Light grey flint.

G. E2 L8 KT2 #1: Piercer on broken blade-like flake. Short point off-set by nibbling retouch on both sides forming concave area at distal end. Light grey flint.

H. E2 L25 KT11 #1: Scraper. Semi-abrupt retouch across distal end forming a straight edge on flake of light grey flint. Plain striking platform with ring crack and resolved bulb of percussion.

I. F1 L1117 KT8 #1: Denticulate. Abrupt retouch around about three-quarters of the circumference of a thick flake forming a denticulated contour. Mid-brown flint, slightly patinated and with water-worn cortex.

J. E2 L24 KT10 #2: Possible piercer. Short point on distal end of flake has been off-set by light retouch in concave areas. Short stretch of abrupt retouch on left edge. Light grey flint; small patch of cortex.

K. D5 L5169 KT3 #1: Scraper. Abrupt scaled and somewhat denticulated retouch on left edge of large flake. Mid-brown matt banded flint; cortex weathered. Dihedral striking platform.

L. D5 L5190 KT10 #1: Blade segment. Right edge rounded and worn smooth. Mid-dark brown flint with inclusions.

M. D9 L11 KT6 #1: Blade segment. Right edge irregularly chipped and edge partly rounded/worn edge. Beige-grey flint.

N. E2 L25 KT8 #1: Blade. Distal segment of thick blade. Edges and distal end have regular chipping. Possibly retouched. Mid-brown flint; weathered cortex.

O. E2 L25 KT17 #2: Backed blade-like flake. The thicker left edge has abrupt retouch on distal half. Right edge irregularly chipped. Plain striking platform with ring crack and double bulb of percussion.

