ANATOLICA XXX, 2004

TELL KURDU EXCAVATIONS 2001

Rana Özbal, Fokke Gerritsen, Benjamin Diebold, Elizabeth Healey, Nihal Aydın, Michelle Loyet, Frank Nardulli, David Reese, Heidi Ekstrom, Sabrina Sholts, Nitzan Mekel-Bobrov and Bruce Lahn[1]

INTRODUCTION

Rana Özbal and Fokke Gerritsen

This article describes the results of the 2001 excavations at Tell Kurdu and presents preliminary studies on the finds categories. The Tell Kurdu Project is part of the Oriental Institute's Amuq Valley Regional Project (AVRP). Since 1995, the AVRP has been conducting a long-term program of excavations in the Amuq Valley (south-eastern Turkey) with the aim of investigating regional settlement dynamics over time. Several Oriental Institute led seasons of excavation have been conducted at the prehistoric mound of Tell Kurdu since 1996 (Edens and Yener 2000a; Yener 2000; Yener et al. 2000b). The year 2001 marked the beginning of a new stage of research when AVRP Director K.A. Yener handed the responsibility of the excavations to the first two authors of this article.[2]

Tell Kurdu is a ca. 15-hectare mound located in the center of the Amuq Valley in the province of Hatay (fig. 1). Brief excavations conducted at the site in the 1930s under the direction of Robert J. Braidwood determined that the site was occupied in Amuq Phases C-E, roughly contemporaneous with the Halaf and Ubaid (6-5th millennium BC) cultures of Northern Mesopotamia (Braidwood and Braidwood 1960). The excavations by the Braidwoods and recent intra-site surface surveys indicate that Amuq C remains occur over the entire 15 ha of the mound (although it has not yet been established whether this whole area was occupied simultaneously). The subsequent 5-7 ha Amuq E settlement was concentrated on the southern part of the site. The 1996, 1998 and 1999 seasons focused on the Amuq E levels of the higher south mound although soundings and trenches were placed in the northern mound as well, for initial investigations of the Amuq C and D levels (Edens and Yener 2000a; Yener 2000; Yener et al. 2000b). The work conducted in

[1] Rana Özbal (Northwestern University, USA), Fokke Gerritsen (Free University Amsterdam, Netherlands), Benjamin H. Diebold (Yale University, USA), Elizabeth Healey (University of Manchester, UK), Ş. Nihal Aydın (MTA Mineral and Research General Directorate, Turkey), Michelle Loyet (University of Illinois at Urbana-Champaign, USA), Frank Nardulli (University of Illinois at Urbana-Champaign, USA), David S. Reese (Yale University, USA), Heidi Ekstrom (St. Mary's University, USA), Sabrina B. Sholts (University of Chicago, USA), Nitzan Mekel-Bobrov (University of Chicago, USA), and Bruce T. Lahn (University of Chicago, USA).

[2] We are grateful to Aslıhan Yener, the director of the Amuq Valley Regional Project who entrusted the excavations to us and is a continued source of encouragement and support. This research was made possible financially by grants from the National Science Foundation (BCS 0118085), the Wenner-Gren Foundation (GR 6788), the American Institute in Turkey (ARIT), and the Fulbright-Hays Program, as well as by the financial and other support of numerous private donors.

2001 specifically focused on the highest preserved Amuq C or Halaf-related level in the northern part of the mound. A major aim was to uncover a broad single-phase horizontal exposure.

Tell Kurdu is not only by far the largest prehistoric settlement in the Amuq Valley, but it is also considerably larger than most Halaf settlements, as Halaf or Halaf-related sites larger than 10 ha are rare (Algaze et al. 1991:195; Bernbeck et al. 1999:110, Campbell et al. 1999, Matthews 2000:108). Halaf-period archaeology has long focused on documenting and explaining the similarities in material culture over Northern Mesopotamia and South-eastern Anatolia. Emphasis has been on inter-regional comparative studies of ceramics and architectural styles (Akkermans 1993; Campbell 1992; Matthews 2000; Watkins and Campbell 1987; Watson 1983). Although a supra-regional framework can address important issues on the continuity of distinctive cultural characteristics over space and time, it leaves a void in the local perspective in which settlements and communities are understood in their specific cultural, geographical, and ecological contexts. Single-phase exposures (fig. 2) such as uncovered in the Amuq C settlement at Tell Kurdu are a prerequisite for addressing questions from a local perspective. To investigate intra-site variability and to infer the spatial and contextual nature of the exposed structures, the analyses conducted include a series of microarchaeological methods that complement traditional artifact studies.

At this stage, it is too early to present a full synthesis of the findings. This report includes a discussion of the architecture and general layout, the results of a series of radiocarbon dates, and summaries of ongoing analyses on ceramics, lithics, fauna, shell, flora, and burials as well as reports on microarchaeological and petrographic studies and DNA analysis of the human remains. The emphasis lies on the single occupation phase to which most excavated contexts belong. Several human burials dug into the main occupation level in later Amuq C and E phases are included in the section on the human burials. A later circa 1 meter wide ditch feature and a number of intrusive pits of Amuq C and D date are not further discussed in this report (fig. 3).

OVERALL PLAN AND STRUCTURES

Rana Özbal and Fokke Gerritsen

General observations

The main objective of the 2001 season at Tell Kurdu was to expand the Amuq C trenches (Tr 12 and 16) exposed in 1999 in the northern part of the site (fig. 1; see Edens and Yener 2000b: 43-46) .[3] This part of the site suffered in the 1970s from bulldozer

[3] The season ran from 18 July-7 September 2001 with permission from the Turkish Ministry of Culture. In addition to AVRP director Aslıhan Yener and Tell Kurdu co-project directors Rana Özbal and Fokke Gerritsen, the 2001 team included Sarah Kielt Costello, Gülçin Çakmakcı, Benjamin Diebold, Özlem Doğan, Mücella Erdalkıran, Elizabeth Healey, Kathryn Keith, Hadi Özbal, Sabrina Sholts, Yukiko Tonoike, and Ayşen Uygur. The 2002 and 2003 study seasons included members of the excavation staff listed above as well as Ahmet Ünal, and Emre Kuruçayırlı. The government representatives for the season were Ünal Demirer of the Antalya and Hakkı Alhan of the Gaziantep museums. In addition, the team included 17 workers from the various villages surrounding the site. We thank the

leveling to make the mound suitable for irrigation agriculture. Because of the leveling, intact architectural remains lie very close beneath the surface of the northern part of the mound. The topmost 20 to 30 cm is destroyed by plowing, but the damage beneath the plow zone is limited to occasional plow scars and shallow irrigation trenches. Estimates about the number and duration of occupation phases that were lost are difficult to give, although intrusive Amuq D pits and Amuq E burials indicate that by that phase the nature of occupation of this part of the mound had changed.

Excavations had begun in 1999 in the center of the northern mound to explore subsurface linear features revealed by a 1998 magnetometry survey (Edens and Yener 2000a: 200). Although the 1999 excavations suggested that these features represented the pisé walls of a large rectangular building, the 2001 season made it clear that this interpretation was erroneous. The faulty reasoning was in part due to the limited size of the 1999 exposure. In 2001, the total excavated area was expanded to 800 m^2 in eight adjacent trenches of 9.5 x 9.5 m separated by 50 cm balks (fig. 2). This clarified the nature of the area: the greenish gray deposits formerly interpreted as pisé walls were actually alleys between densely packed mudbrick architecture.

The exposed structures are part of a neighborhood situated along the northern edges of the settlement (fig. 1). As a result of pre-existing mounding, the architecture had been built on a gentle slope going down towards the north and northeast. The parts of the neighborhood higher up on the slope were understandably more seriously affected by the leveling. Walls and deposits in the southern part of Tr 21 were preserved only to a height of a few centimeters, and earlier deposits began to appear underneath. In contrast, walls stood up to 75 cm in the northeastern part of Tr 25.

The southern part of Tr 24 did not yield coherent architectural remains (fig. 3), probably also due to the leveling. Wall remains and surfaces in this trench are provisionally interpreted as the remains from a poorly preserved occupation phase post-dating the structures in the other trenches. Despite of the uneven preservation, the other seven trenches yielded a coherent settlement plan (fig. 2), which on stratigraphic grounds appears to represent a single phase of occupation with only limited intra-phase modifications (but see the section on absolute chronology below). Floor levels were reached throughout and materials were systematically collected for studies of material culture, zooarchaeology, and paleobotany as well as for fine-grained micro activity-area analyses. Deposits from all interior spaces and many exterior spaces were 100% dry screened with a 5 mm mesh.

Braidwood's exploratory work on the northern part of the mound revealed a build-up of at least three meters of Amuq C deposits (Braidwood and Braidwood 1960:18). The level exposed in 1999 and 2001 must belong to one of the highest in this sequence but it is currently impossible to determine at which elevation our excavations took place in

workmen for their hard work and are most grateful to the excavation and analysis teams for their dedication. Many thanks also go to Hadi Özbal for his help with administrative and logistical aspects of the project as well as for his efforts with the soil collection and analyses. We are very thankful to Olivier Nieuwenhuyse and Chiara Cavallo for useful comments and discussions on Halafian ceramics and fauna respectively. We would finally like to express our gratitude to our cooperative governmental representatives as well as the Rector of Mustafa Kemal University, Prof. Dr. Haluk İpek, and Dean Prof. Dr. Keriman Günaydın for providing us with lab space and housing.

relation to the Amuq C deposits that existed in Braidwood's time. It is certain, however, that the earliest Amuq C phase has not yet been reached. Not only is the exposed level situated on top of another three to four meters of archaeological deposits, but there are also no indications of anything reminiscent of Amuq B characteristics among the pottery assemblage. This is an important observation with regard to the absolute dating of the settlement of the Amuq C Phase, and the temporal placement of the Amuq C period in relation to other Halaf and Late Neolithic/Chalcolithic sites. These issues are further discussed in the section on absolute chronology below.

Streets and alleys

A notable feature of the exposed settlement at Tell Kurdu is the streets or alleys (fig. 2). A number of Chalcolithic settlements in Anatolia, for example, have streets or "roads" (Caneva 2003; Gülçur 2003:fig.2-3; Öztan 2002:56), while Halaf settlements to the east, where structures tend to be somewhat more dispersed, usually require no streets (Akkermans 1993:fig.3: 12; Pollock et al. 2001:fig.2; von Wickede and Herbordt 1988:fig.2; Watkins 1987:227; but cf. Merpert and Munchaev 1984:pl.2). The greenish-gray color of the street deposits at Tell Kurdu distinguishes them clearly from the mudbrick architecture. [4] Excavations removed only the top 5 cm of the streets throughout, although it is clear from pit sections that they are comprised of series of darker and lighter gray to greenish gray lenses, which continue for at least another 40 cm below. In parts, these lenses contain high densities of artifactual materials most likely representing domestic refuse. The "main" street, which runs down in a SW-NE orientation from Tr 21 through Tr 20, Tr 22 and Tr 26 (S68, S72, S73, S74), has an average width of 2 m. This is the most densely refuse-filled area of the settlement. The garbage is densest in the northern end of Tr 21 (S67, S68) and especially in Tr 20 (S72) but the side alley leading into Tr 23 (S69, S70, S71) is also relatively dense in refuse. A row of mudbricks was found at the intersection of this alley with the main street. Since the street deposits around the wall were not excavated it could not be determined whether this was simply a one course high barrier or a wall that was erected at some point to prevent access between these two areas. The remaining alleys include one that leads into Tr 16 (S67, S66, S63) before it forks into S64 and S65 in Tr 12, and S75 in Tr 26 which branches north from S74. These alleyways are not only much cleaner than the main street but they are also much narrower suggesting that they were subjected to less traffic.

Although clearly not a throughway street, a final area that may have served at least as a "dead-end street" is R46 in Tr 25. The upper levels of R46 were not only nearly as densely filled with garbage as S69 and S70, but also yielded large patches of the greenish-

[4] As a pilot study, six soil samples were sent to Boğaziçi University Archaeometry Laboratory to be analyzed by X-Ray Diffraction (XRD) for minerological testing. As expected, all six samples including an offsite comparative sample were high in quartz (silicon dioxide) and calcite ($CaCO_3$). With the exception of the offsite sample, lizardite, a member of the serpentine family, appeared as a minor element in all samples. Currently, it cannot be ascertained whether the quantity of lizardite from street samples is significantly higher than those collected from interior room floors. It must be noted nonetheless, that this mineral is usually pale greenish-gray in color, which is precisely the color of the streets. Further XRD analyses as well as elemental tests are necessary before definitive conclusions can be made.

gray soil characteristic of streets in other areas. It is possible that it served a passageway into area R29, as the presence of a wall between 29 and R46 could not be ascertained. A significant attribute of the streets is that they define distinct areas of the settlement. In the next section, these areas will be discussed separately.

Area A

Streets S64 and S65 define Area A in Tr 12 as distinct compound (fig. 4A). Analysis of the architecture and recovered materials indicates that this area was domestic. The entrance to the compound is through R10. This space lacks a southern wall but two postholes at either side of the entrance may have supported a gate of some sort. The first room one would have reached from R10 is R08. The doorway of this room was distinctly flanked by mudbricks on each side. Entrance into the room required stepping down approximately 10 cm onto compacted room surface 12:90, of which only the eastern half was preserved.

Another possible door from R10 could have been supported by posthole in the southeast corner of room R07. The presence of posthole here suggests that the wall between R07 and R10 was a raised threshold and not an actual dividing wall. The likelihood of free access between these two rooms was also confirmed by microartifact analyses (see microartifact section below). There is reason to believe that R07 is an outdoor courtyard area. The surface here was more uneven than interior floors though evidence suggests it was a living surface. In a late use phase, several pits/hearths were set into the courtyard floor (Edens and Yener 2000b: 45-46). The courtyard floor reached in 2001 had a bin placed along both its eastern and western walls. The western bin is of particular importance because it yielded an *in situ* local painted collared-rim bowl (TK 6447, fig. 8:4) placed upside down over a large fragment of a grinding stone. This courtyard was an activity area where chipped stone knapping took place, among other activities (see microartifact section below and Özbal in press).

Immediately south of the western bin, a doorway leads into R05. The white somewhat patchy plastered floor of the room lies approximately 30 cm beneath the earliest excavated level of the courtyard area. A worn and rounded mudbrick step facilitates entry. To the left of the entrance is a large oven with a 1.5 m diameter, preserved to a height of 30 cm. The floor and the interior of the walls of this oven are fire hardened. Archaeobotanical analyses from deposits within the oven indicate the presence of wheat (*Triticum* sp.), barley (*Hordeum vulgare*) and legumes (see archaeobotanical section in this report). The remainder of the area of this room measures 2 x 1.75 m. Two mudbrick work platforms or workbenches were found against the western and northern walls of this room respectively. A 40 x 30 cm grinding stone with rounded bottom and flat top lay on the northern platform. To the right of this platform was a thin raised bin, which had been covered over with the same white plaster as the floors. The center of the bin contained two large fragments of an open vessel balanced on two cobbles set into the floor. The room yielded a concentration of artifacts in the area between and in front of the two platforms. A complete but smashed vessel was located in the center of the room (TK 8183, fig. 8:6). The objects found on the floor and within the 5 cm deposits above

include: numerous grinding stones of various sizes (e.g. TK 8380, fig. 15:11), a large round disk perhaps a pot stand or pot lid, worked river pebbles, a fragment of pierced bone, four tokens (two disc shaped, one spherical, one oval), one complete and one fragmentary spindle whorl, a sherd roundel, and six sling pellets as well as large quantities of ceramics, obsidian and flint (see section on lithics in this report for more detail on the chipped stone from this room). These objects clearly suggest that food preparation and other domestic activities took place in this room.

Another room bordering courtyard R07 is R06. This room was discovered during the 1999 season and the highest preserved floor (12:28) was excavated at that time. This floor had impressions of a central circular reed mat (Edens and Yener 2000b: 45). The eastern end of the surface was cut by burial 12:14. In 2001, several underlying floors and deposits were excavated such as hard plaster surface 12:52, soft fill layer 12:77, and white flaky plaster surface 12:80 respectively. The earliest floor reached to date (12:80) was also cut by a burial 12:81, presumably cut from floor 12:52. It is interesting that there were two burials cut into the various floors of this room. Measuring from the interior of the room, the walls were preserved to a height of 20-30 cm, but other floors presumably lie beneath. So far, there has been no indication of a doorway, bringing up the possibility of a raised threshold. The 2001 excavations in this room yielded considerably fewer artifacts than in room R05. Among other artifacts the room yielded a large pot stand (TK 7387, fig. 15:12) and one (possibly rodent carried) seal (TK 7944, fig. 13:11).

Among the other rooms of this compound, neither R01 nor R02 could be adequately excavated due to the trench balks, while no floors were reached in either R04 or R09, making it difficult to understand their nature.

Area B

Excavations in Tr 16 did not continue in 2001, as the 1999 season had already reached the earliest floors in R13 and R14, and time did not permit further investigations in R15 and R16 (for R13-R16 see Edens and Yener 2000b: 44-45). Room R12 awaits to be understood in future seasons. The Area B excavations in 2001 focused on Tr 20, exposing the eastern halves of R17 and R24, and R25 (fig. 4b).

As described in the report on the 1999 season, R17 was an area with a series of wash deposits, sloping steeply northeastward (Edens and Yener 2000b: 46). The same sorts of fine-grained, well-compacted deposits with a small number of eroded artifacts continue in the eastern portion of R17. The wash layers in Tr 20 slope northwestwards forming a low depression between the two trenches. The lowest excavated parts of this depression are over 1.5 m beneath the top of the sloping layers. Further excavation is required to determine whether this slope represents the edge of the mounded settlement or a bounded courtyard filled with debris layers. Excavations in R17 in Tr 20 also yielded a possible fragment of a badly eroded wall. Several small pits cut the sloping wash layers.

Room 24 was partly excavated as 16:13 in 1999. Being 5.0 x 2.2 meters in size, it is among the largest rooms that our excavations thus far have uncovered. The 1999 excavations in Tr 16 uncovered a plastered circular feature in the southern corner and two nearby mudbrick workbenches (Edens and Yener 2000b: 45). Signs of burning on the

upper surface of the circular feature 16:15 suggest that it may have been an oven but this could never be ascertained because the center of the feature lies beneath the balk. The thick layer of plastering on its exterior wall sets this feature apart from the typical ovens excavated in other parts of the site. Wall 20:20 separates the room from street S72. Constructed with irregularly shaped bricks averaging 30-40 x 20 cm in size, this wall has several different widths; in the southernmost section it is only a single course wide while in the center and northern sections it widens to three and two courses respectively. A small bin containing relatively high quantities of cereals and legumes (see archaeobotanical report) is set along the interior face in the widest middle section of the wall.

In addition to its structural attributes, the wall yielded several noteworthy deposits and caches. A 40 x 60 cm interior niche (20:26) in the northern section of the wall included a large bovid horn core with the part of the skull still attached, a scapula possibly of a bovid, a rectangular stone block (150 x 80 x 100 mm in size) with naturally smooth sides, and a complete unused blade of green obsidian (68 x 11.5 x 1.8 mm in size, fig. 10:1) as well as several rim and base sherds (Özbal et al. 2003:fig. 4). It is likely that these items were sealed off in some way but this could not be determined with certainty. A single course of mudbricks continues behind the niche, while mudbricks directly underlying the deposit can also be recognized.

Between the central three-row section of wall 20:20 and the narrower one-row wide southernmost portion of this wall there is a 30-33 cm drop in elevation; the southern section lies nearly at the same elevation as the earliest excavated floor in this room. The relative thickness and height of the wall in the south suggests that it may have been a brick-lined threshold, although it could not have served as the main entrance into the room because circular feature 16:15 would have obstructed free passage. Interestingly, the doorway of adjacent room R25 is also blocked by an oven. An alternative entrance to this room could have been through niche 20:26, if this was actually a step. In this case, the objects within the niche must either have been covered or placed in the doorway during the final abandonment of the room. Other instances of horn cores beneath thresholds are reported from the 7-6th millennium BC site of Tell Aswad in the Balikh Valley of Syria (Mallowan 1946: 123-126, fig. 2, cf. Verhoeven 1999: 225).

Excavations directly above the "threshold" at the southern end of wall 20:20, yielded an interesting feature (20:21) and two associated deposits. The feature was columnar in shape, though wider at the top than at the bottom. Preserved to a height of 20-22 cm, it had a top diameter of 65 cm. The fill was green and quite similar to the street deposits but it was finer in consistency and contained few artifacts. We presume that the feature is the remaining fill of a no-longer-preserved basket. Wedged between basket 20:21 and circular feature 16:15 and resting against the western side of the basket were a cache of 34 sling pellets (e.g. fig. 15.8-10) and an antler of a fallow deer (*Dama mesopotamica*). About 40 cm south of this cache, in the narrow area between the two features a contemporaneous smaller cache of seven sling pellets and a horn core was found. Both caches lay on the only convincing floor of this room (20:43).

The small northern room R25 shares wall 20:18 with R24. The walls of the room are preserved to varying heights between 20 and 35 cm. The western wall does not meet

up with R24, leaving a space one could interpret as a doorway, if not for the fact that this entry is blocked by an oven. Only one use surface (20:60) was identified in this room. North of the room and close to the balk, part of an oven was excavated although it is not clear what structures the oven is associated with.

Area C

To the west of alley S68 two rooms of a single building were identified (fig. 2). This structure presumably continues in Tr 24 but was not reached there. At the time of occupation, the structures in Tr 21 were at a higher elevation than those in trenches to the north and east, as the mound appears to have sloped gently towards the north. Modern leveling of the mound surface for agriculture and the subsequent plowing therefore truncated the top of these walls most severely; mudbrick walls in this trench are preserved to a maximum height of only 5-7 cm, which is considerably less than in other trenches.

Although the outer faces of the structure in Area C were easy to recognize, as they were very different in color from the alleys, the inner walls were difficult to define and differentiate from the room deposits. The northern room R19 is surrounded by walls on three sides, but the presence of a back wall was never clearly established. It is possible that the northern wall had a doorway, facing alley S67, close to the baulk. It could not be ascertained whether the walls of R18 are part of the same building. Adjacent room R20 is a large room with an entrance from alley S68. The circular oven located to the left, upon entering this room from the alley, was placed flush against the corner formed by the southwestern and southeastern walls of this structure. The oven, which may have had an opening towards the northeast, has a lining of burnt clay set into a packing of mudbricks placed on their side. No clear occupational surfaces were found in either of these two rooms.

Area D

Area D is bounded by streets S68 to the west and S69/S70/S71 to the north, and lies in Tr 21 and 23 (fig. 2). Preservation of the architecture in this area was poor, especially in the southern parts. As a result, the plan is not well understood. In the east, there are two partially excavated rooms R32 and 33, which each had a surface of compacted earth. It is unknown whether the base of the walls has been reached. Adjacent to R32 lies what appears to be an open courtyard (R31) closed off from the alley S70 by a mudbrick wall. It is cut by an oval pit and an elongated cut feature of prehistoric date filled with very compact loam. Spaces R22 and R21 may be an extension of the courtyard to the west. In between are two walls of which only ephemeral traces were left, and which may represent slightly later features. Sustained attempts to find surfaces in R22 and R21 did not yield results. Deposits that probably predate street S68 and the walls of R22 appeared in this area, confirming the idea that the architecture belonging to the main occupation level had originally been built from a higher elevation than the better-preserved buildings to the north and east.

Finally, R23 is an indoor space with a doorway from street S69. Its walls are wider than found elsewhere, but the room yielded no indications for why this may be.

Inside the room stood a circular oven with highly fired floor and sides in the northwest corner. A bovid skull with horn cores attached was left behind on the only surface encountered in this room, placed upside down against the southern wall.

Area E

Area E includes the structures along the southeast side of the main street, north of alleyway S69 (R27, R28, R53 and R54) as well as adjacent structures and courtyard spaces including R29, R39 and R60 (fig. 2, fig. 5). This division is arbitrary and serves only as a means to discuss the architecture in a coherent unit.

The largest space in Area E is R29, which is most likely an outdoor area. Wall 22:35 and possibly two oval features 22:79 and 22:80 lying on either side may act to divide this area into two functionally different areas; a narrow alleyway to the east and a courtyard area to the west. Both of the oval features are almond-shaped pits with the same orientation, 56 by 30 cm in size and 10-15 cm deep. Their sides are lined with sherds placed vertically into dense and hard orange clay, and they are filled with ash and charcoal. Excavation of one of these features determined that some of the sherds were also burnt. Their function is unclear, but their association with wall 22:35 suggests they may have supported a construction -perhaps a pair of posts each.

The deposits in alley 22:71 are green in color like the rest of the streets with some patches of burnt, whitish soil. Excavation in this area yielded considerable quantities of secondarily deposited artifacts. The surfaces of courtyard R29 west of 22:35 also had sherds, bones, and grinding stone fragments lying on them, consistent with an outdoor area. The finds from the courtyard include numerous sherd roundels, bone tools, (e.g. TK 6180, fig. 14:8, and TK 7259, fig 14:9), as well as hammering and grinding stones (e.g. TK 6538, fig. 15.7). Interestingly, this courtyard also yielded the highest percentage of obsidian in the settlement (table 9).

Somewhat isolated from the rest of the structures in Area E is poorly preserved structure R27. The original size of the structure is difficult to ascertain since most of its walls have been cut away by pits. A fragment of a wall with plaster along the inner face of a possible northeastern wall suggests it could have been a rather large structure. Like rooms 28 and 39, this room contains at least one interior buttress along its southeastern wall and one exterior buttress to the southwest along alleyway S69 (fig. 2). A tiny fragment of plaster along the eastern face of the baulk between Tr 20 and Tr 22 suggests the wall may have continued to the north before it was cut by pit 22:19. The plaster appears to turn a corner and this has been interpreted as another buttress opposite the one on the southeastern wall but this is speculative. Unless the plastered wall discovered to the northeast was actually part of a buttress no buttress was identified along this wall.

North of building R27 lies buttressed room R28, measuring 3.1 x 2.9 m in size. All interior wall faces and buttresses were covered by a thick layer of plaster. The plaster always curves around the buttresses instead of going behind suggesting that they were part of the initial construction of the building. With the exception of the northeastern wall 22:27, where an original interior buttress could have been cut by pit 22:51, all walls have buttresses facing the inside. It cannot be established whether the buttresses provided

structural support to the building, as both walls and buttresses were preserved to a maximum height of only 11-16 cm. A 90-100 cm wide possible doorway gives access to street S73 at the south end of wall 22:11. This room yielded four intact surfaces. From latest to earliest they are: 22:28, 22:50, 22:57, and 22:67. Among other finds, this room yielded a pierced obsidian link (TK 6521, fig. 13:9). Such obsidian links are well known from the Halaf world (Campbell 2000:12, fig.9, fig.10, Matthews 2000:109).

Adjacent room R53 stretches across Tr 22 and Tr 26. Because the floors in this room slope from northwest to southeast, parallel occupational surfaces could not always be matched on both sides of the balk. The northwestern wall of this room (26:4) has an interior buttress similar in size to those in R28 (ca. 80 x 30 cm) but it is not plastered. A much smaller buttress or bench, which did have some evidence for plastering, sits along the northeastern wall. An oval pit-feature similar to those in courtyard area R29 was found on the floor close to the smaller buttress. Three overlying floors (26:10, 26:21, and 26:34) of which the lower two were plastered were excavated in the northern (Tr 26) half of this room.

Six floors (26:11, 26:22, 26:41, 26:56, 26:62 and 26:64), three of which are plastered, were identified in adjacent room R54. The walls in this room are preserved to a height of 35 cm. Plaster floor 26:41 with six worked sherds was the only floor that yielded any small finds. Benches were located along the western and northern walls.

R60 refers to the room wedged between R53, R28, and R39. The only floor excavated here, was plastered suggesting this was an interior space. It is possible that the entrance to the room was from the east.

Lying adjacent to R28 is another single-room building with interior buttresses and wall plastering, R39. This building has buttresses in the center and corners of all four walls, creating niche-like indentations along its short sides. Excavations in the structure yielded a series of surfaces (from the earliest, they are consecutively: 25:88, 25:103, 25:87, 25:83, 25:60, and 25:40). A preview beneath the earliest excavated floor suggests the presence of older occupational surfaces, although time did not permit for their excavation. The earliest excavated floor (25:88) lies 18-23 cm beneath the height of the walls. All surfaces with the exception of uppermost packed-earth surface 25:40 were thickly plastered usually ranging in color from bluish gray to pink. Only surfaces 25:88, 25:87, and 25:60 were preserved across the whole room. Although all floor deposits were 100% dry screened through a 5 mm mesh, this room – and especially the plastered floors – yielded few artifacts. A spindle whorl found on the highest earthen floor (TK 7263, fig. 14:6) is one of the few finds from the room. Ongoing microartifact analyses, however, observed that 19 of the 24 (79%) 1-3 mm beads discovered come from various plastered floors of this room.

