Hacı Elamxanlı Tepe: Excavations of the earliest Pottery Neolithic occupations on the Middle Kura, Azerbaijan, 2012

By Yoshihiro Nishiaki, Farhad Guliyev, Seiji Kadowaki, Yui Arimatsu, Yuichi Hayakawa, Kazuya Shimogama, Takehiro Miki, Chie Akashi, Saiji Arai and Shahin Salimbeyov

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Ключевые слова: Предметные слова: Южный Кавказ, Северная Месопотамия, Хачи Эламханли Тепе, неолитизация, расписная керамика, трапециевидные наконечники стрел

Introduction

In order to understand the origin and developments of Neolithic farming communities in the southern Caucasus, research of the Šomutepe or Šomutepe-Šulaveri culture is essential. This Pottery Neolithic entity is represented by numerous mound sites located primarily in the Middle Kura Valley and is known as the region's oldest Neolithic entity since its initial discovery in the 1960s.[1] Although a few archaeological sites reportedly date from an earlier Neolithic or Mesolithic period, none have been properly documented and published using modern standards.[2] Well-documented earlier Neolithic sites do exist in the Black Sea basin to the west.[3] However, they are distributed rather far from the Middle Kura and their relationship with the Neolithic entities of concern here remains undemonstrated. Accordingly, the Šomutepe-Šulaveri culture is regarded as the oldest Neolithic entity with the best evidence to date of an economy based on food production. Research of its origin directly contributes to clarifying the origin of Neolithic farming communities in the region.

The Azerbaijan-Japan joint archaeological mission to the Tovuz region, Middle Kura, aims to shed new light on this issue through intensive fieldwork at related archaeological sites **(Fig. 1)**. The main focus thus far has been the excavation of Göytepe, one of the largest Šomutepe-Šulaveri settlements in the region.[4] At the same time, efforts have also focused on locating Neolithic sites predating the Šomutepe-Šulaveri sites. During the 2011 survey in the Göytepe vicinity, one such possible site was discovered. This site is Hacı Elamxanlı Tepe, situated approximately 1 km northwest of Göytepe **(Figs. 2–4)**. Our intensive surface investigation yielded abundant chipped obsidian and flint artifacts dating to the Neolithic but very few pottery sherds. Moreover, the techno-typological features of the lithics suggested an age earlier than the Šomutepe-Šulaveri phase. In order to evaluate this estimate, the first season of excavation was carried out between July and August of 2012. What follows below is a summary of the results of this campaign, which show this new Neolithic site's significance to our understanding the origin of the Šomutepe-Šulaveri culture in the Middle Kura.

(Y. Nishiaki and F. Guliyev)

Geographical setting

The study area is located on the northern side of the Lesser Caucasus, where many alluvial fans are formed along the mountain foothills by rivers draining northward from the mountains **(Fig. 3)**. The edges of alluvial fans are cut off by the main course of the Kura River, which drains eastward and terminates at the Caspian Sea. The area's climate is warm and humid today, with annual mean precipitation of 300 mm; the monthly mean temperature in winter is −2.3–6.5 °C and in summer ranges between 19.5–31.7 °C.[5] The modern climatic type is supposed to be BSk (cold arid steppe) to Cfa (generally warm, with very humid and hot summers) following Köppen's classification.[6] Vegetation cover in the area is characterized by steppe, and the dominant land use involves agriculture and uncultivated meadows with great availability of ground and river water on the alluvial fans.

The mound of Hacı Elamxanlı Tepe comprises an oval form measuring ca. 60 × 80 m in diameter, with a height of 1.5 m relative to the surrounding

[1] Нариманов 1987.
[2] Akhundov 2004.
[3] Korobkova 1996; Kiguradze/Menabde 2004.
[4] Guliyev *et al.* 2010; Guliyev/Nishiaki 2012a; Guliyev/Nishiaki 2012b.
[5] Data at Ganja, World Meteorological Information, 2013.
[6] Kottek *et al.* 2006.

Fig. 1
The Middle Kura Valley. Map showing the location of Hacı Elamxanlı Tepe and related Neolithic sites

plain **(Figs. 4; 6)**. The mound's location near Qovlar village, ca. 1.1 km NNW from Göytepe, is in a marginal area between two main alluvial fans formed by the Zayam River to the east and the Asrik River to the west **(Fig. 3)**. Although the Asrik River's modern channel has less discharge with an upstream catchment area of 146 km^2 from the fan's apex, the discharge could have been much more extensive in the Pleistocene judging from the particle size and rock type of sediments in the modern channel and terrace cover along the Asrik River. The long axis of gravels in the Asrik River is predominantly 10–20 cm (up to 55 cm at a sampling point near Hacı Elamxanlı Tepe), and the varied rock type of these gravels includes andesite, carbonate rocks and pyroclastic flow deposits. These are comparable to those in the Tovuz River located farther west. Therefore, discharge from the Asrik River has likely been affected by inflow from the Tovuz River catchment. Abandonment of the Asrik River from this catchment most likely occurred prior to the Last Glacial Maximum (hereafter LGM), perhaps in MIS 3–4 or earlier. Based on this, coarse gravels up to 15 cm long found in surficial sediments around Göytepe were probably transported from either the Tovuz or Zayam Rivers.

Several fluvial terraces have developed along the Asrik and Tovuz Rivers **(Fig. 5)**. The relative height of the uppermost terrace from the modern riverbed along the Asrik River is approximately 20 m at an elevation of ca. 400 m a.s.l., whereas the terrace along the Tovuz River is 60 m with a maximum valley width of 1,000 m. Such a deep incision along the Tovuz River may have occurred during the Pleistocene following abundant alluvial filling events in the glacial periods. Clear terraces are present at about 4 m and 20 m higher than the modern riverbed, which comprises several alternating layers of gravels and sandy to muddy sediments. The modern riverbed is being impaired by gravel quarrying, probably causing recent incisions a few meters deep into the modern riverbed.

In the late Pleistocene, rivers on the alluvial fans around Qovlar should have been sufficiently active to transport coarse sediments from their mountain catchments where sediment supply from

Fig. 2
Hacı Elamxanlı Tepe. General view, looking northwest

slopes may have been greater under glacial or periglacial environments than they are today. After the LGM about 20 ka (MIS 2), several incision events occurred.[7] These events are presumed to have partly coincided with the lowering of the Caspian Sea. Alluvial infilling could have also occurred in colder periods and the 20 m high terrace in the Tovuz River probably filled in the Younger Dryas at about 13–12 ka.[8] The 20 m high terrace is also observed in the Zayam River east of Hacı Elamxanlı Tepe. The 4 m high terrace in the Tovuz River formed in the Holocene, possibly around 6–2 ka.[9]

The 60 m deep Tovuz River valley suggests that the region around Qovlar was subject to extensive geological incisions at least after the late Pleistocene. This was caused by either the Caspian Sea level fluctuations, tectonic displacement by faults running along the Kura River, or climatic changes. The longitudinal profile of the Tovuz River shows a prominent knickzone at ca. 700–1300 m a.s.l. and the incision in the downstream alluvial reach with a straight profile should be associated with the propagation of the knickzone or knickpoints.

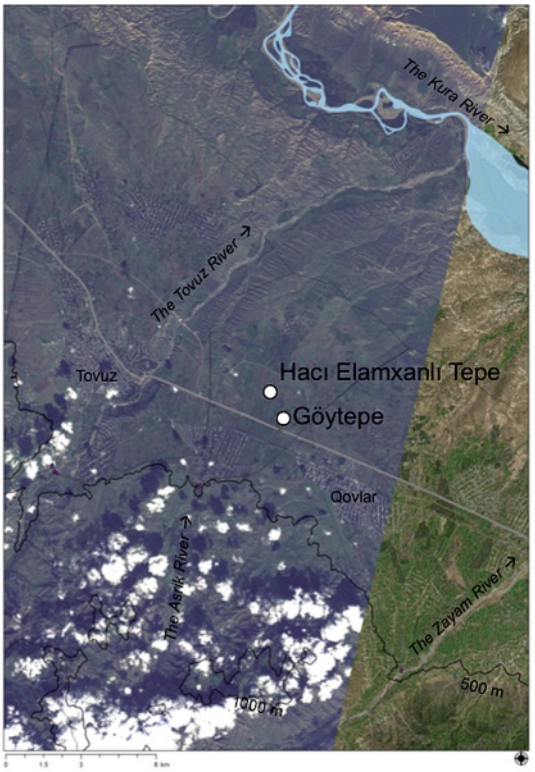

Fig. 3
Study area in the Middle Kura Valley. Background is an ALOS AVNIR-2 satellite image

[7] Ollivier *et al.* 2011; Ollivier *et al.* 2012.
[8] Ollivier *et al.* 2011.
[9] Ollivier *et al.* 2011.

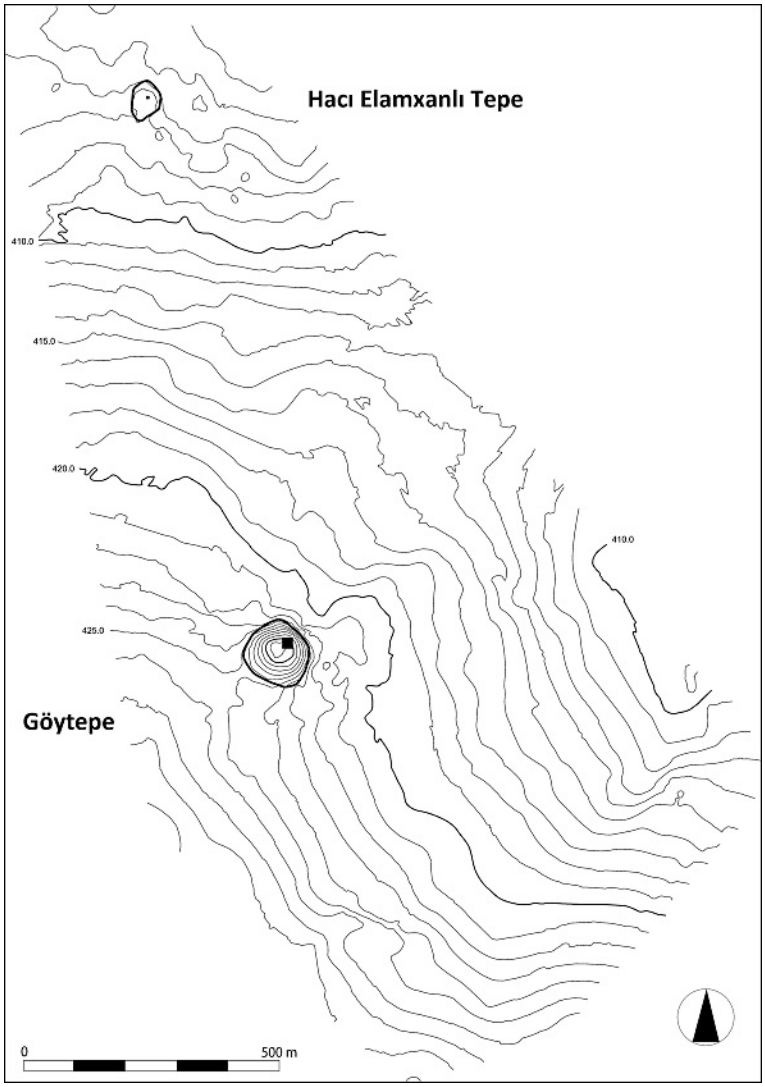

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Fig. 4
Hacı Elamxanlı Tepe. Topographic map showing the geographic relationship between Hacı Elamxanlı Tepe and Göytepe

