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Volume 2

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Contents of Vol. 2

Islamic Archaeology

Late Prehistoric Investigations at Shakar Tepe, the Shahrizor Plain, Iraqi Kurdistan: Preliminary Results of the First Season (2019)

Takahiro Odaka*, Osamu Maeda**, Kazuya Shimogama***, Yuichi S. Hayakawa°, Yoshihiro Nishiaki°°, Nawshirwan A. Mohammed°°°, and Kamal Rasheed°°°[1]

Abstract

The Shahrizor Plain is an intermontane valley located in the eastern part of the Sulaymaniyah Governorate, Iraqi Kurdistan, where its local prehistory has gradually come into view through various ongoing investigations during the last decade. However, archaeologists have struggled to explain the apparent chronological hiatus that exists in the local Late Neolithic settlements around 6000 cal BC. In order to fill this gap, our new field project began at Shakar Tepe in September 2019, and successfully recovered the cultural deposit which yielded distinctive artifact assemblages dated to the late 7th millennium BC. In addition, some evidence of Chalcolithic occupation was also found.

Introduction

The Shahrizor Plain is situated in the eastern part of the Sulaymaniyah Governorate, the Kurdistan Region of Iraq. This geographic location which connects intermontane valleys along the Zagros Flanks with the Diyala River is key to understanding the historical role of Iraqi Kurdistan as a gate to the Mesopotamian Lowland and the Iranian Plateau. Today, the Shahrizor Survey Project (SSP) directed by Simone Mühl in collaboration with the Directorate of Antiquities in Slemani and the succeeding excavations at several sites have revealed rich archaeological sources in this plain (e.g., Altaweel *et al.* 2012; Nieuwenhuyse *et al.* 2016; Nieuwenhuyse, Odaka and Mühl 2016; Wengrow *et al.* 2016; Carter *et al.* 2020; Matthews *et al.* 2020). However, our understanding of these sources is still developing and even the basis of archaeological studies such as the spatiotemporal framework of material culture is still being established.

In particular, there are some enigmatic gaps in the chronology of late prehistory. These gaps, for example, lie between the early 7th and the mid-6th millennia cal BC. Although the SSP has identified more than 40 prehistoric sites (Fig. 1), most of them have been dated to the Late Halaf (*ca*. 5500–5200 BC), and/or the Chalcolithic period (the 5th–4th millennia BC). However, only a few sites have provided evidence for around 6000 BC.

Our study of the surface materials collected by the SSP resulted in the assumption that sites of Shaikh Marif I (SSP-37) and Shaikh Marif II (SSP-43) have cultural deposits from around 6000 BC (Odaka, Nieuwenhuyse and Mühl 2019). Therefore, in April 2019, we submitted a proposal for excavations at these two sites located on the north shore of the planned

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lake of the Darband-i Khan Dam to the Directorate General of Antiquities in the Kurdistan Regional Government. However, when we visited the sites on 27 August 2019, they were submerged under the water of the dam lake due to the excess winter/spring rainfall caused by the irregular climate in that year, and hence, it was impossible to excavate them. We also visited one of the other prehistoric sites, Shakar Tepe (SSP-24), on 27 and 29 August to find alternative options. We decided to submit an additional application for excavations at this site on 31 August, after considering the results of the surface survey. Thanks to the warm understanding and kind support of the Directorate General of Antiquities headed by Kaifi Mustfa Ali, we were able to conduct the excavations from 2 September to 20 September 2019 (Odaka *et al*. 2020). The financial support was obtained from the Grants-in-Aid for Scientific Research of the Japan Society for the Promotion of Sciences.

Surface Survey

The SSP team collected a large amount of archaeological material on the surface of Shakar Tepe. Although most of them were dated to historical ages, such as the Early to Middle Bronze Age, Iron Age, and Parthian-Sasanian Period, a few potsherds and lithics were likely to be from the Late Neolithic and Ubaid Periods (Mühl pers. comm.). On 27 and 29 August, we visited the site to confirm the presence of the materials belonging to the latter two prehistoric periods and to understand the current situation.

The site forms an oval plan, consisting of a low mound in the north-eastern half and a high conical mound with a flat top in the south-western half. The dam lake extends to the north end of the site and occasionally reaches the skirt of the mound. Two streams flow into the lake on the south-eastern side of the site. The northern edge of the mound has undergone extreme erosion by dam water and has been destroyed by modern agricultural activities.

The late prehistoric materials were scattered in a limited area of the eroded north-western part of the mound. The collected potsherds can be divided into two groups typologically and chronologically. The first group can be called Hassuna-like pottery, characterised by incised decorations on buff-colored surfaces. It can be dated to around 6000 BC in the Late Neolithic period, which precisely corresponds to the gap in the archaeological evidence from the Shahrizor Plain. The second group is Ubaid pottery, characterised by black and red brown painted decorations on buff surfaces, apparently belonging to the early to middle 5th millennium BC.

