

# Preliminary Reports on the Excavations at Burgut Kurgan and Bobolangar in 2017

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## ABSTRACT

The current report presents the results of the 2017 excavations of two prehistoric sites in, or in the vicinity of, the Zarabag Oasis, South Uzbekistan. In the Yaz I settlement of Burgut Kurgan, the 2017 excavation season focused on a small portion of the stone wall and was not able to confirm the presence of a gate hypothesised during the 2016 excavations. A trial excavation consisting of three trenches (BBL01–BBL03) was conducted at the site of Bobolangar, which was discovered during a previous field survey in 2016. The pottery sherds collected on the surface of Bobolangar were from the Late Bronze Age and the date of the site was confirmed by the presence of Late Bronze Age pottery in secure stratigraphic contexts. Moreover, two burials were found in trench BBL03. Based on the characteristics of the burial traditions, it is likely that both individuals were interred during the Middle Ages and the graves were cut into the Late Bronze Age layers of the site. The human skeletons were exceptionally well-preserved and preliminary details of the bioarchaeological analyses are presented here.

## KEYWORDS

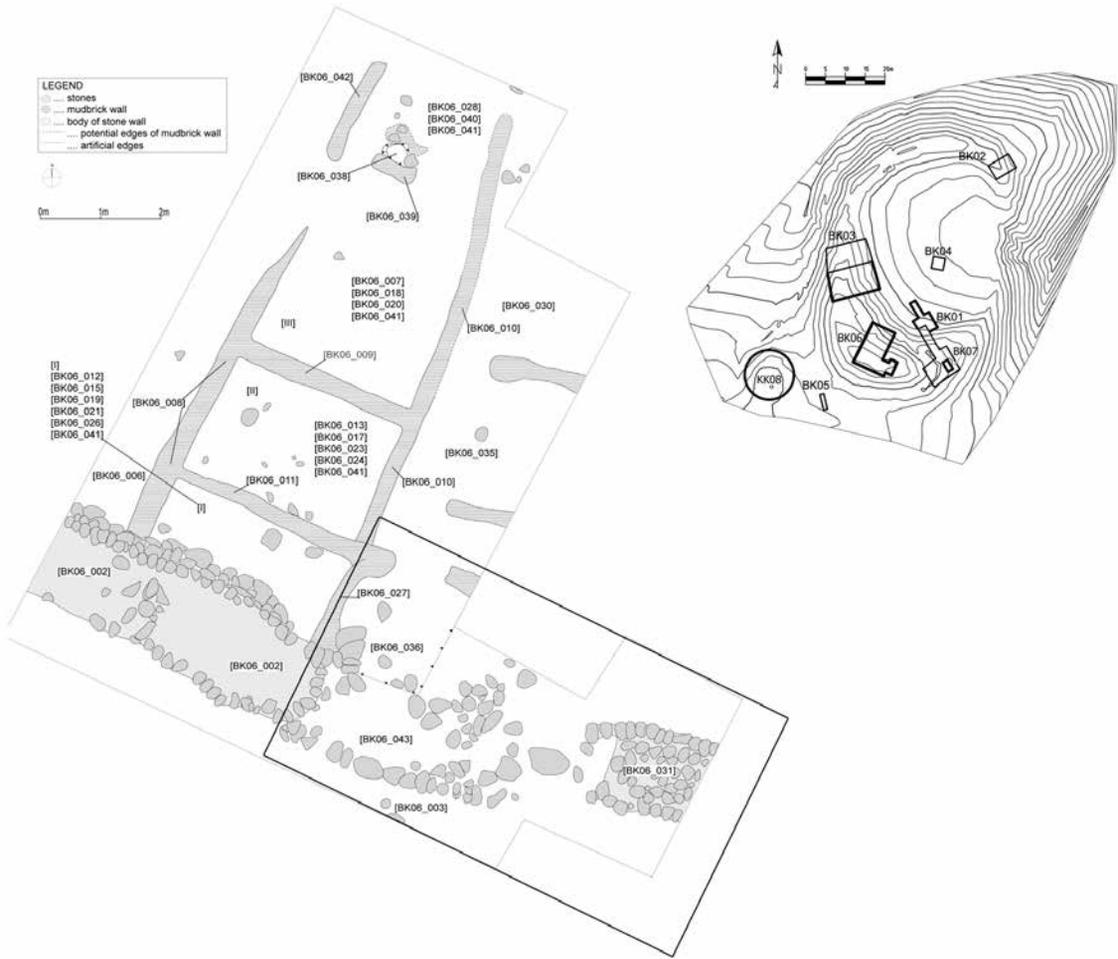
Central Asia; Sapalli culture; Yaz I culture; Late Bronze Age; Early Iron Age; burial; anthropological analysis.

Similar to the previous years, the activities of the 2017 Czech-Uzbekistani archaeological mission in the Pashkhurt Valley, south Uzbekistan, consisted of a series of surveys complemented by targeted excavations. The results of the surveys are presented elsewhere in this volume, as are those of the excavations of the kurgan-like features. The present report summarises the excavations of two prehistoric settlement sites conducted in 2017: the Early Iron Age Burgut Kurgan and the Bronze Age site of Bobolangar.

## BURGUT KURGAN (JK)

The excavation of the Yaz I site of Burgut Kurgan was conducted over a period of three field seasons, from 2015–2017 (cf. STANČO *et al.* 2016; KYSELA *et al.* 2017). In comparison with the previous field seasons (2015 and 2016), the 2017 excavation took place in a rather limited area corresponding with an enlargement of the south eastern part of trench BKO6, which was initially excavated in 2016. The dimensions of the 2017 trench were 4×7 m (**Pl. 4/1**).

The principal objective of the 2017 excavation was to confirm or deny the existence of a ‘passage’ in the stone wall (BKO6\_031/043) that was preliminarily identified in the later stages of the 2016 excavation (KYSELA *et al.* 2017, 96). The possible ‘passage’ manifested itself as a gap, slightly more than 1 meter wide, between two portions of the stone wall (BKO6\_031 and BKO6\_043), with a large flat stone in the middle. In 2016, the working hypothesis of the interpretation of this gap was that it was a gate that was contemporary with a phase of settlement discovered in the previous excavations. It was previously suggested that the possible



**Fig. 1: The trench BK06 – state of research in 2016 and the extent of the 2017 excavation (black rectangle). In the insert above right – the position of the trench BK06 in the site. Drawing by J. Havlík.**

gate had either been filled for one reason or another, or that the gate was contemporary with a later occupation that reused the older site – in this latter case the flat stone would act as a threshold.

The excavation produced some rare evidence of occupation that probably occurred after the abandonment of the main phase of settlement of the site. This evidence included a pit (BK06\_048/049) dug into the upper levels of the wall that was topped with stones. The only pottery fragments from the fill of this pit date to the main occupation phase of Yaz I (Early Iron Age). However, these pottery fragments may have been redeposited within the fill when the pit was dug and therefore we cannot be sure if this pit was created during a much later visit to the site.

After removing the wind deposited upper layers (BK06\_045, BK06\_051, BK06\_056), the top of mudbrick walls (BK06\_052 and BK06\_053) appeared in the eastern part of the trench. In the central and north-western part of the trench, similar structures appeared only at a later stage below layer BK06\_057 and flush with the wall BK06\_052. The stratigraphy indicates that structures in the central and western part of the trench (BK06\_060 and BK06\_065) were constructed earlier than BK06\_052.



Fig. 2: The presumed gateway. Photo by J. Kysela.