Along with the long-term incision trend of surrounding rivers in the Holocene, availability of water for humans on the alluvial fans may have changed. The rapid incision forming the 20 m terrace along the Tovuz and Zayam Rivers may have affected the water table on alluvial fans. This base level decrease could have thus been linked to a locational shift of surficial springs on the fans. Moreover, an associated decrease in surface water discharge from the upstream mountains could have occurred. (Y. Hayakawa)

2012 Excavation season

In order to record the site's entire occupational history by defining architectural levels, an initial excavation area at Hacı Elamxanlı Tepe was opened at Square M10 (5 × 5 m) encompassing the highest part of the mound **(Figs. 6; 7)**. For this purpose, our excavations recorded the stratigraphic positions of major architectural remains as key features for defining stratigraphic units. This includes deposits and features related to the construction, use, and abandonment of the architectural remains. To organize the stratigraphic relationships of various architectural remains and archaeological deposits, we identified spatial units as "context," which corresponds to a depositional unit (e.g., a mudbrick wall, building floor, pit fill, or cluster of artifacts) or an excavation unit (e.g., each excavation grid made on a building floor for recording spatial distribution of floor deposits). Using contexts as a unit of stratigraphic analysis, we grouped them by building level based on their stratigraphic relationship with major architectural features. Artifacts, ecofacts, and other samples were primarily collected by contexts. In addition, dry sieving was conducted to recover small remains for 50% of the deposits from Neolithic levels, while we sieved 100% of the deposits with high artifact density.

Excavations at Hacı Elamxanlı Tepe during the 2012 season reached the depth of approximately 150 cm from the present surface but did not reach

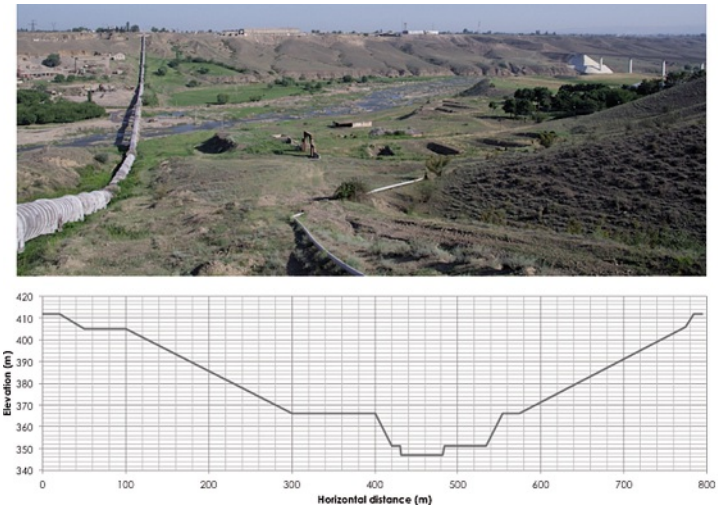

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Fig. 5
The Tovuz River. – 1 View looking downstream (northwest). The big pipe on the left is for irrigation, which delivers water from west to east over the Tovuz (and terminates at the Asrik). Next to the pipe, a quarry plant is shown on the opposite (left) side of the river; – 2 Cross profile of the Tovuz River (view upstream). Terraces at 60 m, 20 m and 4 m height are shown

virgin soil. As a preliminary result of this stratigraphic examination, four building levels (Levels 1–4 from the top) were defined for the Neolithic deposits. The following descriptions of these levels refer to the numerical names of contexts, such as 7, 12, and 60, indicating particular archaeological features and deposits.

Level 1

The uppermost building level identified in Square M10 consists of a curvilinear mudbrick wall (9) forming a half circle ca. 2.7 m in diameter **(Fig. 8)**. The walled space opens to the east. On its western side another curvilinear wall (50) is attached, extending into the western section wall of the excavation square. The base of Wall 50 (ca. 406.25 m a.s.l.) defines the stratigraphic bottom of Level 1. The archaeological deposits between the construction and abandonment events of Wall 50 are primarily assigned to this level, which stratigraphically corresponds to the upper floor associated with Wall 9.

Although Walls 9 and 50 were preserved to the height of only 15–20 cm in Level 1, associated archaeological deposits yielded two clusters of artifacts that indicate occupational surfaces. One of these was found in brown sediments (42) at the eastern side of Wall 9. This was a cache of sling stones (34 and 40), which also included an obsidian

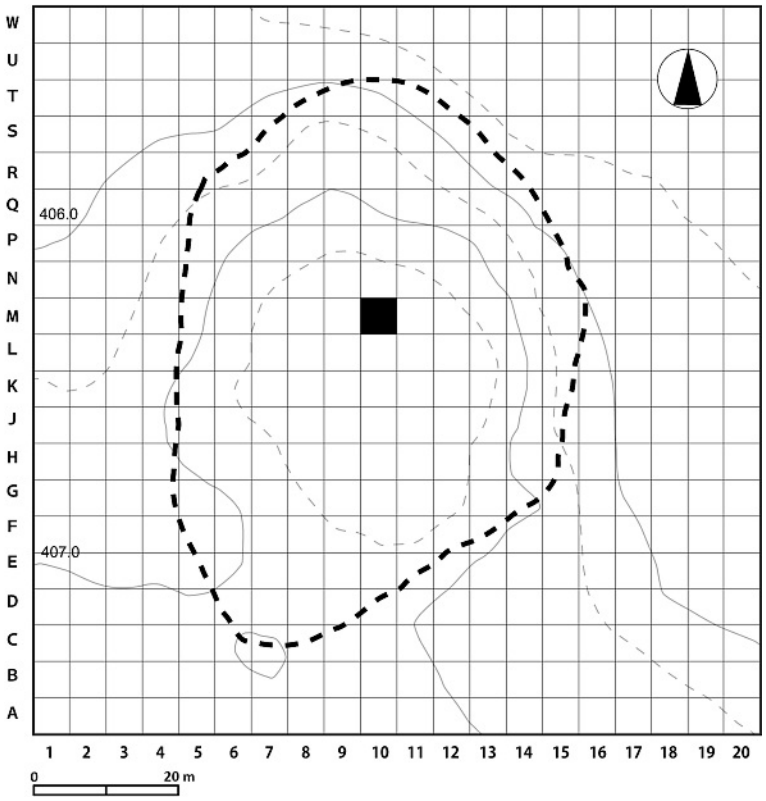


Fig. 6
Hacı Elamxanlı Tepe. Grid indicating Square M10 (5 × 5 m) that was excavated in 2012

Fig. 7
Hacı Elamxanlı Tepe. An overview of Square M10 from the northwest. Göytepe is seen among the trees to the far right

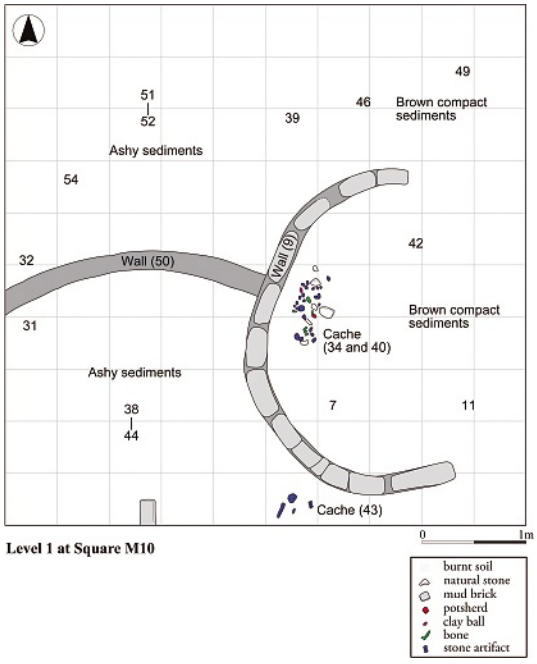


Fig. 8
Hacı Elamxanlı Tepe. Architectural features of Neolithic Level 1 in Square M10

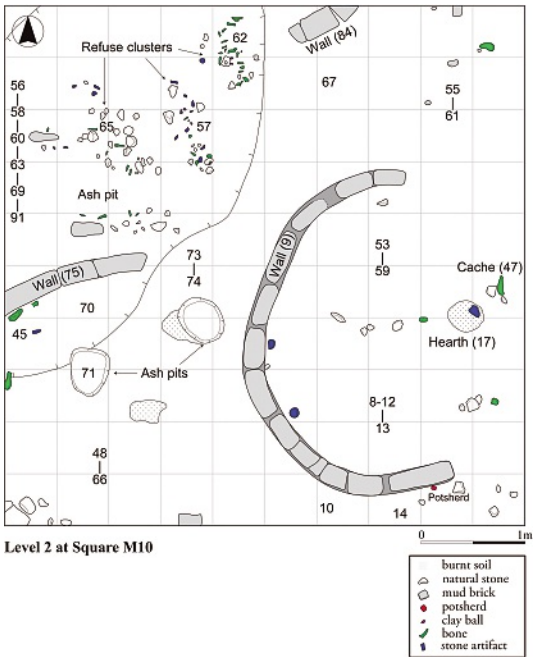


Fig. 10
Hacı Elamxanlı Tepe. Architectural features of Neolithic Level 2 in Square M10

core, animal bones, and a single clay sling missile, concentrated near the wall **(Fig. 9)**. Another artifact cluster was recovered in ashy deposits in the southern outdoor area near Wall 9, consisting of obsidian and flint artifacts (43).

In terms of spatial use, Level 1 of Square M10 is generally characterized by contrasting natures of the deposit between the eastern and western areas, bounded by Wall 9. The main deposit in the eastern area comprises brown sediments with vegetal inclusions (7, 11, 42, 46, and 49), which may have derived from collapsed mudbrick walls. The western side was covered with ashy deposits (31, 32, 38, 44, 51, 52, and 54) containing a higher density of refuse than the brown sediments in the eastern area.