Room 39 was unusual in that three vessels (TK 8566, fig. 6.7; TK8567, fig.7.9; TK8569, fig. 8.7), one of which contained cremated human remains (burial 25:8), were found inside the wall in the northern corner of the structure. The placement within the wall suggests that it served as a foundation deposit. In the room there was a platform placed against the south-central buttress. In the western niche next to the platform lay an *in situ* cup (fig. 6:1), while a plastered circular basin (25:104) with a ca. 28 cm diameter was set in the floor close to the western corner of the platform. The purpose of the

platform is unknown but given the exceptional foundation deposit and unusual characteristics of the room, one may hypothesize that this was an altar of some sort. Further excavations in the room are necessary to test this hypothesis. No clear doorway was identified although a possible threshold was noted by the excavator along the southern part of the west wall (22:31), but this awaits confirmation.

Being both large rooms with plastered interior buttresses, one wonders whether there was a relationship between adjacent structures R28 and R39. A bit of exterior wall plaster preserved on the western wall of R39 (22:30) where it meets the eastern wall of R28 (22:27), suggests that R39 is earlier than structure R28, yet the three radiocarbon dates obtained from these two rooms strongly indicate otherwise (see the section on radiocarbon dates). Perhaps the lower floors in R39 will yield earlier dates when excavations continue.

Area F

A series of 5 rooms R26, R56, R57, R58, and R59 form a single row north of alleyway S74 (fig. 2). The plan of these rooms appears somewhat different from other areas where structures are usually clustered in groups around a courtyard.

Although room R59 is separated by a side alley from the other rooms, its positioning along street S74 suggests that it was contemporaneous with the rest of the architecture in the trench. Measuring 1.5 x 2.3 m. this room had four walls preserved to a maximum height of 30 cm. The exterior faces of these walls were better preserved than the interiors. Wall 26:13 to the south has well preserved bricks measuring ca. 30 x 33 cm on its outer face with possible remnants of exterior plastering. The eastern 70 cm is most probably a doorway. The room yielded several well-preserved clayey unplastered surfaces, namely 26:17, 26:23, 26:25, 26:35 and 26:60, all sloping from the northeast corner to the south and west. North of this building is an oval plastered basin containing burnt fill. Ceramics from this basin suggests that it may date to a slightly later period than the present phase (B. Diebold personal comm.).

A series of rooms lie along street S74, west of R59 and S75. The wall facing the alley may be a single contiguous wall, while the wall running along the back of these rooms may not represent a single phase of construction. R58, the northernmost room in this series has a doorway facing alley S75. Although the walls were preserved to a height of 25-30 cm, the room had no identifiable interior surfaces. Instead, several steeply sloping wash layers and a later pit were noted. R57, to its southwest, on the other hand, was more straightforward. This L-shaped room had a 56 cm wide doorway, with a well-preserved threshold, with two to three cobbles placed in the interior corners of either side. To the west of the doorway was a ca. 60 cm wide mudbrick platform. It is possible that the wall between R56 and R57 did not support a roof but that it acted as a low partition or workbench. On top of this construction sits an oval basin made of loam, which would have served both R56 and R57. Adjacent room R56 may have had its own doorway to street S74 but this could not be ascertained. No clear floors were identified. The two adjacent rooms, R26 and R55, also yielded no identifiable occupation surfaces. All other

architecture identified to the north of the street such as R61 is poorly preserved or damaged by later pits. Time did not permit for detailed investigations in this area.

Area G

This area includes a dense cluster of rooms around space R44, in the eastern end of the exposed neighborhood (fig. 2, fig. 5). The large size of R44 (2.5 x 5 m) suggests it may have been an open courtyard. Its surface was covered with a thick layer of whitish silica remains sloping down towards the center. Among the finds lying directly on this surface one finds a large sherd disk (ca. 26 cm in diameter), an *in situ* cup, a stone bowl (TK 8387, fig. 15:5), a biconical spindle whorl (TK 8675, fig. 14:7), and a stone chisel (TK 8915, fig. 14:15) and a thin walled jar (TK 8255, fig. 6:10). In addition, an antler of a red deer (*Cervus elaphus*) was found lying against the southern wall.

To the north of the courtyard area are a series of rooms R40, R41, R42, and R43. It could not be ascertained whether R40 is an outdoor or indoor space as this area was cut by a cluster of later pits. A circular oven behind a small dividing wall contained a 60 cm long grinding stone and two burnt ceramic vessels (including fig. 7:8). Our information on rooms R42 and R43 is minimal. Better understood is R41, which underwent several use stages. Ten clearly identifiable floors, all of compacted, usually light colored earth were excavated in this room. Other unexcavated floors may still lie beneath. At the lowest excavated level, the walls stood to a maximum height of 31 cm. Radiocarbon samples (no. 3 and no. 6), taken respectively from the tenth and fourth floors from the top, suggest that duration and use phase of each floor was relatively short. Various features such as a bench or step in the eastern corner, a bin along the southern wall, wall niches along the northern and eastern walls, a basin in the floor, and an associated oven on a platform in the west end were constructed in the various occupational phases and modifications in the use of this room. The purpose of the platform in the western part of the room is unknown. Keyhole shaped oven 25:7 lying on the platform appears to be associated with the later use phases of this room. No entrance was identified although the absence of bricks in the eastern portion of the northern wall of R45 suggests this may have been a shared threshold.

South of the courtyard, we find a cluster of several relatively small rooms R48, R49, R50, R51, R52, and R62 (fig. 2, fig. 5). No surfaces were identified in many of these rooms (R48, R49, R52 and R62) although it is possible that occupational floors in these structures have not yet been reached. Rooms R50 and R51, which yielded two floors each, were excavated down to a maximum height of 40-50 cm below the levels of the top of the walls. The upper of surface in R50 was made of compacted earth and had several vessel fragments lying on it, while the lower surface in this room yielded remains of reed matting. Adjacent room R51 is potentially larger than other rooms in this section. The room had a mudbrick step or bench along the western wall. Of the two surfaces excavated in this room, the upper was plastered and yielded a cluster of three *in situ* vessels (TK 8064, fig. 8:5; TK 8065, fig. 7:7; TK 8066, fig. 6:11) placed between the bench and the southern corner of the rooms, while the lower one was a compacted earth floor. No doorways or thresholds were identified for either of these rooms.

The rooms and spaces to the west of the courtyard are somewhat more difficult to interpret. R46 may originally have been an indoor area, which was then converted into an outdoor space either an alley giving access to the eastern portion of R29 or an open trash-lot. This is suggested not only by the fact that the lowest surface in this space appeared to be an indoor surface with patches of plaster, but also that the western face of mudbrick wall 25:47 was buttressed and plastered. Similar plastered buttresses have been found in nearby rooms R27, R28, and R39. In a later phase, R46 appears to have become densely filled with trash. The artifact densities in the upper floors of this space were nearly as high as in the alleyways and the greenish color of the deposit resembled the streets as well.

R45 and R47 are two adjacent rooms west of R44. Neither of these two rooms yielded intact surfaces although disconnected fragments of plaster were found in the room fill of R45. A burial of a small child (25:89) was found in the room fill deposits of this room. R47 had two benches. The one along the south wall of the room was short and had a concentration of large animal bones piled up against it. The long one along the eastern wall was plastered.

Area H

This area consists of a complex of small rooms, R30, R34, R35, R36, R37, R38, partially excavated in Tr 23, 22 and 25 (fig. 2). It is bounded to the south by streets S69, S70, and S71, and to the northwest and northeast by open spaces R29 and R46. The complex continues into the unexcavated area east of Tr 23. Room 35 had access from street 70, but for the other rooms it is unclear how they were entered. Understanding the layout and functions of these rooms is made more difficult by several intrusive pits, and the generally low level of preservation of the walls, being maximally 20 cm high. Room 30 contained a surface with patches of plaster with a plastered circular basin set into it. An *in situ* vessel lay on the surface in the western corner. Among the many artifacts from this room we find several stone bowl fragments (e.g. TK 7020, fig. 15.3; TK 8931, fig. 15.4), and examples of worked bone (e.g. TK 7666, fig. 14.10). Rooms 36 and 37 had sequences of two and three surfaces respectively. R37 contained an ash-filled basin with plastered sides. R38 to the north of R36 had the poorly preserved base of an oven, but no convincing floor level was recognized. The southern room of this complex (R35) was closed off from the street only in its earlier use life. In a later phase, it appears to have been open, as the uppermost deposits from the street S70 continued over the mudbrick wall remains between the street and room.

Area I

The only trench where architecture was found that could not be stratigraphically linked to that in the other trenches was trench 24, or Area I (fig. 3). The structures that were found directly below the plow zone lie 30 cm higher than those in adjacent Tr 12 and about 10 cm higher than those in Tr 21, and thus presumably date to a later phase of occupation. Further ceramic studies will have to clarify whether the structures date to a later Amuq C phase or to the beginning of the Amuq D period.

As the plan shows (fig. 3), mudbrick walls as well as a circular and a keyhole shaped oven were encountered in the northern half of the trench, where excavations went 5-10 cm deeper than in the southern half. The walls occur in two clusters. To the east lies a corner of a room, of which no remains were found in the adjacent trenches. An infant jar burial (24:16) was set into a floor within the room, but it is impossible to establish whether the burial belonged to a later phase of occupation of the room or postdates the walls. The architecture to the west is not well understood, and it likely that there are two phases that could not be separated. A fill deposit in the northern half of the trench yielded an elaborately decorated stone mace head (TK 7810, fig. 15:6). Finally, an Amuq E burial (24:3), an undated but intrusive burial (24:27) as well as several pits were found.

Absolute Chronology and Stratigraphic Considerations

Fokke Gerritsen and Rana Özbal

Ten samples were submitted for AMS dating to the University of Arizona laboratory. They consisted of ten single, charred grain seeds, selected from reliable loci from different parts of the exposed remains, including nine indoor surfaces and one street deposit. No samples were selected from later pits or burials. From rooms R39 and R41 (fig. 5), a sample was selected from an earlier as well as a later floor. The radiocarbon dates obtained from these rooms are consistent with the relative age of the floors.

Samples were dated with two goals in mind: 1) to obtain a general date for the main architectural level, and 2) to collect evidence enabling inferences about the time range incorporated within the occupation level and/or chronological differences between the different architectural units. Table 1 gives the uncalibrated and calibrated dates for the ten samples.

In uncalibrated dates BP, the samples range from circa 7170 to 6300 BP. When calibrated, the total possible range lies between 6220 and 5080 cal BC (95.4% reliability interval). When the oldest and three youngest dates are omitted (see below), the six remaining dates fall within a 200 year period between 7030 and 6840 BP, representing a total possible range from 6020 to 5530 cal BC. The combined date for these six is 6937±24 BP (statistically significant at a 99% confidence interval), giving a maximum calibrated range (at 95.4%) between 5870 and 5720 cal BC. In general terms, this indicates that the excavated Amuq C settlement dates to the first half of the sixth millennium cal BC, probably to somewhere between 5900 and 5700 cal BC.

This placement in the first half of the sixth millennium cal BC is contemporaneous with Late Neolithic or Early Chalcolithic sites in Anatolia and may have implications for our understanding of the temporal relationship between the Amuq C and the Halaf Period in Syria and Northern Iraq. Based on ceramic shapes and designs, the Amuq C has most commonly been associated with a later phase of the Halaf Period (Akkermans 1993:132; Braidwood and Braidwood 1960:137; Davidson 1977:265-72; Matthews 2000:101; Watkins and Campbell 1987:439). Based solely on absolute chronologies however, the exposed occupation level could be considered roughly contemporary with the end of the

Halaf Ib (Early Halaf) Period and possibly the beginning of the Middle Halaf or Halaf IIa Period of Northern Mesopotamia (Campbell 1992:61-97).[5] As explained above, there is reason to believe that the level exposed in 2001 is not at the beginning or particularly early in the Amuq C sequence suggesting underlying Amuq C layers could yield even earlier dates. Nonetheless, the chronological placement of the exposed levels at the end of the Early and/or the beginning of the Middle Halaf Periods appears to be at odds with the Kurdu ceramic evidence, as Middle/Late Halaf parallels exist for the shapes and designs represented in the Kurdu assemblage (Davidson 1977:265-72).[6] This suggests either that Halaf ceramic sequences for Northern Iraq and Northern Syria correspond only approximately with Amuq versions of Halaf-like pottery (cf. also Watson and LeBlanc 1990:132-133), or that the chronological subdivisions within the Halaf period may need to be revised (cf. also Akkermans and Wittmann 1993:160-61).[7]

With regard to the second aim of the radiocarbon dating program, the range of dates among the samples gives reason to be optimistic about the possibility of refining the internal chronology of the occupation level, but also cause for concern. Four dates from four different excavation trenches (Samples 4 through 7) are quite close in date. They can be combined to a date of 6904±31 BP (5840-5710 cal BC), statistically significant at a 99% confidence interval. This indicates that Areas A, F, G and H are contemporaneous in absolute dates, and that it is therefore quite likely that they were inhabited at the same time.

Nevertheless, the oldest and the three youngest dates fall outside the range of 5900 to 5700 cal BC. One possible reason for the long time range represented by the samples is that even though short-lived, single-entity samples were used, some of the dated seeds are intrusive or otherwise not related to the event they were expected to date. We have no reasons, however, to assume that the outlier samples are any less reliable than the others.

This suggests that another explanation has to be considered, which is that the stratigraphic composition of the architectural level is more complex than could be detected during the excavations. This particularly concerns Area E, which yielded the oldest and youngest dates. Many stratigraphic clues are still missing from the picture, as we have not excavated to the earliest floor levels throughout and have not taken apart the walls themselves. Nevertheless, our present understanding of the stratigraphy does not give reason to believe that the plan is a composite of different phases of building, use and abandonment greatly separated in time. If it were not for the radiocarbon dates, we would have been confident about the possibility of interpreting the whole of the architecture as representing a single phase of occupation, that is to say that most or all the excavated buildings would have had a considerable degree of temporal overlap. In a general sense,

[5] The closest phase from the Balikh Valley of Northern Syria is the Balikh IIIC (Akkermans 1993: 134; Nieuwenhuyse 1997). Anatolian and Cilician sites with comparable radiocarbon dates include Can Hasan I, Level IIB (Thissen 2002: 303), and Mersin Yumuktepe, Late Neolithic levels XXIV or XXV (Caneva 1999: 109; Thissen 2002: 309).

[6] Painted ceramics constitute only a very small fraction of the Amuq C pottery assemblage at Tell Kurdu and may have limited value for chronological comparisons of levels and sites.

[7] It must be noted that nearly all of the ceramics represented in this report come from secure contexts (unless noted otherwise, see the Appendix for context information), while the relatively tight range obtained for the AMS samples leaves little doubt about the integrity of the absolute dates.

this finding warns against too much confidence in published plans of settlement occupation levels that are not accompanied by an adequate set of radiocarbon dates.

The only sample that could be expected to post-date the others is Sample 8, taken from the upper deposits in the street of Tr 23 and thus presumably related to a relatively late phase in the use of the street. Two samples (9 and 10) are later in date than Sample 8, coming from two floor levels of room R39. The probability curves of these two demonstrate very little overlap with the earlier samples. This indicates that the niched and buttressed room R39 is a later addition to the overall plan, or at least that it continued in use after surrounding buildings had been abandoned (as unexcavated floors of this building lie beneath). Even more striking is that the earliest floor of the adjacent niched and buttressed room R28 produced the oldest date in the range, between 6220 and 5880 cal BC (Sample 1). For R28 and R39 to have had any overlap in their existence, the later (undated) floors of R28 and the earlier (not yet excavated) floors of R39 together have to span a time range of a minimum of 250 years. This exceeds our expectations of the normal use-life of a mudbrick building. In order to rule out that unreliable samples were dated, we plan to submit several more samples for AMS dating.

EXCAVATIONS AT TELL KURDU, 2001: THE POTTERY

Benjamin H. Diebold

Introduction

The pottery from the operations on the north lobe of Tell Kurdu excavated in 2001 revealed a rich and diverse assemblage. Aside from a few pits and graves dug into the excavated levels from later periods (primarily a series of Ubaid related burials associated with the large cemetery placed at that time on the then-unoccupied north lobe of the mound), the assemblage is roughly contemporaneous with the Halaf period, or phase C of the Braidwood chronology (Braidwood and Braidwood 1960).

Since the 2001 excavations concentrated on exposing a wide lateral area in order to explore synchronic issues of spatial organization and resource utilization, a deep chronological refinement of the phase C period is not yet possible. The radiocarbon data do raise the possibility of a recoverable ceramic sequence from the area, but more research is necessary. Consequently, what we do have is a fine representation of the phase C assemblage from contemporaneous, or nearly contemporaneous, contexts. When analyses of similar wide area Ubaid period contexts are complete, detailed comparisons of the ceramic assemblage between two major phases of the site will be possible. What this report presents is a summary of the major findings of the study of ceramics thus far completed from phase C contexts of the north lobe of Tell Kurdu (see also Diebold 2000:63-65).

Methodology

In each unit, excavators were asked to rank the quality of the locus (a unit of natural deposition) on a scale of 1 to 4. A rank 1 locus represented the highest quality – a

short term, unmixed deposit of a single event, for example a burial. A rank 2 locus represents the next highest quality, which was a deposit with relatively little mixing, confined to a single period, e.g. a small pit. A rank 3 locus indicates deposits of mixed ancient remains, e.g. disordered pits or places of possible mixed stratigraphy like decayed mudbrick, while a rank 4 locus denoted contexts that were possibly contaminated by modern remnants, e.g. plow zones. For purposes of the present study, only pottery from ranks 1 and 2 contexts was considered.

For each of these relatively higher quality deposits, all sherds, including body sherds, were sorted according to major ware groups, which were then counted and weighed. Additionally, every sherd was submitted to a random sampling test, determined by dice (following the example of a similar strategy employed by Stuart Campbell and the ceramic analysts at the Domuztepe excavations; Campbell et al. 1999). Any sherd that fell within the 10% probability decile was then described more carefully. The only sherds that were not subjected to the 10% probability test were those deemed too small to have supplemental scientific analysis, like instrumental neutron activation analysis, performed on them. Effectively, that meant any fragment smaller than about 2-3 square centimeters was considered a reject, and was not included in the sample. All sherds of final 10% sample group were then macroscopically studied for inclusion information (table 2), color, surface treatment, thickness, and weight, in addition to being digitally photographed. Moreover, sherds within the probability group with diagnostic shapes had those relevant attributes recorded, like diameter, and were drawn. Additionally, any sherd that fell within a 1% probability number was not only individually recorded, but was set aside for chemical analysis, which includes instrumental neutron activation analysis (INAA). Study of the INAA results (performed at the Missouri University Research Reactor) is ongoing. Finally, any sherd that did not fall within the 10% analysis group, but that still seemed significant or particularly diagnostic, was recorded on an ad hoc basis, and described, drawn and photographed.

Discussion

The first major decision was the definition of ware groups. After a series of experiments with alternative typologizing strategies, the fundamental soundness of the Braidwood typology prevailed, and, with only a few refinements at present, is reproduced here. The wares and frequencies for phase C recorded by the Braidwoods are shown in Table 3.

Our experience thus far with the assemblage is that while the Braidwood groups are fundamentally sound, though possibly amenable to subdivision, the frequency data needs revisiting. Braidwood's monumental labors in the Amuq include the definition and description of a 6,000 year cultural sequence of a variety of artifact categories derived from the several sites sampled or excavated by the Chicago team in the 1930s, which has fundamentally lasted since the publication of their seminal report in 1960. However, the early part of the sequence, in particular phases C and D are not only represented by the

smallest amount of excavation material, but also the most hastily excavated.[8] Due to exigent circumstances, the Braidwoods were forced to excavate Tell Kurdu, in 50-centimeter increments and selected only certain diagnostics, especially decorated ones, for subsequent analysis in Chicago.

Our results are presented in Table 4 below. Obviously of note is the relatively high frequency of the various types of cooking wares. In fact, while Dark-faced Burnished Ware (DFBW) is considered the type marker for the region and period, the Dark-faced Unburnished Wares (DFuBW) are probably more diagnostic, or more specific to the central Amuq. The Braidwoods describe two variants of DFuBW, one of which is a more buff-faced, thick walled ware, while the second is generally thin-walled (occasionally remarkably so), fire-blackened, and often very roughly textured. The second is the most characteristic ware of any phase C ware, and comes in a relatively limited variety of large bowls, generally with interior thickened rims (fig 7:1-6). Tell Kurdu and several other phase C period sites uncovered in the Amuq survey (e.g. Tell Rasm, AS80; Hasanuşağı; Tell Judeidah, etc) contain very characteristic examples of DFuBWv2. The thin walls of some of the DFuBWv2 examples deserve special note. These vessels occasionally had rim diameters approaching 50 cm, yet with walls only 4-5 mm thick. They showed extensive sand or grit inclusions, which appear to offer an extra measure of thermal shock resistance and vessel hardness (Rye 1976), probably necessary for a form style characterized by such thin walls, which ranged from 3 mm to 8 mm. In contrast, the buffer variant of DFuBWv1 showed a range of 5 mm to 1.1 mm. In all cases, the cooking wares rely extensive on grit or sand inclusions (probably in sufficient concentration or with sufficient potter purpose to designate as a temper), though the inclusions in the DFuBWv1 variety are somewhat larger and coarser, while those of the Cooking Pot Ware class are yet more coarse and thick. No particularly compelling parallels are documented outside the Amuq for these cooking wares, especially the particularly diagnostic DFuBWv2, though it is possible the Qoueiq (Mellaart 1981) or the Rouj Basin have some (Iwasaki and Tsuneki 2003; Tsuneki et al. 1998; Tsuneki and Miyake 1996; Iwasaki et al. 1995).

The best parallel assemblage for the DFuBWv2 at Tell Kurdu is actually that at the site of Tell Rasm, also in the Amuq Plain (and documented in the Amuq Valley Regional Survey; Yener et al. 2000a). While Tell Rasm has yet to be formally studied, the DFBW and DFuBW there are essentially identical to those at Tell Kurdu. Unlike Tell Kurdu, Rasm is notably lacking in any painted wares, aside from a few carinated bowls of a local painted style, very similar to those from Tell Kurdu. The only patterned differences between the DFuBWs at Tell Rasm and Tell Kurdu appear to be that those at Tell Rasm tend to be more red or more light brown, and somewhat harder, while those at Tell Kurdu are inclined to be more gray or black, and a bit more brittle.

Most of the interest in the pottery of this period of the Amuq has centered around the DFBW phenomenon. DFBW is a broadly defined ware, essentially encompassing a variety of forms and pastes under a general categorization of surface treatment. The

[8] See Braidwood and Braidwood 1960: 19, fig. 15, for a chart representing the relative quantities of excavated material.

tremendous variability of the forms and wares of DFBW make it difficult to sub-divide. However, there are some groups that do begin to emerge after study. There is a group of medium sized, high-necked jars with a slipped, very dark, highly lustrous surface that has a nearly lacquered quality. The pastes for these tend to be relatively free of inclusions, and dark brown or gray in color. A small group of DFBW sherds looked to be hemispherical or slightly closed pinch rim bowls, again medium-sized, with a distinctive brownish surface and a streaky burnished finish (not pattern-burnished). These sherds contained somewhat more grit inclusions than the lacquer-like sherds, with a thinner slip, or no slip. Another set of DFBW had a distinctively buff surface color, while yet another was red painted or washed and then burnished. A final group had a smooth, dull gray exterior, and may be the result of a DFBW with a pronounced slip that had spalled off (originally suggested by Matson, in Braidwood and Braidwood 1960). Insufficient quantities of these potential subvariants of DFBW were sampled according to the 10% rule from the high quality contexts of the north lobe operations of 2001 at Tell Kurdu to provide very definite quantitative or descriptive information at this point.

Basically, three varieties of painted ware were distinguished: monochrome, Halaf, and local painted. Among these, local painted was the most commonly reported. The distinguishing criteria here is that the Halaf sherds were defined on the basis of direct stylistic correspondence with Halaf-related sherds of northern Syria or Iraq, e.g. cream bowls with Halaf style designs. Monochrome painted sherds were produced from a fine buff, well-oxidized paste, often with quite thin walls, and with design elements that combined elements of the classical Halaf with aspects of local tradition. The Local Painted group is essentially, whatever was left over, though there were a distinctive series of pots with occasionally elaborate red or orange painted designs. The Local Painted series certainly tended to be thicker, somewhat coarser, and with denser, redder paints than either the monochromes or the Halaf painted.

Conclusion

The ceramic assemblage at Tell Kurdu is dominated by a distinctive series of coarse, thin-walled cooking vessels, a fine series of burnished wares, and a group of local painted wares, with the occasional admixture of what may well be import pieces from Halaf-related regions to the east. The sense is of an assemblage with a strong local tradition, which has attenuated contact with a Halaf-like sphere of interaction. This is in contrast to what has previously been reported of the Ubaid period settlement at Tell Kurdu, where the assemblage has relatively few local constituents, and looks very much like a classical Ubaid period assemblage in northern Syria (Diebold 2000). When this insight is combined with the pattern of pre-Halaf or very early Halaf-related period pottery in the Amuq looking more related to sites along the Levantine littoral (e.g. Ras Shamra), the following long scale pattern appears. A distinct regionalism with a tendency to link to sites along the Mediterranean littoral gives way during the Halaf period to an emerging series of contacts with sites to the east in Syria, followed by what amounts to near complete assimilation to Ubaid related styles during the early northern Ubaid period (e.g. Hammam et Turkman IVb-c, Akkermans 1988a).

THE TELL KURDU 2001 CHIPPED STONE

Elizabeth Healey

Introduction

Some 2534 chipped stone artifacts were recovered during the excavations in 2001. They were catalogued and recorded in some detail depending on context (tables 5 and 6); the present report provides an overview of those from the more secure contexts. However, it may be remarked in passing that the composition of the assemblages from the later and mixed levels does not greatly vary from the Amuq C contexts although some of the material from the surface and plough zones seems to belong to a different technology (cf. Edens 2000:78).

The purposes of the study were various, including: (1) to ascertain whether the relative proportion of flint to obsidian was consistent throughout the excavated contexts or whether it changed unit by unit, (2) to differentiate between the different flints and obsidians used and to try to ascertain their sources, (3) to obtain some understanding of the reduction processes involved and to see if they were affected by different raw materials, and (4) to ascertain what was made and where it was used. All these areas have been addressed at some level, but some are the subject of further study.

A range of flints and obsidians has been used as raw materials. Flint is the most frequently used but obsidian accounts for about 23% of the raw material in Amuq C contexts combined, though it varies from unit to unit, being as high as 48% in R 29 (fig. 2 for room numbers) (cf. Edens 2000:78). The flint is of various colours and textures similar to those described by Edens (2000:74-75). It could have been obtained in the immediate locality although it is possible that some were obtained from the Amanus mountains c. 15km away (Edens 2000:75).

Obsidian, on the other hand, does not occur locally and its sources are some distance away in Cappadocia and in eastern Anatolia. The use of obsidian from both these source areas has been confirmed through geo-chemical analysis of some of the obsidians from previous excavations (Bressy et al. forthcoming); the results of geo-chemical analyses of the obsidians from the 2001 excavations still are awaited. However, as a general means of differentiating sources, colour in transmitted light, used judiciously with geo-chemical analysis, has proved useful (Healey 2000:135-6; Tykot and Ammerman 1997:1003). The proportions of the different coloured obsidians from the Amuq C contexts are shown in Table 7. Obsidians of translucent gray colour are usually associated with central Anatolian sources though there are a variety of types with this broad group; green and brown obsidians and possibly black (Campbell and Healey in prep) almost certainly come from eastern Anatolia. Since well over 50% of the obsidian is of eastern Anatolian type it would seem that, in common with other contemporary sites in the general area, connections with Eastern Anatolia were strong at this time (Maeda 2003:182).

Obsidian Technology

The black, green and gray obsidians all seem to have been worked on the site at some point in their life history. Indeed one green blade has part of the weathered surface of the original nodule on the dorsal surface (fig. 10:3) suggesting that it is a fairly early-stage piece. The technology is geared towards blade production and the finest blades (the longest blade measures some 85 mm in length and just over 10 mm wide) were produced by pressure flaking as evidenced by the partially ground platform remnants and the regularity of the blades and the hooked distal terminations (Wilke 1996:300). However, there are indications of earlier stages in the reduction process too, including re-used cores (fig. 10:7), various shaping and trimming pieces and wider blades (some of the blades measure up to 25 mm in width, e.g. fig. 10:12).

Most blades seem to be from uni-directional cores but there is a blade-like piece from R24 with bi-directional scarring and change of orientation is also evident from a slightly overshot blade from R28 which removes part of an opposed ground platform and similarly a trimming piece from R59 which has been struck at right angles to the flaking axis to refresh either a platform or a ground edge (fig. 10:9, 10:10). Although most of the pieces are regularly flaked, one blade-like trimming piece (fig. 10:8) from room 29 removes a deep step on the face of a core suggesting a miss-hit at some stage in the reduction process. Core preparation and shaping by cresting is suggested by a lateral blade from room 53 (fig. 10:5) with truncated cresting scars.

Retouching of obsidian is almost entirely confined to the edges of blades with the occasional notches (possibly damage) and no formal tools made of obsidian have so far been recovered except for a possible burin from R 39 (fig. 10:12). Compared to the flint blades only a small proportion of the obsidian blades have been retouched, and it is possible that some of the rather fragile fine blades such as fig. 10:1, found in a wall niche, did not have a utilitarian purpose.