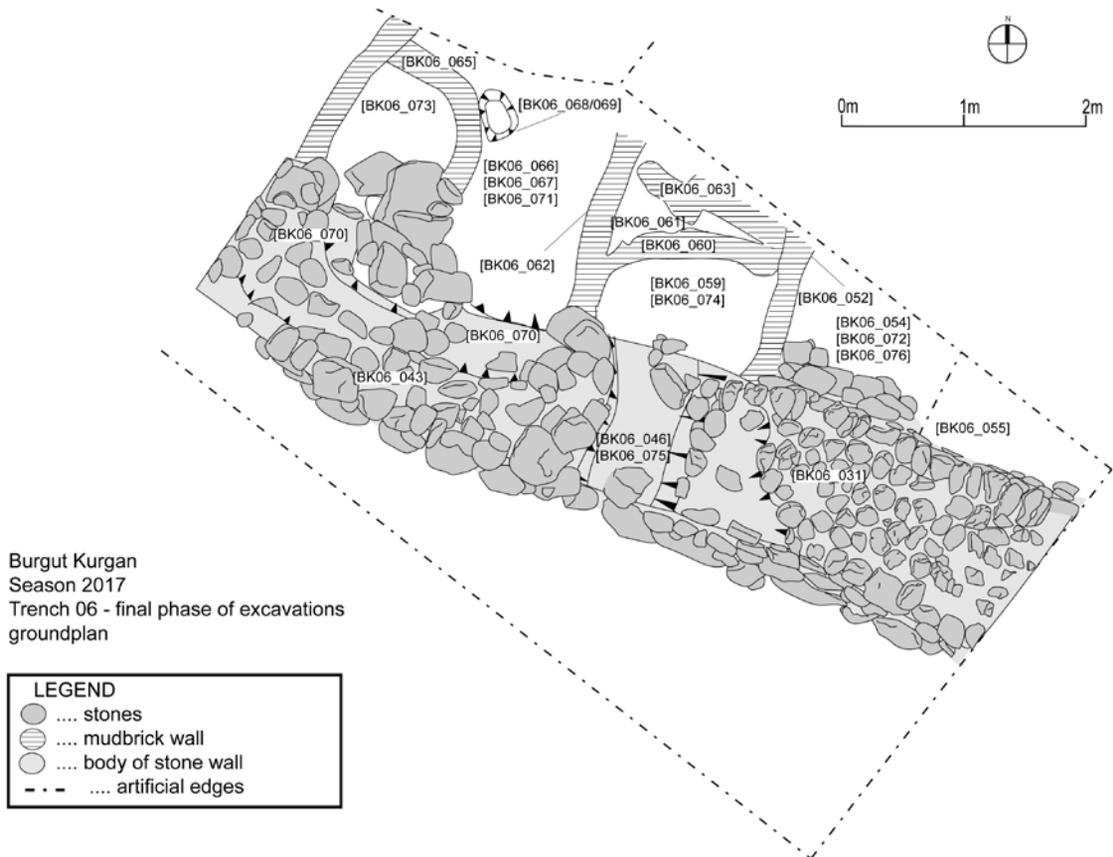


Fig. 3: Overall plan of the 2017 excavation in Burgut Kurgan. Drawing by J. Kysela.

The small structure BKO6\_o60 was in the form of a semi-circular wall attached to the stone wall BKO6\_o43/o31. In the western part of the trench, another very similar structure to BKO6\_o60, labelled BKO6\_o65, appeared at an even deeper stratigraphic position. However, only the lowest mudbrick courses were preserved from both structures; both were probably contemporary and built on the same level.

BKO6\_o60 was filled in with very loose layer (BKO6\_o59) which contained numerous pottery sherds. It had a clear, well-preserved beaten floor (BKO6\_o74) that had traces of lime and organic temper in it. On the other hand, in BKO6\_o65 the fill (BKO6\_o64) was rather stony and poor in finds; the floor was paved with pottery fragments similar to the so called ‘kata’ in trench BKO3. The area between the two structures was covered by a layer (BKO6\_o66/o67) containing numerous mudbrick fragments and pottery sherds that were lying flat. A small pit (BKO6\_o68/o69) was dug from layer BKO6\_o66/o67. This was apparently the first occupation horizon because all layers and structures rest directly on ‘anthropized virgin soil’ – sterile soil that has cultural artefacts pressed in it from above – indicating the earliest period of human occupation.

As far as the stone wall is concerned, the 2017 excavation aimed to clarify the existence of the presumed gateway between BKO6\_o31 and BKO6\_o43 and understand the chaotic state of the inner portion of BKO6\_o43. First, the excavation failed to verify the hypothesis of a gate in the wall. The space of the assumed gateway was filled with large stones (up to 70 cm) packed in compressed *pakhsa*; the stones were however mutually interlocked throughout the entire volume of the fill and at no level were we able to identify a surface which could have served as a walkable horizon. This was the case throughout the entire thickness of the wall down to its lowermost level consisting of huge boulders set into a *pakhsa* bank. This *pakhsa* bank



Fig. 4: Structures BKO6\_o60 (left) and BKO6\_o65 (right) excavated. Photos by J. Kysela.



**Fig. 5: The phases of excavation of the assumed gateway. Photos by J. Kysela.**

(BK06\_075 and BK06\_070) could be identified throughout the entire excavated part of the wall. A boulder facing was used on the outside. The inside was left without a facing in the western part of the wall (BK06\_043), and was largely not preserved. In fact, the western portion of the wall was preserved only on the exterior while the interior seems to have been damaged as the entire inner face of the wall was missing. In the north-westernmost part of the trench, some stray stones (already outside the limits of the wall and therefore presumably remnants of its destruction) were in direct contact with structure BK06\_065. The relationship between the fallen stones and BK06\_065 could not be determined and it was unclear if BK06\_065 was built at the foot of the stone wall and was covered by its destruction or if it was built after the stones had already fallen. What is clear is that the phase of the semi-circular structures was not earlier than the construction of the stone wall BK06\_043 because the mudbrick structures either rest against it or are covered by its partial destruction. The structures are covered by the straight mudbrick walls (BK2017\_06\_053 and BK2016\_06\_027) and were possibly destroyed by activities taking place around the latter. The stone wall remained in service in this later phase. The supposed gateway is likely only a repair to maintain the function of the wall in the later period of its existence.

The 2017 excavation provided new, valuable information on the site's general stratigraphy as well as so-far unknown construction features (i.e. the two semicircular structures encountered for the first time at the site). The tasks for the near future include synthesising the

stratigraphic sequences of the single trenches, all of which differ from each other in minor ways, and outlining a single all-encompassing construction history for the site.

## THE TRIAL EXCAVATION ON THE SITE OF BOBOLANGAR, ZARABAG OASIS (AA, JK)

### INTRODUCTION

The site of Bobolangar is situated at the west margin of the village and oasis of Zarabag above the abundant spring of Bobolangar (37°45'43.45"N, 66°44'25.40"E, 998 m.a.s.l.). The oasis of Zarabag, located in the Pashkhurt Valley of the Surkhan Darya province, south Uzbekistan, lies in the steppe belt of the Kugitang mountains piedmont, which also represent the boundary between Uzbekistan and Turkmenistan (15 km to the west from Zarabag village). Bobolanghar (*bobo* = Uzb. 'old man'; *langar* = Uzb. 'shadoof/well pole') was detected during the field survey in the oases of Kugitang Piedmont in 2016 (AUGUSTINOVÁ *et al.* 2017, 104–148, 185–188). The site is situated on a small spur of a descending dry stony ridge on the right bank of the seasonal river Machayly<sup>1</sup> (approximately 120 m from the riverbed). In the vicinity of the site there is a water source of identical name – Bobolangar Buloq (*buloq* = Uzb. 'spring'). The site was visibly disrupted by the activities of local inhabitants and a rescue excavation was warranted. Based on the plentiful assemblage of ceramic fragments collected from the surface the site, Bobolanghar was preliminarily dated to the Bronze Age.

Bobolanghar is situated on a flat platform on top of the spur with size 25×35 m (**Fig. 6**). The remainder of a probable water canal, which is not in use today, skirts the site from the west, north and east sides. On the surface, there are clearly visible remains of stone structures in two basic shapes – rectangular and circular (d. ca. 1.5 m). These structures, as well as a basic topographic plan of the site, were recorded by total station and are depicted on the plan **Fig. 7**.

The site lies in the vicinity of gardens and, because it is shaped as a mound, it offers an easy way to access clay for more recent building and agricultural activities. As a result, these activities disrupted the surface of the site and brought to light archaeological materials and structures. There were two substantial terrain disturbances caused by more recent clay digging – one on the north-west and one on the south-east side of the site. Most of the rich archaeological material collected from the field prospection during the 2016 season came from these two areas, but numerous ceramic fragments were also scattered across the surface of the site. The areas of the surface disturbance determined the placement of the 2017 trenches.

### EXCAVATION

#### *Aim and methods of the excavation*

There were several objectives for the excavation of the Bobolanghar site.