Fig. 9
Hacı Elamxanlı Tepe. Cache of sling balls and other tools (40) next to Wall 9 in Neolithic Level 1

Level 2

This building level underlies Level 1 and is stratigraphically limited by the base of Wall 50 at the top and by the bases of Walls 9 and 75 at the bottom **(Fig. 10)**. More specifically, the beginning of Level 2 is defined by the construction of Wall 9, a half circular wall, and Wall 75, another curvilinear wall extending to the west. A lower floor of Wall 9 corresponds to this level, although Wall 9 remained standing until Level 1 when it was reoccupied (cf. **Figs. 8; 10**). Wall 75 was constructed on the fill of a large ash pit (>3 m) located in the northwestern part of Square M10. Although the wall extends from the western section wall towards the east, the preserved wall portion does not connect to Wall 9, leaving a ca. 1 m wide passage. The absolute elevation of the base of Wall 75 is ca. 405.75 m a.s.l. at the western section wall and is 25 cm lower than the base of Wall 9 (ca. 406.00 m a.s.l.). The surface where Wall 75 was constructed in the large ash pit was either lower than the base of Wall 9 or the

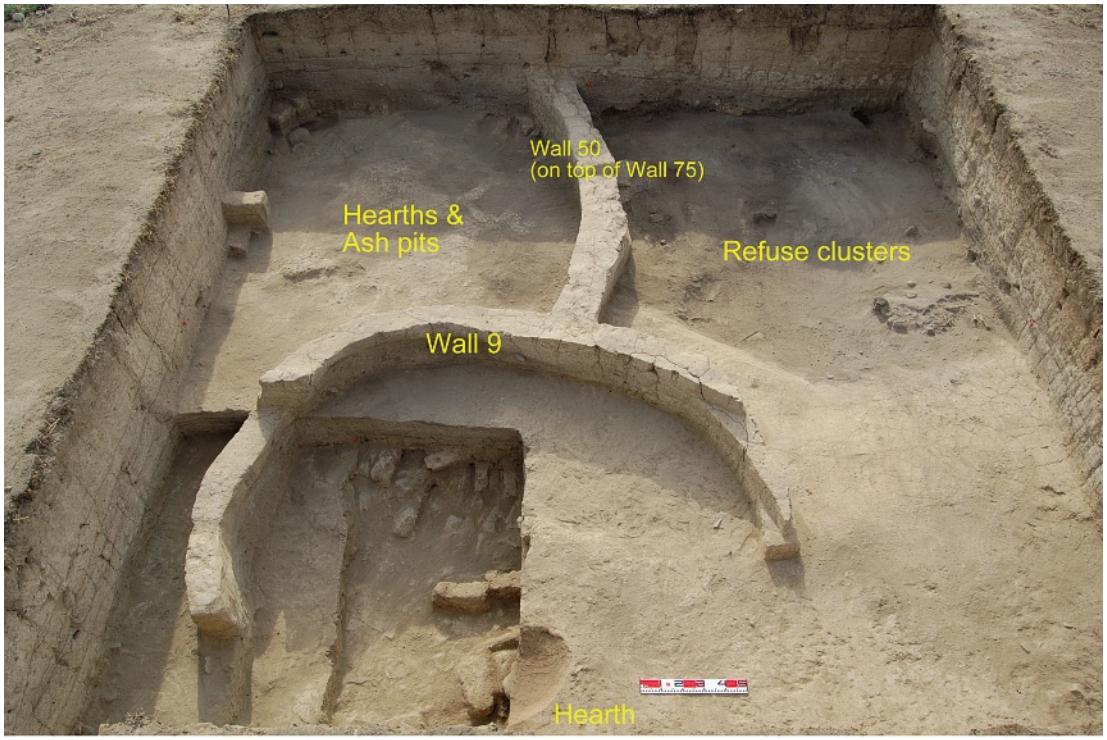


Fig. 11
Hacı Elamxanlı Tepe. Mudbrick walls and occupational surfaces of Neolithic Level 2 in Square M10, looking west. Note the contrasting nature of deposits on opposing sides of Wall 9

base of Wall 75 sank into loose ash deposits, despite some cobbles having been used as wall foundations. Wall 84 at the northern end of Square M10 is slightly curvilinear and preserved at the height of only few centimeters. Its western extension was probably destroyed by the construction of a large ash pit.

The occupational surface of Level 2 in Square M10 is again characterized by the contrasting use of space between the eastern and western areas bounded by Wall 9 **(Fig. 11)**. The eastern area is partially surrounded by Wall 9; the occupational surface there was associated with a small hearth (17) and its adjacent distribution of artifacts (13 and 47), including a perforated antler, handstone, and an abrader. Except for these features, only a small volume of refuse was recovered in the eastern area with brown sediments. In contrast, the western area is widely distributed with ash deposits, particularly inside the large pit (56, 58, 60, 63, 69, 70 and 91). This contained a great volume of refuse, including animal bones, chipped and ground stones, charred botanical remains, burnt cobbles and clay pieces, and some pottery sherds, which were often recovered in clusters (57, 62, and 65). The recovery of pottery sherds, particularly those with painted decorations, is noteworthy given their overall rare occurrence at Hacı Elamxanlı Tepe (see below). Although these remains were deposited in the large ash pit that usually contained secondary refuse, the sieved materials include small remains, such as abundant stone tool chips. In some contexts, these indicate either the adjacency of activity areas or

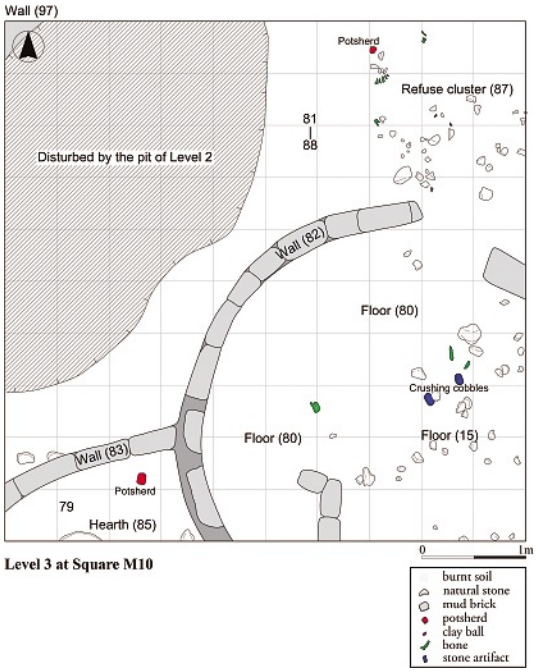


Fig. 12
Hacı Elamxanlı Tepe. Architectural features of Neolithic Level 3 in Square M10

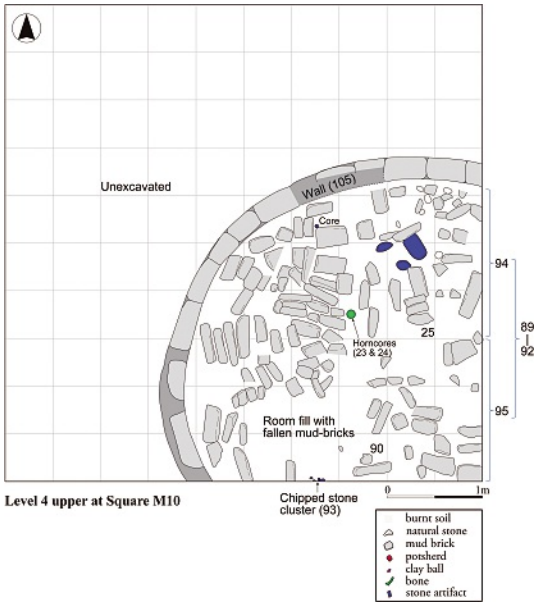


Fig. 13
Hacı Elamxanlı Tepe. Architectural features of the upper part of Neolithic Level 4 in Square M10

thorough cleaning of living space. The former scenario may be consistent with the recovery of two hearths immediately south of the large ash pit.

Level 3

The beginning of Level 3 is primarily defined by occupational surfaces associated with two mudbrick walls (82 and 83). Wall 83 stretches in an east-west direction, attached to Wall 82 that forms a large circular room (probably >4 m in diameter) with an opening to the north in the excavated area **(Fig. 12)**. A floor surrounded by a curvilinear Wall 82 consisted of ashy sediments, where some cobbles, artifacts, and animal bones were horizontally distributed. The floor likely represents the reoccupation of a collapsed circular building (Wall 105 in Level 4) because the floor is located above the room fill containing a large number of mudbricks that fell out of Wall 105. Therefore, Wall 82 may represent the remaining part of the collapsed Wall 105 or an additional construction on top of Wall 105 during Level 3. At the southwestern corner of Square M10 is an area constrained by Wall 82 and 83. The fill of this room is ashy in the southern part, where a small hearth was detected. This room also yielded the only rim sherd (ca. 10 cm) found at the site thus far. In addition, the recovery of a mudbrick at the northwestern corner of Square M10 indicates the presence of another wall (97) in this level, although it was disturbed by an ash pit constructed during Level 2.

Level 4

The main deposits of Level 4 include a building floor (96 and 98) associated with Wall 105 and the overlying room fill with a large number of mudbricks (89, 92, 94, and 95). Wall 105 occupies the

Fig. 14
Hacı Elamxanlı Tepe. Room fill densely distributed with mudbricks, which probably resulted from the collapse of Wall 105, looking west

same location as Wall 82 in Level 3. Although Wall 82 may have been the upper extension of Wall 105 or an additional construction on top of Wall 105, the former is open at its northern part. The outside of Wall 105 in Level 4 has not yet been excavated.

The deposits inside Wall 105 are about 30–40 cm thick and filled with numerous mudbricks. Some of the bricks are lying side by side and somewhat parallel to the nearby wall, indicating that they collapsed from a stacked section used to constitute the upper portion of Wall 105 **(Figs. 13; 14)**. This idea is consistent with the fact that bricks are more densely distributed and form taller piles near the wall.

In any case, this apparent room fill not only represents collapsed walls but other finds indicate that it was likely used for other purposes. The most noteworthy find is a cluster of about 10 horn cores of goats in the middle of the room between mudbricks, ca. 15–25 cm above the floor **(Fig. 15)**. Although it is difficult to determine the meaning of this deposit, the horn cores were likely laid intentionally side by side. Another cluster comprises chipped obsidian and flint that continues into the southern section wall (93). Considering that it includes blades and flakes, this may have been a cache of usable tools as opposed to a refuse dump.

Under the mudbrick scatter, we recovered an occupation floor (96 and 98) that appears to have retained clear traces of domestic activities **(Fig. 16)**. Although this activity area was only partly revealed in the excavation area, we collected artifacts and sediment samples by 1×1 m grids (nine grids in total) to examine the spatial distribution of domestic refuse. This should help us gain insight into the use of space by Neolithic residents at Hacı Elamxanlı Tepe.

Although detailed analyses of the excavated samples will be conducted in the future, field observations of the building floor suggest patterned use of the indoor space. First, the floor is characterized by the presence of two hearths, each of which is associated with an area containing ash and many charcoal fragments. The northern ashy area was distributed with many stone artifacts, including grinding and pounding tools, a small chisel, chipped stone flakes/blades, and a core. There was also a single pottery sherd. In contrast, the density of artifacts around the southern hearth is low, although another cluster of artifacts and/or debris may be located in the unexcavated area south of the hearth. In the south, an obsidian core tablet was recovered beside the wall.

Another interesting feature is a pit containing a cache of sling balls and a chipped stone core (99: **Fig. 17**). The pit was located between the wall and northern hearth area. In addition to the pit, there were two large animal bones and an elongated cobble (polisher?) with clear striations on the surface. As these pieces were located near the wall, they may have been deposited as provisional refuse for future use, similar to the tools stored in the pit.