The presence of Hassuna-like pottery lends enough support to our evaluation that Shakar Tepe is a key site which could fill the chronological gap in the late prehistoric Shahrizor Plain. Additionally, the estimated date of the site (around 6000 BC) corresponds to the timing of early dispersals of farming communities from the Zagros Flanks into the Mesopotamian Lowland. Therefore, excavations at the site will provide important evidence for the contributions of the Iraqi Kurdistan to socio-cultural development towards urbanisation. In addition, the imminent threat of damaging the cultural deposits due to the lake water and agricultural activities urged us to undertake rescue excavations at Shakar Tepe.

Topography and Natural Resources

Shakar Tepe is located on the south-western coast of the lake of the Darband-i Khan Dam, which covers the lower part of the alluvial fans of tributaries along the Tanjero River. The topographic mapping of its surroundings was carried out using aerial photographs from an

unmanned aerial vehicle (UAV, drone; model: Parrot ANAFI) and structure-from-motion multi-view stereo (SfM-MVS) photogrammetry. The geographic coordinates of ground control points were measured with a carrier-phase corrected global navigation satellite system (GNSS), and digital elevation model (DEM) and orthorectified mosaic image were obtained (Fig. 2). The results revealed that the present mound of Shakar Tepe is approximately 20 m high, in an area of 300 m by 150 m. Our Observations of topography suggest a significant reduction of the original mound size, especially at the north and south edges, due to erosions in later periods likely caused by the lake level rise after the formation of the reservoir.

The site lies at the confluence of two small *wadi*s, dissecting the gently undulating slopes on the right bank of the Tanjero River (Fig. 3). While further research is required to understand how much the modern site setting reflects the past one, the Neolithic inhabitants are likely to have been able to acquire water easily near the site; besides the *wadi*s, at least three small springs are present within a 1 km range. In addition, the raw material for stone tools was also probably easily available. Secondary flint cobbles of up to 25 cm in diameter are scattered along the wadi beds and banks, also within 1 km from the site (Fig. 4). They include medium-grained ones sufficient for manufacturing flaked stone tools. In fact, their colors, texture, and cortex types closely resemble those of the flint commonly used for Neolithic tools. Based on these observations, Shakar Tepe is considered to have occupied a favorable location for natural resources.

Excavations of Operation A

As the late prehistoric materials were collected on the surface of the limited location, we could easily determine the first area to be excavated. This area, named Operation A, was laid on the north-western skirt of the high conical mound. This side of the mound seems to have been destroyed and looks like a steep cliff. The long trench was aligned from the bottom of the cliff towards north-west, in perpendicular to the gentle slope, as a step trench measuring 9.5 m long and 2.0 m wide. At the end of the season, we reached the virgin soil at the northern end of the trench, approximately 5 m below the highest surface level of this operation.

Stratigraphy and Radiocarbon Dates

Although the detailed stratigraphic sequence has not been completely examined, we provisionally identified three cultural phases in Operation A (Fig. 5: 3). In terms of archaeological periodisation, all phases appear to be late prehistoric.

1. *Lower Late Neolithic Phase*. At the northern end of Operation A, we exposed a thick, hard, and compact yellowish-brown deposit at a deeper level above the virgin soil. Lenses of ashy soil containing charcoal were repeatedly observed in this deposit. No buildings have been identified. Nevertheless, the artifacts recovered from this level demonstrate that this deposit can be distinguished as a separate cultural phase preceding the upper level. The radiocarbon dates of the four charcoal samples from this phase fell between 6400 and 6220 BC (Fig. 5: 4).
2. *Upper Late Neolithic Phase*. This phase is the thickest and predominant in the cultural deposit of Operation A. Based on the two structures recovered, it can be subdivided into three occupation levels. In the upper level, part of the fire installation was found in the south-eastern corner of the operation (Fig. 5: 2). The middle level consisted of a long

straight *tauf* wall (Fig. 5: 1). It is 30 cm thick and is preserved up to approximately 1 m high. Below the wall, the accumulation of this phase continued deeper until the lower phase. The radiocarbon dates of 22 charcoal samples from this phase fell within the range from 6240 to 6000 BC, while two samples containing small amounts (< 400 μg) of carbon (TKA-21797, 21798) and one sample (TKA-22556) were dated slightly older (Fig. 5: 4). The difference in the dates between each building level could not be clearly recognised.

3. *Ubaid Phase*. The uppermost layers mostly consist of hard, mudbrick-like soil that yielded potsherds from the northern Ubaid horizon. These layers were recovered only in the south-western part of the operation. No buildings or structures were discovered. Radiocarbon dating of charcoal samples from this phase was not successful, with a single sample indicating a clear outlier: 43,000 BP (TKA-21861). This perhaps implies that the layers of the Ubaid Phase consist of disturbed secondary deposit.

As such, stratigraphic sequence of 5 m thick cultural deposit yielding abundant recovered artifacts in association with two well-preserved structures suggest that Shakar Tepe provides essential information for the discussion of archaeological chronology in this region. The radiocarbon dates from Shakar Tepe cover the period from approximately 6400 to 6000 BC, which includes the chronological gaps previously identified in the late prehistoric Shahrizor Plain.