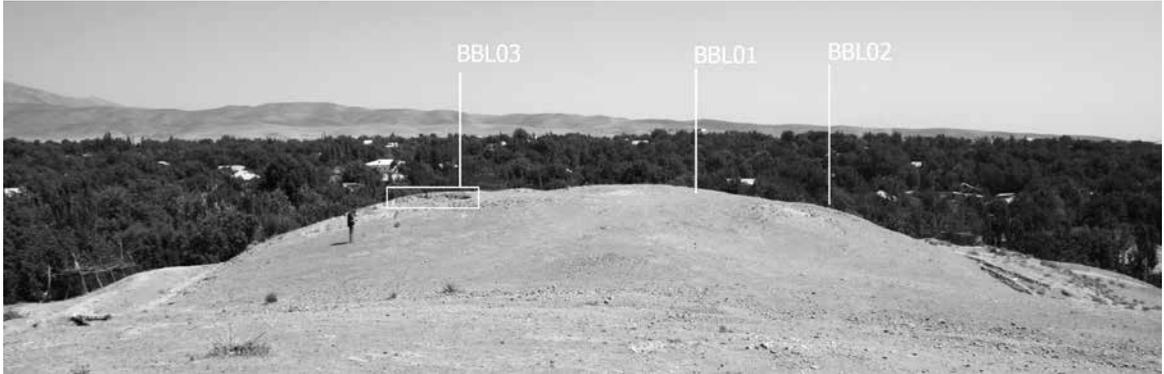
The first was a rescue excavation to mitigate any further damage caused by the more recent disturbance of the site.

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1 The majority of water flows through the Machayly River in the spring; during the rest of the year, only a slight stream flows or the riverbed remains dry.

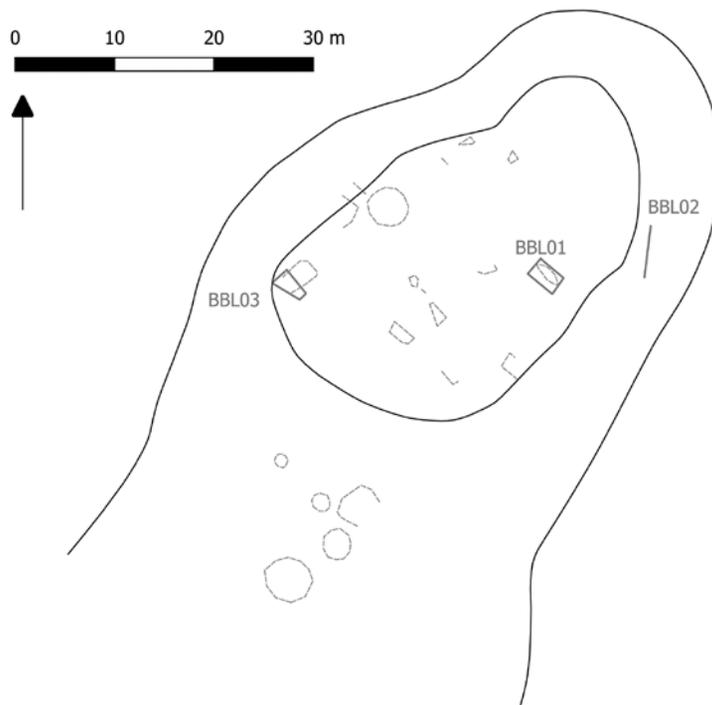
The second aim was to collect the relevant data for dating and define the function of the site in each specific historical period.

The third aim was to assess the site's significance in the context of the other sites in the region – with a focus on the Late Bronze Age period.



**Fig. 6: The placement of trenches at the site Bobolangar – view from south-west.**

Photo by A. Augustinová.



**Fig. 7: Plan of the site of Bobolangar with trenches BBL01–BBL03 highlighted; dashed line – stone structures visible on surface. Mapping in the field conducted by P. Cejnarová and A. Augustinová; plan by A. Augustinová.**

Three trenches were opened (BBL01–BBL03; **Figs. 6–7**) in areas adjacent to the disturbances at the site. The first trench (BBL01) was opened on the top platform and corresponded with an

oval stone line; the second one (BBL02) was located on the site's east edge and acted to straighten and clear the profile disrupted by more recent clay digging; the third trench (BBL03) was placed on the south-west of the site, and cleared the disrupted surface of an area delimited by a stone structure visible on the surface, with a further extension into the non-disrupted parts of the stratigraphy.

The excavation was conducted and documented by Jan Kysela and Anna Augustinová (both Charles University, Prague – Czech Republic). The skeletal remains uncovered in trench BBL03 were excavated and studied by bioarchaeologist Rebecca L. Kinaston (University of Otago, New Zealand) and documented with photogrammetry by Tatiana Votroubeková (Charles University, Prague – Czech Republic). The basic topographic plan and other geodetic measurements were carried out by Petra Cejnarová and Anna Augustinová (Charles University, Prague – Czech Republic), and subsequently processed by Anna Augustinová. The archaeological finds were primarily dated according to the expert examination of Shapulat Shaydullaev (Termez State University, Uzbekistan).

#### *Trench BBL01*

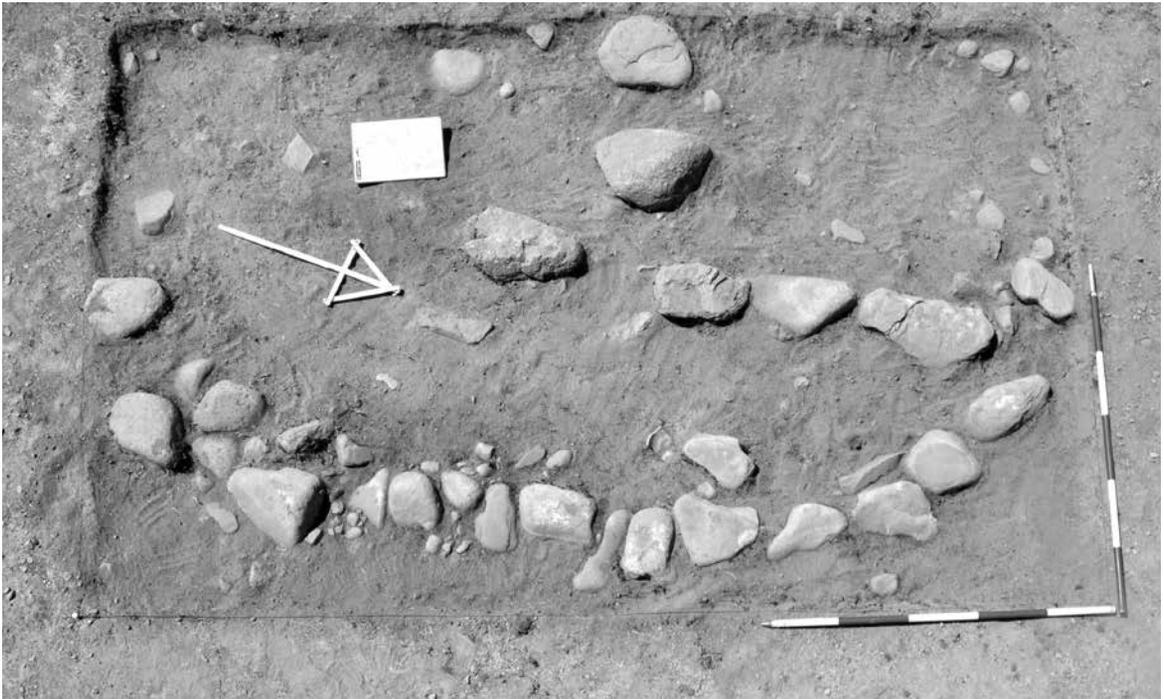
The trench BBL01 (2×3 m) was opened on the eastern part of the top platform of the site (**Figs. 6–7**). Its placement was chosen based on an oval feature delimited by stones (oriented to NNE-SSW) visible on the surface, that was preliminarily interpreted as the remains of a grave (**Fig. 8**).

Excavations took place exclusively inside the oval stone structure where four stratigraphic layers were recognized (BBL01\_002, BBL01\_006, BBL01\_007, BBL01\_008). At the depth of 0.65 m (BBL01\_008), several pieces of human bone were found. At the depth of 0.71 m, we discovered the remains of a wooden structure, samples of which have been taken for analysis that are currently underway.

Eleven stratigraphic units were distinguished within the trench (BBL01\_001–BBL01\_011). The ceramic fragments found in trench BBL01 were consistent with pottery from the Late Bronze Age and date to this period (overall, 183 ceramic fragments have been collected, 34 of them were diagnostic; **Tab. 1**).