Fig. 15
Hacı Elamxanlı Tepe. Cluster of goat horn cores (23 and 24) laid among the mudbrick scatter inside Wall 105, looking west

(S. Kadowaki, K. Shimogama and S. Salimbeyov)

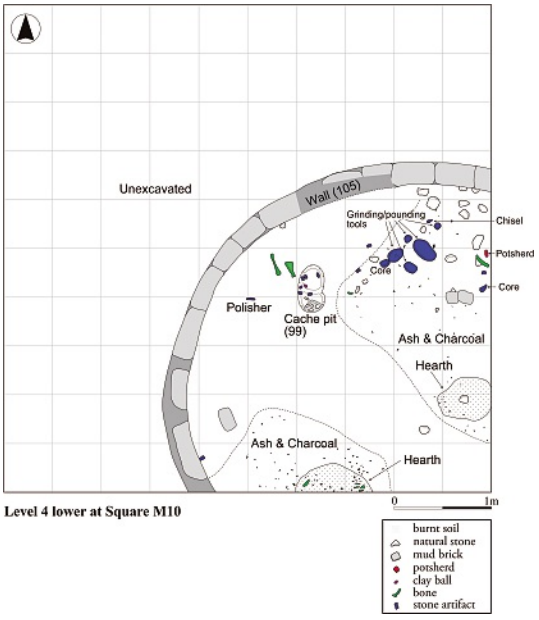


Fig. 16
Hacı Elamxanlı Tepe. Architectural features of the lower part of Neolithic Level 4 in Square M10

Fig. 17
Hacı Elamxanlı Tepe. Cache of sling balls and a chipped stone core in a pit from which some pieces were already removed, looking east

Radiocarbon dating

Seven radiocarbon dates have been obtained for the four Neolithic levels **(Tab. 1; Fig. 18)**. All of these dates are based on charcoal remains collected by experienced archaeologists from proper contexts such as fire hearths. An inconsistency is noted for the two dates of Level 4 (IAAA-120698 and 120699), which seem to differ considerably from one another. However, the 2-sigma range of IAAA-120698 includes a possible timespan of 5969–5955 cal. BCE, which is wholly bracketed within the 2-sigma range of the other date for Level 4, IAAA-120699. Therefore, sample IAAA-120698 cannot necessarily be considered as anomalous. Keeping this in mind, it is remarkable that all seven dates are fairly concentrated in a short period of the first quarter of the 6th millennium cal. BCE.

At the same time, they seem to comprise two groups, roughly 6000–5900 cal. BC for Levels 4 and 3, and 5900–5800 cal. BC for Levels 2 and 1. Interestingly, this is in accord with the stratigraphic observations presented above: Levels 4 and 3 shared the same basic architectural plan, the latter having been built directly on the former **(Figs. 12; 13)**. This is also the case for the relationship between Levels 2 and 1 **(Figs. 8; 10)**. The real change in architectural plan occurred only between Levels 3 and 2. The revealed sequence could be divided into two phases as indicated by radiocarbon dates.

(Y. Nishiaki)

Material remains

Pottery

The pottery from Hacı Elamxanlı Tepe excavated in 2012 consists of 21 sherds, including three pieces from the surface and the topsoil deposits, probably dating to the Bronze Age or later. Pottery sherds dating to the Neolithic period number 18 pieces. The rare occurrence of pottery sherds is striking in comparison with both the large quantity of chipped stone artifacts from this site (see below) and the huge amount of pottery sherds recovered from the nearby Neolithic site of Göytepe.[10] However, it should be noted that all four Neolithic levels yielded pottery sherds. Accordingly, despite the scarcity of pottery, the Neolithic levels of Hacı Elamxanlı Tepe excavated to date belong to the Pottery Neolithic.

[10] Guliyev/Nishiaki 2012a; Guliyev/Nishiaki 2012b.

Level	Context	Lab no.	Date bp	Cal BC (1 sigma)	Cal BC (2 sigma)
Level 1	HAJ2012 M10-54	IAAA-120693	7,000 ± 30	5974 calBC–5951 calBC (19.6%) 5917 calBC–5873 calBC (36.8%) 5863 calBC–5846 calBC (11.9%)	5985 calBC–5834 calBC (92.6%) 5826 calBC–5810 calBC (2.8%)
Level 2	HAJ2012 M10-48	IAAA-120694	6,960 ± 30	5890 calBC–5799 calBC (68.2%)	5971 calBC–5954 calBC (3.8%) 5912 calBC–5752 calBC (91.6%)
Level 2	HAJ2012 M10-68	IAAA-120695	6,930 ± 30	5838 calBC–5755 calBC (68.2%)	5882 calBC–5733 calBC (95.4%)
Level 3	HAJ2012 M10-15	IAAA-120696	7,070 ± 30	6001 calBC–5974 calBC (28.0%) 5952 calBC–5916 calBC (40.2%)	6015 calBC–5893 calBC (95.4%)
Level 3	HAJ2012 M10-79	IAAA-120697	7,060 ± 30	5992 calBC–5970 calBC (20.6%) 5955 calBC–5907 calBC (47.6%)	6012 calBC–5886 calBC (95.4%)
Level 4	HAJ2012 M10-96H	IAAA-120698	7,080 ± 30	6003 calBC–5974 calBC (29.5%) 5951 calBC–5917 calBC (38.7%)	6015 calBC–5895 calBC (95.4%)
Level 4	HAJ2012 M10-96I	IAAA-120699	6,950 ± 40	5885 calBC–5783 calBC (68.2%)	5969 calBC–5955 calBC (2.7%) 5907 calBC–5739 calBC (92.7%)

Tab. 1
Hacı Elamxanlı Tepe. Radiocarbon dates for the Neolithic levels excavated in 2012

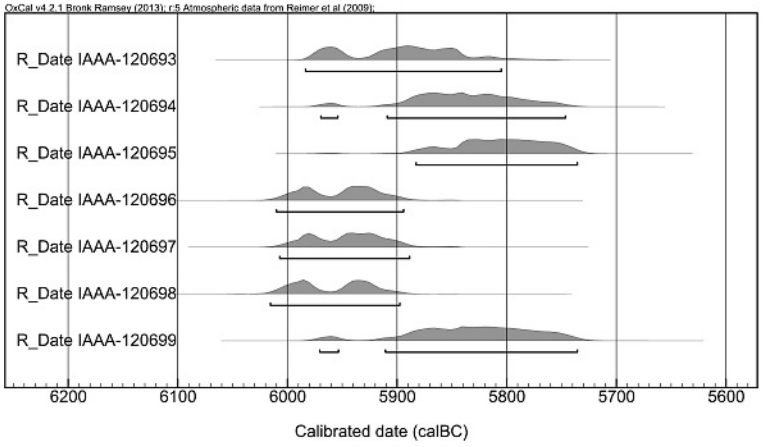


Fig. 18
Hacı Elamxanlı Tepe. Calibrated radiocarbon dates for the Neolithic levels

Technological characteristics

The Neolithic pottery of Hacı Elamxanlı Tepe is characterized by highly varied production techniques. While all of the sherds are from vessels made using coils or small slabs of clay, they exhibit great variability in other technological features such as the preparation of paste, surface treatment, decoration techniques, and firing method.

The Neolithic sherds are divided into four categories based on production technique. First, two sherds are assigned to *fine ware* **(Fig. 19)**. The paste of this category contains characteristically small grains of mica and occasionally small brown minerals with a diameter of 0.1–0.5 mm. The vessel wall is relatively thin, less than 10 mm. The interior surfaces are horizontally wet-smoothed **(Fig. 19,2. 4)**. As for the exterior surface, one of the two sherds is slipped after wet-smoothing, resulting in a brownish-gray color (7.5YR4/1) of the surface **(Fig. 19,1)**. The grayish-brown (7.5YR5/2) exterior surface of the other specimen is treated by light burnishing **(Fig. 19,3)**. Both of these sherds are well-fired and do not retain any trace of secondary firing.

The second category refers to *mineral tempered common ware,* which contains brown or reddish-brown mineral inclusions about 0.5–1.0 mm in diameter. Two sherds belong to this category. The exterior surface is treated by light burnish, while the interior surface is always wet-smoothed. These sherds are also well-fired, exhibiting a gray core.

The third and fourth categories consist of *mineral tempered coarse ware* and *chaff tempered coarse ware*. The *mineral tempered coarse ware* has plenty of black or reddish-black mineral inclusions with a diameter of 1.0–5.0 mm. The wall is relatively thick. The surfaces are treated by careful wet-smoothing or light burnishing. The exterior surface displays a grayish-brown color and the interior surface is reddish-brown. Both categories often show traces of secondary firing **(Fig. 20,2–3)**. Only one sherd contains a small amount of mica. The *mineral tempered coarse ware* comprises the most common pottery at Hacı Elamxanlı Tepe. Yet the paste and surface treatment techniques are fairly variable, suggesting that this category could be further divisible when a larger sample size is available next season.

Representing the second most common type, the *chaff tempered coarse ware* contains extensive 1.0–10.0 mm chaff inclusions, sometimes with grains. The wall is relatively thick (~15 mm). The exterior surface presents a dull brown or dull orange color and the interior is grayish-yellow-brown or dull yellow-orange in color **(Fig. 20,1)**. This pottery type is also well-fired and a gray core is sometimes identified in the section. Surfaces are well-smoothed at the early stage of drying.

Fig. 19
Hacı Elamxanlı Tepe. Neolithic painted pottery. – 1, 3 Exterior surfaces; – 2, 4 Interior surfaces

Fig. 20
Hacı Elamxanlı Tepe. Neolithic pottery. – 1 Chaff tempered coarse ware; – 2–3 Mineral tempered coarse ware; exterior (left) and interior (right) surfaces

Morphological characteristics

The recovered pottery assemblage does not include any complete vessels or fragments of the base and only consists of body and rim sherds. Therefore, a precise reconstruction of their vessel shape is difficult. More or less plausible reconstructions have been made for a few sherds only: the two sherds of the *fine ware* probably correspond to the shoulder **(Fig. 21,1)** and body part **(Fig. 21,2)** of small jars. The largest sherd recovered this season is the *chaff tempered coarse ware*, which would have been a part of deep bowl **(Fig. 21,3)**.

Decoration is limited to painting that is applied only to the fine ware. Motifs are restricted to geometric designs, for which a combination of horizontal, oblique, and zigzag lines show variability **(Fig. 21,1–2)**. The colors of paint are black

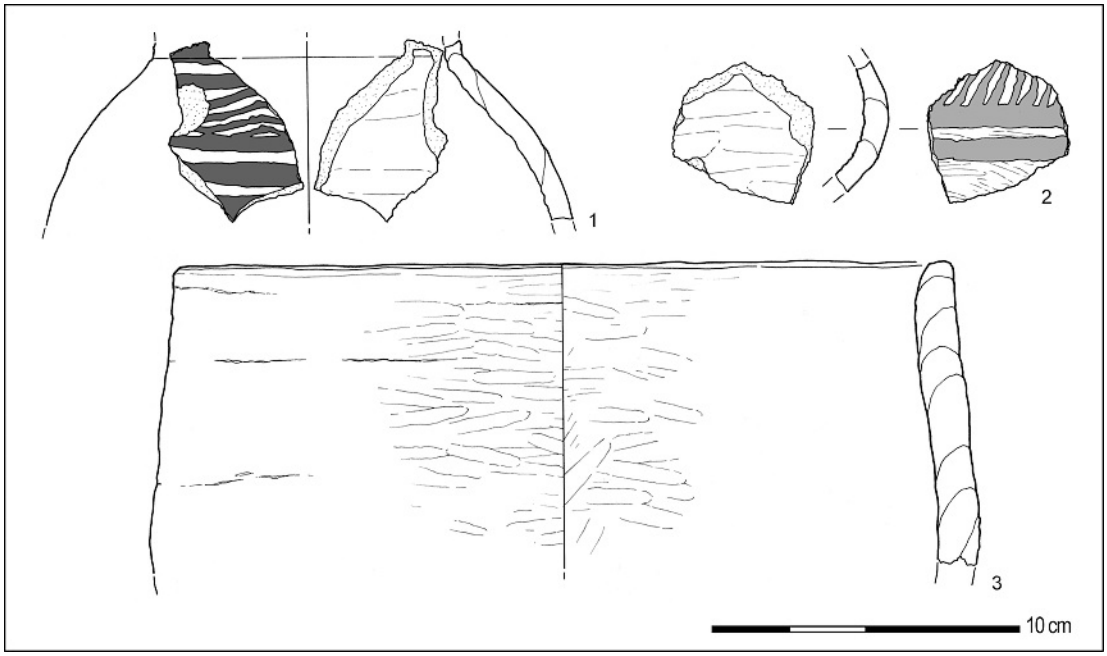


Fig. 21
Hacı Elamxanlı Tepe. Neolithic pottery. – 1–2 painted fine ware; – 3 chaff tempered coarse ware

(**Fig. 21,1**; 10YR1.7/1) or dark reddish-brown (**Fig. 21,2**; 2.5YR3/3). It seems that geometric decorations were painted on the upper body and relatively broad horizontal lines were painted near the widest part of the body of a small jar.