This is further supported by the use of a squat, flaring flake of transparent brown gray obsidian from R28 (fig. 13:9) which has been shaped into an oval by abrupt retouch truncating and blunting the proximal end while the curve of the hinge fracture on the distal end provides the other edge. It measures 50 x 17 mm and is about 6 mm thick. The perforations at both extremes appear to have been drilled from both faces. There is also a barrel-shaped bead of translucent gray/brown obsidian from R04 (fig. 13:2).

Flint Technology

The cores are fragmentary and not very informative. Blades predominate in all contexts forming over 50% of the Amuq C assemblage and over 80% of these have been retouched. Few of the blades are complete, but the larger glossed blades are substantial and measure between 60 and just over 80 mm in length. The blades are sub-parallel in plan form and tend to taper to a pointed end. Striking platform angles are quite acute. Most are struck from uni-directional cores; cross-sections of the blades are normally triangular or trapezoidal. They tend to have plain narrow striking platform remnants and the diffuse bulbs suggest the use of a soft hammer.

Conventional terminology has been used to aid comparison of retouched forms on a wider scale but it does not necessarily imply function and it is hoped that for the future some use-wear analysis may be undertaken. Retouched forms including glossed pieces, scrapers, perforators or points, burins, arrowheads, bifacials and miscellaneous retouched pieces are discussed below. The main types of retouched forms from the secure contexts are summarized in Table 8 and their distribution by unit detailed in Table 9.

Miscellaneous retouch: This catch-all category includes not only the shape-defined elements but also a variety of forms including blanks with non-invasive edge retouch, which does not radically alter the original shape of the blank. Mostly this is nibbling edge retouch, which occurs on the distal end and/or the edges. Two of these pieces, both from R24 are worn (i.e. the edge is rounded through use). There are also five pieces with regular, parallel semi-invasive retouch along one or both edges like fig. 11:16.

Glossed pieces: Glossed pieces, both complete and broken, are present in 23 out of 40 rooms. Mostly they occur in ones and twos but R05, R24, R28, R30 and courtyard R47 have four or five each and R42 has ten. The street deposits, which are probably made up of debris from the houses, also have similar numbers of glossed blades; S68 in fact has eleven such pieces. The presence of gloss suggests that these pieces had a common purpose, although this remains to be confirmed through use-wear analysis. They are by no means of a standard form as those illustrated in figure 12 show. Many are broken so that it is not possible at this stage to meaningfully quantify each type, though it can be remarked that unmodified pieces are unusual. The following summarizes the variation in form:

1) Backed and truncated: these occur in a variety of shapes from sub-parallelograms (fig. 12:3) to those with curved backs (fig. 12:1) merging into crescentic pieces (fig. 12:4). Sometimes, as in fig. 12:7, an oblique truncation at one end is opposed by a rounded one at the proximal end. One from R29 (fig. 12:6) has retouched ends with cortex forming the back.

2) Truncated ends (fig. 12:5, 12:11-14): These are blade segments truncated at both ends to form parallelograms, but with no retouch on the back; sometimes the end is concave which may form a point. Others have only one end modified.

3) Other less formal types include blades with the retouch shaping the ends (fig. 12:9).

Usually gloss only occurs on one edge (probably due to the backing retouch and the shape for hafting). The extent of the gloss ranges from a narrow band to heavier more extensive gloss often reaching to the ridge. The distribution of the gloss tends to follow the shape of the working edge for example if the working edge is concave then the distribution of the gloss is concave.

Several pieces (not included in the glossed totals) have been shaped but do not show any gloss and it is possible that they are unused or only slightly used (cf. the shaped-defined elements at Sabi Abyad (Copeland 1996:293).

Scrapers: Only four pieces which could be described as scrapers were found. Two have end retouch on the end of a blade-like piece (fig. 11:13); fig. 11:9 is a heavier and more crudely denticulated piece from the courtyard R44 that shows some possible rubbing on the ventral face.

Perforators or points: Three main forms are included here, all with attention to the point, which may be worn. Three squat flakes have been retouched on both sides, which converge to form a point, and five blades have less distinctive retouch on a naturally pointed flake (fig. 11:5 and 11:6). A more distinctive form has the point is emphasized either by opposing notches or by elaborate retouch. The point (fig. 11:1) found on the floor of R05 has a long and delicate point with a quadrangular cross-section formed by abrupt retouch on both edges and on the ventral face at the tip; some points have signs of heavy wear (fig. 11:4 and 11:7).

Burins: Burins are mainly struck from a truncated end or from a retouched edge (fig. 11:11). Most are fairly robust objects but fig. 11:12 is an example of a slighter type. Also some glossed pieces have burin facets on them that may be a hafting device or possibly a secondary use because of the size of the blade. Although burins have been seen as graving tools it is possible that they are cores of the production of spalls for use as drill bits (Findlayson and Betts 1990).

Arrowheads: Only one arrowhead of transverse type was found (fig. 11:14). It is made on a blade fragment, with abrupt retouch on the sides and nibbling edge retouch on the cutting edge, which is unusually convex.

Bifacials: This is a heterogeneous group of artifacts characterized by flaking on both the dorsal and ventral surfaces of the blank, but are unlikely to have served a common purpose. Amongst these attention should be drawn to the piece illustrated in fig. 11. Bifacial 11:15 is made on a flake or blade, which has been ground on the ventral surface and has cortex on the dorsal face. It is relatively long and narrow and has been bifacially flaked with semi-invasive and semi-abrupt retouch forming a lenticular cross-section. There is a butt of a possibly similar but larger fragment of lenticular cross-section that was recovered from R57. It has been bifacially flaked around the edges with semi-invasive retouch. The cortex on the dorsal surface has been rubbed smooth and possibly incised and there are also some indications of rubbing on the ventral face.

Discussion

Typologically the artifacts are similar to those found in other Halaf-related assemblages (cf. Copeland 1996:316; see also Braidwood and Braidwood 1960 and Edens 2000). The range of activities seems to have been largely restricted to cutting some silica-rich material (glossed blades), possibly incising objects (burins) and perforating objects (points) such as the obsidian pendant as well as softer materials.

The particular interest of the chipped stone is that not only is it is from securely dated Amuq C contexts, but also that the artifacts have been found *in situ* in rooms, courtyards and street contexts. These contexts together with the microdebitage evidence (see the microartifact section below; Özbal and Healey forthcoming) will offer an opportunity to establish activity areas (cf. Rainville 2001:32-33).

Numbers and variety of types and proportion of obsidian vary greatly from unit to unit as Table 9 demonstrates. Only thirteen interior rooms had more than twenty artifacts and within each of these the proportion of obsidian varies from as high as 42% (R05) to as low as 4% (R28). The presence of fine blades, apparently deposited in a wall niche in

R24 and the pendant in R28 and the bead in R04 may suggest that its presence was more than utilitarian.

It is expected that further research will help to clarify the role that chipped stone played in the activities pursued in this area of Tell Kurdu.

THE SMALL FINDS

Fokke Gerritsen

Next to ceramics and chipped stone, the excavations yielded smaller assemblages of other artifact categories. These consist of a range of types, including personal ornaments such as beads and pendants, administrative artifacts such as tokens and seals, and implements and containers made of stone, bone, ceramic and clay, but not of metal. This range appears to be fairly typical of Late Neolithic and Early Chalcolithic settlements in Anatolia and Northern Mesopotamia (e.g. Bernbeck 2001; Merpert and Munchaev 1993b: 194-196; Spoor and Collet 1996). This section presents brief characterizations of the artifact categories, concentrating mostly on the finds that come from secure Amuq C contexts. Finds from the plow zone or from intrusive pits are excluded unless they deserve individual mention.

Figurines are quite rare (fig. 13:12, 13:13). There is one anthropomorphic figurine made of lightly baked clay of which only the head remains. Noteworthy is also a finely made curved horn made of a light-colored stone, which presumably belonged to a cattle figurine.

Beads and pendants mostly are of stone. Shell and animal teeth are less frequently used. The shapes include pierced discs, cylinders, barrels (e.g. an obsidian bead, fig. 13:1) and rounded rectangular 'pillow' shapes. In addition, the microartifact analyses yielded numerous stone beads often no larger than 1 to 3 mm in size. Several pendants with drilled loops on the back occur in various shapes, including a stylized anthropomorph (fig. 13:3) and a triangle (fig. 13:8, from plow zone), and are often decorated with incised lines and drilled holes. It is possible that some of these were also used as seals. Excavations at Domuztepe have yielded a nearly exact parallel for the above-mentioned triangular pendant/seal (fig. 13.8; Carter et al. 1999:fig.16.1). A quatrefoil seal (fig 13:10) also has parallels at other Anatolian Halaf related sites such as Fıstıklı Höyük (Pollock et al. 2001:fig.10f) and Domuztepe (Campbell et al. 1999:fig.14.4). One stone disc (13 mm in diameter) with a lateral piercing (fig. 13:11) has an extremely finely incised scene depicting a bird of prey attacking a fish or other animal. Although it comes from a secure context (lower floor of room R06), the uniqueness of this pendant or seal give some reason for caution; it may be an artifact of later date that was transported down to this level by bioturbation.[9]

In addition to pendants that may have served as seals, there is one seal made of a ceramic lug handle (fig. 13:14). Late Neolithic levels at Mersin Yumuktepe yielded

[9] Nonetheless, figurative designs with remarkable detail have been found on sealings from Sabi Abyad Level 6 (Duistermaat 1996: fig. 5.7-5.8).

similar example of a lug handle ceramic seal (Caneva 1999:fig.20). The interior face of the handle is deeply incised with a geometric pattern of sub-perpendicular lines. Clay sealings were rare despite 100% dry screening of nearly all reliable contexts (the number of fragments of identifiable clay sealings is less than five). The most convincing sealing (fig. 13:22) is a discoid made of burnt clay, with coil impressions, possibly of a basket, in the base and possible rope impressions on its upper surface. Although this leaves the question of sealing practices (and its possible implications for the administration of property) open for the moment, there is clear evidence for the use of clay tokens (fig. 13:15-21). Twenty-four objects were found that can be interpreted with some confidence as tokens, based on identifications at other sites. The most common shape is a cone with a round base of 10 to 15 mm and a height of 8 to 20 mm (fig. 13:15-13:18). Less frequent are spheres, discs (fig. 13:20) and a single almond or wheat-grain shaped token.

Perhaps related to the use of tokens are a number of reworked pottery fragments or sherd roundels. Recently, the suggestion has been made that sherd roundels functioned as mnemonic devices (Kielt Costello 2000). Sherd roundels occur frequently in the Amuq C deposits at Tell Kurdu, but their contextual information does not provide evidence to support or denounce this hypothesis. The possibility of multiple functions has to be left open for the moment. Sherd roundels range from very well rounded discs (fig. 14:1, 14:2) to coarsely rounded sherds. In some instances reshaping a sherd was clearly done by chipping the edges. Sometimes the painted design appears to have been an element in the selection of the sherd (14:1, 14:3). There is a considerable variety in the size of sherd roundels, ranging from 2.5 to around 10 cm across. Next to circles, recurring shapes include hexagons and D-shapes (fig. 14:4).

Spindle whorls and bone tools comprise a large fraction of the small finds. Spindle whorls (fig. 14:5-14:7) are of common forms, mostly made of baked clay and recycled sherds. There is one lentoid pierced stone disc (14:5). Implements made of bone include awls made from metapodia, pins and a spatula (fig. 14:8-14:12).

Hammering and pounding stones as well as grinding equipment such as mortars, pestles and querns are well attested at Tell Kurdu (fig. 15:7, 15:11). A group of grinding stones found on and around a workbench in room R05 (cf. fig. 4), together with other objects and installations related to food preparation confirms their use for grinding grains.

Celts made of different types of stones occur with some frequency (n=21), although more than half of them come from the plow zone and may not be Amuq C in date. Two are narrow in relation to their length and are presumably chisels (fig. 14:15-14:16). Axes (with symmetrical beveling of the cutting edge) and adzes (with asymmetrical beveling) are equally common. Some celts show indications of heavy use, the butt end is often battered (fig. 14:18) and the working edge varies from sharp to well rounded. Presumably, celts were mainly used for woodworking. More for symbolic than practical use is an elaborately decorated mace head of dark gray to black stone (fig. 15:6). It was found in a deposit in trench 24 and is therefore stratigraphically related to the main Amuq C occupation level only in a general sense (see above). It is a double cone with a rounded rectangular section at the widest diameter. It has four, somewhat battered buttons at the corners. The ends are decorated with concentric incised lines.

A final category of artifacts made of stone are ground stone vessels (fig. 15:1-15:5). These are mostly low, open bowls with diameters of 8 to 20 centimeters. There is one fragment of the neck of a small jar. Most stone vessels are thin-walled with a smooth finish. Some show signs of reshaping of the rim (fig. 15:5).

PETROGRAPHIC ANALYSES OF STONE OBJECTS

Ş. Nihal Aydın

Petrographic analyses were conducted on 25 stone artifacts dating to Amuq Phases C-E from the 1996, 1998 and 1999 seasons at the MTA (Maden Teknik Arama) Mineral and Research General Directorate laboratory in Ankara (Aydın 2002). The analyses characterized the raw materials of stone artifacts by determining their hardness, structure, and reaction with diluted HCl. Further identifications were made using a polarizing microscope. While the larger analyzed artifacts such as grinding stones, hammer stones, pestles, querns, and other stone objects were identified as basalt albitized, andesite, quartz arenite, lithic arkose, micrit (limestone), chlorite granofels, and hydrothermal mineral calcite, smaller objects such as stone disks, counters, whorls, and celts were identified as sandy calc-arenite, subarkose, tuffaceous sandstone, litharenite (sedarenite), micrit limestone, and serpentinite. Sedimentary rocks with relatively low hardness (values between 3.5 and 5) appear to be used most frequently especially for the smaller objects, whilst basalt and andesite (5.5 to 6.5 hardness values) are favored for grinding stones, querns, and pestles. MTA archive reports (e.g. Aslaner 1973; Atan 1969) show that all raw materials are available in the direct vicinity of the Amuq Plain with the exception of tuffaceous sandstone (TK 2229) and chlorite granofels (TK 0665 and TK 1936). The latter three objects could either represent foreign imports or are from local rock types that remain unrecorded in the geological surveys conducted in this region.

MICROARTIFACT ANALYSIS

Rana Özbal

The microartifact studies at Tell Kurdu are part of a larger program of fine-grained activity-area analyses, which also include soil micromorphology (carried out at Boston University Micromorphology Laboratory) and the identification of the mineralogical and elemental composition of occupation surfaces (carried out at Boğaziçi University Archaeometry Laboratory). As the above-mentioned analyses are still in progress, this report will present preliminary results obtained through the study of microartifacts (also see Özbal in press). The methodology used is explained elsewhere (Özbal 2000). To date, 191 soil samples (totaling 510 liters) that were collected from Amuq C deposits during the 2001 season have been analyzed, yielding over 35,000 microartifacts.[10] Although

[10] In this study, 15 mm has been taken as the maximum microartifact size. In this report, only four types of microartifacts are considered: ceramics, chipped stone, bone and shell. Other studies may use different criteria in the definition of microartifacts (see Cessford 2003, Rainville 2002: 196, Rosen 1993).

statistical analyses to distill information from the data are ongoing, some preliminary patterns are already visible. More definite and comprehensive results will appear in future reports.

Perhaps the clearest pattern yielded by the analyses is a notable difference in density of microartifacts between streets and room/courtyard spaces. Density is calculated by dividing the total counts for each microartifact category in a sample by the volume of the sample (in liters). As is visible in Table 10, streets, which contain visibly high quantities of macro domestic refuse and garbage, are also extremely high in microartifactual remains. Density values for micro ceramics, chipped stone, and bone from the street samples are multiple times higher than values from rooms/courtyards. This pattern indicates a fundamental difference in the cleanliness of these spaces. Micro shell densities are an exception, being roughly equally abundant in street and room/courtyard samples. This may be due to the fact that shell was brought to the site through both natural and cultural agents; it also occurs in high densities in some of the off-site samples taken as a reference. In addition, it is clear from the table that microbone is found much more frequently than other microartifact categories in all types of contexts.

The preliminary analyses furthermore indicate the presence of two activities in various rooms and courtyards; (1) burning as indicated by burnt microbone and (2) chipped stone knapping.

Burning alters the physical appearance of bone, making the identification of burnt bone or – in this case – burnt microbone relatively easy. Comparisons of the percentage of burnt microbone in samples taken across a floor surface can provide information on the location of burning activities, assuming that small fragments of bone lying on and within floor surfaces become burnt after a localized fire in a particular place. Interestingly, burnt bone concentrations seem to be higher in the center of the room on several overlying floors of R28 (table 11). Although no formal hearths were present (and in most cases no signs of burning could visibly be identified on the floor surfaces), the burnt microbone concentrations are indicative of repeated burning activities taking place in the same location through different phases in the use life of this room. The concentration in the highest of the four floors is less pronounced than in the other floors -possibly because pit 22:51 (fig. 5) was detected only after the microartifact samples were taken- and may not necessarily signify burning. The difference between the total percent of burnt bone for centers and the edges of the room is statistically significant ($p < t = 0.95$). Analyses continue to determine whether other rooms also yield such evidence for burning locations. Preliminary results indicate that a similar pattern is present on the earliest excavated floor of R39 (table 11).

A second activity noted by the microartifacts is lithic knapping, as exemplified by the micro chipped stone densities in courtyard R07. Localized densities of like-colored micro flakes, chips and other debitage can indicate the location of chipping activities (Middleton 1998:210-232). The density of micro chipped stone in this courtyard is considerably higher than in other locations (three times higher than the average of the rooms, and higher even than the density in the streets), presumably because chipping activities took place here. It is not surprising that an exterior courtyard space was selected for lithic knapping. The most notable concentration comes from the north-center of the

courtyard where over 100 fragments of yellowish flakes and chips were found in several samples collected from this area. Interestingly, the fact that the northwestern-most sample from adjacent R10 also yielded yellow flakes of the same color and texture may confirm the presumed doorway between these two areas. There may be other lithic concentrations, including a small group of reddish flint flakes in the south and a number of obsidian flakes to the west of the courtyard and in the threshold of the doorway into R05, but these are relatively small clusters. A detailed discussion of the chipped stone knapping in this area is forthcoming (Özbal and Healey forthcoming).

In addition, beads, no larger than 4 mm in size were also found among the microartifacts. Interestingly, 19 out of the 24 beads found (79 %) come from two overlying floors in room R39. These beads vary in color from grayish black to dark red and range from 1 to 3 mm in size. The beads were found in six samples over distant corners and different floors of the room yet the possibility of whether they all originate from a single broken necklace remains.

TELL KURDU FAUNAL ANALYSIS

Michelle Loyet and Frank Nardulli

Introduction and Methodology

In this analysis, we present a general account of the Tell Kurdu faunal materials, as well as a discussion of the differences between the faunal assemblages from 2001 and previous seasons. Several aspects of the data will be discussed including the relative abundance of the species present in the faunal assemblage, the mortality profiles of the various taxa and the food utility indexes of the sample.

While species distribution, or the relative abundance of species present in a faunal assemblage can provide indications on the composition of the pastoral economy (including relative reliance on domestic and wild fauna, the types of domesticates produced), mortality profiles offer insights in herd management. Most importantly, through mortality profiles we are able to determine whether animals were intended for use as food resources, or whether they were used for traction, hides, milk, or in the case of sheep, wool. Mortality curves can be constructed using a variety of data, including tooth eruption and wear as well as epiphyseal fusion of long bones. Tooth wear can estimate the age of the animal at death, as tooth wear is an ongoing process. Epiphyseal fusion only indicates that the animal survived long enough for the epiphysis in question to fuse, but not how long the animal subsequently survived.[11]

[11] Ages at death based on tooth eruption and wear were determined using methods outlined in Deniz and Payne (1982), Grant (1982), and Levitan (1982); see also the appendices of Hillson (1986). In the cases where epiphyseal fusion was used to determine the age at death, data from Silver (1969) and Noddle (1974) were used. The construction of tooth survivorship curves was done using methods outlined in Zeder (1991) and Redding (1981). Long bone survivorship curves were computed using a method developed by Redding (1981: 248) that calculates fusion scores based on the proportion of bones that are fused or fusing, versus those that are unfused, in each age class. Those bones that have the same latest age at fusion are combined in to a single age class.

A third aspect of the faunal assemblage to be discussed in this report is the determination of the food utility of the body parts in question. Using the modified general utility index (MGUI) developed by Binford (1978) and refined by Lyman (1994), we are able to measure the amount of meat (weight of fat and muscle tissue), marrow (volume of the marrow cavity multiplied by the percentage of fatty acids present in the marrow), and grease (volume of the cancellous skeletal material multiplied by the percentage of fatty acids present in the marrow) associated with the samples. This produces indices of the food utility for each of the carcass parts for human consumers. After these values are altered to account for low-value parts such as metapodials that may appear in the archaeological record as "riders" being brought to the site attached to high-value parts, they are normed to a scale of 1 to 100, resulting in the percentage modified general utility index (%MGUI) (Binford 1978; Lyman 1994).

Likewise, to measure the abundance of carcass parts, we follow traditional zooarchaeological procedure (Lyman 1985, 1994) and use %MAU (minimum numbers of animal units) for each anatomical part (e.g., proximal humerus, distal metacarpal). The MAU is calculated as the minimum number of those elements (MNE) present in a collection, normed by dividing that value by the number of times that element occurs in one complete skeleton (Lyman 1992). It does not take into account side or ontogenetic age differences in the initial counting of the element, but the resulting values MAU do indicate which carcass portions are more or less abundant than others. For analytic and graphing purposes, the MAU is normed to a scale of 1 to 100 and is referred to as %MAU.

The Tell Kurdu Assemblage

Two different faunal assemblages are used in this study: the assemblage from the excavations in Trenches 12 and 16 in 1999 (Yener et al. 2000b: 78-80; Loyet 2003), and the assemblage from the 2001 season. While the 1999 assemblage includes a mix of screened and unscreened samples, in 2001 nearly all contexts were screened. In addition, whereas the 1999 sample is comprised of Amuq C materials with an admixture of Amuq D materials from later pits and plowed contexts, the 2001 sample is exclusively from secure Amuq C contexts, mostly from residential deposits. Variability between these two assemblages is thus expected, as both screening and differences in periodization can introduce biases.

The differences in screening between the two seasons are apparent in the average specimen sizes; while the average for the 1999 sample was 7.34 grams, this value fell to 2.36 grams in the 2001 sample. However, experiments carried out by Shaffer (1992:129-136), demonstrate that even sieving with a 5 mm mesh result in the nearly complete loss of animals less than 140 grams in weight (see also Watson 1972). It is expected then, that considerable portions of the microfaunal remains are absent from the assemblage, particularly smaller mammals, fish, and birds. In fact, microartifact analyses conducted by Rana Özbal demonstrate that 334 remains of fish and 99 fragments of bird were recovered in the 510 liters of soil screened to date using a 1 mm mesh (Özbal, personal communication). These numbers are considerably higher than values attained for fish and

bird in the macro samples. However, for reasons of consistency and inter-site comparability, faunal remains recovered from microartifact analyses will not be included in this analysis.

The size of the 2001 assemblage indicates that it may be less subject to biases than the smaller 1999 sample (table 12). In addition to the above listed factors, perhaps the most important reason for why the 2001 sample is thought to be more reliable is that the material comes from secure residential Amuq C contexts, including room and streets deposits.

In the Amuq C Phase, about three fourths of the diet is derived from domesticates, although wild animals including cervids, gazelle and fish played a significant role in the subsistence of economy (table 13). Mammalian domesticates present in the assemblage include sheep and goat, cattle, and pig. Wild cattle was also identified in mixed contexts. Other taxa such as equids, may also be domestic, but are not present in great enough numbers to contribute significantly to the pastoral economy. For the purposes of this analysis, sheep and goat have been combined into a single taxonomic category, ovicaprines. Table 13 shows that ovicaprines and cattle represent a large proportion of both assemblages. Cattle, however, may represent a much more important resource. Their larger size allows for their use as draft animals, as well as producing greater amounts of milk and yielding more meat. Cattle most likely provided the majority of the meat consumed at Tell Kurdu. Even the most conservative meat yield estimates suggest that cattle yielded over 8 times more meat than sheep or goat (Clark 1993). Pig (*Sus*), is the only other domesticate.

This leaves a large portion of the assemblage to be accounted for. While some of the remaining taxa, including gastropods, carnivores, and rodents, may not represent food resources, the more common wild taxa most likely do, especially cervids, gazelle, and fish. Cervids are especially abundant in forest edges (McCorriston and Hole 1991:57) and the high quantities of cervids at Tell Kurdu suggest that the region may have been forested. Aquatic resources such as fish, turtle, and bivalves would have been easily obtainable in the vicinity of Tell Kurdu. The fish have not been entirely identified, but preliminary analysis shows that the most common piscene taxa by far is catfish (*Clarias* sp.), which live in low-oxygenated water (Brewer 1987). Geomorphological investigations indicate the presence of nearby pools and marshes in the sixth millennium BC (Wilkinson 2000: 174-177).

A large proportion of wild animals (comprising nearly one quarter of the 2001 assemblage) is not entirely unexpected, as similar patterns can be seen at the same time in the Khabur Valley, in eastern Syria. In the southern portion of the Khabur, Zeder (1995, 1998) has examined the fauna from a number of sites, spanning from the 6th to the 2nd millennium BC. In comparing proportions of wild to domestic fauna from these sites, it can be seen that there is a fairly diverse use of animal species from the 6th through the 4th millennium BC, with wild fauna representing as much as 40% of the overall assemblage. It is not until the beginning of the 3rd millennium where a steady increase in the percentage of domestic fauna is apparent. Cavallo's overview of the subsistence economies of Halaf sites in which each settlement's faunal assemblage is summarized

(1997:21-30) also suggests great diversity over the Near East at this time (also cf. Akkermans 1993:250-268).

Age and Mortality Data

This section presents two types of age data: mortality curves based on tooth wear data, and survivorship curves based on epiphyseal fusion. It must be noted that the age mortality data presented here are from the 1999 sample and may not be entirely representative of the Amuq C Period (see above).

As can be seen in the ovicaprine mortality profile based on tooth eruption and wear data (fig. 16A), very few animals were culled at a young age, with a peak in culling possibly coinciding with maturation or reaching full growth. Beyond this, there is a steady drop-off in culling. This may indicate a possible focus on milk or wool production, but with meat still playing a dominant role. In the case of the survivorship curve based on epiphyseal fusion (fig. 16B), there is a drop in survivorship after the 24-month stage. This coincides with the peak in culling in the mortality curve, again indicating a slightly older population than would be expected if only meat production were the aim, but is not indicative of any extensive production of secondary products, such as milk and wool.

With profiles 16A-B, interpretation is difficult due to variation in the intervals. However, when the information is re-plotted as number of deaths per year (fig. 16C) to account for this, we can see that as opposed to a peak in death at the 1-2 and 2-3 year range, there is rather a sharp decline in number beyond the first years of life. This also indicates a possible focus on production of secondary products.

In the case of cattle, a survivorship curve based on epiphyseal fusion was constructed, because it was not possible to create mortality curves due to the lack of complete mandibles in the Amuq C assemblage (fig. 16D). One notes a drop in cattle survivorship after three years, but with significant portions of the population surviving beyond that point. This may be indicative of a focus on both meat and dairy production. Given the presence of the pools and marshes, the area around Tell Kurdu would have been fairly well watered, creating an amenable environment for raising cattle. It would have been a reliable source of meat as well as milk for the population of Tell Kurdu.

For pig, like in cattle, only survivorship data was available, due to lack of complete mandibles (fig. 16E). As is illustrated by the survivorship curve, there is a drastic drop in survivorship at approximately 2 years. Pigs represent a fast maturing, high fat, and high-calorie meat source (Pollock 1999:105), and offer no secondary products such as milk, wool, and traction. However, with their large litters, and flexible diet, they are an excellent source of food, even given their high water requirement and sensitivity to heat (Zeder 1991:28-31).

Body Part Distribution

To determine the type of resource strategies used at Tell Kurdu and to identify the level of specialization in the subsistence economy, the distribution of both sheep/goat and cattle %MAU versus the %MGUI were plotted in a scatter-plots (Binford 1978; Lyman 1994). The 2001 faunal sample was used for this study. The scatter-plots both for

sheep/goat (fig. 16F) and for cattle (fig. 16G) show a reverse L-shaped curve, known as the gourmet curve, with few low-value specimens and many high-value units. This pattern suggests that the sheep/goat and cattle body-part distributions are the result of food waste. If butchery as well as consumption were taking place within the excavated spaces, we would expect to find both high and low-value bones in similar quantities. Spearman's rho between the skeletal part frequencies and their structural density for the ovicaprine assemblage is insignificant (rho = 0.3108, P = 0.2247), indicating that there is no evidence for density-mediated destruction that may bias body part distribution. Similarly, there is no evidence for density-mediated destruction in the cattle sample (rho = 0.0896, P = 0.7071). These findings are in accordance with that of a residential area and suggest either that butchery took place in a separate location or that butchery waste was deposited elsewhere.