The preliminary assumption that the oval stone structure represented a grave was confirmed, nevertheless it does not correspond with the burial habits of the Bronze Age.<sup>2</sup> In Bobolangar the presence of Late Bronze Age ceramic fragments in the fill of the grave pit was likely a result of secondary soil deposition during grave digging and filling. With the exception of the few bone fragments there was no skeleton present and it was therefore likely disturbed after burial. Remains of a wooden container or possible structure were preserved in the north part of the grave pit and extended beyond its circumference to the west (**Fig. 9**). The wooden fragments may represent the remains of a coffin, but they may also have been part of some earlier construction. Based on the surface appearance of the grave (oval of stones) and its orientation (NNE-SSW), we suggest that it was dug in the Middle Ages after the coming of Islam into the Central Asia in 7<sup>th</sup> century AD.

2 There is variability in the Late Bronze Age grave types. The necropolis could be part of the settlement area as in the case of Sapalli Tepa (ASKAROV 1973; TEUFER 2015, 7–14) or the burial ground could be created in separate area as in Džarkutan (ASKAROV – ABDULAEV 1973; TEUFER 2015, 19–22) or Bustan (TEUFER 2015, 22). In none of these cases are the graves marked on the surface by loose lying stones. The shapes of the grave pits are variable (most frequented types of graves are catacomb graves, pit graves and ditch graves) and they take shape on surface of rectangle or irregular circle. The skeletons are situated on the side with bent limbs.



**Fig. 8:** The trench BBL01 at the site Bobolangar after cleaning of the surface. Photo by J. Kysela.



**Fig. 9:** The remains of the wood container or structure at the bottom of the grave. Photo by J. Kysela.

### *Trench BBLO2*

During the excavation of the second trench, BBLO2, we rectified and cleaned the profile of the east edge of the site in an area disturbed by more recent clay digging (**Fig. 7**).

Six cultural layers were recognized there (BBLO2\_001–BBLO2\_006). Only 16 ceramic fragments were obtained during the clearing of the disturbed profile (**Tab. 1**). Although the ceramic fragments came from various stratigraphic units, they were all consistent with Late Bronze Age pottery and dated to this period, similar to trench BBLO1.

The stratigraphy (**Fig. 10**) was very difficult to clearly distinguish because of the extremely dry profile that was permanently exposed to direct sunlight. The upper parts (dried out and, to a large extent, already humified) had a uniform character (BBLO2\_002 and BBLO2\_009). These upper layers probably concealed more, unrecognizable, layers as is clear in one place where a thin charcoal layer (BBLO2\_003) could be seen. Only at the very bottom of the section did the stratigraphy become more clear; a sequence of layers were identified there, likely corresponding with a floor of human habitation. A relatively thick layer of clay that appeared to have once been mudbrick and lacked any finds (BBLO2\_004) covered a hardened deposit (BBLO2\_006) containing some ceramics and animal bones and a fine powdery layer with greenish tinge (BBLO2\_005). These layers covered a layer of hard trodden pure clay (BBLO2\_008) that was on top of an accumulation of boulders (BBLO2\_007), interpreted as a possible built floor. The layers BBLO2\_004–008 were interpreted as a sequence of construction (BBLO2\_007–008), use (BBLO2\_005–006) and destruction (BBLO2\_004) of a single habitation. Continuation of the site's occupation after the destruction is clear from the hint of a burnt horizon (layer BBLO2\_003) higher in the profile. The stratigraphy between BBLO2\_003 and BBLO2\_004 is, however, completely unclear due to the inability to distinguish BBLO2\_009 between them.

### *Trench BBLO3*

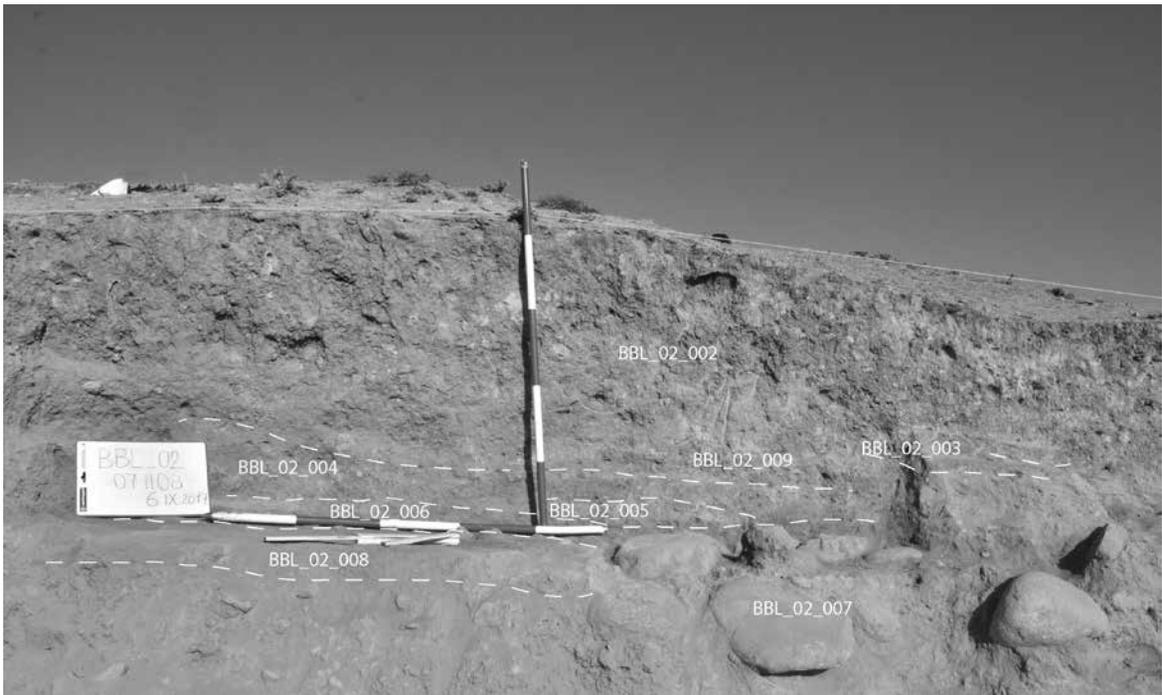
The third trench BBLO3 (1×3 m) was opened where the surface disturbance on the south-west side of the site occurred (**Figs. 7, 11–12**) in the area where most of the ceramic fragments were collected during the previous season in 2016 (AUGUSTINOVÁ *et al.* 2017, 125–128). According to the testimony of local inhabitants, ceramic vessels and human bones were discovered there several years ago during clay digging.

The area selected for excavation was where the surface disturbance intersected a rectangular stone structure visible on the surface (BBLO3\_003). The profile of the disturbance was cleaned and the trench was extended in the north-eastern direction into the non-disturbed terrain.

Overall, 17 stratigraphic units were distinguished in the trench (BBLO3\_01–BBLO3\_17) and 157 ceramic fragments were found in eight layers (**Tab. 1**). Twenty-seven of the sherds were diagnostic and were consistent with a date from the Late Bronze Age, as was the case with the finds from trenches BBLO1 and BBLO2. Two human skeletons were discovered in the trench, interred on their right sides with an orientation of northwest-southeast. They were studied and documented by Rebecca Kinaston and the results are presented below. Samples for AMS dating, aDNA and isotope analyses were taken from the skeletons; the analyses are currently underway.

The stratigraphy of trench BBLO3 indicates that there were several horizons of settlement in the Late Bronze Age that were likely disrupted by later cemetery activity.