Archaeological context

Excavation contexts of the Neolithic pottery vary, including the ash deposit, pit, and ashy sediments on the floor. In Level 2, both of the painted fine ware sherds were discovered in the ash deposit **(Fig. 10)**. Furthermore, several sherds were recovered in a cluster from the ashy sediments of the large pit in the northwestern area in association with animal bones, charred botanical remains, and burnt clay. The pottery of Level 3 includes the current assemblage's largest sherd, which was a rim portion of the chaff tempered coarse ware **(Figs. 20,1; 21,3)** discovered this season *in situ* in the room fill near a small hearth **(Fig. 12)**. Level 4 yielded a single sherd of chaff tempered coarse ware, excavated in the ashy area near the hearth on the building floor **(Fig. 16)**.

The small sample size of sherds prevents us from conducting a statistical comparison of the pottery by level. Nonetheless, we may note that the lower levels yielded only coarse wares, while all the fine and common wares were discovered in the upper two levels.

Discussion

The pottery assemblage excavated at Hacı Elamxanlı Tepe is unique in the region and differs considerably from the well-known pottery assemblages of the Šomutepe-Šulaveri culture. First, the significantly rare occurrence of pottery at Hacı Elamxanlı Tepe is remarkable. Second, the incidence of clearly painted pottery also represents an important difference. A small amount of painted pottery does exist at Šomutepe-Šulaveri sites like Göytepe.[11] However, the decoration is always very simple and does not represent any recognizable motif. The existence of painted pottery of Hacı Elamxanlı Tepe is indisputable and no comparable pottery has been reported from Šomutepe-Šulaveri sites or other Neolithic sites in the region.[12] The highly elaborated techno-stylistic features rather suggest its resemblance to pottery of remote regions, including Samarra pottery of Upper Mesopotamia. Third, the technology of the mineral tempered coarse ware is also different. The common occurrence of mineral tempered coarse ware at Hacı Elamxanlı Tepe may be reminiscent of a frequently noted type in the lowest levels of Göytepe.[13] However, the mineral tempered coarse ware of Hacı Elamxanlı Tepe does not retain any relief decoration, which is typical of Šomutepe-Šulaveri

[11] Guliyev/Nishiaki 2012a, 75.
[12] cf. Helwing/Aliyev 2012.
[13] Guliyev/Nishiaki 2012a, 75.

	Obsidian	Red brown flint	Green tuff	Red dacite/ rhyolite	Other volcanic	Unidentified (non obsidian)	Total
Topsoil (n = 350)	74%	4%	4%	8%	4%	5%	100%
Level 1 (n = 794)	59%	14%	5%	11%	5%	6%	100%
Level 2 (n = 1987)	46%	38%	3%	7%	1%	6%	100%
Level 3 (n = 769)	54%	17%	6%	12%	4%	7%	100%
Level 4 (n = 535)	57%	14%	1%	22%	5%	1%	100%
Total	53%	24%	4%	10%	3%	5%	100%

Tab. 2 Hacı Elamxanlı Tepe. Frequency of raw material types of chipped stones

pottery.[14] Moreover, production techniques such as the selection of mineral inclusions and surface treatment differ significantly between the mineral tempered coarse wares of Hacı Elamxanlı Tepe and the typical Šomutepe-Šulaveri pottery of Göytepe.

In addition to the radiocarbon dates, these differences suggest that the finds at Hacı Elamxanlı Tepe represent a Neolithic pottery assemblage previously unknown in the Middle Kura region, predating the Šomutepe-Šulaveri phase of the Pottery Neolithic period. It might even represent one of the oldest Neolithic pottery assemblages in the southern Caucasus. Although we are not yet able to specify the origin of this pottery assemblage, we aim to define how pottery manufacturing started in the region. Important issues also worthy of future investigation include whether the first pottery was locally made or imported and what social and economic roles the oldest pottery played in the local community.

(Y. Arimatsu)

Stone artifacts

The first season of excavation in Square M10 of Hacı Elamxanlı Tepe yielded nearly 4,500 chipped stone artifacts. We sieved 50% of the Neolithic deposits to collect small remains, while all deposits with high artifact densities were sieved. The number of artifacts collected from Level 2 (ca. 2,000 pieces) is two to three times larger than other levels **(Tab. 2)** due in part to a high density of artifacts in the pit fills (see above). The overall volume of the Level 2 deposits was also increased by large pits that were dug into underlying levels.

Obsidian is the predominant raw material of chipped stones from Hacı Elamxanlı, accounting for ca. 45–60% **(Tab. 2)** of artifacts. However, the unsieved topsoil may have resulted in a collection biased towards obsidian, since this rock type is more visible than others in the field. Potential sources of obsidian found at this site are found in the Lesser Caucasus Mountains; our raw material sourcing analysis currently underway should allow us to identify more specific source locations.

Non-obsidian raw materials include red-brown flint, red dacite/rhyolite, green tuff, and other volcanic rocks. Red-brown flint is fine-grained and more than 10% of debitage (including unretouched flakes/blades, chips, and debris) retain cortex, the size of which is too small to indicate the nature or sources of parent rocks. Several flint outcrops are known in the upper portion of the Aghstafa River,[15] ca. 40–60 km from Hacı Elamxanlı Tepe, although the limestone area in the lower Aghstafa Valley may have other sources. Most of the other raw materials are locally available within a range of 10 km. Red dacite/rhyolite and other volcanic artifacts show weathered angular surfaces, indicating their derivation from outcrops. Green tuff occurs locally as fluvial cobbles.

Among these varied raw materials, the knapping of obsidian is distinct in several techno-typological aspects. For example, the proportion of retouched tools is quite high in obsidian assemblages **(Tab. 3)**, suggesting a greater degree of use and curation of the exotic raw material. Burins are the most frequent tool type **(Fig. 22,8–9)**, accounting for ca. 30%; their frequency is almost equal to spalls **(Tab. 4)**. These are followed in frequency by retouched and nibbled pieces, then splintered and denticulated pieces. Among others, trapezes form a distinct tool type **(Fig. 22,1–3)** that are made on bladelets segmented either by snapping or oblique truncation. Snapped ends are sometimes associated with slightly flat retouch on the dorsal surface. These retouch methods are observable on some bladelet segments (that are not exactly trapezoidal) recovered

[14] Chataigner 1995, 91–96, 112–117; Hansen/Mirtskhulava 2012, 77–82.

[15] Gasparyan 2010.

		Obsidian		Red brown flint		Green tuff		Red dacite/ rhyolite		Other volcanic		Unidentified (non obsidian)		Total	
		n	% by levels	n	% by levels	n	% by levels	n	% by levels	n	% by levels	n	% by levels	n	% by levels
Topsoil	Retouched tools	92	35%	0	0%	2	14%	3	10%	2	13%	0	0%	99	28%
	Debitage	163	63%	15	100%	11	79%	26	90%	12	80%	16	94%	243	69%
	Cores	5	2%	0	0%	1	7%	0	0%	1	7%	1	6%	8	2%
	Total	260	100%	15	100%	14	100%	29	100%	15	100%	17	100%	350	100%
Level 1	Retouched tools	206	44%	10	9%	2	5%	3	3%	0	0%	10	22%	231	29%
	Debitage	260	55%	99	88%	35	92%	88	97%	36	97%	35	76%	553	70%
	Cores	3	1%	4	4%	1	3%	0	0%	1	3%	1	2%	10	1%
	Total	469	100%	113	100%	38	100%	91	100%	37	100%	46	100%	794	100%
Level 2	Retouched tools	320	35%	14	2%	7	13%	8	6%	0	0%	13	11%	362	18%
	Debitage	585	64%	710	95%	46	87%	124	92%	19	100%	102	88%	1586	80%
	Cores	9	1%	26	3%	0	0%	3	2%	0	0%	1	1%	39	2%
	Total	914	100%	750	100%	53	100%	135	100%	19	100%	116	100%	1987	100%
Level 3	Retouched tools	156	38%	1	1%	6	13%	6	6%	2	6%	1	2%	172	22%
	Debitage	259	62%	124	95%	38	83%	86	92%	30	94%	45	88%	582	76%
	Cores	1	0%	6	5%	2	4%	1	1%	0	0%	5	10%	15	2%
	Total	416	100%	131	100%	46	100%	93	100%	32	100%	51	100%	769	100%
Level 4	Retouched tools	116	38%	2	3%	1	17%	12	10%	2	8%	0	0%	133	25%
	Debitage	187	61%	66	90%	4	67%	102	88%	23	88%	5	71%	387	72%
	Cores	4	1%	5	7%	1	17%	2	2%	1	4%	2	29%	15	3%
	Total	307	100%	73	100%	6	100%	116	100%	26	100%	7	100%	535	100%

Tab. 3
Hacı Elamxanlı Tepe. Frequency of general classes of chipped stones by raw material types

together with trapezes in the same contexts or in close proximity. We identified these retouched bladelet segments as unfinished trapezes **(Fig. 22,5–7)**.

Most obsidian tools are made on blades or bladelets that show unidirectional dorsal flaking scars. The evidence for on-site obsidian-blade production is scarce but indicated by a few blade cores that were subsequently exploited for expedient flake removal **(Fig. 22,14)**. On the other hand, the manufacture of obsidian bladelets is more evident from several prismatic bladelet cores **(Fig. 22,11–12)** and more than two dozen platform tablets with bladelet scars. The bladelet cores and platform tablets often show wide working surfaces extending around the circumference of the striking platform, somewhat like "bullet-shaped cores."[16]

In comparison with obsidian, non-obsidian raw materials show much lower percentages of retouched tools and different proportions of tool types **(Tabs. 3; 4)**. For example, sickle elements are mainly produced on red-brown flint, green tuff, and unidentified non-obsidian materials **(Fig. 23)**, although these artifacts may be underrepresented in obsidian due to the difficulty of recognition. Scrapers and retouched flakes account for large proportions of red dacite/rhyolite and other volcanic rocks **(Fig. 22,10)**. Notably, some trapezes and burins are made of red-brown flint in addition to obsidian **(Fig. 22,4)**.