Conclusions

The excavations at Tell Kurdu offer a glimpse into a settlement at a time when social and political hierarchies were developing. Based on the data, it would seem that during the Amuq C Phase at Tell Kurdu, the residents were practicing a diverse and generalized subsistence strategy, relying neither entirely on domestic nor wild fauna. Even within the domestic fauna, there is no clear preference for any single taxon. These generalized subsistence practices are mirrored in the mortality and survivorship data available for the three main domestic taxa. It would appear that the residents were focusing on subsistence products rather than production of secondary products, especially given the mortality data for cattle and ovicaprines. Excavated contexts to date have yielded primarily food waste, and it is presently unknown where in or around the settlement butchering took place.

TELL KURDU SHELLS

David S. Reese

To date, all Tell Kurdu shells (n=371) recovered from the 1996, 1998, 1999, and 2001 seasons and dating to Amuq Phases C, D and E have been analyzed. Considering that Kurdu is at least 40 km from the easiest accessible coast, it is not surprising that only 24 % of the total is marine shell. These imported items appear mostly to have had ornamental uses. Freshwater shells are by far the most common at Tell Kurdu and comprise 63% of the assemblage. The remaining 13% includes several species of land snails. Geomorphological investigations suggest the presence of a nearby lake at the time (Wilkinson 2000:174-177), so presumably freshwater shells could have been collected in the vicinity.

This brief report will mainly focus on shells from secure Amuq C levels. A complete report comparing Amuq C, D, and E shell assemblages is forthcoming (Reese forthcoming). Excavations in Amuq C levels have yielded marine shells including gastropods, bivalves, and scaphopods. Among the gastropods, are *Murex trunculus, Columbella rustica, Conus mediterraneus, Arcularia gibbosulus, Monodonta turbinata,*

Neverita josephina, and *Ancilla.* By far the most common gastropod present during the Amuq C Phase is *M. trunculus*. The Braidwoods also discovered a specimen of this species at Tell Kurdu (Braidwood and Braidwood 1960:174). Excavations from the subsequent Amuq D and E Phases yielded several additional marine gastropod species including *Thais haemastoma, Cerithium vulgatum,* and *Luria lurida*. Although less abundant, marine bivalves recovered in Amuq C levels include *Cerastoderma edule, Glycymeris* and *Donax trunculus*. Additionally, the scaphopod *Dentalium* and particularly *D. dentalis*, appears to have been the preferred raw material for shell beads (fig.13: 5).

Two types of freshwater shells dominate the assemblage: *Unio*, an edible bivalve and *Melanopsis*, a gastropod. Interestingly, there appears to be a decline in the quantity of freshwater shells in Amuq Phases D and E. In Phase C, freshwater shells comprise the majority of the assemblage, with *Unio* being most common. The presence of this species at Tell Kurdu was also noted by the Braidwoods (Braidwood and Braidwood 1960:225).

The final category of shells found at Tell Kurdu consists of land snails, which are probably found naturally in the archaeological deposits. Two types of land snails are most common, namely the edible *Helix* and much smaller *Oxychilus*.

ARCHAEOBOTANICAL REPORT FOR THE 2001 TELL KURDU SEASON

Heidi Ekstrom

Compared with previous seasons, the 2001 excavations at Tell Kurdu yielded little botanical material. This is partly because many of the analyzed samples are derived from small deposits that do not typically yield large quantities of charred seed remains. A total of 46 samples were collected and processed during the course of excavation, 10 of which were analyzed. As can be seen in Table 14, the botanical samples selected for analysis, which yielded 212 seeds and plant parts, are from room deposits, and inside *in situ* vessels, ovens, and bins. These contexts prevented the collection of 40-liter samples as in past seasons (Ekstrom 2000:81). Instead, sample size for the 2001 season averaged approximately 6.5 liters. Cereal species include *Hordeum vulgare, Triticum dicoccum, T. boeoticum,* and several fragments of indeterminate *Triticum* species (n=3). Large legumes such as *Cicer arietinum* (chickpea), *Lens culinaris* (lentil), and *Pisum* (pea) were not identified, though many (n=25) poorly preserved large legume fragments are present. Numbers are minimal, but other notable taxa include *Ficus* (TK 6651), and *Linum* (TK 8015). Weed seeds were also present and consist of two genus of clover and several other species common to archaeobotanical samples in the region (table 14).

Additionally, wood charcoal was present in most of the analyzed samples, but in very small amounts. Unfortunately, the wood fragments were too minute to identify to species level with any measure of confidence. Two unsorted samples (TK 8423 and TK 8814) were briefly looked at and contain large quantities of charred wood remains. Preliminary observations classify these fragments as hardwoods, however wood remains were not a focus of this analysis.

Despite the small quantity of seed remains collected during the 2001 season, remains from Tell Kurdu not only compare nicely with other contemporaneous sites, most notably, Ras Shamra (Van Zeist and Bakker-Heeres 1984-86), and Girikihaciyan (Van

Zeist 1979-80), but they are also consistent with findings of previous excavation seasons (Helbaek 1960, Ekstrom 2000). Further sorting of samples may add to the overall assemblage of botanical material present during occupation. However, it is unlikely that any significant new information will be obtained given the small sample volumes.

THE TELL KURDU HUMAN BURIALS

Fokke Gerritsen and Sabrina Sholts

During the 2001 season twelve human burials and one dog burial was found in the North Mound operations. Three additional burials, which were found in Trench 12 in 1999, are included in this report (Edens and Yener 2000b, 43). All burials contain the remains of single individuals. This report describes general aspects of the burials but does not aspire to be an exhaustive report on the burial practices. Age determinations await analysis by a physical anthropologist. For the method of sexing human remains using DNA analysis, see the report in this article by Nitzan Mekel-Bobrov and Bruce Lahn. In this report, the Trench:Locus number combination is used to identify the burials. The locations of the graves are shown in the plans (figs. 2-5).

Sorted by stratigraphic positioning, the graves can be grouped as follows. Burials 12:81 and 25:8 are contemporary with the main Amuq C occupation level; burials 12:14 and 25:89 may also be, given their positioning in relation to the architecture, although there are no stratigraphic controls to confirm this. Burials 25:80 and 22:2 are stratigraphically later than the main occupation level, but their grave goods indicate an Amuq C date (fig. 8:1). The placement of burial 25:80 against the outside of a wall of room R39 further suggests that it could belong to a phase when the building was still in use or had recently been abandoned. For burials 12:12, 12:13, 23:10, 24:27, 24:16, 26:2, 26:12, the stratigraphic information indicates that they probably or certainly post-date the main occupation level, but whether they date to the Amuq C, D or E phase is uncertain. Burial 26:12 contained pottery of shapes that are not common in the assemblage of the main occupation level but that judging from the fabric and paint could well date to the Amuq C phase. Finally, burials 23:11 and 24:3 can be dated to the Amuq E phase, both on stratigraphic grounds and typological characteristics of the grave goods. Three more burials of Amuq E date were found in Trench 4 in 1998, about 100 meters to the east.

The frequent occurrence of graves directly below the plow zone, and in some instances the damage suffered by the graves from recent agricultural activities, suggests that other graves may have been completely lost. This is confirmed by farmers who witnessed the leveling of this part of the mound in the 1970s (when by their estimate 50 centimeters was shaved off the northern part of the mound). The possibility exists that these were part of an Amuq E cemetery on the northern, then uninhabited, part of the mound.

Burial practices

Burial 12:81 represents a form of interment common at Tell Kurdu (fig. 4A). The body of a male is placed in tightly flexed position in a simple pit. There are no grave

goods. The grave is located inside room R06, cut into a plastered floor and sealed by a later floor. Adult burial 12:14, found at a higher level in the same room, was flexed and placed in a simple pit as well (cf. Edens and Yener 2000b: 43). DNA analyses confirmed that this individual was also male. Although disturbed by recent plowing, the position of the burial pit in a corner but not cutting the walls of the structure suggests that this burial either dates to a late occupation phase of the room, or to a phase before the wall remains were covered by later deposits. Similarly, burial 25:89 is a flexed burial placed in room R45.

Burial 25:8 represents a very different type of grave, a cremation burial. DNA analysis determined that it was a female. The cremation remains had been placed in a jar (fig. 6:7). There were no grave goods inside this jar, but it occurred together with a painted bowl (fig. 8:7) and a small narrow necked vessel (fig. 7:9). This cluster was found within the bonded walls of the northeastern corner of room R39, indicating that the urn and accompanying jars were placed inside the wall as it was erected. This suggests a form of foundation deposit for which, as far as we are aware, there are currently no parallels from this period. The section on the architecture above discusses other features of room R39 that indicate it may have served specific social or ritual practices. The possibility that the jars were placed here after the building was abandoned and leveled cannot be ruled out on stratigraphic grounds but is highly unlikely, given the complete absence of a visible pit cutting into the mudbrick wall or other signs of damage to the courses of the wall at the level of the jars. No other cremation burials occur in the 2001 trenches, but a cremation of probable Amuq C date was found in trench 7 in 1998 (Edens and Yener 2000a, 47).

Three burials (12:12, 26:12, 24:16) are jar burials containing newborns or infants. Burial 26:12 in room R54 (and possibly related to a late occupation phase of this room) yielded an infant with flexed legs covered by a large oval bowl. A miniature painted jar was found in the direct vicinity of the bowl. In the other two cases, the skeleton was placed inside the jar.

Burial 24:3 dating to the Amuq E period is the only burial that is not placed in a simple pit. The rectangular grave is lined by mudbricks of which one course was preserved.

Grave goods do not occur in large numbers. Amuq C or undated burials contain maximally two ceramic vessels, and only Amuq E burial 23:11 contains 3 painted vessels (bowl, cup and a jar that contained a few legumes; ident. H. Ekstrom). Four burials contain no grave goods. Beads or other items of personal adornment are entirely absent. Three interments were given animal parts as grave goods. Burial 25:80 (of a sub-adult or adult male) contained a partial cattle mandible placed over the mouth of a jar (fig. 6:9). Burial 24:27 (a female) contained a small horn core, while burial 23:10 may have included several astragali of a medium-sized mammal, but the grave pit and contents were too disturbed to be certain about their position inside the grave. Only the lower leg bones of the person were preserved. The contents of grave 12:14 also suffered from recent plowing, but contained at least five sling pellets of unbaked clay and a bone awl.

The small sample size and the time range represented by the burials from Amuq C to Amuq E makes it hazardous to make statements about patterns in the burial practices.

If anything, the burials excavated so far demonstrate the variability in the Late Neolithic or Early Chalcolithic burial practices also noted by Akkermans (1989).

ANCIENT DNA ANALYSIS OF HUMAN REMAINS FROM TELL KURDU

Nitzan Mekel-Bobrov and Bruce T. Lahn

Introduction

In the almost two decades since the first extraction of ancient DNA in 1984 by Higuchi et al., the analysis of ancient DNA has been transformed from a singular achievement to routine practice. With the explosion of new techniques in molecular biology, most notably the Polymerase Chain Reaction (PCR), and increasingly stringent protocols of avoiding contamination by exogenous molecules, ancient DNA analysis is now able to yield reproducible results with a high degree of certainty. Consequently, analysis of DNA from ancient human remains is becoming increasingly common as one of the many tools wielded by archaeologists in their investigation into the past.

In the present study, we examined the Hypervariable Region I (HVRI) of the mitochondrial genome, and a homologous portion of the amelogenin gene on the X and Y chromosomes, in 14 individuals interred at the site. Our objective was two-fold. First, we were interested in identifying the sex of these individuals, since the morphological data was largely ambiguous due to poor preservation. DNA analysis can provide a powerful alternative by testing for the presence of either XX (female) or XY (male) chromosome combinations. Second, we were interested in determining the amount of genetic diversity at the site in order to ascertain the overall degree of relatedness among these individuals. Mitochondrial DNA (mtDNA), which is inherited exclusively through the mother but is present in both males and females, can be used to address this question.

Materials and Methods

DNA Extraction

DNA extraction was attempted from 3 long bones for each of the 14 individuals. The surface of each bone was removed to a depth of 0.2 cm and 1g of bone powder was produced from the shaft. DNA was extracted in two stages: a 96-hour incubation period in a solution of 5µl 0.5 M EDTA, 300µl 10% SDS, and 300µl 20 mg/ml Proteinase K at 37°C; and a 12-hour incubation period in a 1ml guanidinium thiocyanate solution at 55°C. Purification was carried out with glassmilk beads in the presence of guanidinium thiocyanate.

Amplification

Molecular sexing was carried out by PCR amplification of a portion of the amelogenin gene (Sullivan et al. 1993), yielding differentially sized fragments on the X and Y chromosomes of 106 and 112 base pairs respectively. The PCR product was run out on a 5% NuSieve agarose gel for 120 minutes, and visualized under UV light. The presence of a single band signaled two X chromosomes, while the presence of two bands

signaled one X and one Y chromosome. HVRI of the mitochondrial control region was amplified and sequenced in three overlapping fragments to minimize the size of the PCR products.

To avoid contamination all extraction and amplification procedures were carried under sterile conditions following standard protocol. See Cooper and Poinar (2000) for details.

Results and Discussion

Results from the sexing and mtDNA sequence analysis are summarized in Table 15. Only reproducible results are included here. Results were considered reproducible if they were obtained at least twice from two independent extracts, each from a different bone. Of the 14 individuals analyzed, 9 yielded results for the amelogenin sexing assay, while 11 yielded complete HVRI sequences.

The data on the sex of the individuals interred at Tell Kurdu may yield interesting findings in future studies of burial distribution at the site, potentially linking the concept of gender to other categories of identity, such as class, kinship, and family. With a success rate of 64%, this study demonstrates that molecular sexing assays may be a valuable contribution to analyses of human remains when morphological features are ambiguous.

The mtDNA analysis yielded a relatively high success rate of 78%. This data can be informative on two fronts. First, it may be used to gain some insight into the kinship structure at the site. A total of three distinct haplotypes were identified in the sample of 11 individuals, the sequence of each is listed in Table 15. Since mtDNA is inherited exclusively through the mother, these haplotypes correspond to three distinct maternal lineages. The burial distribution of these lineages may prove informative in future studies. Second, analysis of several diversity parameters may shed some light on the total degree of relatedness among these individuals. Results of this analysis are summarized in Table 16. Data from several modern populations in the region are included for comparative purposes.

It is beyond the scope of this report to go into the details of interpreting these results. It should be noted, however, that the amount of genetic diversity at the site is significantly lower than in modern populations in the region. This is significant in two ways. First, the reduced number of haplotypes relative to sample size is likely the result of immediate family relations among some of the individuals at Tell Kurdu. Second, the low values for both the sequence and nucleotide diversity strongly suggests that the separate lineages (perhaps corresponding to families) are themselves highly related to one another.

Discussion and Concluding Remarks

Rana Özbal and Fokke Gerritsen

Our investigations at Tell Kurdu have two long-term goals: our primary concern is to understand the settlement and community of Tell Kurdu and its development through time at the intra-site level. Secondly, our research considers regional and inter-regional

relations between Tell Kurdu and contemporaneous sites in Anatolia and Northern Mesopotamia.

The 2001 excavations have brought a new focus to the Tell Kurdu Project permitting detailed intra-settlement investigations. While previous seasons sampled Amuq C, D and E occupation in different parts of the mound with general and stratigraphic questions in mind, the aim in 2001 was to concentrate on a single area in order to uncover a wide horizontal exposure. The concerted efforts on a single occupational level build on the groundwork of the previous seasons and allow for a finer level of inquiry. Our intra-site research includes social, political, and economic investigations at the level of household and community.

The exposed settlement plan shows considerable spatial complexity and differentiation in the layout of various areas. In Area F, for example, each room is lined up along the street with its doorway facing the alley, while in Area A and Area G we see clustered complexes around courtyards with little respect to the location of the street. In Area E, one finds two large buttressed rooms with plastered walls that appear to be different both in their architectural plans and in the care involved in their construction. Using contextual methods, we hope to gain insight in the meaning of this variability. Results of our preliminary analyses of the microartifacts and the chipped stone – for which the breakdown by room is already yielding interesting patterns – are contributing to our efforts to understand the nature of various rooms and areas and the dynamics between different areas of the settlement. Continuing analyses of the spatial distribution of these artifact categories as well as ceramics, small finds, shell and faunal and botanical remains, and results of micromorphological and soil chemical analyses, along with additional radiocarbon dates will contribute further towards this endeavor.

In addition to site-specific analyses, Tell Kurdu's location is also conducive to investigating the settlement in its broader cultural and geographic setting. Located in the boundary zone between the Halaf realm and societies of the Anatolian Late Neolithic/Chalcolithic, the sixth millennium settlement at Tell Kurdu appears to have appropriated elements of both these cultures. Architecturally, the site appears closer to the clustered rectangular buildings of the Later Neolithic and Chalcolithic of Anatolia,[12] and less like some Halaf or Halaf-influenced settlements, where rectangular structures are nearly always found in combination with tholoi.[13] Yet, Halaf painted pottery and local imitations of Halaf pottery are clearly attested at Tell Kurdu (figs. 8, 9)[14]. It should be

[12] Such as at Mersin (Garstang 1953: fig. 79); Can Hasan II (2; French 1998: fig.11); Köşk Höyük (Öztan 2002: 56); Güvercinkayası (Gülçur 2003: 506-507); Çatalhöyük East (Mellaart 1967: fig. 9); Tülintepe (Özbaşaran 1992: fig. 26), and Değirmentepe (Esin and Harmankaya 1988: fig. 2).

[13] Such as at Arpachiyah (Mallowan and Rose 1935: fig. 13); Sabi Abyad Level 3 (Akkermans 1993: fig. 3.12); Yarim Tepe III (Merpert and Munchaev 1984: pl. 2); Tell Turlu (Breniquet 1991: 25); Khirbet esh-Shenef (Akkermans and Wittmann 1993: fig. 5); Girikihacıyan (Watson and LeBlanc 1990: fig. 2.15); Fıstıklı Höyük (Pollock et al. 2001: fig. 2, 3); and Çavi Tarlası (von Wickede and Herbordt 1988: fig. 2).

[14] See also Esin and Arsebük 1982: 132 for a settlement with a similar combination of Anatolian/Halaf attributes.

noted however that the percentage of painted wares at Kurdu is considerably less than at most Halaf sites (table 4; Campbell 1992:61, Watson and LeBlanc 1990:135).[15]

Absolute dates also play an important role in understanding Tell Kurdu's interregional connections. The radiocarbon results discussed in this report provide an earlier date for the Amuq C phase than hitherto thought and could prompt a reconsideration of the temporal as well as cultural relationships between the Amuq Valley and Northern Mesopotamian Halaf settlements. With the exception of the two dates both from room R39, the level dates to ca. 5900-5700 cal. BC and is contemporaneous with the end of the Early Halaf Period and/or the beginning of the Middle Halaf Period (Campbell 1992:61-97; see absolute chronology section and table 1).

Future investigations on other aspects of life at Tell Kurdu will continue to shed light on the dynamics of cultural interaction. Most importantly, our research will continue to address the local settlement at the household level to explore issues of intra-site variability and to gain insights into the social, economic, and/or political relationships in the composition of this community.

REFERENCES

Akkermans, P.M.M.G., 1988a – An Updated Chronology for the Northern Ubaid and Late Chalcolithic Periods in Syria: New Evidence from Tell Hamman et-Turkman. *Iraq* 50: 109-145.

Akkermans, P.M.M.G., 1988b – The Sounding at Tell Damishliyya. In: van Loon, M.N., ed: Hammam et-Turkman I, 19-67. Leiden: Nederlands Historisch-Archaeologisch Instituut te Istanbul.

Akkermans, P.M.M.G., 1989 – Halaf Mortuary Practices: A Survey. In: O.M.C. Haex, H.H. Curvers, P.M.M.G. Akkermans eds: To the Euphrates and Beyond: Archaeological Studies in Honor of Maurits N. van Loon. Rotterdam: A.A. Balkema Publishers.

Akkermans, P.M.M.G., 1993 – Villages in the Steppe: Late Neolithic Settlement and Subsistence in the Balikh Valley, Northern Syria. Ann Arbor: International Monographs in Prehistory, Archaeological Series 5.

Akkermans, P.M.M.G and B. Wittmann, 1993 – Khirbet esh-Shenef 1991: Eine späthalafzeitliche Siedlung im Balikhtal Nordsyrien. *Mitteilungen der Deutschen Orientgesellschaft* 125: 143-166.

Algaze, G., R. Brueninger, C. Lightfoot and M. Rosenberg, 1991 – The Tigris-Euphrates Archaeological Reconnaissance Project: A Preliminary Report of the 1989-1990 Seasons. *Anatolica* 17: 175-240.

Anderson, S., A. Bankier, B. Barrell, M. de Bruijn, A. Coulson, J. Drouin, I. Eperon, D. Nierlich, B. Roe, F. Sanger, P. Schreier, A. Smith, R. Staden and I. Young, 1981 – Sequence and Organization of the Human Mitochondrial Genome. *Nature* 5806: 457-465.

Aslaner, M., 1973 – İskenderun-Kırıkhan Bölgesindeki Ofiyolitlerin Jeoloji ve Petrografisi, MTA Yayınlarından 150.

Atan, O., 1969 – Eğribucak, Karaören (Hassa), Ceylanlı, Dazevleri (Kırıkhan) Arasındaki Amanos Dağlarının Jeolojisi. MTA Yayınlarından 139.

Aydın, Ş.N., 2002 – Tell Kurdu Höyüğü'ne (Antakya) Ait Arkeolojik Malzemenin Petrografik İncelenmesi. MTA Dairesi Min. Report no 930.

[15] Such as at Arpachiyah (Hijjara 1997: 68); Yarim Tepe II (Merpert and Munchaev 1993a: 152); Sabi Abyad (Le Mière and Nieuwenhuyse 1996: 176), and Halaf-related sites such as Domuztepe (Campbell et al. 1999: fig. 13); Fıstıklı Höyük (Pollock et al. 2001: fig. 15). But cf. Girikihacıyan (Watson and LeBlanc 1990: 68).

Bernbeck, R., 2001 – Other Small Finds. In: S. Pollock. R. Bernbeck, S. Allen, A.G.C. Gessner, R. Costello, S.K. Costello, M. Foree, S. Lepinski, and S. Niebuhr, Excavations at Fıstıklı Höyük. In: Tuna, J. Öztürk and J. Velibeyoğlu eds: Salvage Project of the Archaeological Heritage of the Ilısu and Charchemish Dam Reservoirs Activities in 1999, 54-56. Ankara: Middle East Technical University.

Bernbeck, R., S. Pollock and C. Coursey, 1999 – The Halaf Settlement at Kazane Höyük: Preliminary Report on the 1996 and 1997 Seasons. *Anatolica* 25: 109-144.

Binford, L.R., 1978 – Nunamiut Ethnoarchaeology. New York: Academic Press.

Braidwood, R.J. and L.S. Braidwood, 1960 – Excavations in the Plain of Antioch, Vol. I. The Earlier Assemblages, Phases A-J. Chicago: University of Chicago Press.

Breniquet, C., 1991 – Un Site Halafien de Turquie Méridionale: Tell Turlu. Rapport sur la Campagne de Fouilles de 1962. *Akkadica* 71: 1-35.

Bressy, C., G. Poupeau and K.A. Yener, Forthcoming – Cultural Interaction during the Ubaid and Halaf Periods: Tell Kurdu (Turkey) Obsidian Sourcing.

Brewer, D.J., 1987 – Seasonality in the Prehistoric Faiyum Based on the Incremental Growth Structures of the Nile Catfish (Pisces: Clarias). *Journal of Archaeological Science* 14: 459-472.

Campbell, S., 1992 – Culture, Chronology and Change in the Later Neolithic of North Mesopotamia. Unpublished Ph.D. Thesis. Edinburgh: University of Edinburgh.

Campbell, S., 2000 – The Burnt House in Arpachiyah: A Reexamination. *Bulletin of the American Schools of Oriental Research* 318: 1-40.

Campbell, S., E. Carter, E. Healey, S. Anderson, A. Kennedy and S. Whitcher, 1999 – Emerging Complexity on the Kahramanmaras Plain: The Domuztepe Project 1995-1997. *American Journal of Archaeology* 103: 395-418.

Campbell, S. and E. Healey, Forthcoming – Sourcing the obsidians from Domuztepe.

Caneva, I., 1999 – Early Farmers on the Cilician Coast: Yumuktepe in the Seventh Millennium BC. In: M. Özdoğan and N. Başgelen, eds: Neolithic in Turkey: The Cradle of Civilization, Plates, 79-88. Istanbul: Arkeoloji ve Sanat Yayınları.

Caneva, I., 2003 – Of Roads, Terraces and Watergates at Mersin XVI. In: M. Özdoğan, H. Hauptmann and N. Başgelen, eds: Köyden Kente, Yakındoğu'da İlk Gelişmeler (From Village to Cities, Early Villages in the Near East), 429-435. Istanbul: Arkeoloji ve Sanat Yayınları.

Carter, E., Campbell, S. and J. Snead, 1999 – Excavations and Surveys at Domuztepe 1996. *Anatolia Antiqua* 7:1-17.

Cavallo, C., 1997 – Animals in the Steppe: A Zooarchaeological Analysis of the Later Neolithic Tell Sabi Abyad, Syria. Unpublished Ph.D. Thesis. Amsterdam: University of Amsterdam.

Cessford, C., 2003 – Microartifactual Floor Patterning: The Case at Çatalhöyük. *Assemblage: The Sheffield Graduate Journal of Archaeology* 7 [Online]. Available from http://www.shef.ac.uk/assem/issue7/cessford.html [Accessed 15/12/2003].

Clark, G., 1993 – The Faunal Remains. In Fouilles du Forum de Cherchel 1997-1981. In: N. Benseddik and T.W. Potter, eds: 6e Supplément au Bulletin d'Archéologie Algérienne, 159-195. Algiers: Agence National d'Archéologie et de Protection des Sites et Monuments Historiques.

Comas, D., F. Calafell, E. Mateu, A. Perez-Lezaun and J. Bertranpetit, 1996 – Geographic Variation in Human Mitochondrial DNA Control Region Sequence: the Population History of Turkey and its Relationship to the European Populations. *Molecular Biology and Evolution* 13(8): 1067-1077.

Contenson, H. de, 1992 – Préhistoire de Ras Shamra. Paris: Editions Recherche sur les Civilisations.

Cooper, A. and H.N. Poinar, 2000 – Ancient DNA: Do it Right or Not at All. *Science* 5482: 1139.

Copeland, L., 1996 – The Flint and Obsidian Industries. In: P.M.M.G. Akkermans, ed.: Tell Sabi Abyad. The Late Neolithic Settlement. Report on the Excavations of the University of Amsterdam (1988) and the National Museum of Antiquities Leiden (1991-93) in Syria. Vols. I and II, 285-338. Leiden: Nederlands Historisch-Archaeologisch Instituut te Istanbul.

Davidson, T.E and T. Watkins, 1981 – Two Seasons of Excavation at Tell Aqab in the Jezirah, N.E. Syria. *Iraq* 43: 1-18.

Davidson, T.E., 1977 – Regional Variation within the Halaf Ceramic Tradition. Unpublished Ph.D. Thesis. Edinburgh: University of Edinburgh.

Deniz, E. and S. Payne, 1982 – Eruption and Wear in the Mandibular Dentition as a Guide to Ageing Turkish Angora Goats. In: B. Wilson, C. Grigson, and S. Payne, eds: Ageing and Sexing Animal Bones from Archaeological Sites, 155-205. Oxford: BAR British Archaeological Series 109.

Diebold, B., 2000 – Preliminary Report on the Ceramic Assemblage at Tell Kurdu. In: K.A. Yener, C. Edens, J. Casana, B. Diebold, H. Ekstom, M. Loyet and R. Özbal. Tell Kurdu Excavations 1999. *Anatolica* 26: 31-117 (58-65).

Duistermaat, K., 1996 – The Seals and Sealings. In: P.M.M.G. Akkermans, ed.: Tell Sabi Abyad. The Late Neolithic Settlement, 339-401. Leiden: Nederlands Historisch-Archaeologisch Instituut te Istanbul.

Edens, C., 2000 – Chipped Stone. In: K.A. Yener, C. Edens, J. Casana, B. Diebold, H. Ekstom, M. Loyet and R. Özbal. Tell Kurdu Excavations 1999. *Anatolica* 26: 31-117 (74-78).

Edens, C. and K.A. Yener, 2000a – Excavations at Tell Kurdu, 1996 and 1998. *American Journal of Archaeology* 104: 198-215.

Edens, C. and K.A. Yener, 2000b – Investigations at Tell Kurdu. In: K.A. Yener, C. Edens, J. Casana, B. Diebold, H. Ekstom, M. Loyet and R. Özbal. Tell Kurdu Excavations 1999. *Anatolica* 26: 31-117 (33-49).

Ekstrom, H., 2000 – Archaeobotanical Remains from the 1998 and 1999 Seasons at Tell Kurdu. In: K.A. Yener, C. Edens, J. Casana, B. Diebold, H. Ekstom, M. Loyet and R. Özbal. Tell Kurdu Excavations 1999. *Anatolica* 26: 31-117 (80-83).