Pottery

Potsherds are quantitatively dominant among the recovered artifacts of the excavations. In addition, large, not so fragmented sherds are quite remarkable in Operation A, although the reason behind this is unknown.

Most potsherds recovered from Operation A can be dated to the Late Neolithic period. In the upper Late Neolithic phase, the ceramic assemblage demonstrates some varieties in ware groups, such as "Hassuna-like" fine ware (Fig. 6: 1-9), fine plant-tempered ware (Fig. 6: 10-12), and coarse plant-tempered ware (Fig. 6: 13-17). "Hassuna-like" fine ware has a fine compact fabric including a small quantity of sands. The surface is mostly buff-coloured, treated with careful smoothing, and decorated with geometric incisions. Repeated short oblique lines ("slashes") are characteristic motifs.

It can be said that this ware group is similar to the so-called Hassuna Standard Ware and, more precisely, to its local variant known at a few sites in the Iraqi Zagros foothills, such as Matarrah in the Kirkuk region (Braidwood *et al.* 1952; Odaka 2019) and Shaikh Marif (Odaka, Nieuwenhuyse and Mühl 2019). However, the fabric (or firing) shows a difference; specimens from Shakar Tepe are generally quite hard, while those from Matarrah and Shaikh Marif appear to be softer. Fine plant-tempered ware has also been collected at Shaikh Marif I, and, probably, recovered from Qalat Said Ahmadan in the Pshdar Plain (Tsuneki *et al.* 2015). This ware group is characterised by fine fabric including a small number of plants and minerals. Red to dark brown slip and burnish are sometimes applied as surface treatments. Carinated bowls are common in vessel shapes, and occasionally painted decorations have been observed. Coarse plant-tempered wares are generally thick-walled, large-sized heavy vessels, including so-called "husking trays." A substantial amount of large-sized straw has been tempered to the fabric containing mineral particles, and a dark-core section is often observed. Decorations such as incisions, appliqués, or paint are rarely

applied. Compared with the assemblage from the other key sites in Upper Mesopotamia, the upper Late Neolithic phase at Shakar Tepe seems comparable to the early phase of the Hassuna period.

Another assemblage consisting exclusively of coarse plant-tempered ware was identified at the lower level of the Late Neolithic phase. Its fabric is more brittle and fragile than that of the upper level, and its section usually displays a dark core. In general, surface colour has a reddish tone. This simple assemblage is comparable with Proto-Hassuna in Upper Mesopotamia, or the Pottery Neolithic phase at Jarmo (*e.g.* Lloyd and Safar 1945; Adams 1983).

In the Ubaid phase, fine chaff or sand tempered buff wares with red brown, dark brown to black painted designs are characteristic, undoubtedly belonging to the late northern Ubaid horizon (Fig. 7: 1-8). Typologically quite common in our examples are short-necked jars (including jars with perforated lugs), bowls with flaring rims, and hemispherical bowls with inwardly beveled rims or tapered rims, most of them painted with simple horizontal bands and wavy lines, and rarely cross-hatched triangles. Unpainted rim sherds, comb-incised jars (Fig. 7: 9-10), and a fragment of clay ring are also included. The occurrence of a possible Dalma impressed sherd (Fig. 7: 11) is worthy of special note, because it may imply a cultural connectivity to the Iranian Zagros region. Best parallel for these Ubaid pottery types can be found across adjacent regions, in particular, from Tepe Gawra strata XVI–XIII (Tobler 1950), Telul eth-Thalathat II levels X–VIII (Shimogama 2019), Tell 'Abada Level I in the Hamrin Basin (Jasim 1985), and more recently reported from Tell Surezha (Stein 2018) and Helawa in the Erbil Plain (Peyronel, Vacca and Zenoni 2016), and Gurga Chiya (Wengrow *et al.* 2016) in the Shahrizor Plain.

Aside from the Ubaid sherds, we lack Halaf and early Late Chalcolithic specimens, demonstrating that the settlement at Shakar Tepe may have been abandoned around the late 6th and the middle of the 5th millennium BC. On the other hand, beveled rim bowl sherds (Fig. 7: 12) and a single piece of complete clay cone dated to the middle to late 4th millennium BC are remarkable among the surface finds, suggesting the possible presence of southern Uruk-related occupation at the site elsewhere.

A number of Bronze Age ceramic sherds were also retrieved from the surface and topsoil layers in Operation A. The sherds derived either from secondary deposits that were washed away by encroaching floodings of the dam water at the skirt of the mound, or fallen from the upper deposits due to runoff precipitation or aeolian erosion. Wheel-made fine ware jars with upturned rims (Fig. 7: 13) may be ascribed to the late 3rd millennium BC or Post-Akkadian, along with a fine wheel-made fragment with corrugated rim (Fig. 7: 14). A possible Shamlu ware sherd with fine incised lines and impressed dots (Fig. 7: 15), and krater rim fragments with ledge rims (Fig. 7: 16-17) also point to the Middle Bronze Age (Janabi 1961; Altaweel *et al.* 2012). Also encountered are fragments of coarse storage vessels with applied impressed bands (Fig. 7: 18-20), which can be dated to the later Early Bronze Age. But these may be dated to the Middle to Late Bronze Ages since similar sherds of those periods were reported from Gurga Chiya (Wengrow *et al.* 2016) and Kunara (Kepinski *et al.* 2015).