The blade/bladelet form occurs much less frequently in non-obsidian debitage and cores **(Fig. 22,13)** and their forms are not as regular as obsidian artifacts. The proportions of blades/bladelets are greater in red-brown flint and green tuff than red dacite/rhyolite or other volcanic rocks and

[16] Wilke 1996.

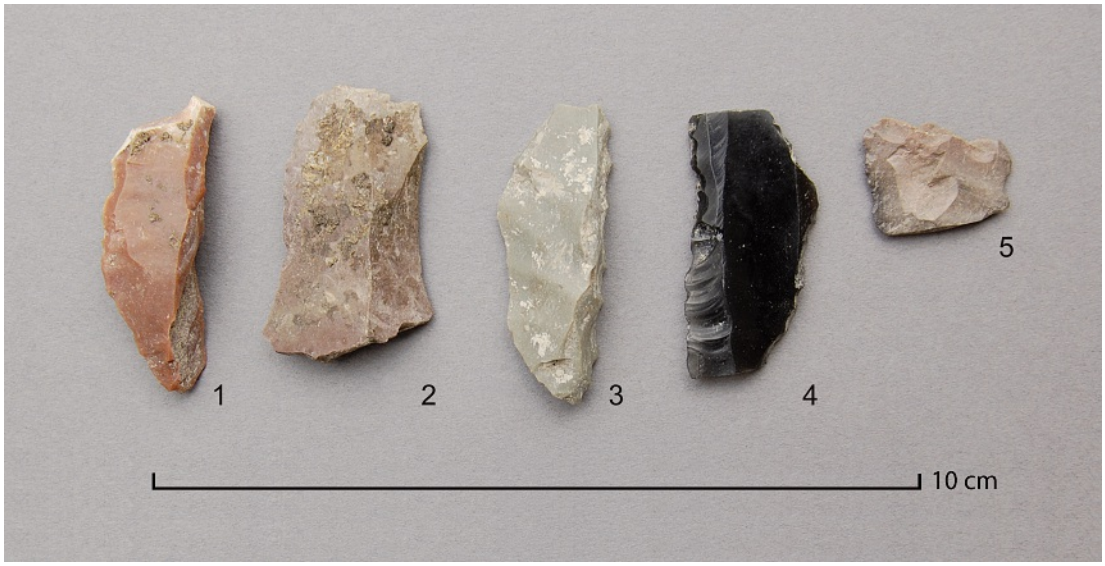


Fig. 22
Hacı Elamxanlı Tepe. Sickle elements. – 1 red brown flint; – 3 green tuff; – 4 obsidian; – 2, 5 unidentified non-obsidian raw material (2 is coated with bitumen remains, 5 is burnt)

	Obsidian (n = 798)	Red brown flint (n = 27)	Green tuff (n = 16)	Red dacite/ rhyolite (n = 29)	Other volcanic (n = 4)	Unidentified (non obsidian) (n = 24)	Total (n = 898)
Trapezes	1.9%	7.4%	0.0%	0.0%	0.0%	0.0%	1.9%
Unfinished trapezes	2.8%	3.7%	0.0%	0.0%	0.0%	0.0%	2.6%
Sickle elements	0.8%	37.0%	43.8%	0.0%	0.0%	45.8%	3.8%
Borers	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%
Scrapers	0.9%	0.0%	18.8%	20.7%	25.0%	8.3%	2.1%
Denticulated blades	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%
Denticulated flakes	0.6%	3.7%	0.0%	6.9%	25.0%	4.2%	1.1%
Notched blades	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%
Notched flakes	0.1%	0.0%	0.0%	6.9%	0.0%	0.0%	0.3%
Retouched blades	11.4%	0.0%	0.0%	0.0%	0.0%	0.0%	10.1%
Retouched flakes	3.1%	18.5%	25.0%	62.1%	50.0%	4.2%	6.1%
Nibbled blades	5.3%	0.0%	0.0%	0.0%	0.0%	0.0%	4.7%
Nibbled flakes	0.6%	0.0%	0.0%	0.0%	0.0%	4.2%	0.7%
Burins	29.1%	25.9%	0.0%	3.4%	0.0%	12.5%	27.1%
Tool spalls	32.1%	3.7%	12.5%	0.0%	0.0%	12.5%	29.2%
Splintered pieces	4.1%	0.0%	0.0%	0.0%	0.0%	4.2%	3.8%
Truncations	1.3%	0.0%	0.0%	0.0%	0.0%	4.2%	1.2%
Others	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Tab. 4
Hacı Elamxanlı Tepe. Frequency of retouched tools from Levels 1–4 by raw material types

the blades/bladelets of the former raw materials are often made into sickle elements, for which flakes are also used as blanks.

Among the techno-typological patterns described above, a potential chronological marker is the smaller proportion of obsidian (ca. 45–60%) at Hacı Elamxanlı Tepe than sites of the Šomutepe-

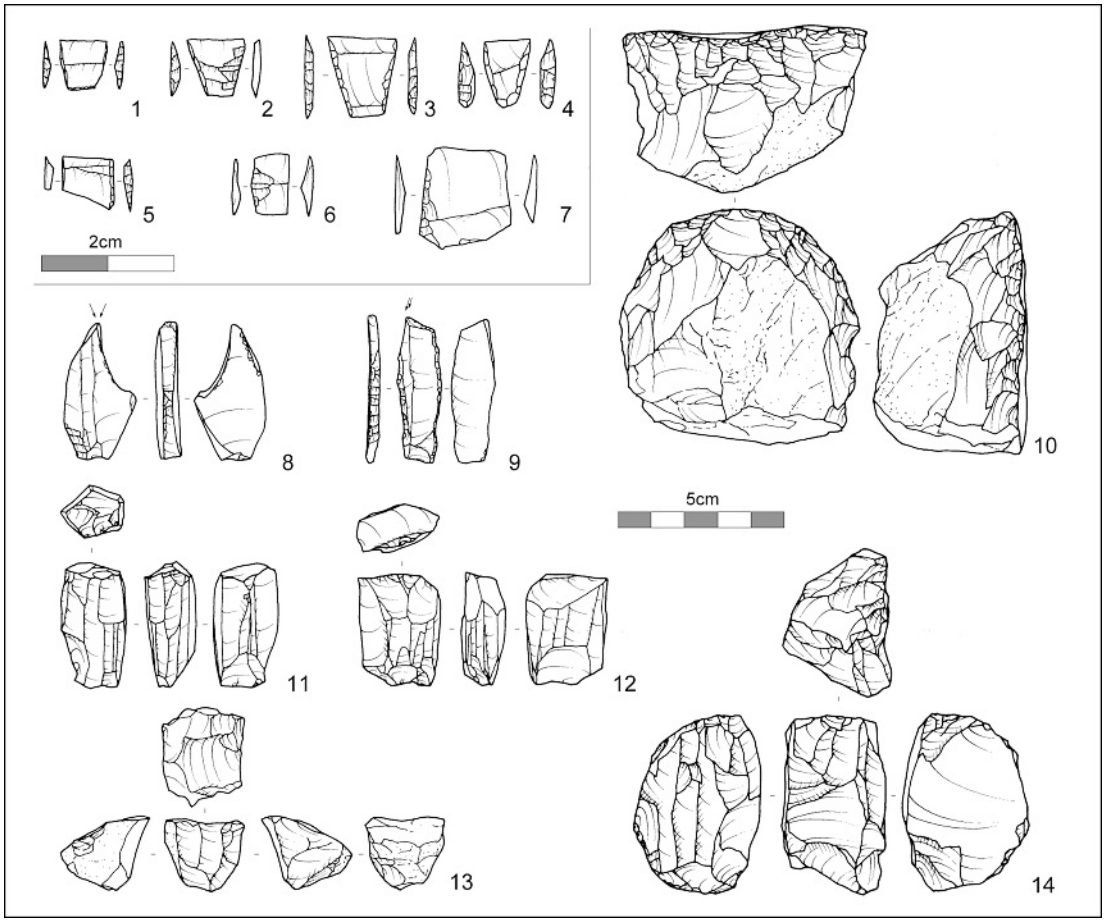


Fig. 23
Hacı Elamxanlı Tepe. Chipped stone artifacts. – 1–4 trapezes; – 5–7 unfinished trapezes; – 8–9 burins; – 10 thick round scraper; – 11–13 bladelet cores; – 14 blade core re-used for flake production (1–3, 5–9, 11, 12, and 14 obsidian; 4 and 13 red brown flint; 10 red dacite/rhyolite)

Šulaveri culture (84–87%).[17] In this sense, it would be worthwhile to examine how the flint industry at Hacı Elamxanlı Tepe compares with flint-dominant assemblages (both Aceramic and Late Neolithic) in the southwestern foothills of the Greater Caucasus, such as at Darkvety Layer IV and the Nagutni type sites.[18]

Another more significant feature of the Hacı Elamxanlı Tepe lithics is the abundance of trapezes based on the production of bladelets from both obsidian and flint. Although these techno-typological elements are not absent in the Göytepe and other Šomutepe-Šulaveri assemblages,[19] they are manifest more clearly at Hacı Elamxanlı Tepe. Cultural historical roots of trapezes and bladelets may be traced back to "Mesolithic" assemblages in the Caucasus,[20] though comparable materials that are chronologically and geographically closest to Hacı Elamxanlı Tepe can be found in some Aceramic Neolithic assemblages in the western part of the Southern Caucasus, such as Anaseuli I and Darkvety Layer IV.[21] The resemblance to these Aceramic Neolithic assemblages is consistent with the radiocarbon dates of Hacı Elamxanlı Tepe preceding Göytepe and also with the rare occurrence of pottery sherds from Hacı Elamxanlı Tepe.

From a wider geographic perspective, it is also notable that similar trapezes are included in early Late Neolithic (or Pottery Neolithic) assemblages in northern Mesopotamia, such as at Kashkashok II,[22] Thalathat II,[23] and Sabi Abiyad Levels 4–10.[24] While the former two sites probably predate Hacı Elamxanlı Tepe by a few hundred years,[25] Sabi Abiyad Levels 1–7 (the Early Halaf and Transitional Phases) appear roughly contemporary with Levels 1–4 of

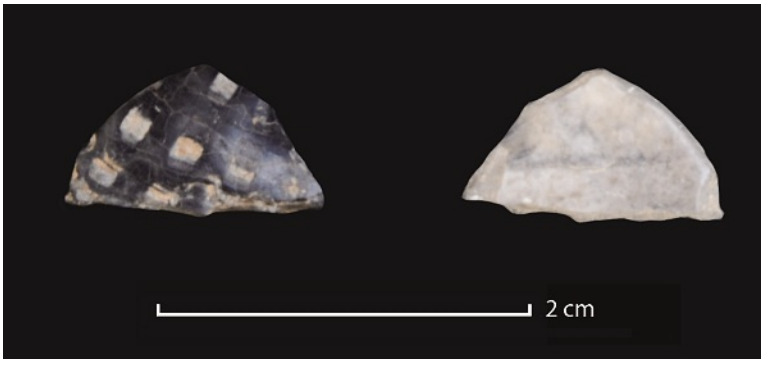
[17] Korobkova 1996, 74.
[18] Kiguradze/Menabde 2004, 353–354.
[19] Kiguradze/Menabde 2004; Hansen *et al.* 2006, 26.
[20] Kozlowski 1996.
[21] Korobkova 1996, 59–63.
[22] Nishiaki 1991, 1993.
[23] Nishiaki 1995.
[24] Copeland 1996.
[25] Nishiaki/Le Mière 2005.