Esin, U. and G. Arsebük, 1982 -Tülintepe Kazısı, 1974. In: Keban Projesi 1974-1975 Çalışmaları. Orta Doğu Teknik Üniversitesi. Ankara: Türk Tarih Kurumu.

Esin, U. and S. Harmankaya, 1988 – Değirmentepe (Malatya) Kurtarma Kazısı 1986. *9. Kazı Sonuçları Toplantısı I,* 79-115.

Findlayson, B. and A. Betts, 1990 – Functional Analysis of Chipped Stone Artefacts from the Late Neolithic Site of Ğabal Na'ja, Eastern Jordan. *Paléorient* 16/2: 13-20.

French, D., 1998 – Can Hasan Sites I: Stratigraphy and Structures. Ankara: The British Institute of Archaeology at Ankara. Monograph No. 23.

Garstang, J., 1953 – Prehistoric Mersin. Oxford: Clarendon Press.

Grant, A., 1982 – The Use of Tooth Wear as a Guide to the Age of Domestic Ungulates. In: B. Wilson, C. Grigson, and S. Payne, eds: Ageing and Sexing Animal Bones from Archaeological Sites, 91-108. Oxford: BAR British Series 109.

Gülçur, S., 2003 – Kentleşme Yolunda. In: M. Özdoğan, H. Hauptmann and N. Başgelen, eds: Köyden Kente, Yakındoğu'da İlk Gelişmeler (From Village to Cities, Early Villages in the Near East), 491-509. Istanbul: Arkeoloji ve Sanat Yayınları.

Healey, E., 2000 – The Role of Obsidian in the Late Halaf. Unpublished PhD Thesis. Manchester: University of Manchester.

Helbaek, H., 1960 – Cereals and Weed Grasses in Phase A. In: R. Braidwood and L. Braidwood, eds: Excavations in the Plain of Antioch, Vol. I. The Earlier Assemblages, Phases A-J, 540-543. Chicago: University of Chicago Press.

Higuchi, R., B. Bowman, M. Freiberger, O.A. Ryder, A.C. Wilson, 1984 – DNA Sequences From the Quagga, an Extinct Member of the Horse Family. *Nature* 312: 282-284.

Hijjara, I., 1997 – The Halaf Period in Northern Mesopotamia. Nabu Publications: Edubba 6.

Hillson, S., 1986 – Teeth. Cambridge: Cambridge University Press.

Iwasaki, T., H. Nishino and A. Tsuneki, 1995 – The Prehistory of the Rouj Basin, Northwest Syria: A Preliminary Report. *Anatolica* XXI: 143-187.

Iwasaki, T. and A. Tsuneki, eds, 2003 – Archaeology of the Rouj Basin: A Regional Study of the Transition from Village to City in Northwest Syria. Vol. 1. Al Shark: Studies for West Asian Archaeology. Tsukoba: University of Tsukuba.

Kielt Costello, S., 2000 – Memory Tools in Early Mesopotamia. *Antiquity* 74: 475-476.

Le Mière, M. and O. Nieuwenhuyse, 1996 – The Prehistoric Pottery. In: P.M.M.G. Akkermans, ed.: Tell Sabi Abyad. The Late Neolithic Settlement, 119-284. Leiden: Nederlands Historisch-Archaeologisch Instituut te Istanbul.

Levitan, B., 1982 – Errors in Recording Tooth Wear in Ovicaprid Mandibles at Different Speeds. In: B. Wilson, C. Grigson, and S. Payne, eds: Ageing and Sexing Animal Bones from Archaeological Sites, 207-214. Oxford: BAR British Series 109.

Loyet, M.A., 2003 – Sustaining Cities: An Examination of Pastoral Economy in Complex Society. Unpublished Ph.D. Thesis. Urbana-Champaign: University of Illinois.

Lyman, R.L., 1985 – Bone Frequencies: Differential Transport, *in Situ* Destruction, and the MGUI. *Journal of Archaeological Science* 12: 221-236.

Lyman, R.L., 1992 – Prehistoric Seal and Sea-Lion Butchering on the Southern Northwest Coast. *American Antiquity* 57: 246-261.

Lyman, R.L., 1994 – Vertebrate Taphonomy. New York: Cambridge University Press.

McCorriston, J. and F. Hole, 1991 – The Ecology of Seasonal Stress and the Origins of Agriculture in the Near East. *American Anthropologist* 93: 46-69.

Maeda, O., 2003 – Prehistoric Obsidian Distribution in the Rouj Basin. In: T. Iwasaki and A. Tsuneki, eds: Archaeology of the Rouj Basin. Vol. 1, 167-186. Al Shark 2. University of Tsukuba.

Mallowan, M.E.L., 1936 – The Excavations at Tall Chagar Bazar and an Archaeological Survey of the Habur Region. *Iraq* 3: 1-85.

Mallowan, M.E.L., 1946 – Excavations in the Balikh Valley (1938). *Iraq* 8: 111-156.

Mallowan, M.E.L. and J.C. Rose, 1935 – Excavations at Tell Arpachiyah, 1933. *Iraq* 2: 1-178.

Matthews, R., 2000 – The Early Prehistory of Mesopotamia 500,000 to 4,500 BC. Brussels: Subartu.

Mellaart, J., 1967 – Çatal Hüyük. A Neolithic Town in Anatolia. New York: McGraw-Hill.

Mellaart, J., 1981 – The Prehistoric Pottery from the Neolithic to the Beginning of Early Bronze IV (c. 7000-2500 B.C.). In: J. Matthers, ed.: The River Qoueiq, Northern Syria, and its Catchment: Studies Arising from the Tell Rifa'at Survey 1977-79, 313-326. Oxford: BAR International Series 98.

Merpert, N. and R. Munchaev, 1984 – Soviet Expedition's Research at Yarim Tepe III Settlement in Northwestern Iraq 1978-1979. *Sumer* 43: 54-68.

Merpert, N. and R. Munchaev, 1993a – Yarim Tepe II: The Halaf Levels. In: N. Yoffee and J. Clark eds: Early Stages in the Evolution of Mesopotamian Civilization, 129-162. Tucson: University of Arizona Press.

Merpert, N. and R. Munchaev, 1993b – Yarim Tepe III: The Halaf Levels. In: N. Yoffee and J. Clark eds: Early Stages in the Evolution of Mesopotamian Civilization, 163-205. Tucson: University of Arizona Press.

Middleton, W.D., 1998 – Craft Specialization at Ejutla, Oxaca, Mexico: An Archaeometric Study of the Organization of Household Craft Production. Unpublished Ph.D. Thesis. Madison: University of Wisconsin.

Noddle, B., 1974 – Ages of Epiphyseal Closure in Feral and Domestic Goats and Ages of Dental Eruption. *Journal of Archaeological Science* 1: 195-204.

Nieuwenhuyse, O., 1997 – Following the Earliest Halaf: Some Later Halaf Pottery from Tell Sabi Abyad, Syria. *Anatolica* 23: 227-242.

Nieuwenhuyse, O. 2000 – Halaf Settlement in the Khabur Headwaters. In: B. Lyonnet, ed: Prospection Archéologique dans le Haut-Khabur. Beyrouth: Bibliothèque Archéologique et Historique 155.

Özbal, R., 2000 – Microartifact Analysis. In: K.A. Yener, C. Edens, J. Casana, B. Diebold, H. Ekstom, M. Loyet and R. Özbal. Tell Kurdu Excavations 1999. *Anatolica* 26: 31-117 (49-55).

Özbal, R., in press – Tell Kurdu'da Mikro Arkeolojik Çalışmalar. *19. Arkeometri Sonuçları Toplantısı.*

Özbal, R., F. Gerritsen and K.A. Yener, 2003 – 2001 Tell Kurdu Kazıları. *24. Kazı Sonuçları Toplantısı, 1. Cilt*: 501-512.

Özbal, R. and E. Healey, Forthcoming – The Lithic Microdebitage from Tell Kurdu.

Özbaşaran, M., 1992 – Doğu ve Güneydoğu Anadolu Kalkolitik Mimarisinde Tülintepe Yerleşmesinin Yeri. Istanbul Üniversitesi Sosyal Bilimler Enstitüsü Prehistorya Ana Bilim Dali Doktora Tezi (unpublished Ph.D. Thesis).

Öztan, A., 2002 – Köşk Höyük: Anadolu Arkeolojisine Yeni Katkılar. *Tüba-Ar* 5: 55-69.

Plaza, S., F. Calafell, A. Helal, N. Bouzerna, G. Lefranc, J. Bertranpetit and D. Comas, 2003 – Joining the Pillars of Hercules: mtDNA Sequences show Multidirectional Gene Flow in the Western Mediterranean. *Annals of Human Genetics* 67(4): 312-328.

Pollock, S., 1999 – Ancient Mesopotamia. The Eden that Never Was. Cambridge: Cambridge University Press.

Pollock, S., R. Bernbeck, S. Allen, A.G.C. Gessner, R. Costello, S.K. Costello, M. Foree, S. Lepinski and S. Niebuhr, 2001 – Excavations at Fıstıklı Höyük 1999. In: N. Tuna, J. Öztürk, J. Velibeyoğlu, eds: Salvage Project of the Archaeological Heritage of the Ilısu and Carchemish Dam Reservoirs Activities in 1999, 1-63. Ankara: Middle East Technical University.

Rainville, L., 2001 – Micro-Debris Based Functional Analyses of Late EBA houses: Building unit IV. In: G. Algaze et al., Research at Titris Höyük in Southeastern Turkey: A Preliminary Report of the 1999 Season. *Anatolica* 27: 30-33 and 86-87.

Rainville, L., 2002 – Micro-Debris Analysis. In: T. Matney et al., Archaeological Investigations at Ziyaret Tepe 2002. *Anatolica* 29: 194-194 and 218.

Rosen, A.M., 1993. Microartifacts as a reflection of Cultural Factors in Site Formation. In: P. Goldberg et al., Formation Processes in Archaeological Context, 141-148. Madison: Wisconsin, *Monographs in World Archaeology* 17.

Redding, R.W., 1981 – The Faunal Remains. In: H. T. Wright, ed.: An Early Town on the Deh Luran Plain. Excavations at Tepe Ferukhabad, 233-261. Ann Arbor: University of Michigan Press, Museum of Anthropology Memoirs 13.

Reese, D.S., Forthcoming – The Tell Kurdu Shells.

Rye, O.S., 1976 – Keeping your Temper Under Control: Materials and the Manufacture of Papuan Pottery. *Archaeology and Physical Anthropology in Oceania* 11: 106-137.

Shaffer, B.S., 1992 – Quarter-Inch Screening: Understanding Biases in Recovery of Vertebrate Faunal Remains. *American Antiquity* 57: 129-136.

Silver, I.A., 1969 – The Ageing of Domestic Animals. In: D. R. Brothwell and E. S. Higgs eds: Science in Archaeology, 283-302. New York: Praeger Publishers.

Spoor, R. H. and P. Collet, 1996 – The Other Small Finds. In: P.M.M.G. Akkermans ed.: Tell Sabi Abyad. The Late Neolithic Settlement, 439-474. Leiden: Nederlands Historisch-Archaeologisch Instituut te Istanbul.

Sullivan, K.M., A. Mannucci, C.P. Kimpton and P. Gill, 1993 – A Rapid and Quantitative DNA Sex Test: Fluorescence-based PCR Analysis of X-Y Homologous Gene Amelogenin. *Biotechniques* 4: 636-638.

Thissen, L., 2002 – Appendix I. CANeW ^{14}C databases and ^{14}C charts, Anatolia, 10,000-5,000 cal BC. In: F. Gérard and L. Thissen eds: The Neolithic of Central Anatolia, Internal Developments and External Relations During the 9th and 6th Millennia Cal. BC, 299-337. Istanbul: Ege Yayınları.

Tsuneki, A., J. Hydar, Y. Miyake, S. Akahane, M. Arimura, S.-i. Nishiyama, H. Sha'baan, T. Anezaki and S. Yano, 1998 – Second Preliminary Report of the Excavations at Tell el-Kerkh (1998), Northwestern Syria. *Bulletin of the Ancient Orient Museum* 19: 1-40.

Tsuneki, A. and Y. Miyake, 1996 – The Earliest Pottery Sequence of the Levant: New Data From Tell el Kerkh 2, Northern Syria. *Paleorient* 22: 109-123.

Tykot, R.H. and A.J. Ammerman, 1997 – New Directions in Central Mediterranean Obsidian Studies. *Antiquity* 71: 1000-1006.

Verhoeven, M., 1999 – An Archaeological Ethnography of A Neolithic Community: Space, Place and Social Relations in the Burnt Village at Tell Sabi Abyad, Syria. Leiden: Nederlands Historisch-Archaeologisch Instituut te Istanbul.

Watkins, T., 1987 – Karabeh Shattani: An Halaf Culture Exposure in Northern Iraq. In: J.L. Huot, ed: Préhistoire de la Mésopotamie: La Mésopotamie Préhistorique et L'exploration Récente du Djebel Hamrin, 221-230. Paris: Éditions du Centre National de la Recherche Scientifique.

Watkins, T. and S. Campbell, 1987 – The Chronology of Halaf Culture. In: O. Aurenche, J. Evin and F. Hours, eds: Chronologies in the Near East, 427-464. Oxford: BAR International Series.

Watson, J.P.N., 1972 – Fragmentation Analysis of Animal Bone Samples from Archaeological Sites. *Archaeometry* 14: 221-228.

Watson, P.J., 1983 – The Halafian Culture: A Review and Synthesis. In: T.C. Young, P.E.L. Smith and P. Mortensen, eds: The Hilly Flanks and Beyond, 231-249. Chicago: The Oriental Institute Publications.

Watson, P.J. and S. LeBlanc, 1990 – Girikihacıyan: A Halafian Site in Southeastern Turkey. Los Angeles: University of California Institute of Archaeology Monographs, 33.

Wickede, A. von, and S. Herbordt, 1988 – Çavi Tarlası. Bericht über die Ausgrabungskampagnen 1983-1984. *Istanbuler Mitteilungen* 38: 5-36.

Wilke, P., 1996 – Bullet-shaped Microblade Cores of the Near Eastern Neolithic. Experimental Replicative Studies. In: S. Kosłowski and H.G. Gebel, eds: Neolithic Chipped Stone Industries of the Fertile Crescent and their Contemporaries in Adjacent Regions, 289-310. Berlin: Ex Oriente.

Wilkinson, T.J., 2000 – Geoarchaeology of the Amuq Plain. In: K.A. Yener, C. Edens, T. Harrison, J. Verstraete and T. Wilkinson: The Amuq Valley Regional Project 1995-1998. *American Journal of Archaeology* 104(2): 163-221 (168-179).

Yener, K.A., 2000 – Between the Tigris-Euphrates and the Mediterranean Sea. The Oriental Institute Amuq Valley Regional Projects, Turkey. In: P. Matthiae, A. Enea, L. Peyronel and F. Pinnock, eds: Proceedings of the First International Congress on the Archaeology of the Ancient Near East, 1801-1812. Rome.

Yener, K.A., C. Edens, T. Harrison, J. Verstraete, and T. Wilkinson, 2000a – The Amuq Valley Regional Project 1995-1998. *American Journal of Archaeology* 104 (2): 163-221

Yener, K.A, C. Edens, J. Cassana, B. Diebold, H. Ekstrom, M. Loyet and R. Özbal, 2000b – Tell Kurdu Excavations 1999. *Anatolica* 26: 31-117.

Zeder, M.A., 1991 – Feeding Cities: Specialized Animal Economy in the Ancient Near East. Washington: Smithsonian Institution Press.

Zeder, M.A., 1995 – The Archaeobiology of the Khabur Basin. *Bulletin of the Canadian Society for Mesopotamian Studies* 29: 21-32.

Zeder, M.A., 1998 – Environment, Economy, and Subsistence on the Threshold of Urban Emergence in Northern Mesopotamia. In: M. Fortin and O. Aurenche, eds: Espace Naturel, Espace Habité en Syrie Nord (10e-2c millénaire av. J.-C.). *Bulletin of the Canadian Society for Mesopotamian Studies* 33: 55-67.

Zeist, W. van, and J.A.H. Bakker-Heeres, 1984 – Archaeobotanical studies in the Levant 2. Neolithic and Halaf levels at Ras Shamra. *Palaeohistoria* 26: 171-199.

Zeist, W. van, 1979-80 – Plant Remains from Girikihaciyan, Turkey. *Anatolica* 7: 75-89.

APPENDIX – CATALOGUE OF FIGURES[16]

Figure 6. Ceramics: dark-faced burnished wares.

TK/pot ID. Provenience. Ware. Diameter and degrees preserved. Firing. Inclusions. Surface color. Surface treatment. Lower boundary of burnishing indicated by double line.

6.1: TK8385/p1466. R39 (25:88, interior floor). DFBW. Ø 12.5cm, 360°. Calcite, fine grit. Ext. surf. 10yr2/1, core 10yr7/4. Burnt bottom, badly encrusted. **6.2:** TK6101/p1234. S68 (21:2, street). DFBW. Ø 12cm, 27.5°. Oxidized. Light grog. Slipped. Exterior surface 2.5y4/1, core 7.5yr5/4. Burnished exterior and interior lip. **6.3:** TK3430. R06 (12:26, interior floor). DFBW. Ø 42cm, 30°. Reduced core; oxidized exterior and lip. Fine mineral. Exterior black burnish to line; interior black burnish on rim to line. **6.4:** TK6998. R39 (22:44, interior floor). DFBW. Ø 14.5cm, 360°. Oxidized core, reduced surfaces. Light fine sand. Black burnishing interior and exterior rim to line. **6.5:** TK7503/G. S73 (26:3, street). DFBW. Ø 36cm, 30°. Oxidized core. Common fine sand. Dark gray int. surf, reddish brown core. Ext. surf. lustrous black burnish to line. **6.6:** TK8197/F. R58 (26:40, possibly from intrusive pit). DFBW. Ø 32-34cm, 20°. Common fine sand. Slipped. Surfaces 2.5yr4/6. Burnished interior. **6.7:** TK8566. R39 (25:8, burial). DFBW. Ø 9cm, 360°. Oxidized core. Common fine sand. Dark brown to dark gray burnishing int. lip and ext. surf to line. **6.8:** TK5512. (22:2, burial cut into street). DFBW. Ø 13cm, 360°. Reduced. Light fine sand. Int. surf. 7.5yr5/2, ext. surf 7.5yr4/1. Lustrous black burnishing int. and ext. to line. **6.9:** TK8453. (25:80, burial). DFBW. Ø 10cm, 360°. Light mineral. Surfaces 2.4yr4/6 to 2.5yr2.5/1. Reddish black burnishing int. and ext. to line. **6.10:** TK8255. R44 (25:34, above courtyard floor). DFBW. Ø 20cm, 360°. Reduced. Surfaces very dark gray to black. Light burnishing ext. neck and shoulder. **6.11:** TK8066. R51 (25:65, interior floor). DFBW. Ø 23cm, 360°. Core 10yr5/2. Int. and ext. surface below burn. 10yr6/2. Lustrous burnishing on int. lip and ext. to line, 7.5yr3/1.

Figure 7. Ceramics: dark-faced unburnished wares.

TK/pot ID. Provenience. Ware. Diameter and degrees preserved. Firing. Inclusions. Surface color. Surface treatment.

7.1: TK2489. R12 (12:21, room deposit). DFuBW. Ø 16cm, 110°. Sand inclusions. Fully reduced. **7.2:** TK8148/A. R05 (12:69, deposit above floor in room). DFuBW. Ø 24cm, ca. 40°. Common fine sand. Reduced core. Dark gray int. surface, dark gray to dark reddish brown ext. surface. **7.3:** TK7875/F. R30 (23:29, room deposit). DFuBW. Ø 30cm, ca. 30°. Reduced core. Common very fine shell. Int. surf. 10yr5/1, ext. surf. 10yr6/2. Sandpaper-like texture. **7.4:** TK3054. R11 (12:19, fill deposit). DFuBW. Ø 46cm, 25°. Dark gray/brown paste, with gray core. Coarse grit (probably sand) inclusions. **7.5:** TK7875/G. R30 (23:29, deposit above floor in room). DFuBW. Ø 42cm, 40°. Reduced core. Abundant fine sand. Int. surf. 7.5yr4/1, ext. surf. 7.5yr3/1. Sandpaper-like texture. **7.6:** TK7891/T. R30 (23:29, deposit above floor in room). DFuBW. Ø 48cm, 60°. Reduced core. Abundant fine mineral. Surfaces 10yr3/2 to 7.5yr3/1. Sandpaper-like texture. **7.7:** TK8065. R51 (25:65, interior floor). DFuBW. max. Ø mouth 10cm, 360°. Oxidized gray core. Fine mineral (grit?). Surfaces 10yr6/2. Spalled ext. surface. Oval section, probably continued use after loss of neck. **7.8:** TK8693. R40 (25:85, from oven). DFuBW. Ø 9cm, 360°. Oxidized core, 10yr6/3. Rare fine sand. Surfaces 10yr7/2 to 10yr5/2. **7.9:** TK8567/p1444. R39 (25:8, burial). DFuBW. Ø 8cm, 360°. Reduced core. Spalled ext. surface.

[16] Illustrations were made by Mücella Erdalkıran and Fokke Gerritsen. Fig. 1 has been adopted from plan by P. Zimmerman.

Figure 8. Ceramics: painted wares, whole vessels.

TK/pot ID. Provenience. Ware. Diameter and degrees preserved. Firing. Inclusions. Surface color. Surface treatment.

8.1: TK5460. (22:2, burial cut into street). Halaf Painted. Ø 10cm. Oxidized. Light calcite, medium grit. Core 5yr6/6, paint 5yr3/2. **8.2:** TK5948/p1077. R19 (21:18, interior floor). Local painted/monochrome ware. Ø 9cm, 360°. Fully oxidized. Exterior surface 10yr8/3; paint 10yr3/2. Heavy concretions in interior. **8.3:** TK8525/p1467. R05 (12:69, interior floor). Local Painted. Ø 16cm, 100°. Fully oxidized. No visible inclusions. Exterior surface 7.5yr7/4, exterior paint 10r4/4, core 5yr6/6. **8.4:** TK6447. R07 (12:65, *in situ* from within bin in courtyard). Local Painted. Ø 20cm, 360°. Light fine sand. Surfaces 5yr7/5, paint 2.5yr4/8 (comp. Akkermans 1988b: pl. 13:96). **8.5:** TK8064. R51 (25:65, interior floor). Local Painted. Ø 12cm, 360°. Fully oxidized. Rare fine sand. Surfaces 5yr7/4, paint 2.5yr5/8. **8.6:** TK8138. R05 (12:69, interior floor). Local Painted. Ø 27cm, 360°. Oxidized, core 5yr5/6. Abundant fine mineral. Surfaces 5yr7/4, paint 10r5/8 (comp. Merpert and Munchaev 1993b: fig. 9.31:4-5). **8.7:** TK8569/p1442. R39 (25:8, burial). Halaf Painted. Ø 12,5cm, 360°. Oxidized. Light grit inclusions. Exterior surface 7.5yr8/6, exterior paint 10r5/8. Slipped.

Figure 9. Ceramics: examples of painted sherds.

TK/pot ID. Provenience. Ware. Diameter and degrees preserved. Firing. Inclusions. Surface color. Surface treatment.

9.1: TK7891/L. R30 (23:29 deposit above floor in room). Painted ware. Ø 11cm, 40°. Fine mineral. Ext. surface 5yr7/4, int. surface 2.5yr6/6, lustrous dark red paint. **9.2:** TK5623/p1078. S68 (21:2, street). Halaf painted/Red on buff/pink. Ø 9cm, 120°. Grog tempered, with possible grit, dung, and calcite inclusions. Exterior surface 7.5yr8/4; paint 7.5yr4/4 (comp. Bernbeck et al. 1999: fig. 11b). **9.3:** TK4756/Z. R13 (16:22, deposit above floor in room). Painted ware. Ø 26cm, 10°. (comp. Hijjara 1997: fig. 373; Nieuwenhuyse 1997: fig. 3.1). **9.4:** TK7576/A. R53 (26:21, interior floor). Painted ware. Reduced core. Rare fine sand. Surfaces 7.5yr5/2, black paint. **9.5:** TK8219/O. R30 (23:29, deposit above floor in room). Painted ware. Ø 15cm, 22°. Oxidized. Rare fine sand. Surfaces 10yr7/3, dark reddish brown paint (comp. Davidson and Watkins 1981: fig. 2.2; possibly also Mallowan 1936: fig. 23.3). **9.6:** TK8799/B. R53 (26:34, interior floor). Painted ware. Ø 6cm, 130°. Oxidized. Rare fine sand. Surfaces 10yr8/3, black paint (comp. Akkermans 1988b: fig. 128; Akkermans 1993: fig. 3.30/7; Gustavson-Gaube 1981: fig. 147). **9.7:** TK7713/K. R53 (26:10, interior floor). Painted ware. Ø ca. 22cm, 45°. Well fired, clinky. Common fine sand. Pink surfaces, light red core, paint 2.5yr4/6 (comp. Contenson 1992: fig. 190:3; Mallowan and Rose 1935: fig. 60:4). **9.8:** TK 8101/I. R08 (12:86, deposit above floor in room). Painted ware. Ø 26cm, 34°. Oxidized. Surfaces 10yr7/3. Slipped? Black paint. **9.9:** TK6181/X. S73 (22:16, street). Painted ware. Ø 25cm, 10°. Fully oxidized. Abundant fine sand. Ext. surface 10yr8/2, int. surface 5yr7/3, paint 7.5yr2.5/3. **9.10:** 8315/R, 8165/J and others. R58 (26:40, pit in room, possibly later/intrusive). Ø 42cm. Painted ware. Oxidized. Common fine sand. Surfaces pink, red paint (comp. Gustavson-Gaube 1981: fig. 92). **9.11:** TK8052/E. R50 (25:59, interior floor). Painted ware. Oxidized. Common fine sand. Surfaces 7.5yr7/4, black paint. **9.12:** TK6101/p1238. S68 (21:2, street). Local Painted. Ø ca. 28cm, <20°. Light grit and calcite inclusions, possibly grog also. Fully oxidized. Surface 7.5yr7/2, core 7.5yr6/4, light reddish paint. **9.13:** TK7730. (26:20, possibly from later context). Painted ware. Rare fine sand. Surfaces 10yr8/3, black paint (comp. Akkermans 1993: fig. 3.36/69; Nieuwenhuyse 2000: 245:3): **9.14:** TK6101/p1231. S68 (21:2, street). Halaf Painted. Ø 30cm, 20°.Very light grit and calcite inclusions. Fully oxidized. Surface (slip) 2.5y7/3, core 5yr6/6. Faded, uneven reddish paint (comp. Iwasaki et al. 1995: fig. 16:18). **9.15:** TK7223/D. R35 (23:34, possibly after abandonment of room). Painted ware. Oxidized. Rare fine sand. Surfaces 7.5yr 7/6. Painted and impressed exterior (comp. Contenson 1992: fig. 208:5).

Figure 10: Obsidian

Illustration no.; TK no., lithic no.; Unit (Trench:Locus), deposit type; object type; raw material, colour

10.1: TK6053. R24 (20:26, niche in wall); blade; obsidian, green. **10.2:** TK5987. R41 (25:10, wall); blade; obsidian, transparent gray. **10.3:** TK8175. R54 (26:22, interior floor); blade-like piece patch of with natural surface; obsidian, green. **10.4:** TK8050, no.1; R24 (20:58, room deposit); blade-like piece with bi-directional; flaking; obsidian, transparent gray. **10.5:** TK6860, no. 1; R53 (22:69, interior floor); part crested blade with edge retouch; obsidian. **10.6:** TK5908, no. 1; R19 (21:18, room deposit); core fragment; obsidian, transparent gray. **10.7:** TK8146, no. 1; R07 (12:79, courtyard surface); core fragment; obsidian, gray brown. **10.8:** TK7262, no. 2; R29 (22:78, courtyard surface); blade-like piece struck to remove step; obsidian, gray. **10.9:** TK5817, no. 2; R28 (22:28, interior floor); blade, slightly overshot with trace of ground platform on distal end; obsidian, transparent gray. **10.10:** TK8798, no. 1; R59 (26:60, interior floor); flake, edge damage and ground edge (? relict platform) on right edge; obsidian, green. **10.11:** TK7228, no. 1; R37 (23:31, interior floor); wide blade with edge retouch; obsidian, green. **10.12:** TK7254, no. 5; R39 (22:44, interior floor); blade with possible burin facet; obsidian, transparent gray.