Iron Age and later materials, though expected, have not been found thus far at least around the excavation area.

Flaked Stones

The great majority of the lithic artifacts from the Late Neolithic phases are represented by irregular flakes made of local chert, which have a grey, brownish grey, or pinkish grey colour with white mottles or black spots and are available at the *wadi* bed near the site (Fig. 4). Regular blades are very rare, and no evidence of blade production using bullet-shaped cores has been identified. A few regular blades, which were probably produced by the pressure flaking technique, were probably imported from elsewhere. Formal chert tools are also rare.

Distinguishing this flake-oriented industry are very large robust blades made of local chert (Fig. 8: 2-7). More than 20 examples have been recovered, including two groups of five blades found from the caches unearthed in the upper Late Neolithic phase. Most of them are complete blades, and their size far exceeds that of normal blades used during the Late Neolithic in this region. They are 120.9 mm long, 43.0 mm wide and 15.3 mm thick on average, and the largest one exceeds 160 mm in length and 60 mm in width. The lateral edges and the central ridges on the dorsal face are not parallel, and their shapes are not standardised. The platform remnants are large and flat, and the platform edges were not well prepared prior to knapping. These features suggest that the blades were detached by direct percussions. While most of these blades have no retouch or use-wear, a few examples have irregular retouch along one lateral edge. It is possible to assume that these blades were used as hand knives, but some examples are mid-segments of a blade with both ends truncated. Although such large robust blades are rarely known from other sites in the region, similar examples, sometimes with sickle gloss, have been reported at Matarrah about 130 km to the west (Braidwood *et al.* 1952: pl. X). No examples of Shakar Tepe show gloss.

Notably, there are two large cores from which this type of blade was detached (Fig. 8: 1). Both are made of reddish-brown local chert and were recovered together from the location close to the caches of the large blades. Although the colour of chert is different from that of the large robust blades, their size and typological features, as well as blade scars on the core surface, are comparable to those of the large blades. This indicates the local production of this type of large blade at this site.

Only 38 obsidian artifacts were recovered in 2019. Provenance study of obsidian by geochemical methods is still being carried out, but almost all are of peralkaline obsidian with a greenish tinge and assumingly originate in the sources in Bingöl or Nemrut Dağ areas in south-east Turkey. The size of the obsidian artifacts is small. The blades (or bladelets) produced by pressure flaking are usually in the form of mid or proximal segments and less than 10 mm in width. There is no firm evidence for the local production of obsidian blades by pressure flaking, but one core tablet, one overshot blade, and some irregular flakes are included. The variation of formal obsidian tools is very limited; however, in addition to one microlith (trapeze), 15 side-blow blade-flakes and one core for side-blow blade-flakes recovered from both the upper and lower Late Neolithic phases are worth mentioning. Side-blow blade-flakes are more commonly known from the Proto-Hassuna and Hassuna sites in the Jazira region and are also known from Jarmo and Matarrah. Examples from Shakar Tepe are those excavated from the southernmost site so far. Peralkaline obsidian with a greenish tinge is predominant, but one side-blow blade flake is made of opaque black obsidian. Their width is 22.5 mm on average, which is much wider than that of obsidian blades. No clear use-wear was observed.

While the use of obsidian and the presence of the side-blow blade-flakes indicate a connection between Shakar Tepe and other Late Neolithic settlements in the north, the chert industry at Shakar Tepe is quite different from the tradition of lithic industries at other sites in the Kurdistan region and Zagros foothill. From the Proto-Neolithic period to the later part of the Late Neolithic, the Mlefatian industry, which is characterised by pressure blade production using bullet cores was widely spread in these areas, as represented by Bestansur, Shimshara, Jarmo, Tepe Guran, and Chogha Sefid (e.g., Kozlowski 1999; Matthews, Richardson and Maeda 2020). However, the lithic industry at Shakar Tepe lacks evidence of pressure blade production and is instead characterised by the production of large robust blades using local chert. It seems likely that the evidence of the lithic artifacts from Shakar Tepe, probably together with that from Matarrah, demonstrates another type of local lithic tradition, which developed in the Late Neolithic period in this region.

Other artifacts

In addition to ceramics and lithic artifacts, several small finds were recovered from the Late Neolithic phase (Odaka *et al*. 2020: fig. 6). A stamp seal is made of greenish stone and has an incised line motif. A flat oval pendant or link is made of a lustrous brownish grey quartz-like stone. Both ends are broken but show traces of perforations. An incised motif was drawn on one face, and the other face was left plain. Clay spindle whorls are similar in size but vary in shape. Bone tools include *spatulae*, awls, and needles.