Fig. 24
Hacı Elamxanlı Tepe. A burnt clay specimen with "basket" impression from Level 1

Hacı Elamxanlı Tepe.[26] This indicates that ongoing discussions on Neolithic cultural links between the southern Caucasus and northern Mesopotamia, currently centered on the Šomutepe-Šulaveri and Halaf cultures,[27] also need to consider earlier time periods. This should help us better clarify the picture of Neolithization in the southern Caucasus.

The excavation at Hacı Elamxanlı Tepe also recovered a significant number of ground stone artifacts, including upper and lower grinding tools, pounders, crushing cobbles, and pebbles (or sling stones), indicating a range of tool types broadly similar to the Göytepe assemblage. Another similarity with Göytepe is the depositional (or abandonment) processes of ground stones, which were often found in clusters on floors, apparently as *de facto* refuse or a cache surrounded by curvilinear walls.[28] We plan to conduct detailed examinations of tool composition, raw material use, and morphometric attributes of food processing tools as well as their stratigraphic patterns in order to clarify when and how cereal processing technology developed in this early agricultural settlement. (S. Kadowaki)

Fig. 25
Hacı Elamxanlı Tepe. A shell fragment from Level 1



Miscellaneous finds

In addition to pottery, chipped and ground stone artifacts and bone tools (see below), the artifact assemblage includes a variety of other Neolithic objects. The most notable are burnt clay specimens, which are far more numerous than pottery sherds. They were commonly found in all occupation levels, especially from the ashy sediments and ash pits of Levels 1 and 2. The fact that burnt clay specimens were rarely found at Göytepe poses intriguing questions regarding their function or use. Their shapes are rather amorphous. The discovery of specimens with "basket" and "cord" impressions **(Fig. 24)** suggests that the present burnt clay collection contains fragments of the clay coating of organic containers.

Another commonly found group of objects is sling stones or missiles. The majority was made of stone, but two were made from clay. Sling missiles were recovered from all Neolithic levels. A noteworthy context is the cache of Level 1, located inside a circular building near the wall. Sling stones were found together with obsidian pieces, clay balls, ground stones, and animal bones in this cache **(Fig. 9)**. Both sling stones and clay balls have a similar shape and size, approximately 3–5 cm in length and about 3 cm in width.

Finds of ornamental objects include one interesting piece of shell. This fragment of a bivalve was recovered from the ashy sediment of Level 1 **(Fig. 25)**. The maximum diameter is 15 mm. Its overall shape is semicircular and the dorsal surface exhibits a grid-like pattern, suggesting that this shell possibly belongs to the family Cardiidae, which includes species known in the Caspian and the Black Sea.

(T. Miki)

Botanical remains

We took 32 flotation samples from 14 contexts of Square M10 during the 2012 season. The amount

[26] Campbell 2007.
[27] For example, Hansen *et al.* 2007; Badalyan *et al.* 2007.
[28] Guliyev/Nishiaki 2012a, 77.

Fig. 26
Hacı Elamxanlı Tepe. Charred remains from Square M10. – 1 spikelet base of hulled wheat; – 2 wheat grain; – 3 barley grain (scale bar = 1 mm)

of sediments for each sample was between 1 and 6 liters, with an average of 2.9 liters. Their contexts include ash pit, hearth, and building floor. One circular structure in Level 4 was sampled in detail because numerous artifacts were found *in situ* on its floor under collapsed mudbrick walls. The samples were collected according to 1 × 1 m sub-grids (A to I) for both macro-botanical and micro-fossil analysis (see above).

The macro-botanical samples were processed by the water-flotation method using a 0.3 mm mesh sieve.[29] Abundant samples of light fractions were collected, but only three of them have been identified to date. The plant remains are mostly charred seeds and chaff, with some mineralized seeds of Boraginaceae. Although the seed density is rather low (on average 11 items per liter), at least two kinds of cereals and several wild species have been identified.

Among food plants, glumes of hulled wheat (*Triticum* sp.), barley rachis (*Hordeum vulgare*), grains of barley and wheat, and one stone of hawthorn (*Crataegus* sp.) were recovered **(Fig. 26)**. Wild taxa are represented by seeds of Asteraceae, Boraginaceae, Brassicaceae, Chenopodiaceae, Fabaceae, and Poaceae. One of the samples contained more than 100 *Chenopodium*-type seeds. Other than the flotation samples, some mineralized hackberry stones (*Celtis* sp.), a common fruit in prehistoric West Asia, were retrieved by hand in the field. The cereals probably include domesticated barley and wheat. However, as the number of remains is too small and most of them are fragmentary, we need more samples for further identification and interpretation of human plant consumption.

(C. Akashi)

Faunal remains

During the 2012 season, a total of 5,984 fragments of animal bones, teeth, antlers, and horn cores were discovered in Square M10. Worked bone tools were also collected (see below). These materials were recovered by both hand-picking and dry-sieving methods. In contrast to the situation at Göytepe, the preservation of faunal remains is poor: almost all specimens are highly fragmented and some are heavily burnt (12%). This suggests differences between the sites in terms of climatic/sedimentological environments, site formation processes, and human activities (e.g., exploitation intensity of animal resources). The poor preservation makes it difficult to identify species from the faunal remains. As a result, the majority of specimens has been identified only to size class (**Tab. 5**).

To date, 15 species have been identified **(Tab. 5)**. These include sheep (*Ovis aries*), goat (*Capra hircus*), cattle (*Bos taurus*), wild or domestic pig (*Sus scrofa*), dog (*Canis familiaris*), red deer (*Cervus elaphus*), gazelle (*Gazella subgutturosa*), hare (*Lepus capensis*), tortoise (*Testudo graeca*), Aves (at least two species), rodent, mollusc, reptile and frog. It is likely that sheep, goats, cattle, and possibly pigs represent domestic animals based on their sizes and morphologies.

Sheep and goats account for more than 80% of the identified faunal remains. Of these, sheep are the predominant taxon in each level. Survivorship for sheep and goats has not yet been analyzed, but most individuals are apparently younger than two years old based on their toothwear patterns. Remains of cattle and pigs are scarce and the latter vary in number by levels. It is important to note that the frequency of cattle increases gradually in the upper levels.

Remains of hunted animals are limited. Among them, bird remains are most notable. Their skeletons are represented only by forelimb elements, which may reflect varied uses of bird remains. One specimen from Level 2 is worked, probably during the process of bead manufacture. Otherwise, it is possible that the inhabitants of this site were interested in feathers.

Based on radiocarbon dating, Hacı Elamxanlı Tepe was settled as early as in the beginning of

[29] The water flotation equipment at the Göytepe expedition house was prepared by Ken'ichi Tanno during the 2009 season.

	Level 1 (n = 1027)	Level 2 (n = 2568)	Level 3 (n = 995)	Level 4 (n = 815)	Total (n = 5405)
Identified					
Ovis aries	24	68	7	29	128
Capra hircus	9	8	3	9	29
Ovis aries/Capra hircus	56	218	29	84	387
Bos taurus	6	10	1	1	18
Sus scrofa	12	8	4	5	29
Gazella subgutturosa	2	1	1	1	5
Ovis/Capra/Gazella	16	47	7	4	74
Ovis/Capra/Gazella/Capreolus	8	0	0	3	11
Bos/Cervus	1	0	1	0	2
Canis familiaris	1	0	1	0	2
Cervus elaphus	1	2	1	1	5
Cervid	0	0	0	1	1
Gazella/Capreolus	0	1	0	0	1
Lepus capensis	0	0	0	2	2
Tortoise	7	6	3	5	21
Bird	0	9	1	1	11
Mollusc	1	0	0	0	1
Reptile	1	1	0	0	2
Small Rodent	6	8	0	3	17
Frog	1	1	1	1	4
Total	152	388	60	150	750
Indeterminate					
Small Mammal	2	2	0	1	5
Small/Medium Mammal	19	400	32	26	477
Medium Mammal	765	1772	859	620	4016
Medium/Large Mammal	12	2	2	1	17
Large Mammal	77	4	42	17	140
Total	875	2180	935	665	4655

Tab. 5 Hacı Elamxanlı Tepe. Number of faunal specimens excavated in 2012

the 6th millennium BCE (and also probably the late 7th millennium BCE). Our zooarchaeological results demonstrate the existence of domestic livestock on the northern side of the Lesser Caucasus as early as the 6th millennium BCE, which represents the oldest and most reliable evidence of animal domestication in the region.

Worked bone and antler tools

The 2012 excavations yielded 83 worked bone and antler tools, accounting for 1.4% of the total faunal remains. The assemblage consists of awls, spatulae, bipoints, palettes, *buttonettes*, hammers, and ornaments. Of these, awls represent the most common tool type (n = 43), which were produced primarily on long bones of medium-sized mammals (mainly sheep and goats). Many specimens are made from blanks acquired by the groove-and-splinter technique, which were then finished by abrasion. Although other types of tools are represented by small sample sizes, observations of surface traces suggest that these were also made using similar techniques.

(S. Arai)

Discussion

The main goal of the 2012 excavations was to define the chronological position of Hacı Elamxanlı Tepe and to clarify whether this Neolithic site predates the Šomutepe-Šulaveri phase. As described above, the results indicate this likelihood. The radiocarbon dates obtained from the latest levels of Hacı Elamxanlı Tepe point to the very early centuries of the 6th millennium BCE, a period earlier than is generally known for the Šomutepe-Šulaveri sites. Although a series of dates run in the 1970s broadly dated the Šomutepe-Šulaveri culture to the 6th–5th millennium BCE,[30] recent, more controlled investigations have narrowed its temporal span to the early-middle part of the 6th millennium BCE. For instance, the resumed excavations at Aruchlo in the Republic of Georgia have assigned its occupation duration to between 5800 and 5300 BCE.[31] Similarly, the oldest levels of Mentesh Tepe, approximately 10 km east of Hacı Elamxanlı Tepe, have yielded comparable materials dating to the second quarter of the 6th millennium BCE.[32] Our excavations at Göytepe also provide a similar picture. Whilst the excavations have not reached virgin soil, the major portion of the 9 m thick Šomutepe-Šulaveri cultural sequence has been dated to the second and third quarters of the 6th millennium BCE.[33] Given that the radiocarbon dates from its lower levels close to the virgin soil are not earlier, the settlement of Göytepe might have been occupied after the abandonment of Hacı Elamxanlı Tepe.

All of these data indicate that Hacı Elamxanlı Tepe is the oldest Pottery Neolithic settlement known to date in the Middle Kura Valley. Moreover, this settlement represents one of the oldest Neolithic sites in the southern Caucasus. Apart from sites requiring further documentation[34] and those without evidence of farming,[35] the oldest group of Neolithic sites in the southern Caucasus has been dated to the interface period of the 7th–6th millennium BCE, to which Hacı Elamxanlı Tepe is quite comparable. In the region east of the Lesser Caucasus, such sites are known in the Mil-Qarabagh plain, approximately 200 km southeast of Hacı Elamxanlı Tepe.[36] On the southern side of the Lesser Caucasus, the oldest traces of farming settlements have been detected in the lowest levels of Aratašen and Aknašen-Khatunarkh. Similarly, their radiocarbon dates point to the early 6th millennium BCE.[37] With the addition of Hacı Elamxanlı Tepe in the Middle Kura Valley to this list of the earliest farming settlements, it is evident that Neolithization was underway on both sides of the Lesser Caucasus Mountains almost simultaneously.