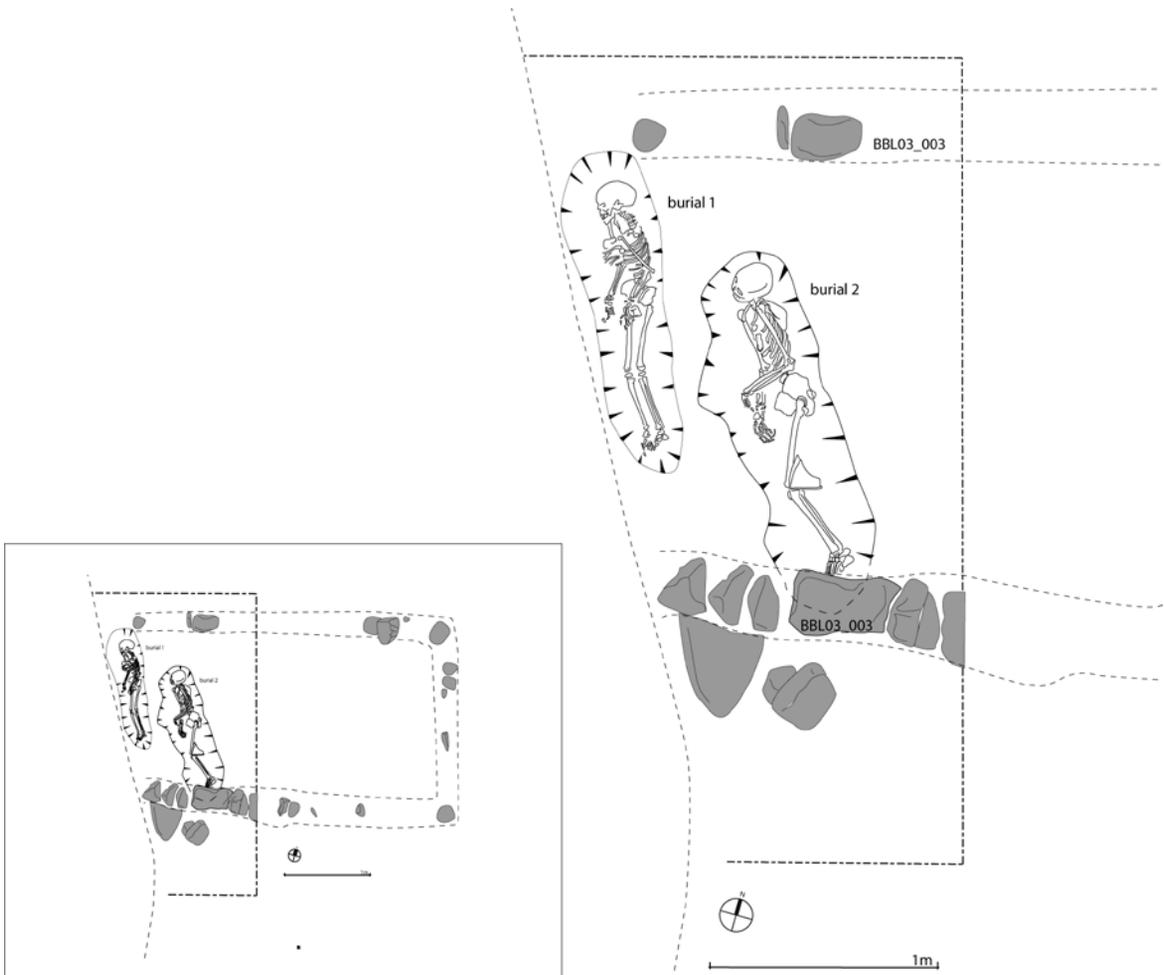
The stone structure proved to be only a single line of stones on the surface. Within the area delimited by this structure, we encountered a stratigraphic sequence of several layers differing from each other by their composition (BBLO3\_004, 005, 006, 012). In all of them, however, ceramic fragments (often from a single vessel in a number of the layers), fragments of hardened



**Fig. 10: The trench BBL02 - the cleaned profile on the east edge of the site Bobolangar. Photo by J. Kysela.**



**Fig. 11: The trench BBL03 in the spot of the terrain disturbance. Photo by A. Augustinová.**



**Fig. 12: Trench BBL03 and position of both burials, in addition to the location of the recent disturbance (irregular dashed line). Drawing by J. Kysela.**

clay (possibly a floor) and charcoal were found. The latter two are convincingly linked with the layers BBL03\_007 and BBL03\_011 (a hard trodden surface in the northern corner and southern edge of the trench) and BBL03\_008 (a thick charcoal layer beneath it covering the greater part of the southern half of the trench and gradually disappearing further to the north). The mixed and disturbed character of layers BBL03\_004, 005, 006, and 012 is clear from the fact that pottery was present from the topmost levels in the area within the stone structure while in the small area excavated outside the stone line, pottery only became more numerous in the lower levels.

The described stratigraphic sequence included two inhumations containing primary burials. Although the grave fill contained plentiful pottery fragments consistent with a Late Bronze Age date, it is probable that the grave pits were dug from above and disturbed the Bronze Age settlement layers. The grave cuts were only clear at the level of the skeletons themselves and the mixed character of the disturbed layers likely made it difficult to recognize these cuts. The grave fill of both interments contained pottery fragments from the same vessels (belonging to the Late Bronze Period; **Figs. 13–14, Pl. 4/2**), which we encountered elsewhere in the layers. The orientation of the graves, moreover, corresponds well with the orientation of the stone rectangle on the surface (BBL03\_003), which in turn, clearly marks the border between the described disturbed stratigraphy in its interior and much more clear stratigraphic sequence

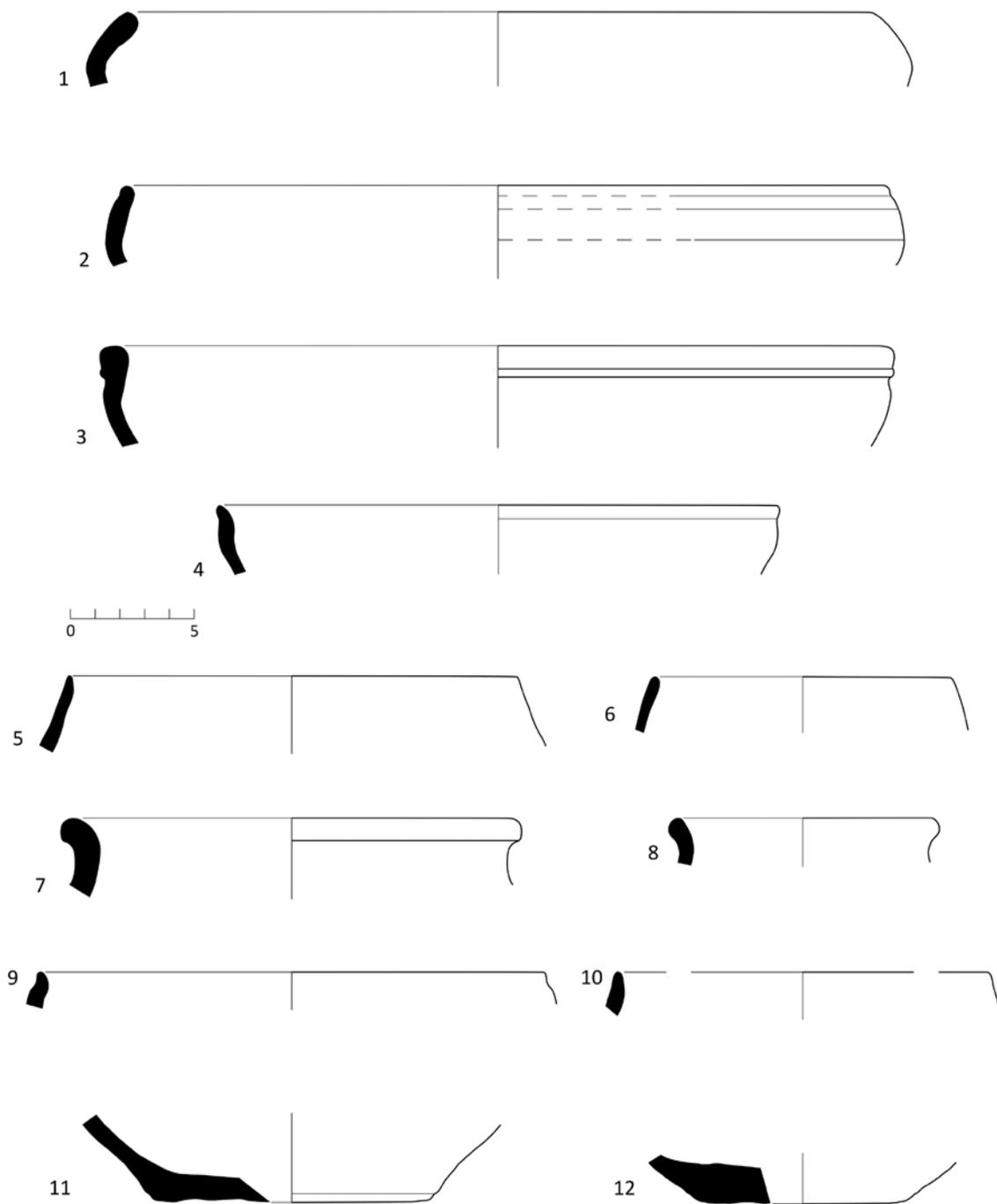
observed in the small part of the trench that extended past its exterior. Despite the extremely limited area, we believe we have identified two floor levels interspaced with settlement/destruction horizons (BBL03\_008) during the Late Bronze Age. For all these reasons we are convinced that the possibly Medieval era graves disrupted the Late Bronze Age cultural layers as the pit for the graves clearly disrupted several horizons of the Late Bronze Age floor.