Figure 11: Drills, points, burins, bifacials and scrapers

Illustration no.; TK no., lithic no.; Unit (Trench:Locus), deposit type; object type; raw material, colour

11.1: TK8053, no. 1; R50 (25:59, interior floor); drill, possibly slightly worn; flint; **11.2:** TK7504, no. 17; S73 (26:3, street); point; flint; **11.3:** TK7504, no. 15; S73 (26:3, street); point; flint; **11.4:** TK7471, no. 5; R24 (20:37, interior floor); point, worn on end and on dorsal surface; flint; **11.5:** TK8062, no. 1; R52 (25:73, room deposit); point; abrupt retouch on distal part of naturally pointed flake; flint; **11.6:** TK8465, no. 2; R52 (25:73, room deposit); point on squat flake; flint; 11.7: TK6851, no. 7; (22:33, wall); point on end of blade, worn; flint; **11.8:** TK8221, no. 4; R30 (23:29, room deposit); point, bifacially retouched on flake; flint; **11.9:** TK8457, no. 2; R44 (25:34, courtyard); scraper with deniculated edge; flint; **11.10:** TK8729; R39 (25:87, interior floor); burin on blade backed; flint; **11.11:** TK8739, no. 3; R40 (25:85, oven deposit); burin on truncated blade, and some retouch; flint; **11.12:** TK8613, no. 2; R53 (26:34, interior floor); burin on blade, truncated end; flint; **11.13:** TK7555, no. 5; R25 (20:51, room deposit); scraper, small retouch on end; flint; **11.14:** TK7439, no. 2; R50 (25:55, room deposit); transverse arrowhead; blade segment with abrupt retouch on both edges; flint; **11.15:** TK7861, no. 4; R23 (23:43, wall/doorway); bifacial, possibly small axe, cortex on dorsal surface and some ground areas on other surface; flint; **11.16:** TK7019, no. 3; R30 (23:29, room deposit); blade-like piece with cortex on one edge and serial flaking (possibly pressure) along left side; flint; **11.17:** TK6051, no. 22; S72 (20:2, street); fragment of tanged piece? Semi invasive retouch on both sides forming a tang; flint.

Figure 12: Glossed blades

Illustration no.; TK no., lithic no.; Unit (Trench:Locus), deposit type; object type; raw material, colour

12.1: TK5956; (24:15, room deposit); glossed blade, blade backed, convex and gloss on edge extending to first arris; flint; **12.2:** TK7225, no. 5; R35 (23:34, trash deposit in room after abandonment); glossed blade, truncated at both ends and backed; flint; **12.3:** TK6103, no. 15; S68 (21:2, street); glossed blade, truncated at both ends and backed; slightly curved in shape; flint; **12.4:** TK6103, no. 13; S68 (21:2, street); glossed blade, convex back formed by abrupt retouch; flint. **12.5:** TK7856, no. 9; R39 (23:42, surface); glossed blade, truncated at both ends and with retouch (? Serrations) on glossed edge; flint; **12.6:** TK5817, no. 4; R29 (22:40, exterior deposit); lightly glossed blade, serrated edge, end truncated and back formed by cortex; flint; **12.7:** TK8729; R39 (25:87, interior floor); glossed blade, edge has chipping, proximal end truncated, distal end round and left edge retouched; flint; **12.8:** TK7019; R30 (23:29, room deposit); glossed blade, distal end truncated, proximal unmodified. Some chipping on glossed edge; flint; **12.9:** TK7019, no. 5; R30 (23:29, room deposit); glossed blade, proximal end retouched to point. Chipped through gloss; flint; **12.10:** TK6377, no. 3; R39 (22:44, interior floor); lightly glossed blade, distal end retouched and with burin-like facet. Retouch on convex edge of right side towards proximal end; flint; **12.11:** TK8189; R57 (26:42, room deposit); glossed blade, truncated at both ends. Serrated edge; flint; **12.12:** TK7225, no. 13; R35 (23:34, trash deposit in room after abandonment); glossed blade, truncated with abrupt retouch at both ends. Some chipping on edge; flint; **12.13:** TK7019, no. 4; R30 (23:29, room deposit); glossed blade, truncated with abrupt retouch at both ends. Distal end inverse and irregular retouch and proximal end

concave; flint; **12.14:** TK8778, no. 4; R54 (26:62, interior floor); glossed blade, truncated at both ends, chipping on glossed edge; flint; **12.15:** TK8221, no. 8; R30 (23:29, room deposit); segment of blade with retouched ends and chipping on edge, but no gloss; flint.

Figure 13: Beads, pendants, seals, sealings, tokens, figurines
Illustration no.; TK no.; Unit (Trench:Locus), object type; raw material

13.1: TK5345. (22:1, topsoil). Bead, obsidian; **13.2:** TK7369. R4 (12:76, room deposit). Bead, obsidian; **13.3:** TK7648. (25:49, fill layer). Pendant/seal, bluish stone; **13.4:** TK8707. R46 (25:79, floor). Pendant/seal, stone; **13.5:** TK6732. (20:6). Bead, dentalium shell; **13.6:** TK7647. R42 (25:28, room deposit). Bead, stone; **13.7:** TK7368. R4 (12:76, room deposit). Pendant, animal tooth; **13.8:** TK7290. (26:1, topsoil). Pendant/seal, gray stone; **13.9:** TK6521. R28 (22:67, interior floor). Pendant, obsidian; **13.10:** TK7961. (24:8, sherd pavement area). Pendant/seal, greenish brown stone; **13.11:** TK7944. R06 (12:77, room deposit). Bead/seal, brown stone; **13.12:** TK7257. (26:1, topsoil). Figurine fragment, unbaked clay; **13.13:** TK8147. R07 (12:79, floor of courtyard). Figurine fragment, stone; **13.14:** TK8529. R10 (12:89, room floor). Seal, recycled pottery lug; **13.15:** TK7639. (25:33). Token, conical, unbaked clay; **13.16:** TK5779. S68 (21:2, street). Token, conical, unbaked clay; **13.17:** TK6341. R41 (25:32, interior floor). Token, conical, unbaked clay; **13.18:** TK5815. R28 (22:28, interior floor). Token, conical, unbaked clay; **13.19:** TK8071. R44 (25:34, courtyard deposit). Token, spherical, unbaked clay; **13.20:** TK5723. R17 (20:8, fill layer). Token, discoid, unbaked clay; **13.21:** TK5924. (23:7, ditch). Token, tear-shaped, unbaked clay; **13.22:** TK5742. (20:15, pit). Sealing with coil impressions, lightly baked clay.

Figure 14: Reworked sherds, spindle whorls, bone implements, celts
Illustration no.; TK no. Unit (Trench:Locus), object type; raw material

14.1: TK8582. (25:78, fill layer). Reworked sherd, ceramic; **14.2:** TK8179. R56 (26:39, room deposit). Reworked sherd, ceramic; **14.3:** TK8929. S69 (23:5, street). Reworked sherd, ceramic; **14.4:** TK7683. R35 (23:34, room). Reworked sherd, ceramic; **14.5:** TK8072. R44 (25:34, courtyard deposit). Spindle whorl, gray stone; **14.6:** TK7263. R39 (22:44, interior floor). Spindle whorl, ceramic; **14.7:** TK8675. R44 (25:96, courtyard surface). Spindle whorl, ceramic; **14.8:** TK6180. R29 (22:33, courtyard deposit). Awl, bone; **14.9:** TK7259. R29 (22:78, courtyard surface). Spatula fragment, bone; **14.10:** TK7666. R30 (23:29, room deposit). Awl, bone; **14.11:** TK7506. S73 (26:3, street). Awl, bone; **14.12:** TK7362. R5 (12:69, room deposit). Awl, bone; **14.13:** TK8565. R44 (25:34, courtyard deposit). Celt, stone; **14.14:** TK6207. R22 (21:23, room deposit). Celt, stone; **14.15:** TK8915. (25:96, courtyard floor). Celt, stone; **14.16:** TK5574. R19 (21:18, interior floor). Celt, stone; **14.17:** TK6239. (25:4, plow zone). Celt, stone; **14.18:** TK8876. (25:110, fill layer). Celt, stone.

Figure 15: Stone bowls, mace head, sling pellets, hammerstone, grinding stone, lid/stand
Illustration no.; TK no. Unit (Trench:Locus), object type; raw material

15.1: TK8144. R07 (12:79, courtyard floor). Bowl, stone; **15.2:** TK8849. R52 (25:73, room deposit). Bowl, green stone (serpentine?); **15.3:** TK7020. R30 (23:29, room deposit). Cup, lustrous black stone, **15.4:** TK8931. R30 (23:29, room deposit). Rim of cup or jar, stone; **15.5:** TK8387. R44 (25:96, courtyard floor). Bowl, stone; **15.6:** TK7810. (24:21, fill layer). Mace head, black stone; **15.7:** TK6538. R29 (22:58, courtyard floor). Hammer stone, basalt; **15.8:** TK7089. R24 (20:37, interior floor). Sling pellet, lightly baked clay; **15.9:** TK7090. R24 (20:37, interior floor). Sling pellet, lightly baked clay; **15.10:** TK7080. R24 (20:37, interior floor). Sling pellet, lightly baked clay; **15.11:** TK8380. R05 (12:88, interior floor). Grinding stone, basalt; **15.12:** TK7387. R06 (12:77, room deposit). Stand or lid, sandstone.

Sample	Lab ID	Provenience	Date BP	cal BC, 1 sigma	cal BC, 2 sigma
1) TK 6641	AA-52965	R28 lowest floor (22:67)	7173 ± 72	6160-6140 / 6090-5920	6220-5880
2) TK 7399	AA-52961	R06 (12:77)	7032 ± 71	5990-5810	6020-5730
3) TK 8896	AA-52956	R41 lower floor (25:111)	6972 ± 48	5970-5950 / 5900-5770	5980-5730
4) TK 7032	AA-52962	R37 (23:31)	6948 ± 53	5880-5730	5980-5720
5) TK 6877	AA-52963	R57 (26:59)	6911 ± 47	5840-5730	5890-5660
6) TK 6763	AA-52964	R41 upper floor (25:36)	6843 ± 90	5800-5630	5970-5950 / 5910-5560
7) TK 8534	AA-52959	R05 (12:88)	6817 ± 88	5780-5620	5890-5530
8) TK 8358	AA-52960	S70 (23:34)	6724 ± 56	5710-5560	5730-5520
9) TK 8894	AA-52957	R39 lower floor (25:88)	6566 ± 58	5610-5470	5630-5380
10) TK 8829	AA-52958	R39 upper floor (25:103)	6306 ± 48	5360-5210 / 5160-5150	5470-5080

- All samples are single charred seeds;
- Calibrated with OxCal 3.9

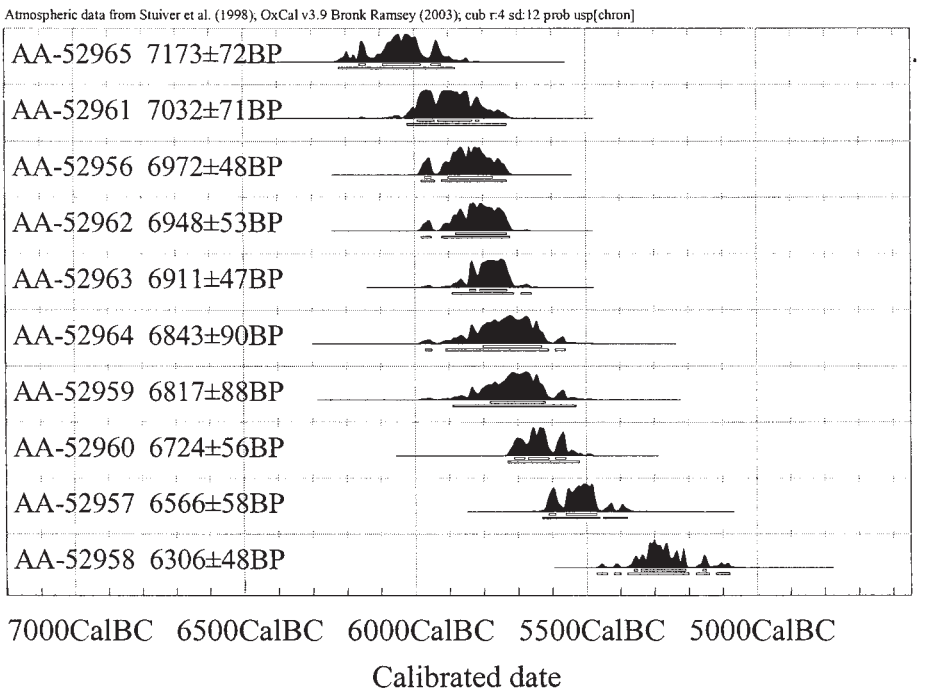


Table 1: Radiocarbon dates with calibrations.

ware	frequency
Dark-faced Burnished Ware	35-40 %
Dark-faced Unburnished Ware	19-24 %
Local Painted Ware	31-36 %
Halaf Painted Ware	4-9 %
Miscellaneous Sherds	0-3 %

Table 2: Wares and frequencies according to Braidwood and Braidwood (1960:138-149).

ware	count	%	weight	%	avg. weight
Cooking Wares	360	13.6	13452	20.3	37.4
DFBW	409	15.5	13931	21.1	34.1
DfuBW	1715	64.9	30694	46.4	17.9
DFuBWv1	*479*		*14007*		*29.2*
DFuBWv2	*1236*		*16687*		*13.5*
Halaf Painted	17	0.6	980	1.5	57.6
Local Painted	91	3.5	6138	9.3	67.5
Monochrome Painted	35	1.3	528	0.8	15.1
Miscellaneous	16	0.6	447	0.7	27.9
Bichrome	*1*		*150*		*150.0*
Corrugated	*12*		*173*		*14.4*
Cream Ware	*1*		*102*		*102.0*
Incised, Impressed, Dentated	*2*		*22*		*11.0*
total	2643	100	66170	100	25.0

Table 3: Count and weight data for ware groups from Phase C high quality contexts excavated in 2001. Italics represent ware subgroups.

inclusion	number	% recorded with that incl.
Calcite	65	14.22%
Cattail (?)	18	3.94%
Chaff	2	0.44%
Chaff, short (dung?)	22	4.81%
Grit	230	50.33%
Grog	24	5.25%
Lime	3	0.66%
Limestone	3	0.66%
Sand	168	36.76%
Shell	46	10.07%
None	38	8.32%

- Table summarizes inclusion data for sherds from appropriate level C type contexts in north mound operations of Tell Kurdu. 619 = number of inclusion instances; 457 = number of individually tested sherds from high quality contexts from appropriate levels of the north mound.
- Note that the percentage is of total sherds, while number is number of inclusion types noted. Since the same sherd might have multiple inclusion types, the number of inclusion types recorded is greater than the number of sherds.
- Note preponderance of calcite + grit + sand, which singly or in combination appear on 90% of all sherds.

Table 4: Pottery inclusions summary table.

	core	chunk	blade	flake	flake or blade	indet	retouched	total flint	% retouched
room deposits	6	5	113	152	24	83	213	596	35
street deposits	1	3	23	57	12	10	63	169	37
courtyards		3	30	30	7	8	40	118	34
features		1	14	31	3	6	28	83	34
mixed/later	13	11	197	277	44	79	376	997	38
totals	20	23	377	547	90	186	720	1963	

Table 5: Counts of flint by type of context.

context	core	chunk	blade	flake	indet	retouched	total	% obsidian
room deposits	2		156	11	3	35	207	25.8
street deposits			44	7	1	8	60	26.2
courtyards			24			6	30	20.1
features			8	2	2	3	15	15.3
mixed/later	3	1	195	15	6	52	272	21.5
totals	5	1	427	35	12	104	584	22.90

Table 6: Counts of obsidian by type of context.

obsidian colour	%	remarks
black (opaque)	12%	
translucent grey	34.6%	includes pieces with stripes and wisps
green	49%	
translucent brown	3.5%	
other	0.7%	including black with grey edges, clear with black and red stripes and black-with-red

Table 7: Proportions of different coloured obsidians.

context	misc retouch	glossed	points	burins	scrapers	Bifacials	other
interior rooms	121	61	10	6	4	6	transverse a'head. fl from pol tool
streets	32	24	5	1			
courtyards	20	15	1	3			

Table 8: Counts of retouched forms by type of secure context.

	Edge retouch	Glossed blade	Point	Burin	Scraper	Bifacial	Other retouch	Cores flint	Total Flint	Total obsidian	Total	% obsidian	Extras and Notes
Room													
R05	8	4	2	1					37	27	64	42 %	
R06	2	4							19	6	25	24 %	
R19	1							1?	17	4	21	19 %	
R24	9	4	1						40	22	62	35 %	obs. blade in wall niche
R25	11				2?				27	9	36	25 %	2 worn edges
R28	11	5							46	10	56	18 %	obsidian link
R30	13	4	2	2		1			50	7	57	12 %	2 serial flaking
R39	8	4		1					45	6	51	12 %	2 serial flaking
R41	8	2		1			Flake from polished tool		33	12	45	27 %	
R42	3	10					1 hammerst.?		32	3	35	9 %	
R49	2							1	15	7	22	32 %	
R53	5	1		1	1				20	7	27	26 %	
R59	5	3				1			22	10	32	32 %	
Totals	86	41	5	6	3	2	0	2	403	130	533	24 %	
Exterior													
R07	8	5		2					22	8	30	27 %	
R29	6	6		1					40	9	49	18 %	point from wall
R31	4	2							24	5	29	17 %	
R44	2	2	1		1				32	8	40	20 %	
Totals	20	15	1	3	1	0	0	0	118	30	148	20%	
Streets													
S68	5	11							34	9	43	21 %	
S69	6	2							26	11	37	41 %	
S72	12	3	1	1					44	17	61	28 %	serial flaking
S73	8	8	4						51	15	66	23 %	
Totals	31	24	5	1	0	0	0	0	155	52	207	25 %	

Table 9: Counts of retouched forms by context. Only contexts with 20 or more pieces are included.

	density (total count / liter) streets	Rooms and courtyards
micro-ceramics	6.23	3.08
micro-chipped stone	7.04	3.85
micro-bone*	159.95	55.16
micro-shell	9.30	8.12

Street samples, n = 8; rooms and courtyard samples, n = 177. * includes burnt bone

Table 10: Microartifact density values for steets and rooms/courtyards.

	room 28 (highest to lowest)				room 39	
floor	28:28	28:50	28:57	28:67	floor	25:88
location	% burnt	% burnt	% burnt	% burnt	location	% burnt
North	12.50	20.55	29.63	2.72	Northeast	11.52
South	7.32	14.52	13.89	11.32	Southeast	20.00
East	5.88	9.86	16.02	7.14	Southwest	9.68
West	9.14	18.92	13.51	7.64	West	3.12
Center	**16.67**	**51.02**	**77.46**	**43.08**	East	6.08
Center	-	**53.85**	-	-	Center	**37.34**
Ct. margin 1	7.89	-	-	17.78	on platform	20.00
Ct. margin 2	-	-	-	30.10	in front platform	12.73

Table 11: Percentage of burnt microbone (of total microbone) by sample for R28 and R39.

	2001 assemblage	1999 assemblage
Identifiable	4919	1630
Unidentifiable	23513	2105
Total	28432	3735

Table 12: Size of 1999 and 2001 analyzed faunal assemblages.

taxon	2001 NISP	2001 %NISP	1999 NISP	1999 %NISP
Ovicaprine	1658	33.70	576	35.33
Bos taurus	1785	36.30	483	29.63
Sus scrofa	318	6.46	226	13.87
Gazella sp.	62	1.26	18	1.10
Cervid	612	12.44	48	2.94
Equus sp.			4	0.25
Small Felid	4	0.08	2	0.12
Medium Felid	3	0.06	4	0.25
Canis sp.	7	0.14	2	0.12
Vulpes			1	0.06
Rodent	18	0.37	19	1.17
Sekeetamys sp.			1	0.06
Lagomorph	3	0.06	2	0.12
Martes	2	0.04		
Aves	24	0.49	5	0.31
Turtle/Tortoise	43	0.89	21	1.29
Fish	244	4.96	152	9.33
Crab			1	0.06
Mollusc	72	1.46	1	0.06
Bivalve			26	1.60
Gastropod	64	1.30	38	2.33
Total identified	4919	100	1630	100

Table 13: Species distribution for Amuq C faunal remains, 1999 and 2001 assemblages.

		TK No. 8015 room deposit in R57	TK No. 6307 room deposit in R40	TK No. 7655 room deposit in R37	TK No. 6699 upper levels from oven in R05	TK No. 7699 lower levels from oven in R05	TK No. 6651 from inside oven in room R03	TK No. 7484 from inside bin in room R24	TK No. 8266 from inside *in situ* vessel in R51	TK No. 8396 from inside *in situ* vessel in R05	TK No. 6446 from inside *in situ* vessel in R07
	Phase	Amuq C	Amuq C	Amuq C	Amuq C	Amuq C	Amuq C	Amuq C	Amuq C	Amuq C	Amuq C
	Volume floated (l)	5.5	7.5	7.25	9.75	9	7.5	3	1.5	12	1.9
	Volume flot (ml)	7	12.5	5	1	0.5	4	3	1.5	2	0.5
	Volume sorted (%)	100	100	100	100	100	100	100	100	100	100
FAMILY											
Crop Plants											
GRAMINEAE	*Triticum* cf. *dicoccum*	-	1	-	-	-	-	-	-	-	-
GRAMINEAE	*Triticum boeoticum*	-	1	-	-	-	-	1	-	-	1
GRAMINEAE	*Triticum* sp.	-	-	-	1	-	-	-	2	-	-
GRAMINEAE	*Hordeum vulgare*	1	-	-	1	-	-	-	-	3	-
GRAMINEAE	Cereal caryopsis indet.	7	7	4	1	6	-	14	-	2	-
LEGUMINOSAE	Lg Legumes indet.	-	2	-	1	-	-	21	-	1	-
Fruits/nuts											
MORACEAE	*Ficus*						1				
Weed Seeds											
	Sm Legumes indet.	-	2	-	-	-	-	-	-		-
PAP/LEG	*Melilotus*	-		-	-	-	-	-	-	2	-
PAP/LEG	cf. *Trifolium*	-	3	-	-	-	-	-	-	-	-
POLYGONACEAE	*Polygonum* seed coat	-	-	-	1	-	-	-	-	-	-
POLYGONACEAE	*Polygonum*	1	7	1	-	1	-	3	-	4	-
CHENOPODIACEAE	*Chenopodium*	-	2	-	-	-	1	-	1	-	1 (uncharred)
CHENOPODIACEAE	*Amaranth*	-	-	4	-	-	-	-	-	-	-
PLANTAGANACEAE	*Plantago* sp.	-	1	-	-	-	-	-	-	-	-
CYPERACEAE	CYPERACEAE	-	1	1	-	-	-	-	-	-	-
LINACEAE	*Linum*	1	-	-	-	-	-	-	-	-	-
BORAGINACEAE	*Echium* (silicified nutlet)	-	-	-	-	4	-	-	-	-	-
THYMELEACEAE	*Thymelaea*	-	-	-	-	-	-	-	-	1	-
GRAMINEAE	*Lolium* sp.	-	-	1	-	-	-	-	-	-	-
GRAMINEAE	wild grass indeterminate	-	-	-	-	-	-	-	-	-	-
COMPOSITAE	COMPOSITAE	-	-	-	-	-	1 (uncharred)	-	-	-	-
	Unknowns	-	-	-	-	3	-	-	-	-	-
Plant parts											
	Wood	little	little	little	little	little	none	little	little	little	little
	seed coats	-	-	-	2	-	-	-	-	-	-
GRAMINEAE	*Tritichum* sp. rachis	-	-	4	-	-	-	-	-	-	-
GRAMINEAE	*T. aestivum/durum* rachis	-	-	-	-	-	1	-	-	-	-
GRAMINEAE	culm node	-	-	-	-	-	8 (1 uncharred)	1	-	-	-
GRAMINEAE	Glume wheat glumes & rachis	-	-	-	-	-	8 (1 uncharred)	1	-	-	-
GRAMINEAE	*Triticum* spikelet fork	-	-	-	-	-	-	1	-	-	-
GRAMINEAE	*Aegilops* spikelet base	-	-	-	-	-	3	-	-	-	-
GRAMINEAE	cf. *Aegilops*rachis	-	-	-	-	-	6	-	-	-	-
GRAMINEAE	Indeterminate cereal parts	-	-	-	-	-	67	-	-	-	-
Totals per sample		**10**	**27**	**15**	**7**	**14**	**79**	**42**	**3**	**13**	**2**
Total Seed Count											**212**

Table 14: Species distribution for analyzed botanical samples.

individual	amelogenin	MtDNA haplotype (Position 16000+)
1) 12:81	XY	104T, 187T, 216G, 239G, 319C
2) 25:8	XX	94G, 163G, 187T
3) 12:14	XY	104T, 187T, 216G, 239G, 319C
4) 25:89	Undetermined	Undetermined
5) 25:80	XY	104T, 187T, 216G, 219G, 312G
6) 22:2	Undetermined	Undetermined
7) 23:10	Undetermined	Undetermined
8) 26:2	XY	94G, 163G, 187T
9) 12:12	Not analyzed	
10) 12:13	XY	104T, 187T, 216G, 239G, 319C
11) 26:12	XX	104T, 187T, 216G, 239G, 319C
12) 24:27	XX	104T, 187T, 216G, 239G, 319C
13) 24:16	Undetermined	104T, 187T, 216G, 219G, 312G
14) 24:3	XX	104T, 187T, 216G, 239G, 319C
15) 23:11	Undetermined	104T, 187T, 216G, 239G, 319C

- 'Undetermined' denotes failure to obtain PCR product or unambiguous sequence from at least two independent extracts. Individuals which yielded only partial mtDNA sequence are not included here. Haplotypes are designated in reference to the Cambridge reference sequence (Anderson et al., 1981).

Table 15: Results of sexing assay by amplification of amelogenin fragments on X and Y chromosomes.

Population	Sample Size	Number of Haplotypes	Sequence Diversity	Nucleotide Diversity (π)
Tell Kurdu	11	3	0.582	0.00672
Turkish[1]	45	40	0.994	0.0149
Algerians[2]	47	27	0.957	0.0158
Moroccan Arabs[2]	50	44	0.993	0.0195
Tunisians[2]	47	42	0.989	0.0171
Basques[2]	173	71	0.942	0.0084
Central Spain[2]	50	38	0.953	0.0128
Galicians[2]	103	62	0.939	0.0092

- [1]Data from Comas et al., 1996. [2]Data from Plaza et al., 2003.

Table 16: Diversity parameters for the Hypervariable Region I in the Tell Kurdu population and several modern populations for comparison.

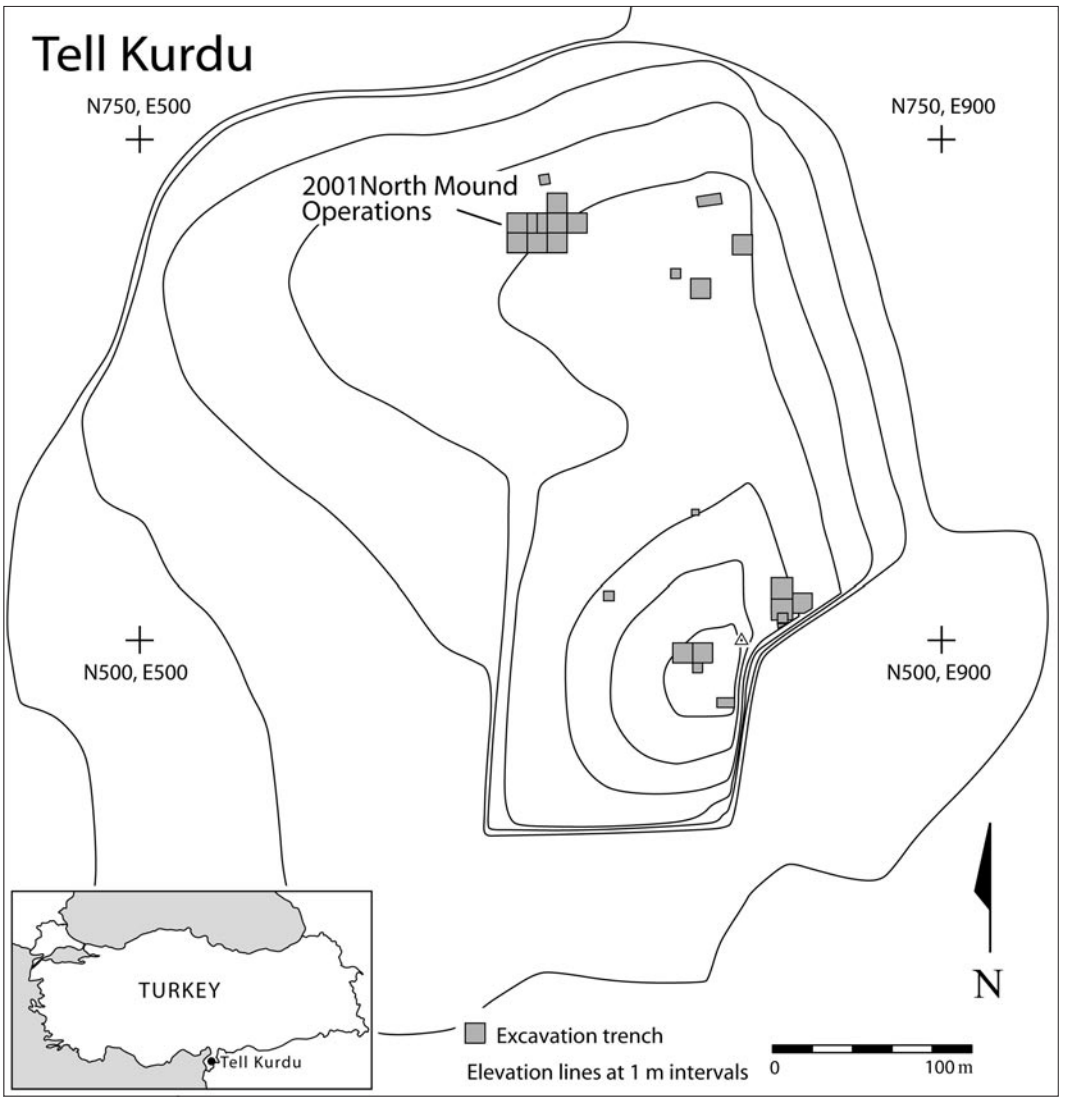


Fig. 1. Topographic plan of Tell Kurdu, showing location of trenches.