Conclusion

Our 2019 campaign at Shakar Tepe was quite short but very successful. We documented a stratigraphic sequence of prehistoric occupations, which covers the period from 6400 to 6000 BC and probably the early 5th millennium BC. Therefore, this new evidence provides important data to fill a part of the chronological gap in the local archaeological records of the Shahrizor Plain, thus achieving one of the goals of this study. Furthermore, the findings imply the existence of a distinctive material culture in this region, which has not been clarified so far. In particular, the lithic industry associated with the Hassuna-related ceramic assemblage is fundamentally different from the tradition of the Mlefatian industry, which is typical to the Neolithic sites along the Zagros foothill. Instead, it is characterised by unique, large robust blades and cores made of local chert.

These results allow us to think ahead and consider further work at this site. We believe that the Late Neolithic phase deserves further investigation. Although very few sherds from this period were collected by the surface survey, gently sloped and relatively flat open space extend to the eastern and western sides of Operation A. Thus, it should be possible to extend our excavation areas for broader exposures of prehistoric cultural deposits. The Late Neolithic period remains poorly understood, not only in the Shahrizor Plain but also in the entire Near East, yet this period is likely to be well represented at Shakar Tepe.

In addition, the Chalcolithic occupation is worth further investigation. Although it was partially exposed during this season, the surface and topsoil materials suggest that more abundant archaeological evidence lay elsewhere at the site. It would be related not only to the local northern Ubaid and the Late Chalcolithic periods, but also to the Iranian Zagros and the southern Uruk material cultures. This holds considerable research potential to study regional interactions during this period.

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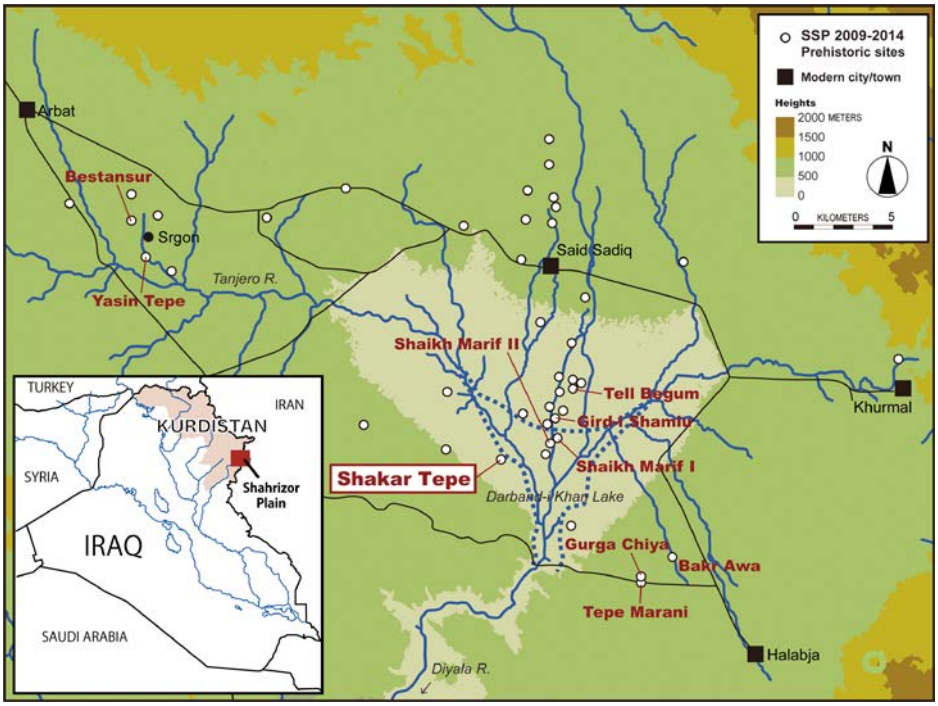

Fig. 1: Distribution of the prehistoric sites in the Shahrizor Plain (after map by Simone Mühl)