## POTTERY

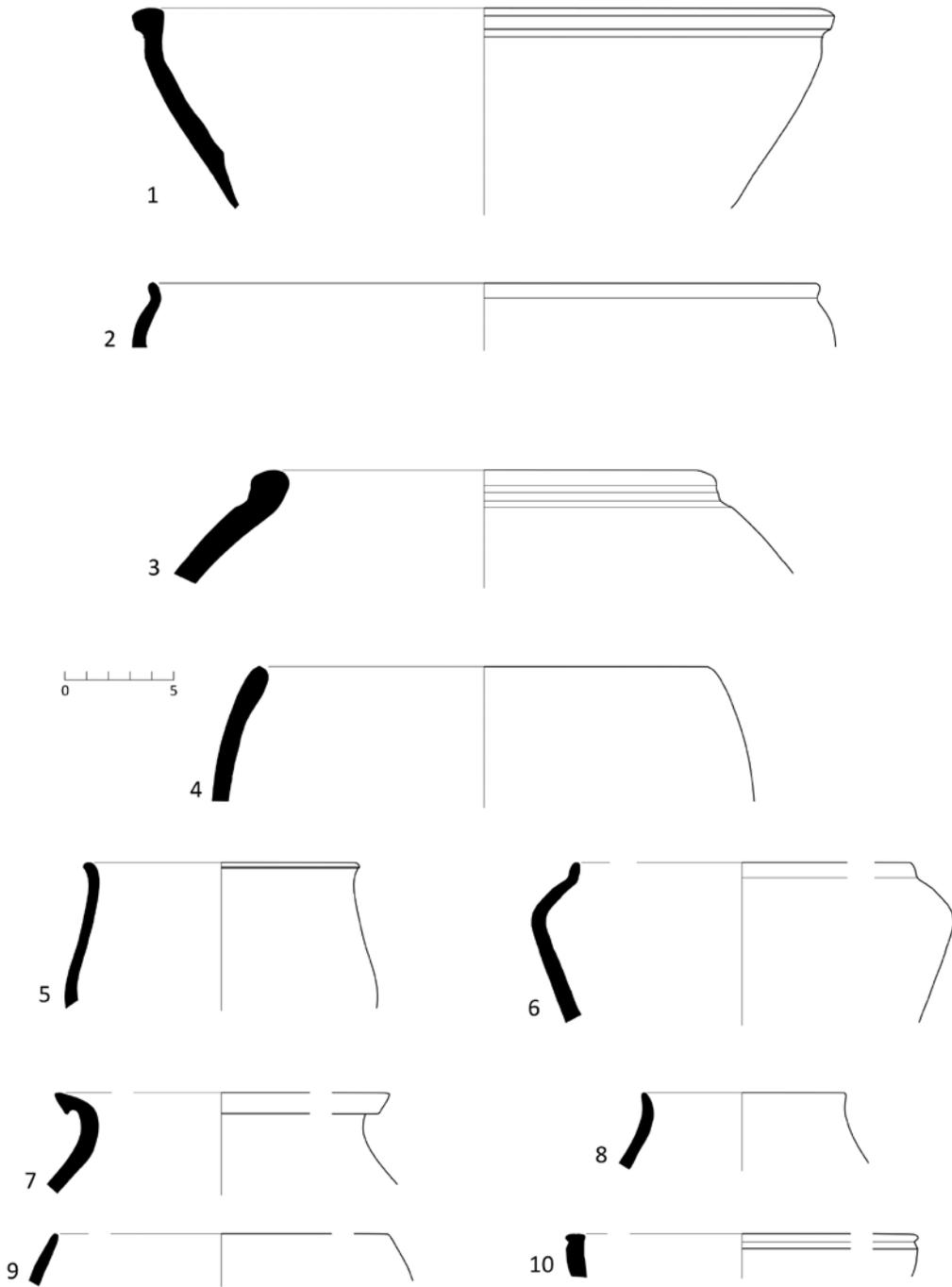
Overall, 350 pottery fragments (81 of them diagnostic) were collected during the research on Bobolangar. Out of these, 81 fragments (35 diagnostic) and one fragment of a 'dastarkhan' (a feasting table made of fired clay) were gathered on the site surface in 2016 and 2017 (AUGUSTINOVÁ *et al.* 2016, 125–127, fig. 20, pl. 4/7). Out of these, 50 sherds (including the 'dastarkhan') belonged to the Late Bronze Age (Sapalli culture; AUGUSTINOVÁ *et al.* 2017, figs. 20–21); one fragment was dated to the Early Iron Age (Yaz I culture); six fragments belonged to the Achaemenid period (5<sup>th</sup>–6<sup>th</sup> c. BC); and one fragment belonged to the High Medieval period (11<sup>th</sup>–12<sup>th</sup> c.). In 2017, another 13 ceramic fragments were collected on the site's surface (marked a 'Surface survey 2017') – all were consistent with Late Bronze Age pottery and therefore date to this period.

The pottery assemblages gained in the three trenches contain overall 269 sherds (46 of them diagnostic). All of them came from settlement deposits disrupted by the later burying activities and therefore no complete vessel was preserved. All the excavated pottery can be classified as Late Bronze Age. The ceramic collection from Bobolangar includes wheel-thrown pottery; both its ceramic matter and the represented types are characteristic of the Late Bronze Age in Bactria. Their parallels can be found in the large ceramic collections from the sites in north Bactria such as Sapalli Tepa (ASKAROV 1973), Jarkutan (ASKAROV – ABDULLAEV 1983; ŠIRINOV – BARATOV 1997) and Tilla Bulak (KANIUTH 2010; 2011).

The typical shapes are: the stemmed bowls (**Fig. 13:1–2**, cf. ŠIRINOV – BARATOV 1997, 74, Abb. 6:2; **Fig. 14:2**, cf. ŠIRINOV – BARATOV 1997, 74, Abb. 6:1; KANIUTH 2010, 137, Abb. 11, type 280; **Fig. 14:3**, cf. TEUFER 2015, 585, Taf. 207:5), the deep conical cups (**Fig. 13:3–4**, cf. ŠIRINOV – BARATOV 1997, 74, Abb. 6:3; KANIUTH 2010, 136, Abb. 10, type 400; **Fig. 14:1**, cf. ŠIRINOV – BARATOV 1997, 74, Abb. 6:5), the biconical pots (**Fig. 13:5–6** and **10**, cf. TEUFER 2015, 40, Abb. 17, type B/2 or 41, Abb. 18, type C; ŠIRINOV – BARATOV 1997, 115, Abb. 32:17–18; P'JANKOVA *et al.* 2009, 123, Abb. 27:5; **Fig. 14:9**, cf. ŠIRINOV – BARATOV 1997, 115, Abb. 32:17, 18), the bowls (**Fig. 13:9**, cf. ŠIRINOV – BARATOV 1997, 103, Abb. 24:25 and in ŠIRINOV – BARATOV 1997, 115, Abb. 32:23), the piriform vessels (**Fig. 14:8**, cf. TEUFER 2015, 35, Abb. 13, type B/2; ŠIRINOV – BARATOV 1997, 115, Abb. 32:14; ASKAROV 1973, 159, tabl. 18:4), the goblets (**Fig. 14:5**, cf. TEUFER 2015, 35, Abb. 13, type A; ŠIRINOV – BARATOV 1997, 74, Abb. 6:10), the bulbous pots (**Fig. 13:8**, cf. P'JANKOVA *et al.* 2009, 130, Abb. 32:7). Also fragments of a jar were collected (**Fig. 13:7**, cf. KANIUTH 2010, 135, Abb. 9, type 100; TEUFER 2015, 481, Taf. 103:5, 467, Taf. 89:3).