Chronologically placed prior to the main sites of the Šomutepe-Šulaveri culture, Hacı Elamxanlı Tepe raises important questions. For example, can we interpret it to represent a completely different culture or an earlier phase of the same cultural entity? Indeed, this question gets to the point of a major issue, which is the origin of the Šomutepe-Šulaveri culture. The archaeological record from Hacı Elamxanlı Tepe should certainly make important contributions to clarifying this issue. However, it is premature to explore this issue in depth at the present stage of research, since the current excavations of Hacı Elamxanlı Tepe are too limited in scale to understand certain aspects such as settlement organization and architectural techniques. More importantly, our excavations at Göytepe have not defined the oldest stage of the long Šomutepe-Šulaveri cultural sequence, whose assemblage is key for comparison to Hacı Elamxanlı Tepe.

Whatever the case, it is nonetheless clear that the available evidence has important implications for understanding the origin and development of the Šomutepe-Šulaveri culture. One implication is that although continuity is seen between Hacı Elamxanlı Tepe and the typical Šomutepe-Šulaveri sites, differences are also evident. For example, a relatively large building size is uniquely different at Hacı Elamxanlı Tepe[38] despite other similarities in architecture, such as the use of plano-convex mudbricks and the (semi-)circular floorplan. Common traces of domestic activities within the building also differ. However, this conclusion is based on a limited excavated area, while such traces are often found in an open-air courtyard at Göytepe. Among the material remains, the rarity of pottery and the common manifestation of mineral tempered ware at Hacı Elamxanlı Tepe are comparable to features in the lower levels of the Göytepe sequence.[39] However, as already noted, the technology for making those wares differs and the presence of painted fine ware at Hacı Elamxanlı Tepe represents a remarkable difference. The lithic assemblages also show similarities and differences. While both assemblages are characterized by obsidian pressure debitage, the use of obsidian is less common and trapeze-arrow-

30 Нариманов 1987, 194; Korobkova 1996, 74.
31 Hansen/Mirtskhulava 2012, 85–86.
32 Lyonnet/Guliyev 2012, 87–88.
33 Guliyev/Nishiaki 2012b.
34 Museibli *et al.* 2009; 2010. The small settlement of Hasansu, also in the Middle Kura Valley, is reported to contain an aceramic Neolithic layer below a Šomutepe-Šulaveri layer.
35 Arimura *et al.* 2010.
36 Helwing/Aliyev 2012.
37 Badalyan *et al.* 2010.
38 Guliyev/Nishiaki 2012b.
39 Guliyev/Nishiaki 2012b.

heads and flint scrapers are far more abundant at Hacı Elamxanlı Tepe than at Göytepe. In addition, the blade size of tools at Hacı Elamxanlı Tepe is apparently smaller, resulting in a higher frequency of bladelets than blades. The device and technique used for pressure debitage must have differed in the production of these different sized blanks.[40]

These lines of evidence most likely reflect the unique formation processes of the Šomutepe-Šulaveri culture. In other words, the material elements characterizing the Šomutepe-Šulaveri culture such as those known at Šomutepe, Aruchlo, and Göytepe, did not appear in the Middle Kura as a "package." Instead, these elements appeared one by one. The picture of the Šomutepe-Šulaveri culture defined in the 1980s[41] is thus considered as a collective view to cultural changes in the early centuries of the 6th millennium BCE. Previous attempts at dividing the Šomutepe-Šulaveri culture to several stages have been mainly based on pottery, relying on limited information of their stratigraphic contexts.[42] The data from both Hacı Elamxanlı Tepe and Göytepe would provide a valuable framework for investigating the changing cultural patterns over a long timeframe.

The second implication on the early stages of the Šomutepe-Šulaveri culture is related to the cultural link with the Middle East, which has been repeatedly mentioned in the literature.[43] The discovery of Hacı Elamxanlı Tepe allows us to evaluate this with a longer chronological perspective. Most important is the discovery of painted fine ware, whose exceptionally high quality strongly suggests it was imported from regions to the south. Sherds of imported painted wares such as Samarra and Halaf from Anatolia and Northern Mesopotamia have been known from the southern Lesser Caucasus.[44] If the provenance is confirmed, the two sherds from Hacı Elamxanlı Tepe are the first examples from the northern foothills. The occurrence of a unique type of trapeze-arrowheads at Hacı Elamxanlı Tepe also indicates a link with the south. Although the trapeze-arrowheads themselves were widely utilized in late 7^{th} and early 6^{th} millennium BC contexts from the "East Wing of the Fertile Crescent" stretching from Anatolia to southern Iran,[45] those of the southern Caucasus include a distinct type. This is the bilateral pressure-flaked trapeze, whose lateral sides are segmented by snapping, and the snapped ends are associated with flat pressure retouch on the dorsal surface **(Fig. 22,2.6)**. This unique type of arrowhead also occurs in Upper Mesopotamia. Remarkably, parallel arrowheads have been discovered together with Samarra pottery at Sabi Abyad I in Levels 6–4, dated to the same period of ca. 6000–5900 BCE at Hacı Elamxanlı Tepe.[46] As mentioned in the section on chipped stone artifacts, the overall characteristics of the lithic industry at Hacı Elamxanlı Tepe never indicate a foreign origin but the closest parallels are found in the earlier period of the southern Caucasus. The recovery of unique arrowheads as well as painted ceramics attests to interactions between the southern Caucasus and regions to the south at the 7^{th}–6^{th} millennium boundary period.

(Y. Nishiaki)

Conclusion

The 2012 excavations of Hacı Elamxanlı Tepe revealed rich Neolithic occupational deposits on the upper portions of the mound. The associated archaeological evidence, including radiocarbon dates and traces of plant and animal domestication, indicates that those deposits are derived from an early farming community from the very early centuries of the 6th millennium BCE. This corresponds to the oldest Pottery Neolithic phase in the southern Caucasus. It is evident that Hacı Elamxanlı Tepe possesses a great deal of potential for investigating the origin and development of early farming communities. It also demonstrates that the Neolithic communities appeared as early as the beginning of the 6th millennium BCE, in tandem with other regions on both sides of the Lesser Caucasus Mountains.

It remains to be determined whether the cultural entity of Hacı Elamxanlı Tepe signifies a new culture or if it represents an early phase of the Šomutepe-Šulaveri culture. However, similarities and differences in material remains, such as circular mudbrick buildings, mineral-tempered pottery, and the chipped stone industry indicate that the entity of Hacı Elamxanlı Tepe embodies an important formational stage in the Šomutepe-Šulaveri culture. Although the 2012 excavations were limited to the latest levels, further excavations at Hacı Elamxanlı Tepe are expected to reveal earlier ones. More evidence for defining this cultural process over an even longer chronological perspective will be obtained over the next seasons.

(Y. Nishiaki and F. Guliyev)

[40] Wilke 1996; Badalyan *et al.*, 2010.
[41] Нариманов 1987.
[42] Chataigner *et al.* 1995; Kiguradze/Menabde 2004.
[43] Нариманов 1987; Korobkova 1996.
[44] Нариманов 1987; Badalyan *et al.* 2010.
[45] Kozlowski 1999.
[46] Akkermans 1996.

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Yoshihiro Nishiaki
The University Museum
The University of Tokyo
Tokyo 113-0033
Japan
E-mail: nishiaki@um.u-tokyo.ac.jp

Farhad Guliyev
Institute of Archaeology and Ethnography
of the Academy of Sciences of Azerbaijan
Baku AZ1143
Azerbaijan
E-mail: fred_amea@mail.ru

Seiji Kadowaki
Nagoya University Museum
Nagoya University
Nagoya 464-8601
Japan
E-mail: kadowaki@num.nagoya-u.ac.jp

Yui Arimatsu
Department of Archaeology
Hiroshima University
Higashi Hiroshima 739-8511
Japan
E-mail: yui_a_0513@yahoo.co.jp

Yuichi Hayakawa
Center for Spatial Information Science
The University of Tokyo
Tokyo 113-0033
Japan
E-mail: hayakawa@csis.u-tokyo.ac.jp

Kazuya Shimogama
Ancient Orient Museum
Tokyo 170-8630
Japan
E-mail: kzyshmgm2@hotmail.com

Takehiro Miki
Department of Archaeology
he University of Tokyo
Tokyo 113-0033
Japan
E-mail: lambtake@yahoo.co.jp

Chie Akashi
Faculty of Letters, Arts and Science
Waseda University
Tokyo 162-8644
Japan
E-mail: cats@moegi.waseda.jp

Saiji Arai
Department of Archaeology
The University of Tokyo
Tokyo 113-0033
Japan
E-mail: rhino_deracine@yahoo.co.jp

Shahin Salimbeyov
Institute of Archaeology and Ethnography
of the Academy of Sciences of Azerbaijan
Baku AZ1143
Azerbaijan
E-mail: salimbeyov@hotmail.com

Summary

Hacı Elamxanlı Tepe is a small Neolithic mound situated near Tovuz in the Middle Kura Valley, west Azerbaijan. It was discovered during a site reconnaissance survey conducted in 2011 in the vicinity of Göytepe, an important Neolithic mound from the Šomutepe-Šulaveri cultural phase. Göytepe is known as one of the oldest full-fledged Neolithic sites in the southern Caucasus. Since the surface collection suggested an earlier Neolithic date for Hacı Elamxanlı Tepe than for Göytepe, test excavations were carried out in the summer of 2012. The results demonstrate that this settlement indeed derives from a very early Pottery Neolithic community from the beginning of the 6th millennium BCE or earlier, predating the major occupation period of Šomutepe-Šulaveri sites such as Göytepe and Aruchlo. At the same time, similarities and differences are revealed between the cultural assemblages of Hacı Elamxanlı Tepe and the Šomutepe-Šulaveri sites. These findings point out that more substantial investigations of this mound should lead to our better understanding the origin of the Šomutepe-Šulaveri culture, the earliest farming community in the region.

Резюме

Хаджи Эламхали тепе, расположенный недалеко от Товуза в среднем течении Куры, Западный Азербайджан, представляет собой небольшой холм-поселение эпохи неолита. Памятник был обнаружен в 2011 году при проведении археологической разведки местности в непосредственной близости от Гёйтепе, ключевого памятника, относящегося к неолитической культуре Шомутепе-Шулавери. Гёйтепе известен как один из древнейших памятников эпохи неолита на Южном Кавказе. Однако, сборный материал позволил предположить более раннюю дату для Хаджи Эламхали тепе, чем для Гёйтепе. Результаты тестовых раскопок, проведённых летом 2012 года наглядно демонстрирует заселение памятника начиная с эпохи раннего керамического неолита начала 6-го тыс. до нашей эры или раньше, непосредственно перед возникновением памятников культуры Шомутепе-Шулавери, таких как Гёйтепе и Арухло. В то же время, были выявлены как сходства – так и различия между культурными комплексами Хаджи Эламхали тепе и памятников типа Шомутепе-Шулавери. Полученные нами результаты указывают на необходимость дальнейшего исследования памятника Хаджи Эламхали тепе, что, по всей видимости, позволит лучше понять происхождение Шомутепе-Шулавери как наиболее ранней земледельческой культуры в регионе.