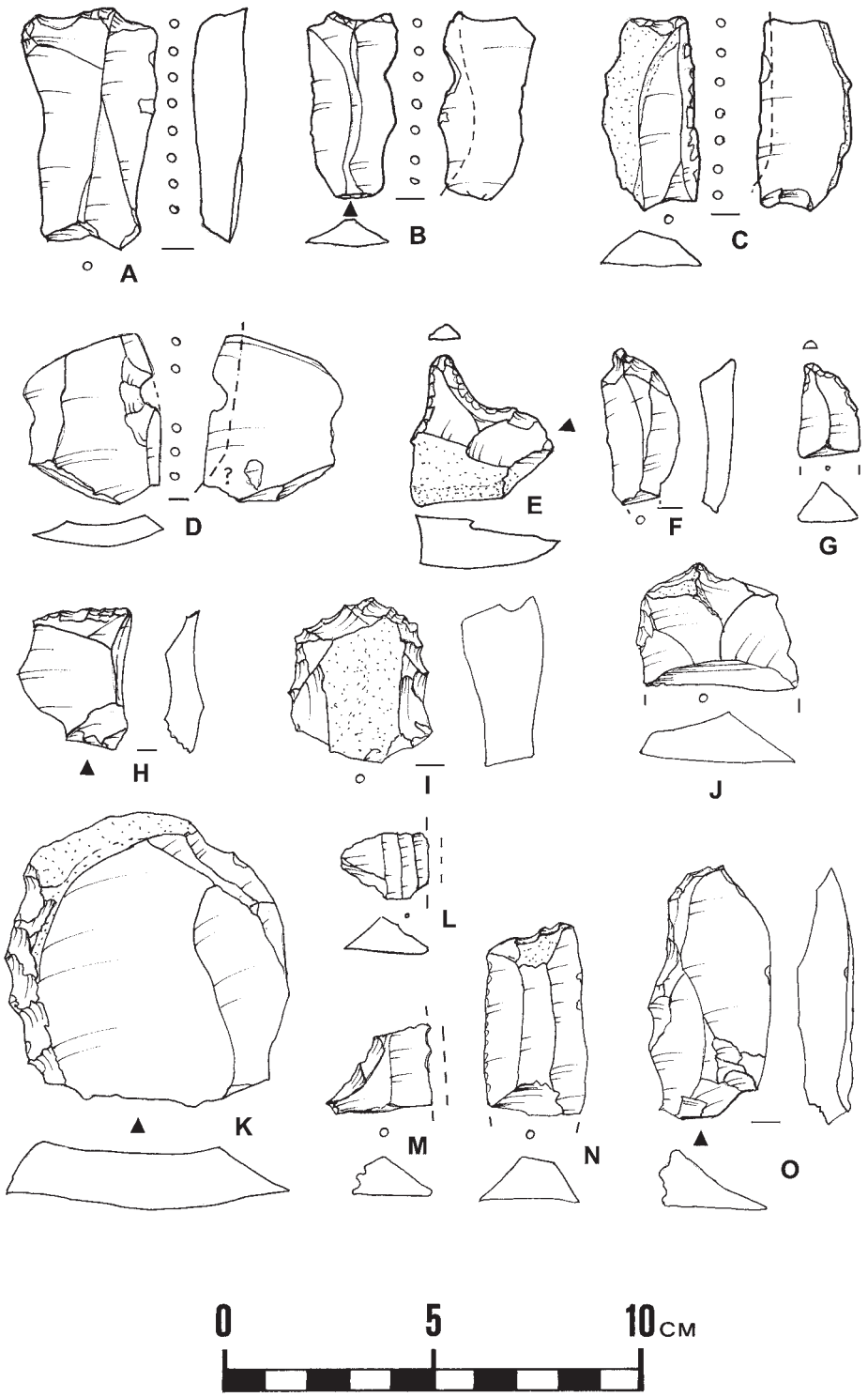


Fig. 23. Flint lithics from various trenches.

Figure 24 descriptions

A. D8 L19 KT2 #1: Blade segment. Edges worn; left edge damaged. Some striations visible. Translucent green obsidian.

B. D5 L5190 KT13 #1: Blade segment. Edges worn; left edge very damaged. Right edge heavily worn or possibly ground which encroaches partly onto the ventral surface. Some striations visible. Translucent green obsidian.

C. D5 L5190 KT23 #1: Blade segment. Retouch on both edges, but left edge damaged. Translucent green obsidian.

D. F1 L1117 KT8 #1: Transverse arrowhead. Segment of blade retouched across break and on side to form a tranchet. Translucent green obsidian.

E. E2 L25 KT18 #1: Segment of a thick blade. Right edge has semi-invasive scale flaking on dorsal surface and abrupt edge retouch on the ventral forming a bevel. Left edge has inverse retouch on distal part. Opaque black slightly coarse obsidian with grey edge.

F. D5 L5190 KT13 #2: Blade segment. Nibbling edge retouch and slightly worn on both edges. Translucent green obsidian.

G. D5 L5169 KT8 #1: Blade segment. Both edges crushed and some flaking on ventral surface. Translucent green obsidian.

H. D5 L5190 KT13 #3: Blade segment. Nibbling edge retouch and slightly worn on both edges. Translucent green obsidian.

I. D5 L5169 KT8 #2: Distal end of blade. Square shaped with slight hinge termination. Some chipping on edges. Translucent green obsidian.

J. D5 L5190 KT13 #1: Écaillé piece. Blade fragment appears to have been struck on an anvil. Translucent brownish- grey obsidian.

K. D8 L19 KT2 #2: Small écaillé piece splintered at both ends. Fairly coarse opaque black obsidian with grey edge.

L. E2 L25 KT18 #2: Core fragment? Small struck lump with multi-directional scars and cortex on two faces. Slightly coarse opaque black obsidian with grey edge.

M. E2 L22 KT4 #1: Écaillé piece. Cortex on back. Splintering at both ends. Slightly coarse opaque black obsidian.

N. E2 L22 KT4 #2: Écaillé piece. Splintering at both ends. Fairly coarse opaque black flint with grey edge.

O. E2 L24 KT2 #1: Core fragment? Small struck lump with multi-directional scars and some step fracturing. Slightly coarse opaque black obsidian with grey edge.