**Fig. 13: Bobolangar. Selected pottery from trench BBL01 (cultural layers - BBL01\_01: 1; BBL01\_02: 3-4, 6-8, 11; BBL01\_03: 5, BBL01\_06: 2, 9-10, 12). Drawings by A. Augustinová and J. Matznerová.**



**Fig. 14: Bobolangar. Selected pottery from trench BBL03 (cultural layers - BBL03\_01: 9; BBL03\_02: 10; BBL03\_04: 3-4, 6-8; BBL03\_08: 5; BBL03\_09: 1; BBL03\_13: 2). Drawings by A. Augustinová and J. Matznerová.**

## CONCLUSION

During the 2017 trial excavation at the site of Bobolangar we confirmed the preliminary assumption, based on the surface collection of pottery fragments during the 2016 field survey, that the site was a Late Bronze Age settlement.

During the excavation we detected several settlement horizons dated to the Late Bronze Age. In the trench BBLo2 we documented several floor levels in addition to cultural layers. A similar situation was also observed in trench BBLo3, where at least two Late Bronze Age settlement horizons (including a burnt horizon) could be distinguished that were later – probably in the Middle Ages – disrupted by burial activity (cf. below).

The orientation of the human skeletons uncovered in trench BBLo3 corresponded with the orientation of the grave pit inside the stone oval in trench BBLo1. Both skeletons in BBLo3 were aligned with the small stone quadrangular feature on the surface (BBLo3\_003) in terms of orientation and dimension. The quadrangular stone enclosure may therefore be considered a surface marking of a group of graves akin to the stone oval that marked the assumed grave in BBLo1. The same interpretation – i.e. surface markings of graves or grave clusters – may be at least hypothetically advanced for all the stone features documented on the surface. Even though the backfill of the graves contained pottery fragments dated to the Late Bronze Age, these were likely deposited when the graves disturbed the earlier – i.e. the Late Bronze Age – settlement layers. Based on the orientation and design of the graves, we suggest that they date to the Medieval Period – after the arrival of the Islamic culture into the area in the 7<sup>th</sup> c. AD.

## ANTHROPOLOGICAL ANALYSIS OF THE SKELETONS FROM THE SITE OF BOBOLANGAR, TRENCH BBLO3 (RK)

Two single interments, designated burials 1 and 2, were found in trench BBLo3 at the site of Bobolangar. As discussed, it was originally thought that the burials were Bronze Age interments. However, the burial position of the two individuals (flexed on right side), lack of burial goods, and presence of broken Bronze Age ceramics in the grave fill of both burials likely indicate that both individuals were from a later period – possibly the Medieval Period. The following is a preliminary description of the burials and a more in-depth publication is in preparation. AMS dating and ancient DNA analysis of both burials is currently underway at the Max Planck Institute for the Science of Human History, Jena, Germany. For both individuals, stable isotope analysis of carbon, nitrogen and sulphur will be undertaken to assess paleodiet. Strontium and oxygen isotope analyses will be conducted to assess migration. Microparticle analysis of dental calculus is currently being organised. Histological analyses of the ribs are currently underway to assess health.

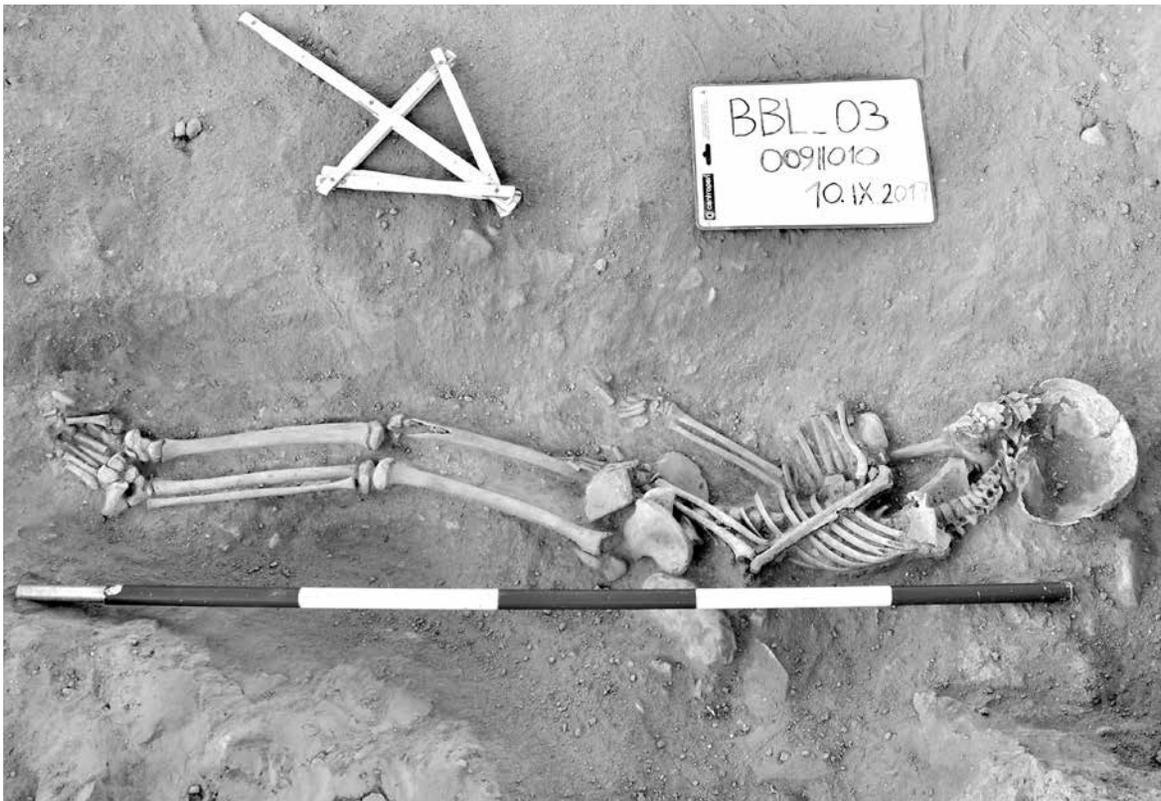
### THE BURIALS

#### *Burial 1*

Burial 1 was a child interred in a semi-flexed position on its right side oriented northwest by southeast, head facing west (**Fig. 15**). The bone preservation was excellent and the skeleton was complete with the exception of some missing hand and foot phalanges. The left parietal and orbit were crushed when first found but otherwise the skull was intact, albeit crumbly from sun exposure. Rocks were present around the pelvic area and these may have been part of the burial fill or intentionally placed there. There was a disturbance to the right upper

thorax of burial 1 after decomposition as the manubrium of the sternum was found above the left shoulder and the right upper ribs were not in anatomical position.

The age of burial 1 was estimated as 8–10 years from the extent of epiphyseal fusion, tooth eruption and tooth formation (SCHEUER – BLACK 2000). The only pathology observed on the postcranial skeleton was a possible healed periosteal reaction on the anterior surface of the proximal end of the left tibia, which is a non-specific indicator of physiological stress and infection, but may also result from trauma (**Fig. 16**). Burial 1 had a mixed dentition (i.e. includes both permanent and deciduous teeth). The remaining deciduous teeth – the maxillary and mandibular molars – displayed high rates of tooth wear (grades 5–8, SCOTT 1979) (**Fig. 17**). The first permanent molar displayed less severe wear (grades 1, SCOTT 1979) and this is likely because the permanent first molar had only erupted within the last few years of this individual's life. The extreme wear of the deciduous dentition indicates this child ate gritty and/or fibrous foods from an early age. Mild calculus deposits (calcified plaque) (grade 1 BROTHWELL 1981) were observed on both the deciduous and permanent teeth. Calculus can form as a result of poor oral hygiene, but has also been associated with diets high in starch and/or protein (HILLSON 1996). In the deciduous dentition, dental enamel defects in the form of brown hypocalcifications were present. In the permanent dentition, three teeth displayed linear enamel hypoplasia, and one of these was also affected by brown hypocalcifications. These dental enamel defects indicate that burial 1 underwent periods of physiological stress during the time of tooth formation (i.e. earlier in childhood and infancy) (LEWIS – ROBERTS 1997).