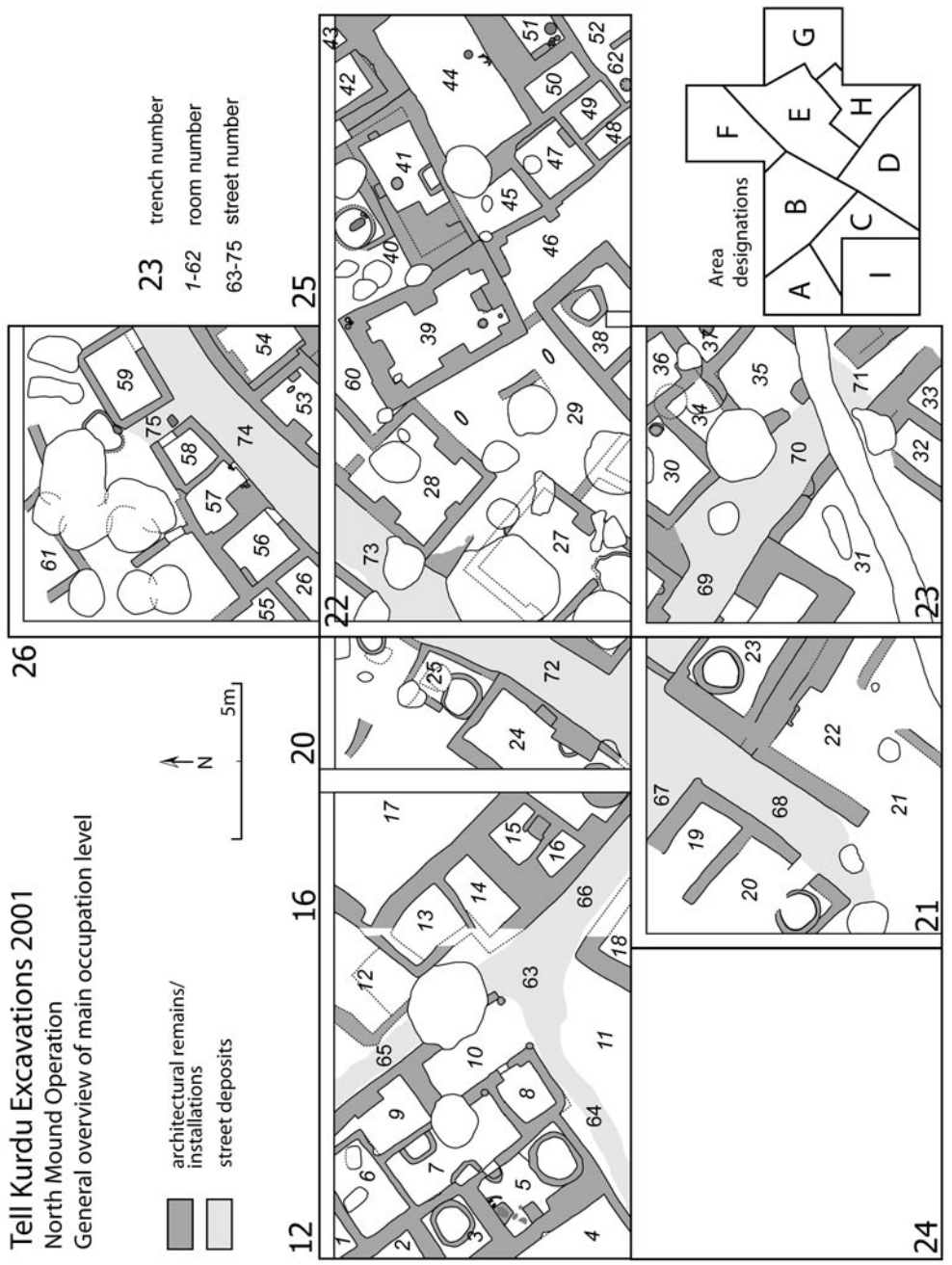


Fig. 2. Plan of North Mound Trenches, showing main occupation level.

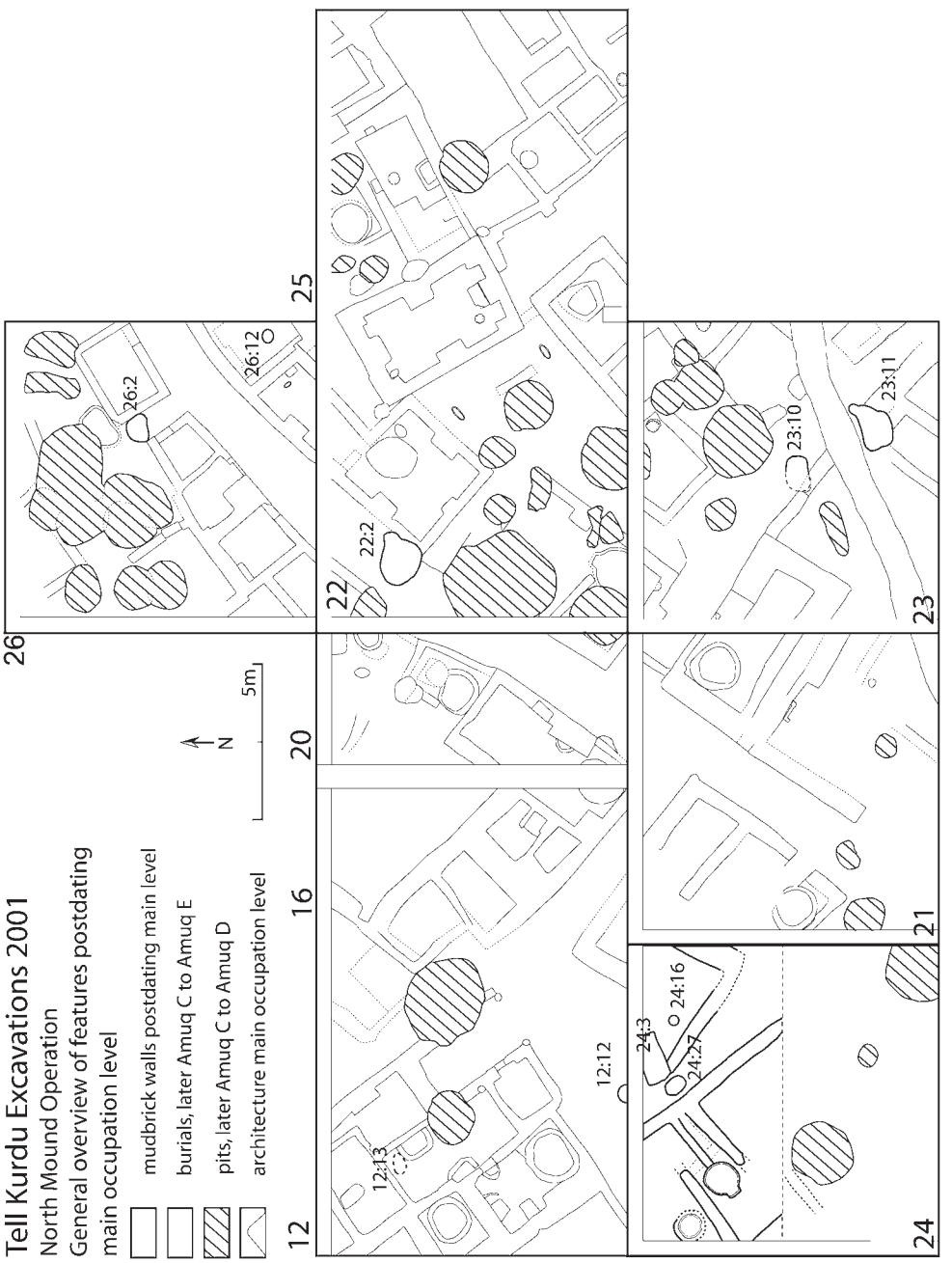


Fig. 3. Plan of North Mound Trenches, showing features post-dating the main occupation level.

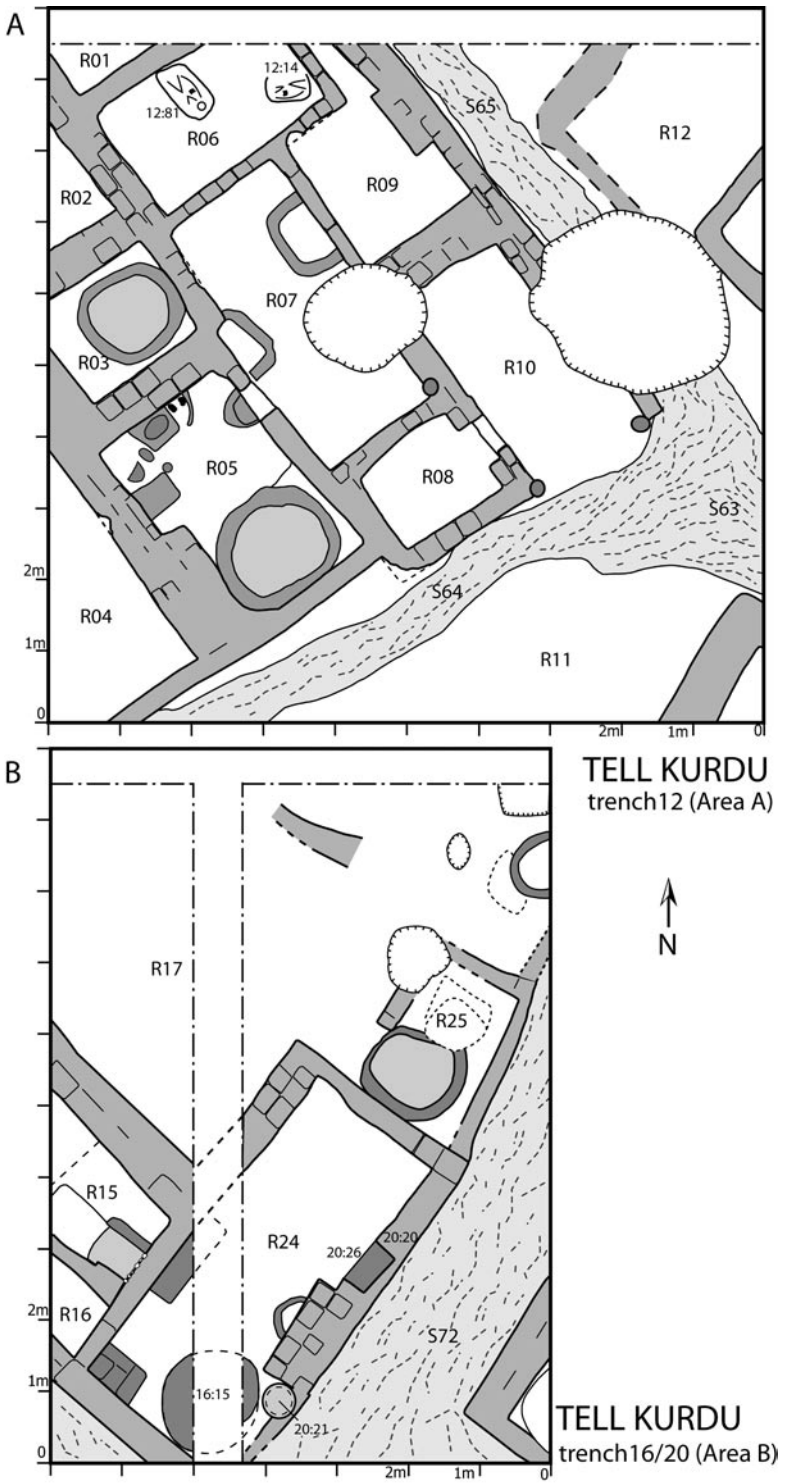


Fig. 4. **A**: plan of Area A (Tr 12); **B**: plan of Area B (Tr 16/20). For key see figure 5.

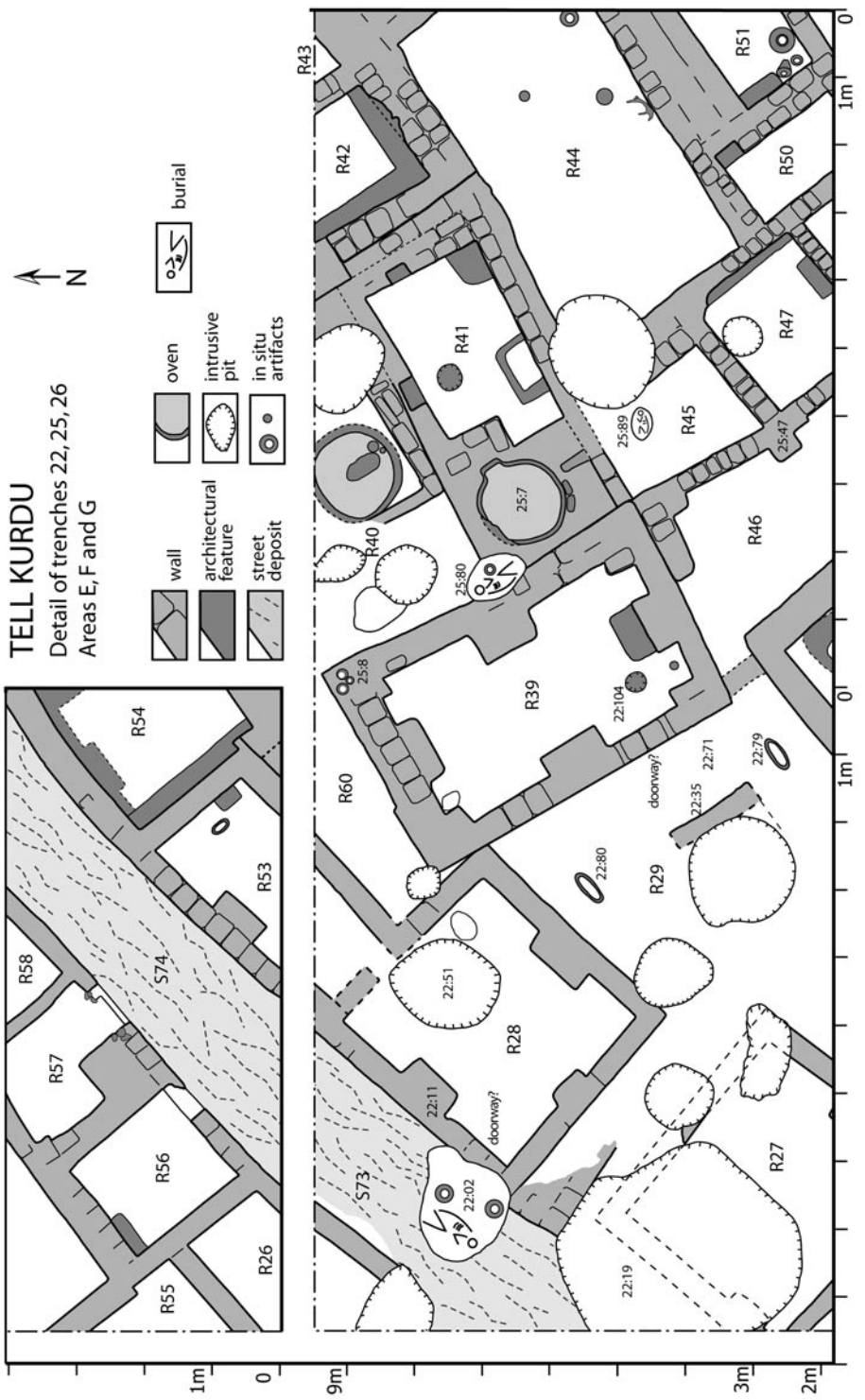


Fig. 5. Plan of Areas E and G (Tr 22, 25, 26).

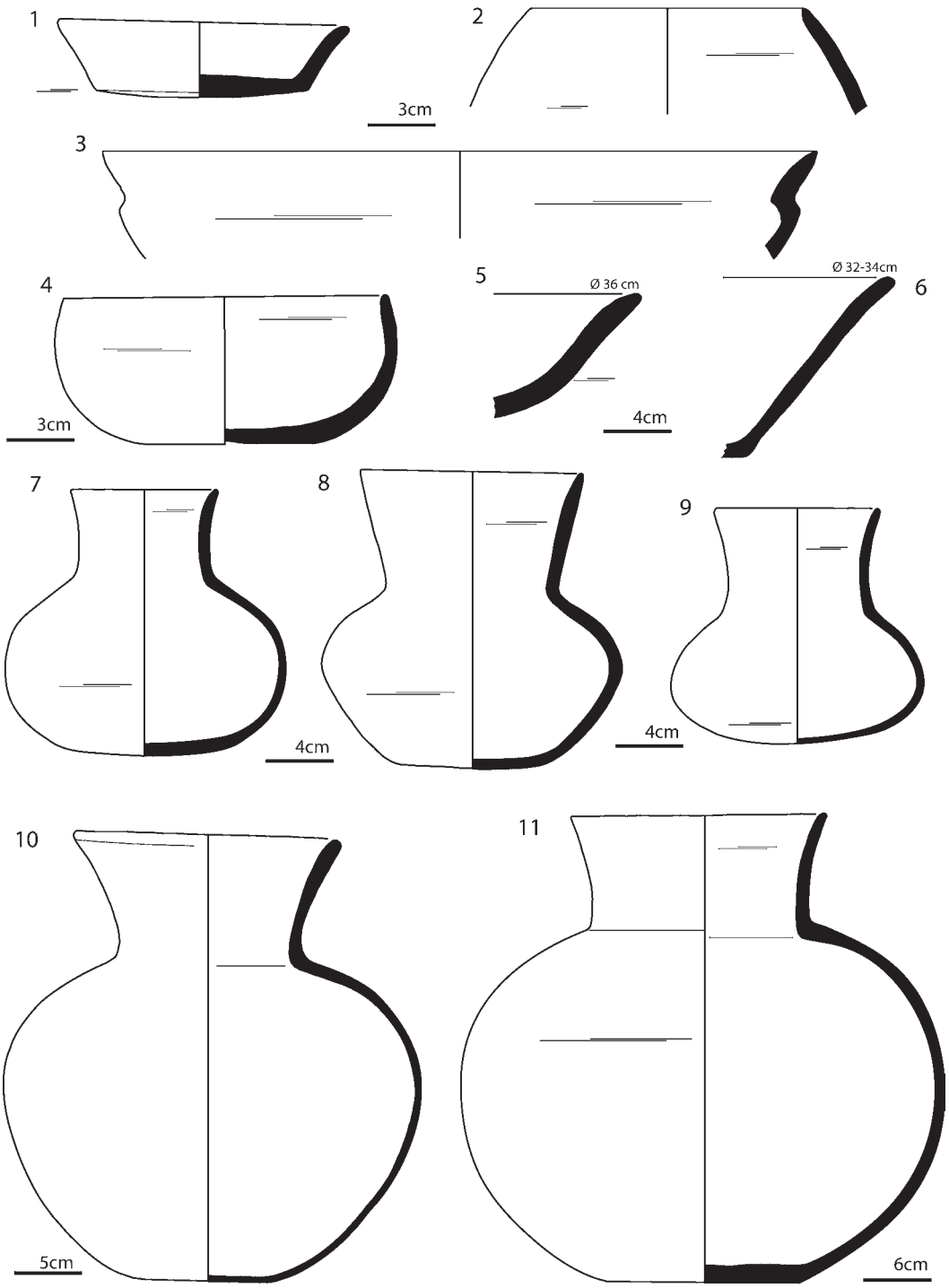


Fig. 6. Ceramics: dark-faced burnished wares.

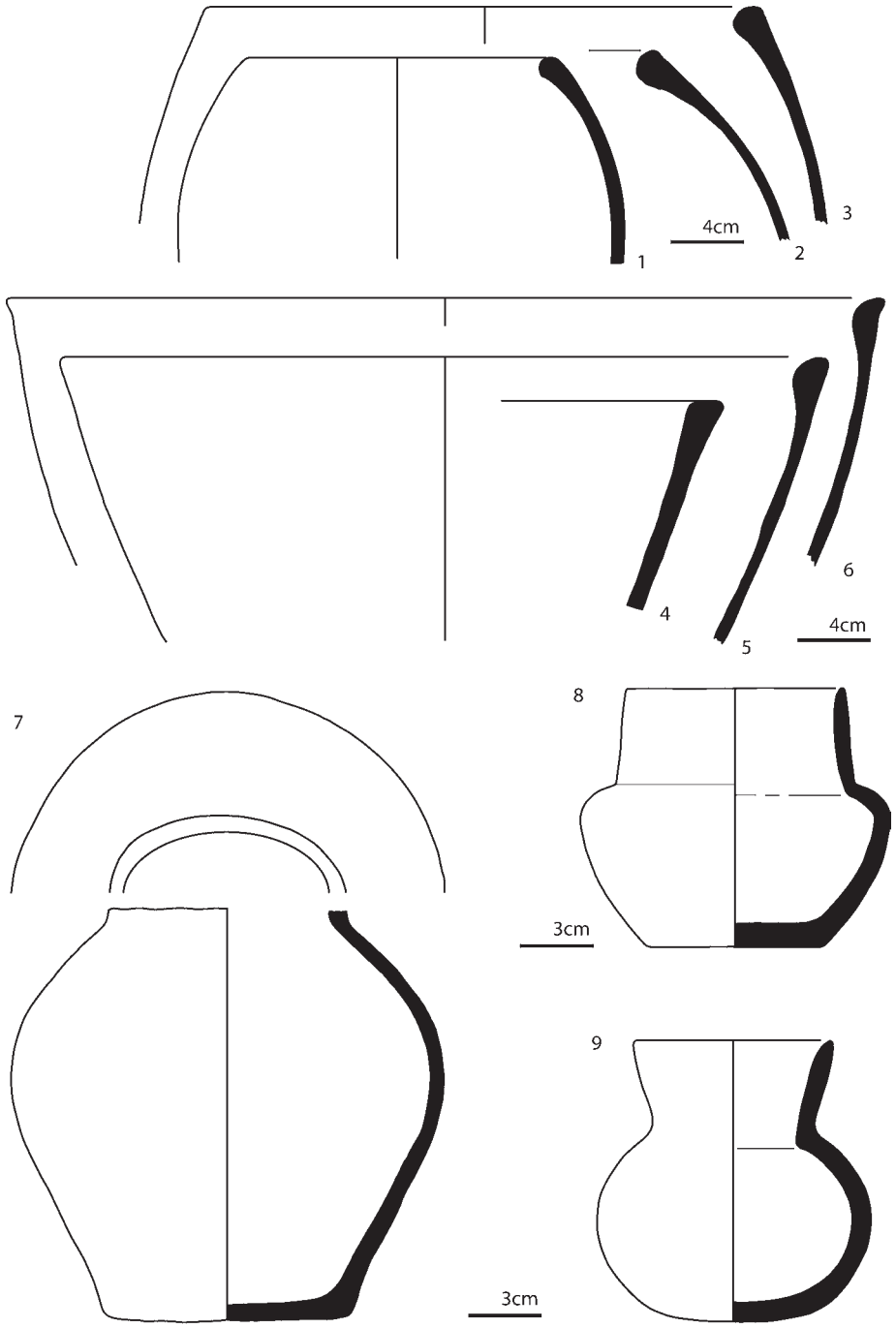


Fig. 7. Ceramics: dark-faced unburnished wares.

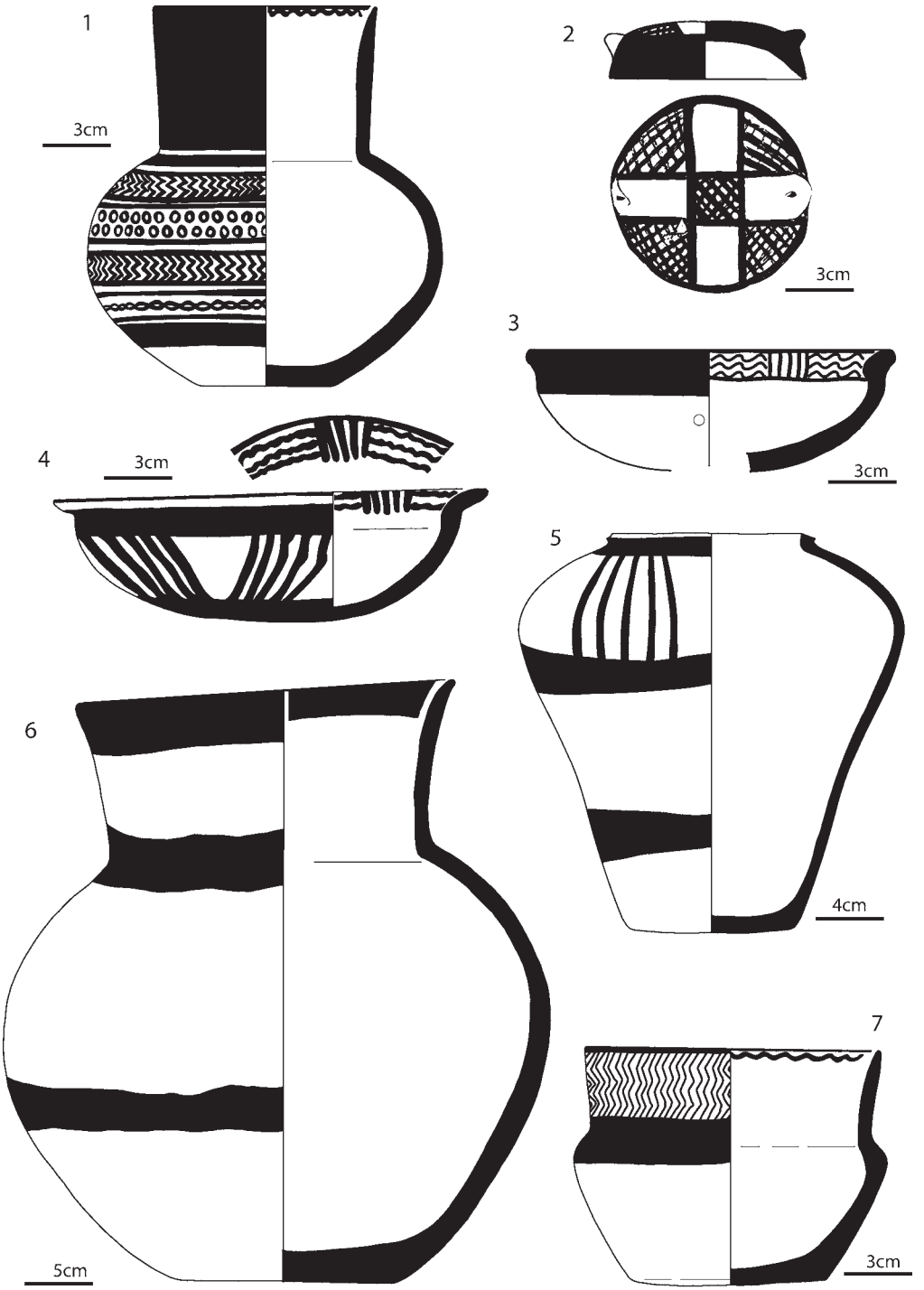


Fig. 8. Ceramics: Halaf, monochrome and local painted wares.