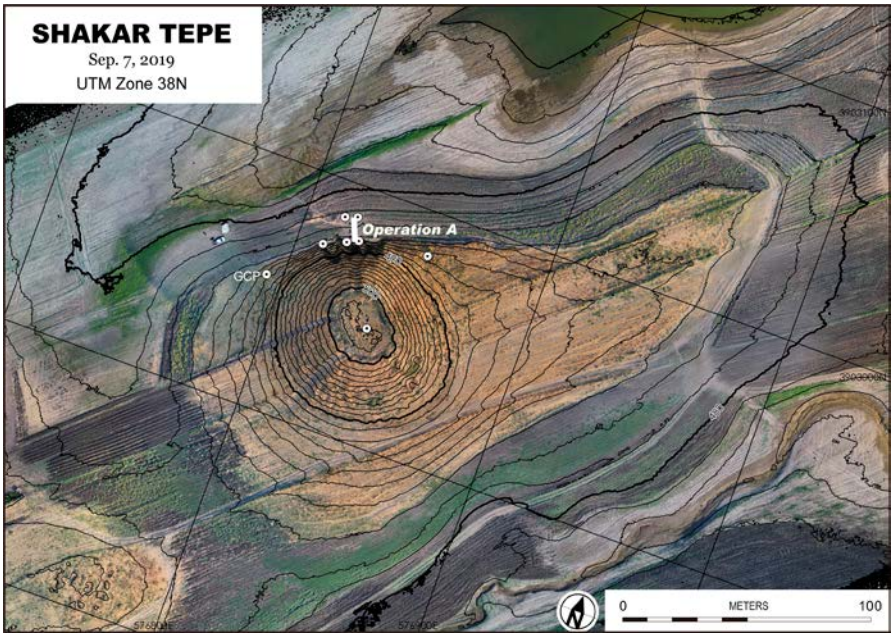

Fig. 2: Topographic map with the orthorectified mosaic image of Shakar Tepe

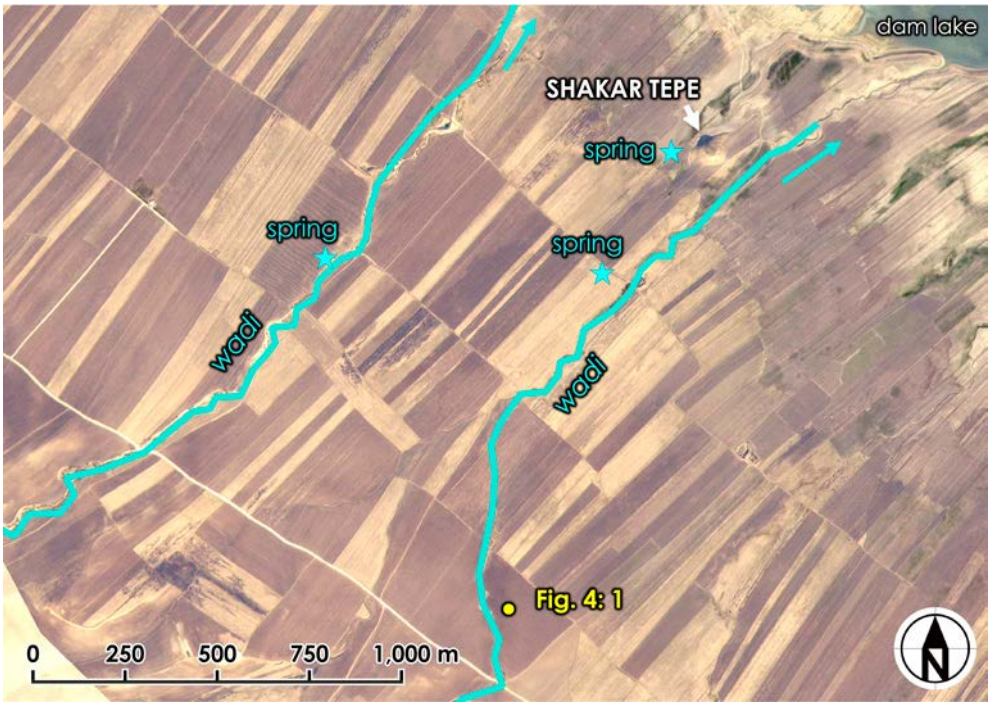

Fig. 3: Location of springs and *wadi* channels in the surrounding area. Background satellite image is of TripleSat Constellation-1 by 21AT taken on November 15, 2019, distributed from Earth Observation System