**Fig. 15:** Bobolanghar, Burial 1. Position of the burial, of the 8–10 year old child. Photo by J. Kysela.



**Fig. 16: Burial 1. Possible healed periosteal lesion on the superior, anterior aspect of the left tibial diaphysis. Photo by R. Kinaston.**



**Fig. 17: Burial 1. Heavy tooth wear of right maxillary deciduous molars. Photo: R. Kinaston.**

### *Burial 2*

Burial 2 was a young/mid-age (mid 20s to late 30s) adult female interred semi-flexed on her right side, oriented north/northwest by south/southeast, facing west (the same position as burial 1) (**Fig. 18**). The grave-pit appeared slightly too small for the individual as the head of burial 2 was compressed on the north side of the grave so the skull was almost vertical instead of resting horizontal on the base of the grave (**Fig. 19**). The edge of the bottom of the grave appeared to be lined with stones, likely from the nearby river, and this was especially apparent on the east side of the burial.

The bone preservation was excellent, and the skeleton was complete. The skeleton was very gracile. Sex was estimated using the pelvic and cranial morphology (BUIKSTRA – UBELAKER 1994). Age was estimated using the pubic symphysis (BROOKS – SUCHEY 1990), the auricular surface, sternal rib ends (İŞCAN *et al.* 1985), the presence of late-fusing epiphyses and cranial suture closure (BUIKSTRA – UBELAKER 1994). Only the right pubic symphysis was assessed as there was a possible osteoclastic lesion present on the surface of the left pubic symphysis.

**Stature:** Living stature was estimated using two methods that utilised regression equations of long bone lengths (SJØVOLD 1990; TROTTER – GLESER 1952; 1958). It should be noted that the reference populations used to develop these stature estimates are different from that of Burial 2, and this may introduce some error into the estimations (**Tab. 1**). Although there is a range of stature estimates depending on what long bone measurement was used, both methods produced a similar average height of 161.62 cm and 161.39 cm for burial 2, respectively.



**Fig. 18:** Bobolanghar, Burial 2. General view of the burial of an adult female. Photo by J. Kysela.

**Pathology:** The right and left wrists, hands and fingers were flexed, with the exception of the thumb of the left hand which was extended (**Fig. 20**). The feet appeared extended (plantarflexion) and rotated inwards (inversion) (**Fig. 21**). The extreme flexion of the hands and extension and inversion of the feet may suggest that this individual had a condition that led to spasticity (e.g. stroke, cerebral palsy, brain injury, multiple sclerosis and other neurological disorders).



**Fig. 19: Position of the cervical vertebrae and cranium indicating that burial 2 was crammed into the grave. Photo by R. Kinaston.**

Long bone	Side	Length (mm)	Stature estimate (1)	± 1 SD	Stature estimate (2)	± 1 SD
Humerus	L	311	162.47	4.45	162.67	4.94
Humerus	R	315	163.81	4.45	164.57	4.94
Radius	L	233	165.37	4.24	163.86	4.98
Radius	R	235	166.32	4.24	164.67	4.98
Ulna	L	251	164.94	4.30	164.68	4.96
Ulna	R	250	164.51	4.30	164.21	4.96
Femur	L	400	152.90	3.72	155.16	4.52
Femur	R	410	155.37	3.72	157.79	4.52
Tibia	L	360	N/A		160.82	4.69
Tibia	R	355	N/A		158.27	4.69
Fibula	L	345	160.70	3.57	160.56	4.06
Fibula	R	342	159.82	3.57	159.43	4.06
<b>Average</b>			<b>161.62</b>		<b>161.39</b>	

**Tab. 1: Stature estimation for females from (1) TROTTER – GLESER (1952; 1958) and for males/females from (2) SJØVOLD (1990).**



**Fig. 20: The flexed wrists, hands and fingers of burial 2 (note the left thumb was found extended into the soil). Photo by R. Kinaston.**



**Fig. 21: The extended (planterflexed), inverted feet of burial 2. Photo by R. Kinaston.**



**Fig. 22:** Moderate to severe pitting located on the posterior aspect of the right and left patellae, osteophyte formation around the margins of the articular surface and osteochondritis dissecans present on posterior surface between the medial and lateral articular surfaces of the patellae. Photo by R: Kinaston.



**Fig. 23:** Extreme tooth wear on the labial surface of the maxillary incisors (heavier on left side). Photo by R. Kinaston.



**Fig. 24:** Interproximal caries affecting the CEJ of the left second maxillary molar.

Some bony changes associated with pathology or trauma were observed on the post-cranial skeleton of burial 2. These included: septal aperture in the olecranon fossa of the left humerus and osteoclastic and osteoblastic lesions on the proximal aspect of the head of the left ulna; osteoclastic and osteoblastic lesions on the anterior, superior aspect of the proximal tibia, lateral to the medial condyle; a small osteoclastic lesion on the inferior aspect of the mid-shaft of the intermediate phalanx of the right second digit of the hand; a possible osteoclastic lesion present on the surface of the left pubic symphysis; moderate to severe pitting located on the posterior aspect of the right and left patellae (**Fig. 22**), especially on the medial articular facet in addition to slight to moderate osteophyte formations around the margin of the articular facets of both patellae (no lesions were observed on the patellar surface of the right and left

femurs); osteochondritis dissecans were present on posterior surface between the medial and lateral articular surfaces of the patellae; porosity of the vertebral body joint surfaces and osteophyte formation on the superior margin of lumbar vertebrae L3, L4 and L5. The patellae, tibia and lumbar spine pathologies may be indicative of degenerative joint disease or, in the case of the patellae, chondromalacia resulting from wear caused by physical deformity or traumatic injury. Osteochondritis dissecans is thought to form as a result of minor repeated trauma to the articular patellar surface.

The only pathology of the crania was observed in the dentition and surrounding alveolar bone, of which both the maxilla and mandible were available for analysis. Tooth wear was heavy on the anterior teeth (grades 4–6 MOLNAR 1971) and less so on the molars, especially the second and third molars (MOLNAR 1971; SCOTT 1979). The left dentition was more heavily worn than the right side, especially in the anterior dentition (**Fig. 23**). The pattern and extreme wear of the labial surface of the maxillary incisors was not consistent with corrosion and may suggest some type of use of the teeth for a functional purpose other than eating. Caries (cavities) were observed on two teeth and included an interproximal caries of the cemento-



**Fig. 25: Heavy calculus deposits; advanced, active periodontal disease that had exposed the tooth roots; massive caries that destroyed the lower left first mandibular molar, leaving the mesial tooth root intact; and the antemortem tooth loss of the left, second mandibular premolar, with complete alveolar resorption of the tooth socket. Photo by R. Kinaston.**



**Fig. 26: Heavy calculus deposits and advanced periodontal disease of the right maxilla. Photo by R. Kinaston.**

-enamel junction (**Fig. 24**) and a massive caries. The massive caries destroyed a majority of the lower left mandibular first molar, leaving a residual tooth root behind (**Fig. 25**). There were deposits of calculus (calcified plaque) on the teeth (grades 1–3 BROTHWELL 1981) and these were especially heavy (grade 2–3) on the lower mandibular incisors and canines and maxillary premolars and molars (**Figs. 25–26**). The calculus may have influenced the development of periodontal disease, which was severe and advanced enough to expose the tooth roots (**Figs. 25–26**). Two teeth (a mandibular third molar and premolar) were lost before the time of death and the sockets of these teeth had completely remodelled before the time of death (**Fig. 25**). Caries are associated with diets high in refined carbohydrates and calculus deposits have been linked with diets high in starch and protein (HILLSON 1996). Both conditions and associated pathologies (periodontal disease and antemortem tooth loss) are also caused by poor oral hygiene (HILLSON 2008). Of the 26 observable teeth, Burial 2 had three teeth (11.5 %) affected by linear enamel hypoplasia (LEH) - lines in the enamel that form as a result of physiological stress in childhood. LEH is a non-specific indicator of stress, which can occur as a result of periods of malnutrition and disease during the time of tooth formation (LEWIS – ROBERTS 1997).

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Pl. 4/1: BK2017\_06 by the end of the 2017 excavation. Photos and of 3D model by T. Votroubeková.



Pl. 4/2: Cup on feet excavated in Bobolangar - typical vessel form of the Late Bronze Age (Sapalli Culture). This particular vessel was recomposed from sherds found throughout the entire stratigraphy of the trench BBLo3 including in the backfill of the graves, evidencing clearly the disturbance of settlement layers by the later graves (photo by T. Votroubeková, reconstruction by A. Augustinová).