P. E2 L24 KT2 #2: Large flake struck from a changed orientation core. Cortex on dorsal surface and on striking platform. Fairly coarse opaque black obsidian.

Q. E2 L25 KT8 #1: Long narrow early stage flake removing outside curvature of the nodule. Cortex on dorsal surface. Slightly coarse opaque black flint.

R. D5 L5190 KT23 #2: Flake with parallel flake scars. Striking platform plain with slight lip and diffuse bulb of percussion. Black obsidian with grey edge.

S. E2 L24 KT7 #1: Large flake struck from a changed orientation core. Cortex on dorsal surface. Striking platform indeterminate with much step fracturing on edge. Fairly coarse opaque black obsidian.

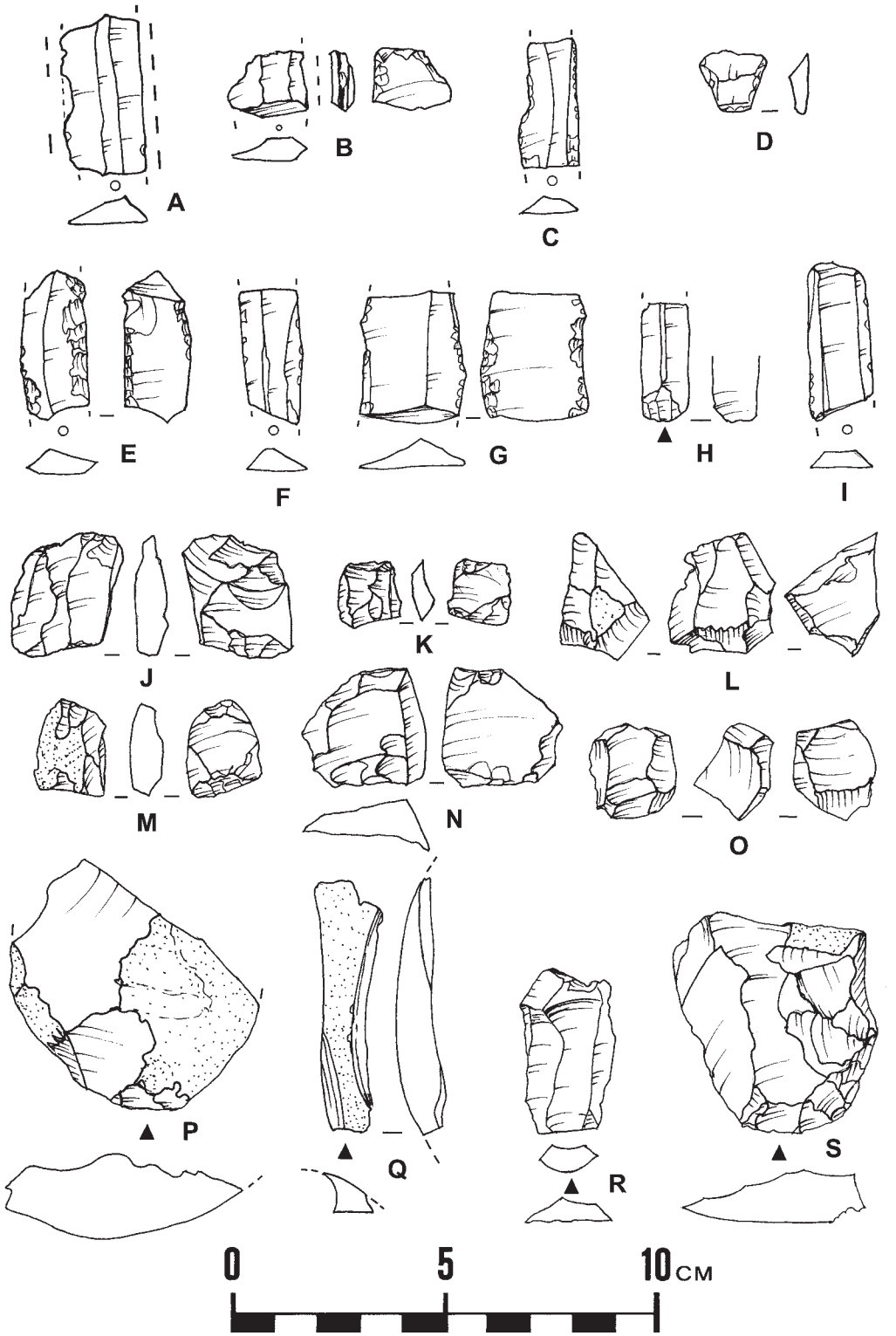


Fig. 24. Obsidian lithics from various trenches.

Figure 25: Obsidian arrowhead (D.5.5190.27) from Ubaid context in trench D5.

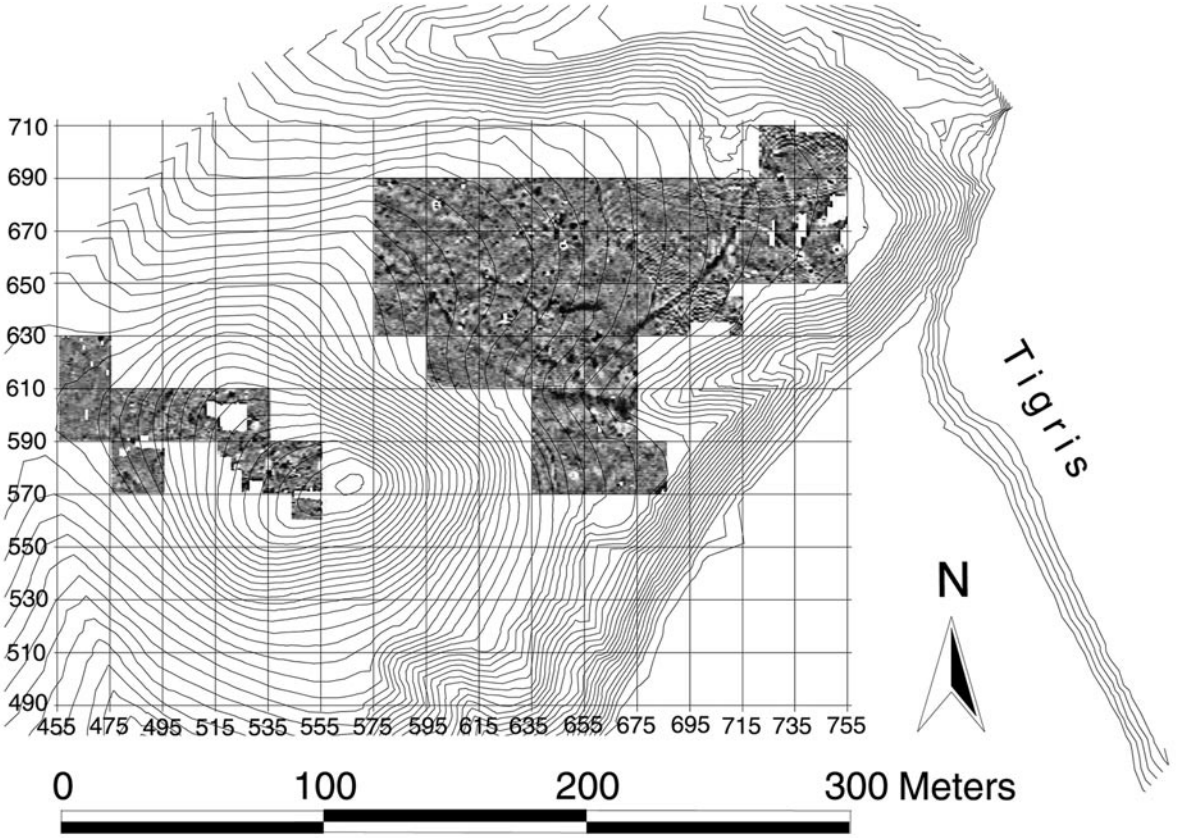


Figure 26: 2004 season remote sensing data in its 20 x 20 meter collection grid superimposed onto the site topographic map.