Fig. 4: Secondary flint cobbles along the *wadi* beds and banks

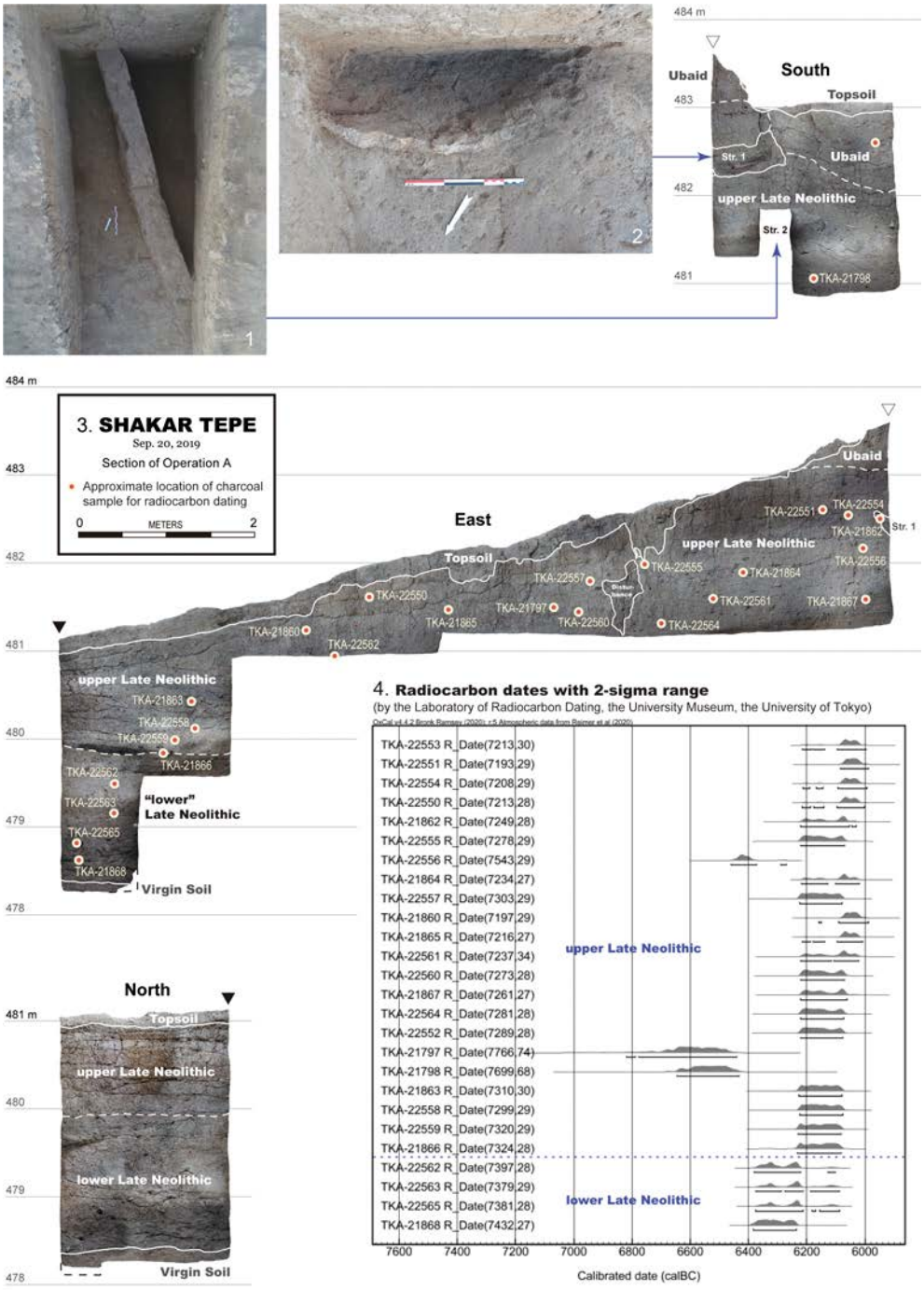

Fig. 5: *Tauf* wall (1), fire installation (2), sections of Operation A (3), and radiocarbon dates of Operation A (4)