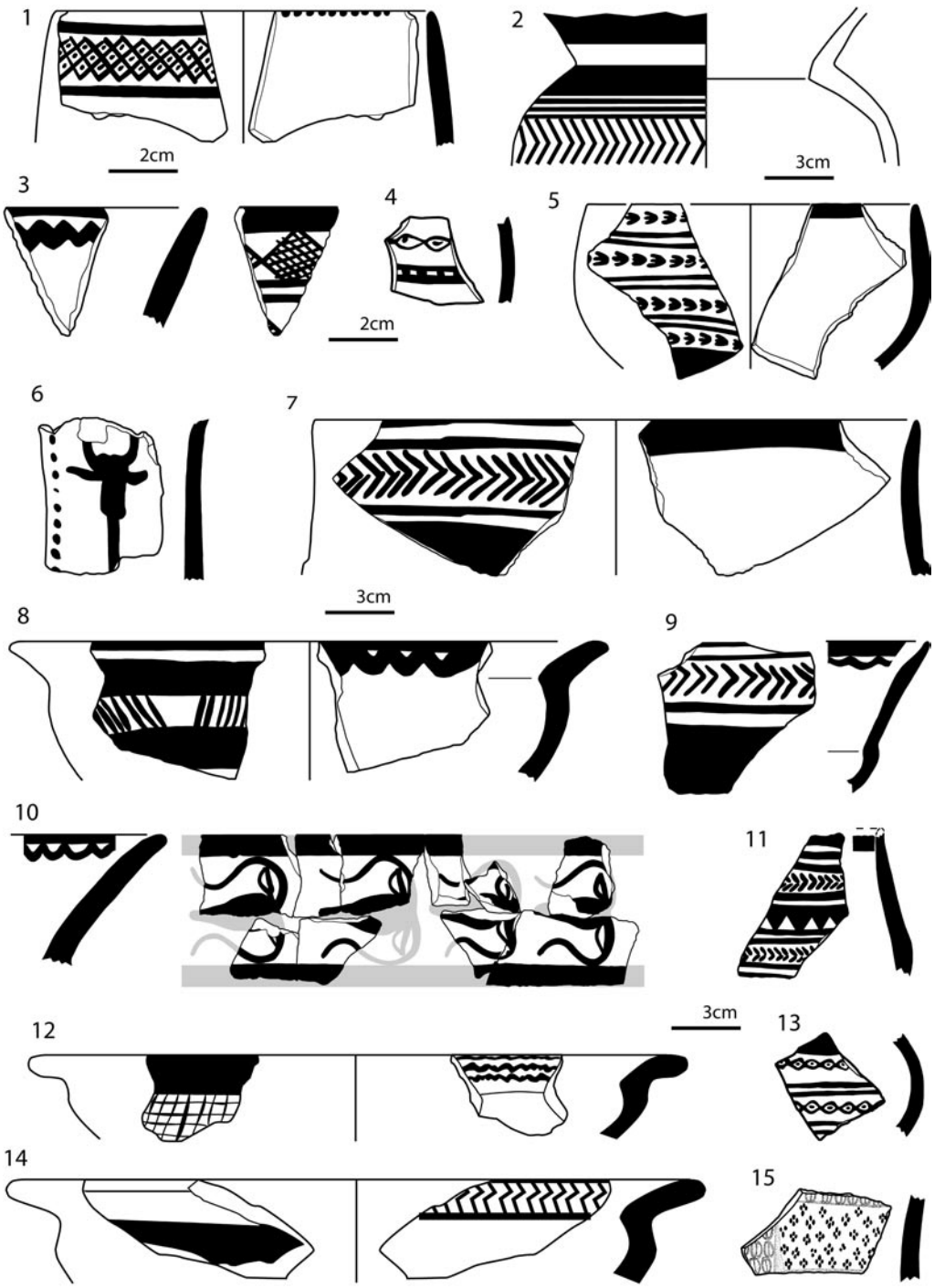


Fig. 9. Ceramics: Halaf, monochrome and local painted wares.

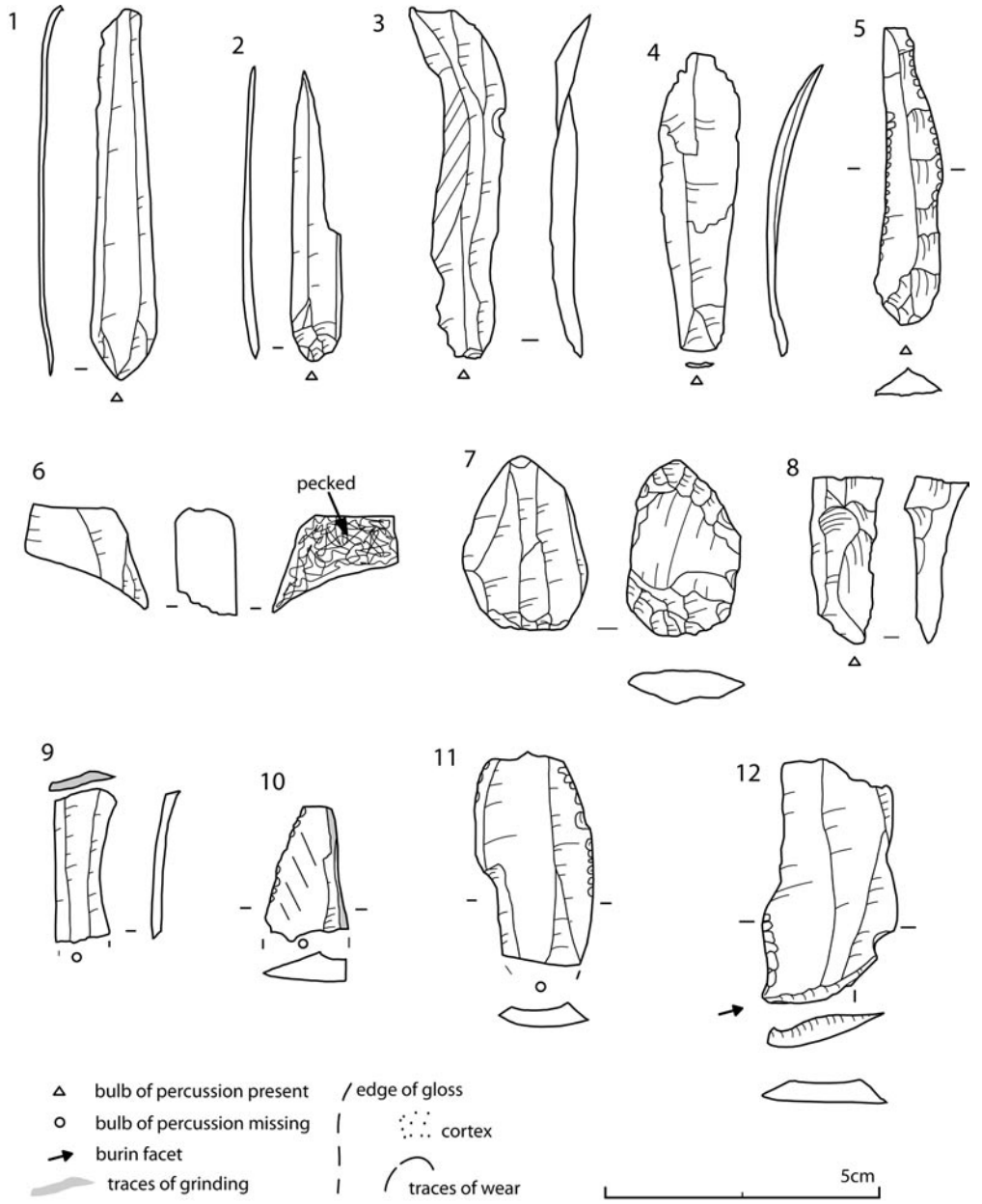


Fig. 10. Chipped Stone: obsidian.

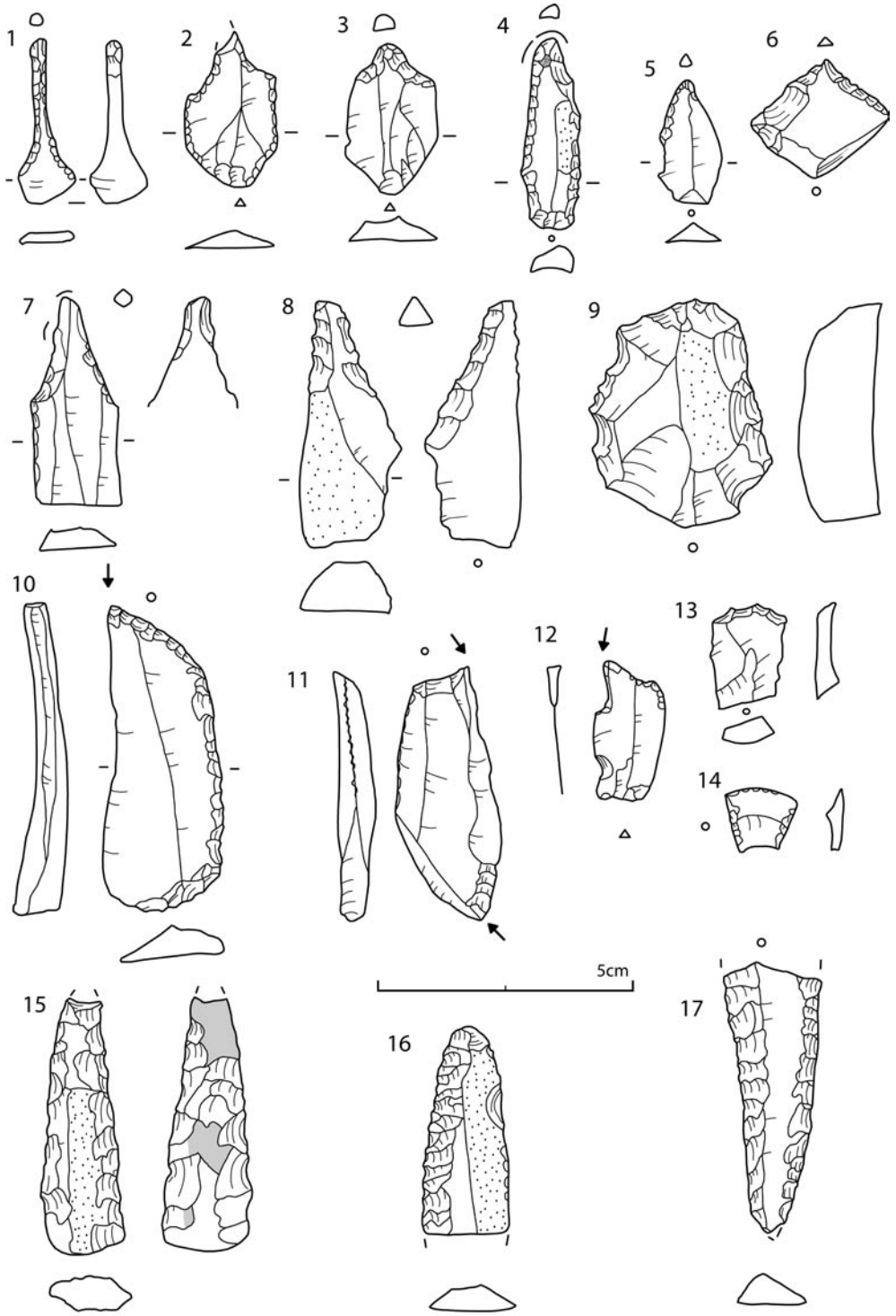


Fig. 11. Chipped Stone: flint drills, points, burins, bifacials and scrapers.

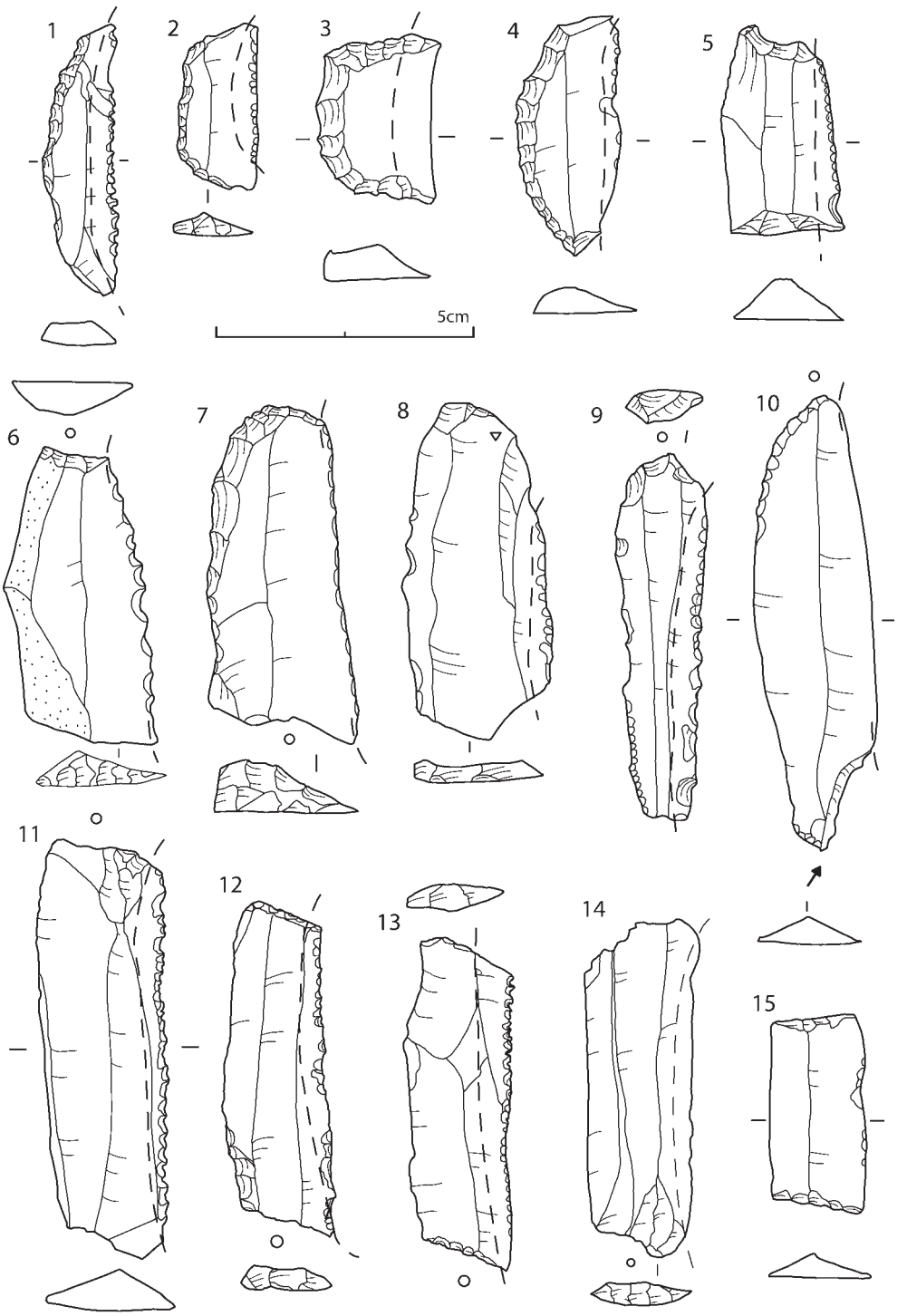


Fig. 12. Chipped Stone: flint glossed blades.

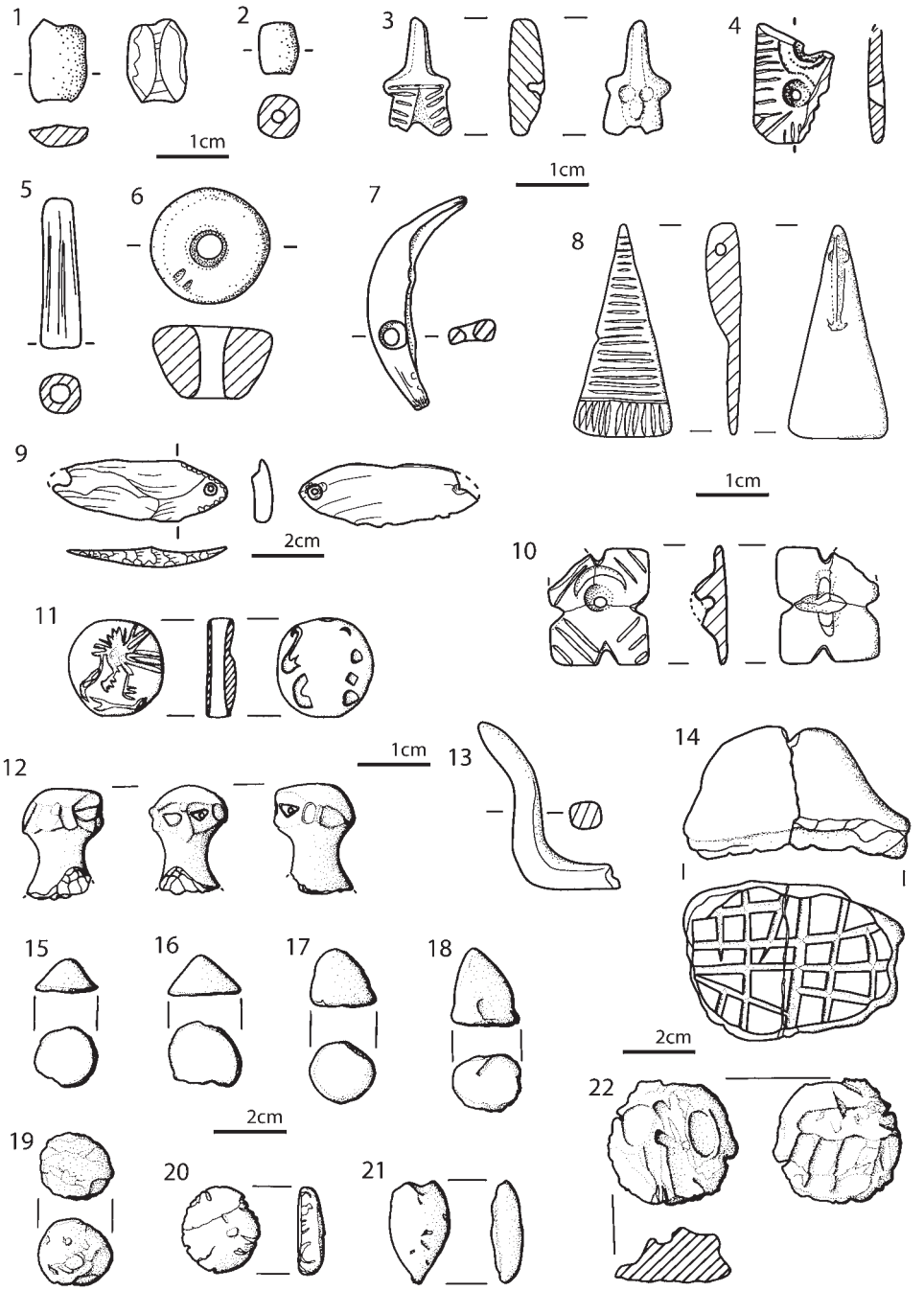


Fig. 13. Selected beads, pendants, seals, figurines and tokens.

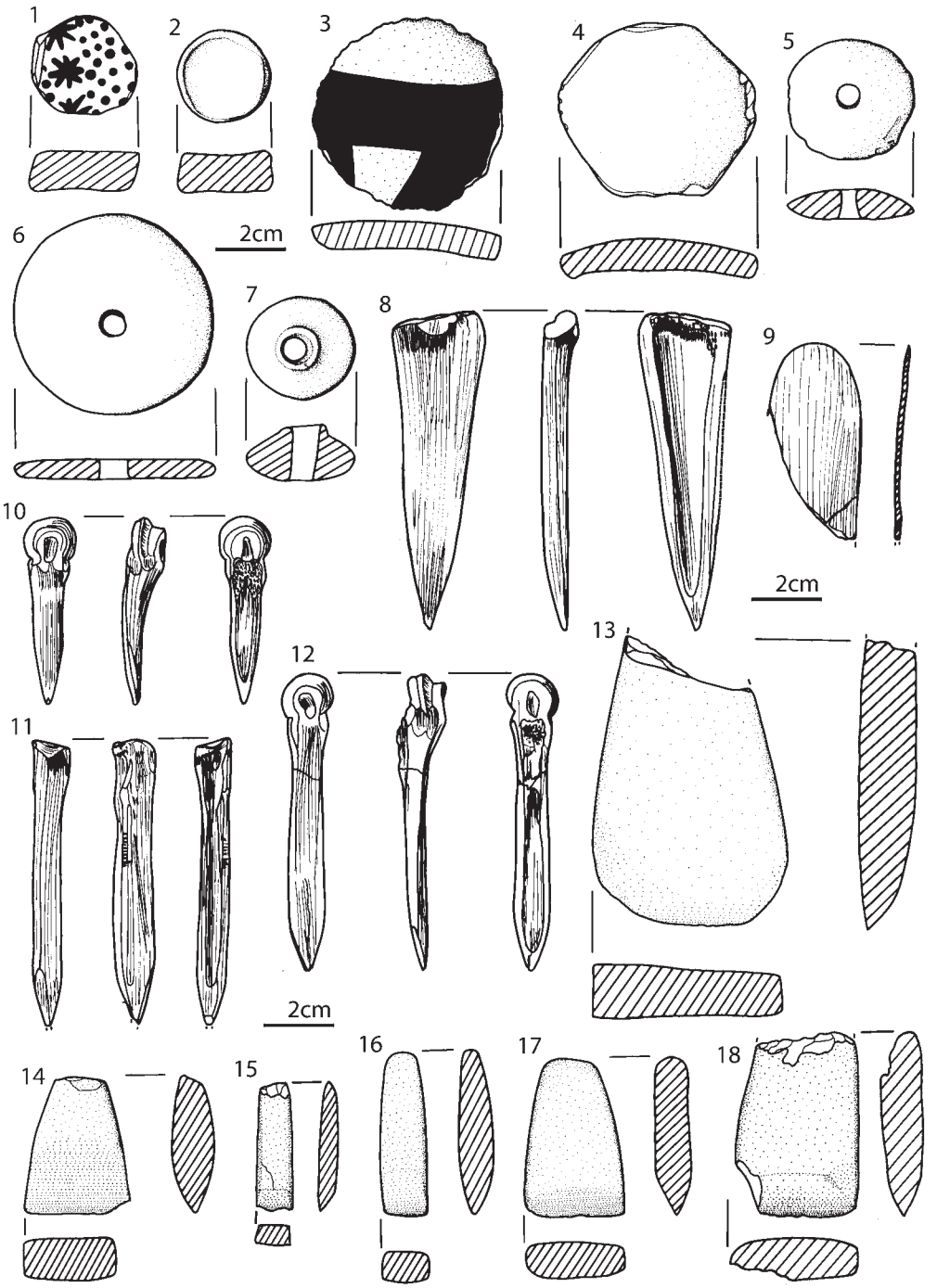


Fig. 14. Selected worked sherds, spindle whorls, bone implements and celts.

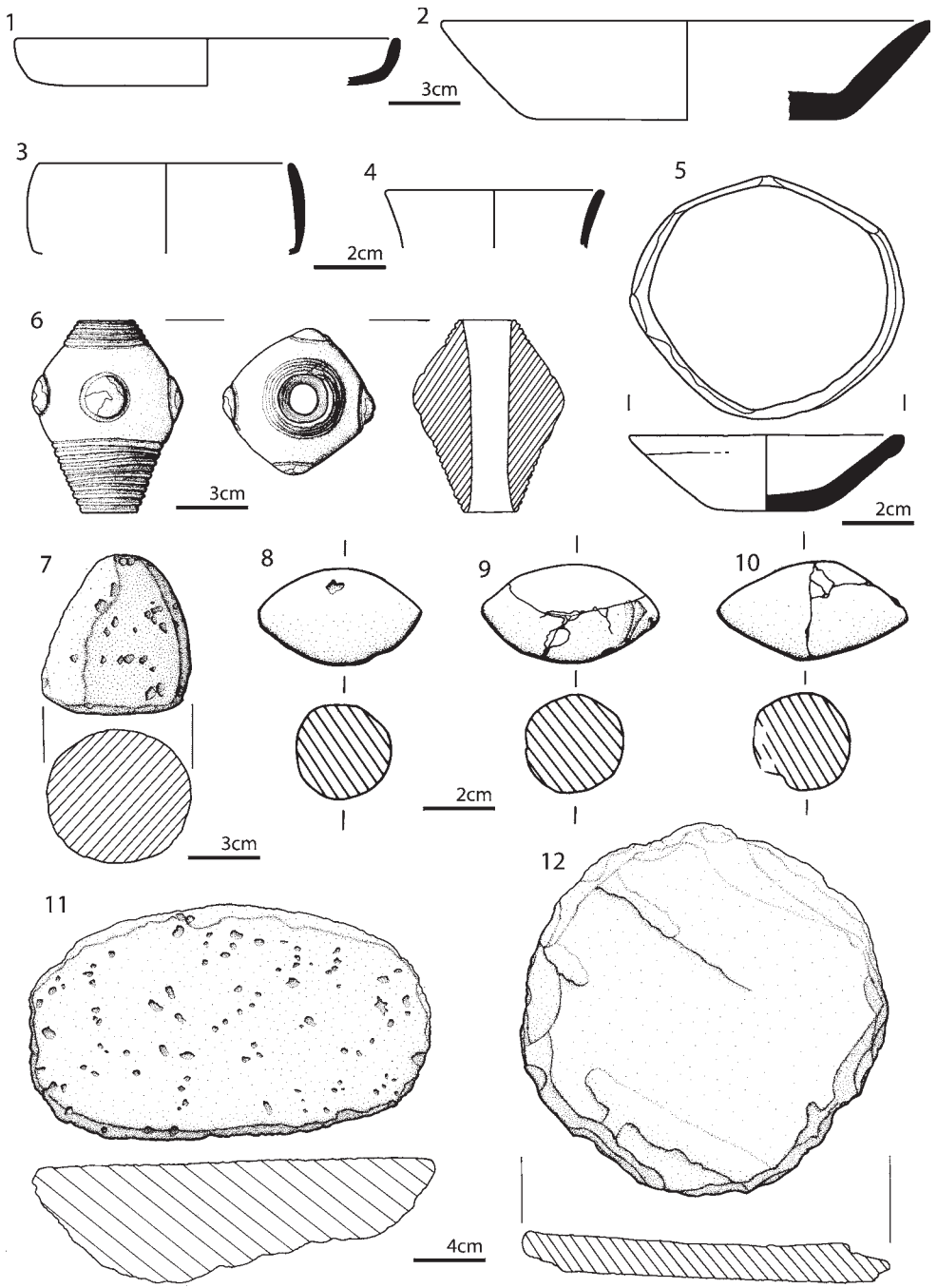
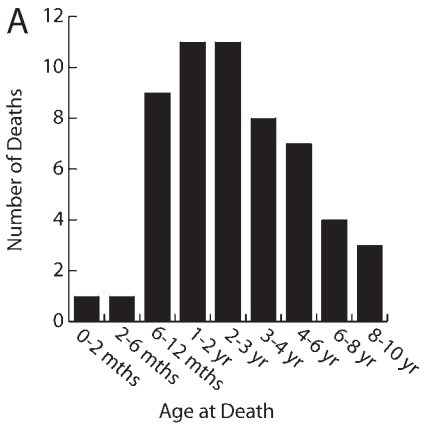
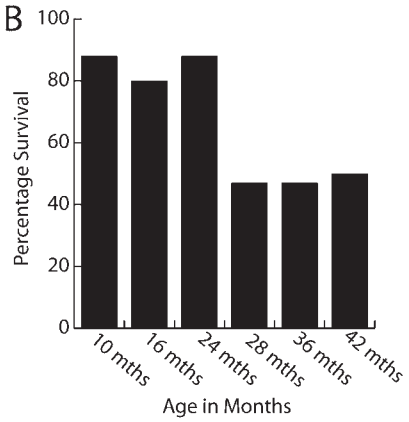


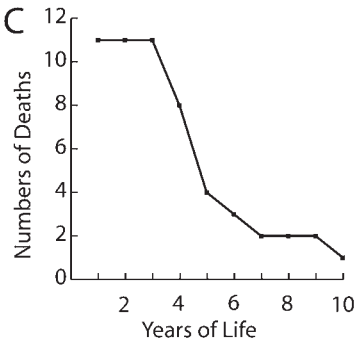
Fig. 15. Selected stone vessels, mace head, sling pellets, grinding and hammering stones and pot lid or stand.



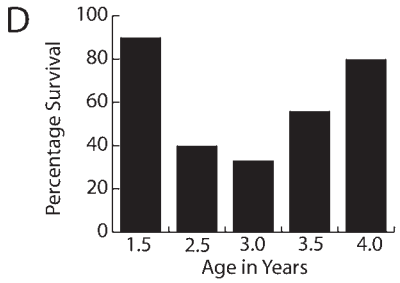
Sheep/goat mortality profile based on tooth eruption (n = 55)



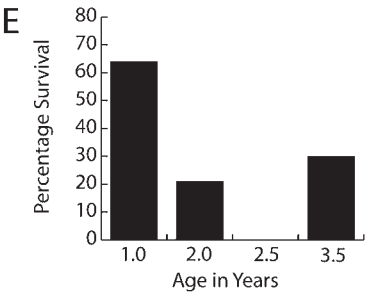
Sheep/goat survivorship based on epiphyseal fusion (n = 175)



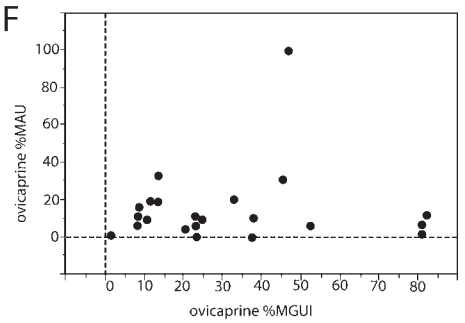
Mortality of ovicaprines plotted as number of deaths per year.



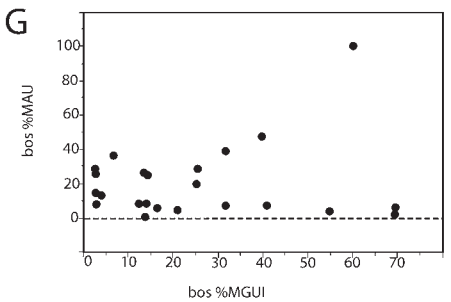
Cattle survivorship based on epiphyseal fusion (n = 96)



Pig survivorship based on epiphyseal fusion (n = 77)



Sheep/goat %MAU versus %MGUI



Cattle %MAU versus %MGUI

Fig. 16. **A-G**: fauna diagrams.