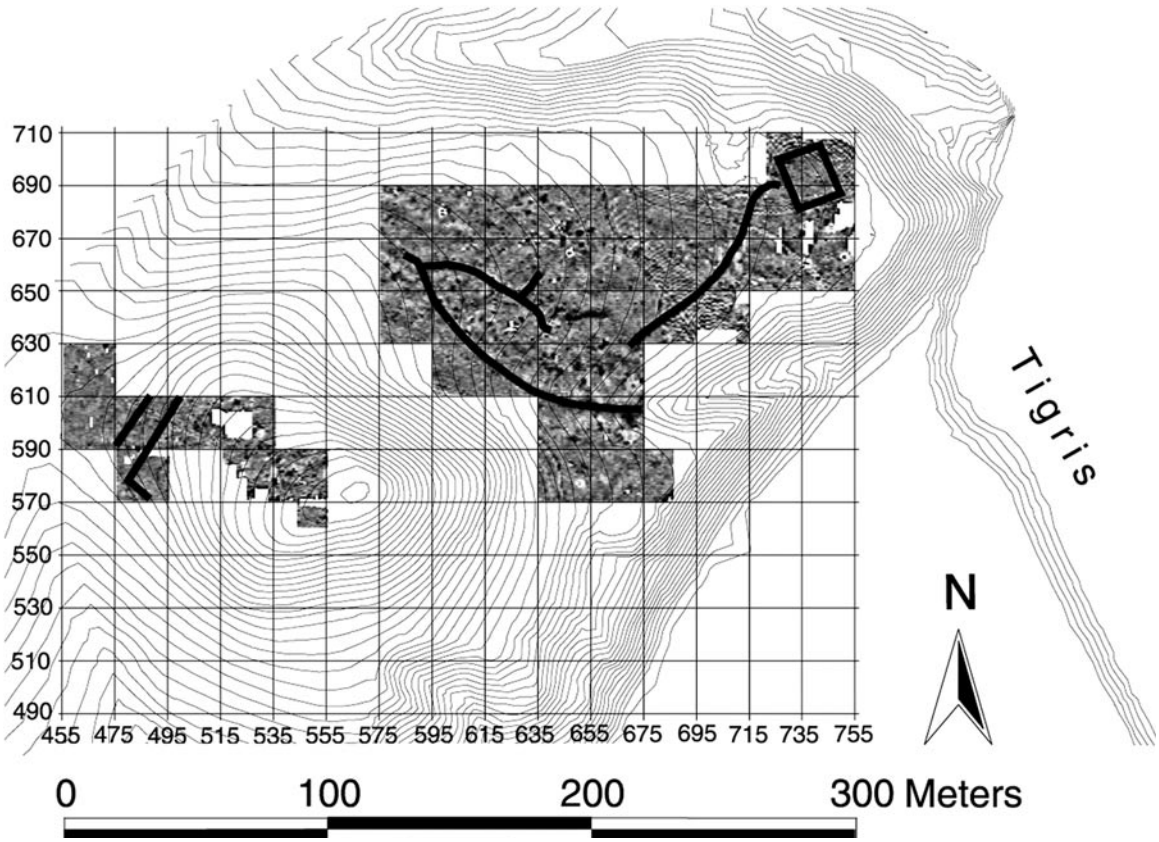


Figure 27: Previous figure with features discussed in the text marked by black lines. Features include: linear and square features in the lower town, and the wall on the western side of the tell. The latter is marked by a line for its outer face, and a line for its inner face where the clay layer to the east contrasts with the wall to the west.