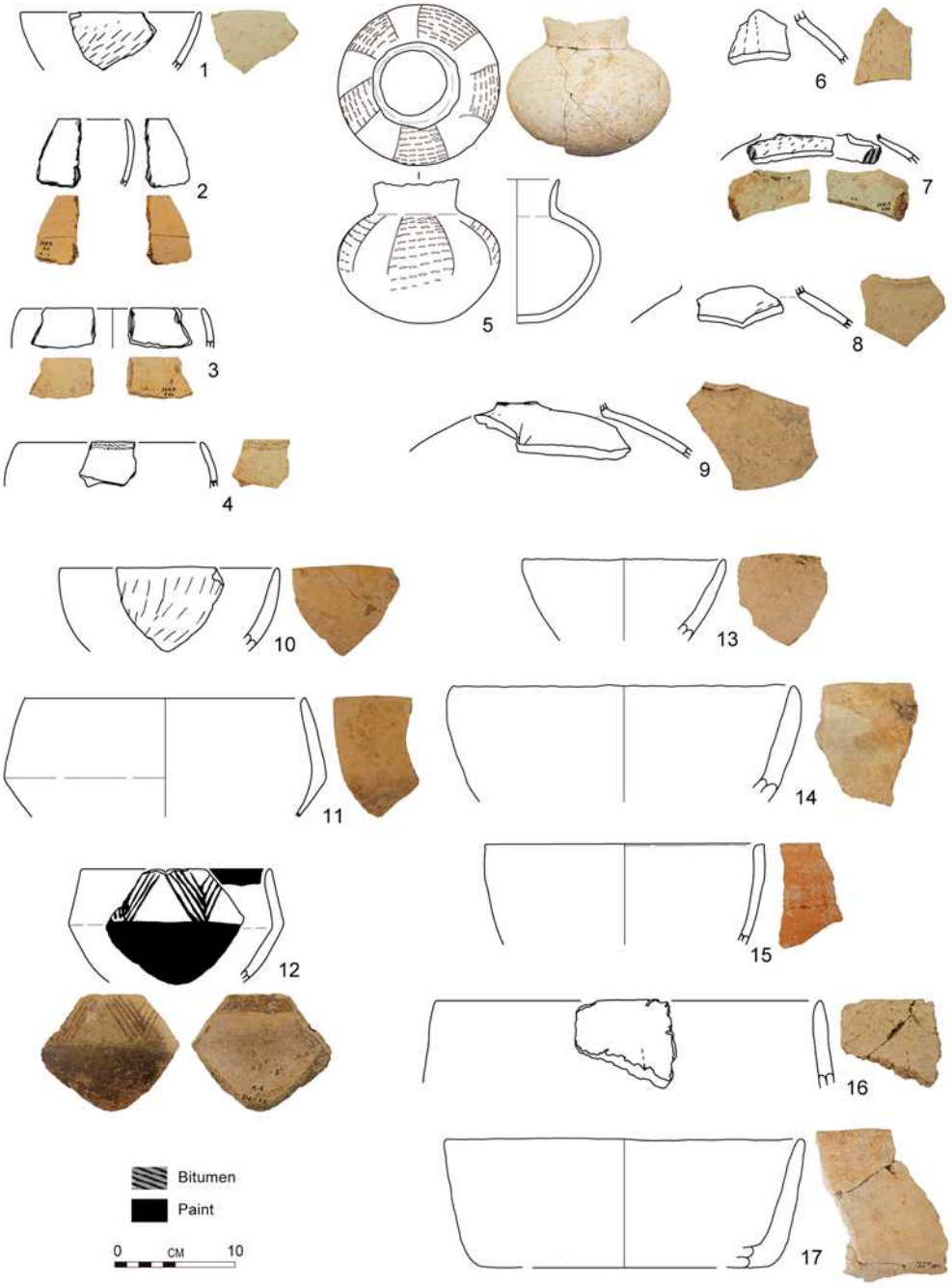

Fig. 6: Late Neolithic pottery from Operation A

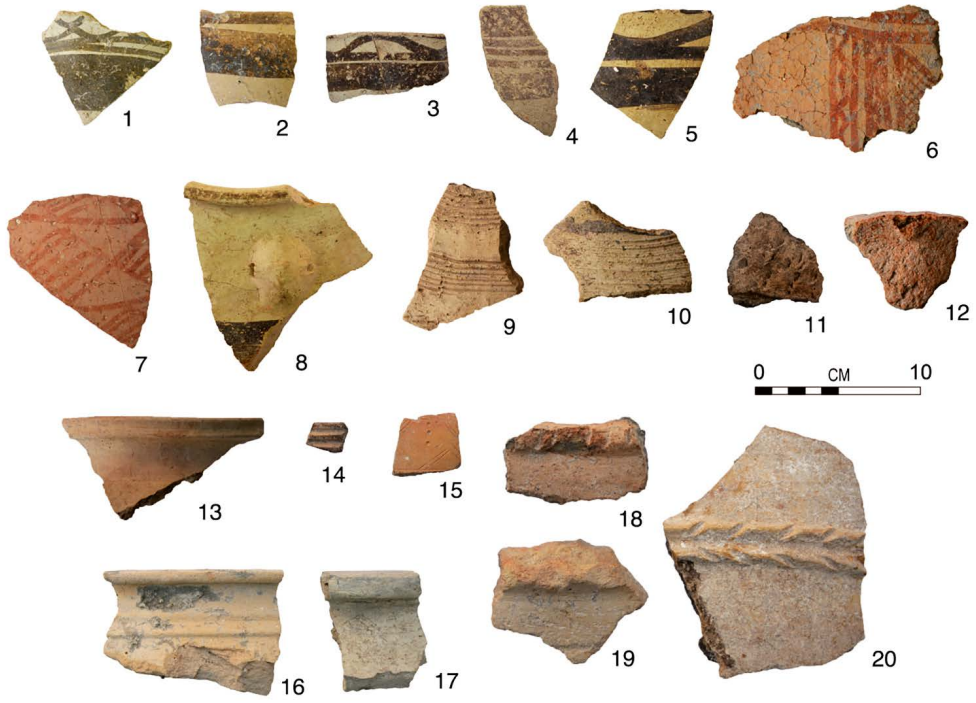

Fig. 7: Chalcolithic and Bronze Age pottery from the surface and the topsoil layer in Operation A

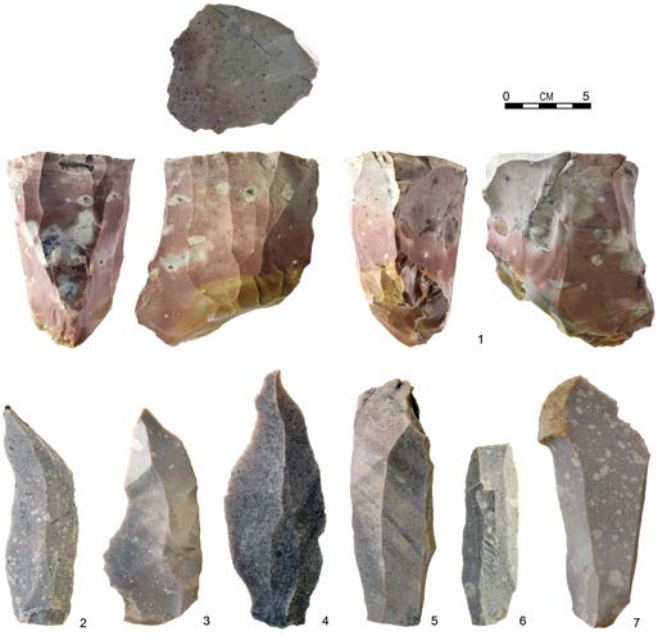

Fig. 8: Late Neolithic flaked stone artifacts from Operation A