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The Iron Gate and its environs in the Hellenistic period. Preliminary report for archaeological research in the Baysun District (South Uzbekistan), Season 2019

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ABSTRACT
This report summarizes the starting points, methods and results of the archaeological research of the Czech-Uzbek team investigating the Hellenistic settlements in the vicinity of Darband, in the upper reaches of the Sherabad Darya, in the Baysun District of southern Uzbekistan in season 2019. A significant amount of archaeological material has been obtained using a systematic surface metal detector survey and targeted excavations of a limited scope. We were able to confirm that some of these sites, such as Daganajam Tepa and perhaps also Mirzali, were inhabited only in the Hellenistic period, while in the case of the others, a settlement in the 3rd and 2nd centuries BC was only one of their occupation phases (Kapchigay Tepa, Darband wall).

KEYWORDS
Darband wall; surface survey; metal detectors; Bactria; Hellenistic period; Baysun Mountains; Kugitang Piedmonts.

INTRODUCTION

Resuming archaeological survey works of two previous field seasons (2017, 2018) undertaken within the framework of the project 'On the Oxyartes' Rock: detecting forts and refuges of the Alexander the Great period in Central Asia', the Czech-Uzbek team aimed to explore the hitherto detected sites in the Bactro-Sogdian borderlands (in the vicinity of the famous Iron Gate of Darband) in order to obtain as much archaeological data on the Hellenistic settlement in the study region as possible. At the same time, we placed an emphasis on the employment of the least destructive research methods. In this second step of the research, we launched several activities, primarily a systematic metal detector survey at the Darband wall and several other sites. Secondly, selected sites became subject to small-scale trial excavations. Moreover, by means of the surface survey we continued targeting the gaps between the already known sites. The amount of archaeological material gained during the survey is immense and it is beyond the scope of the present report to make it all public. In the following pages we summarize our aims, methods, and results in a very preliminary way, while the in-depth publications of the data and material, as well as a final evaluation of these, will follow soon.

The field season of the Czech-Uzbek expedition in 2019 lasted from September 8 to September 27 with its base situated again in a private house in a strategically located Darband village, from where individual research groups could easily reach all the relevant sites.

METAL DETECTOR SURVEY

Since 2015, the Czech-Uzbek team started using metal detectors during both the archaeological excavations and surface surveys in the Sherabad and Baysun Districts, although on a limited scale. In the very beginning, at the sites dating from the second half of the 2nd millennium BC (Yaz I culture) in the Pashkhurt basin, one or two devices were employed in the field with two basic goals: to gain all – or at least some – metal objects at the sites of this culture for which metal artefacts are basically unknown; and to sample selected locations in the landscape during the surface survey in order to gain significant chronologically sensitive artefacts such as coins and arrow heads.[1] The obvious success of the latter approach led us to consider a more systematic use of this method.

Hence, the first systematic (as opposed to the earlier sampling / random) metal detector survey was conducted from the 8th to the 24th September 2019 at the following archaeological sites: Darband wall, Daganajam Tepa (village of the same name), Mirzali at Khojay Gor (close to Loylagan village), and Kapchigay (part of Darband village) (cf. the map in **Fig. 1**). Typically, four metal detectors operated simultaneously under the direction of Tomáš Bek. The team members were Miroslav Kratochvíl, Jan Černý, and Marek Vinklát. The detectorists were supported by a person operating a hand-held GPS to pinpoint the position of the detected metal objects.

Apart from a more systematic and intensive survey, the methodological starting points were designed along the same lines as in 2018 (Stančo *et al*. forthcoming), when the survey method was based upon verified practices (Vích 2014; Boon 2013). The basic idea of the survey was to minimise the negative impact on archaeological contexts and especially to avoid entirely intact archaeological situations thus preventing their disruption. For this very reason, VLF (Very Low Frequency) metal detectors were used, which do not have a large depth range (tens of centimetres at the most), but allow the detection of small metal objects (even in fractions of grams). The XP Deus detector with different types of coils was used for prospecting. For the location of finds, total station was used first, but this practice was soon given up since the difficult terrain made the systematic use of this device impossible. Consequently, only a hand-held GPS receiver was used, producing a measurement error in units of meters at most.

Tab. 1 shows the time consumption and the yield of the finds at individual sites.[2] Our aim was to distribute the man / hour effort evenly at various parts of the sites in order to compare the find density and their spatial relations to the site's topographic features. The 'all metal' mode of the devices was systematically used for the prospecting in order to avoid any unwanted discrimination against some metals, especially iron. Only obviously modern items, such as bullets, cartridge cases, wires etc., were removed from the find corpus. All other objects were cleaned, conserved, measured, weighed, photographed, and also partly drawn. They were also subject to pXRF measurements aiming to determine their elemental composition (see below). **Tab. 2** demonstrates the general overview of the find assemblage characteristics. A series of detailed publications of various classes of objects prepared in collaboration with relevant specialists will follow in the near future.

1 For part of the results and description of the method prior to the systematic phase, see Stančo *et al*. forthcoming.

2 The basic characteristics of all the mentioned sites were recently published (Stančo 2021) some other information can be found below.

Tab. 1: The amount of time and labour invested to the individual sites during the metal detector survey.

Date	Site	Sector	Devices	Time spent (hours)	Men/hours
08/09/19	Mirzali (Khojay Gor)	whole	4	4	16
09/09/19	Darband Wall	Northeastern part 1	4	8	32
10/09/19	Darband Wall	Northeastern part 2 Nortwestern	4	8	32
11/09/19	Darband Wall	Nortwestern	4	4	16
11/09/19	Kapchigay Tepa	among the houses in the village	4	1.5	6
12/09/19	Darband Wall	Central part – east 1	4	7	28
13/09/19	Daganajam Tepa	Tepa	3	3	9
13/09/19	Darband Wall	Central part – east 2	4	4	16
15/09/19	Darband Wall	Southeast (around the fort)	3	6	18
16/09/19	Darband Wall	Southeast	4	7.5	30
17/09/19	Darband Wall	Southeast and south	4	8	32
18/09/19	Darband Wall	South and soutwest	4	8	32
19/09/19	Kapchigay	Tepa Slope above	3	3	9
19/09/19	Daganajam Tepa	Tepa Left river bank	4	2	8
21/09/19	Darband Wall	Central part – west Around the bridge (west of DW)	4	5	20
23/09/19	Kapchigay	Slope above	1	6	6
24/09/19	Mirzali (Khojay Gor)	slopes	1	8	8
In total	4 sites			93	318

Tab. 2: The yield of finds from the surveyed sites.

Site		Darband Wall	Daganajam Tepa	Kapchigay (tepa)	Kapchigay (slope above)	Mirzali	In total
Men / hours		256	17	10	11	24	318
N° of finds total		629	21	6	53	112	821
N° of fins in	Copper alloys	518	18	5	50	94	685
	Silver	29	0	0	3	4	36
	Gold	2	0	0	0	0	2
	Lead	52	1	1	0	12	66
	Iron	25	2	0	0	2	29
Coins		365	7	2	22	55	451
Arrowheads		53	2	0	5	0	60
Finger rings		3	0	0	0	1	4

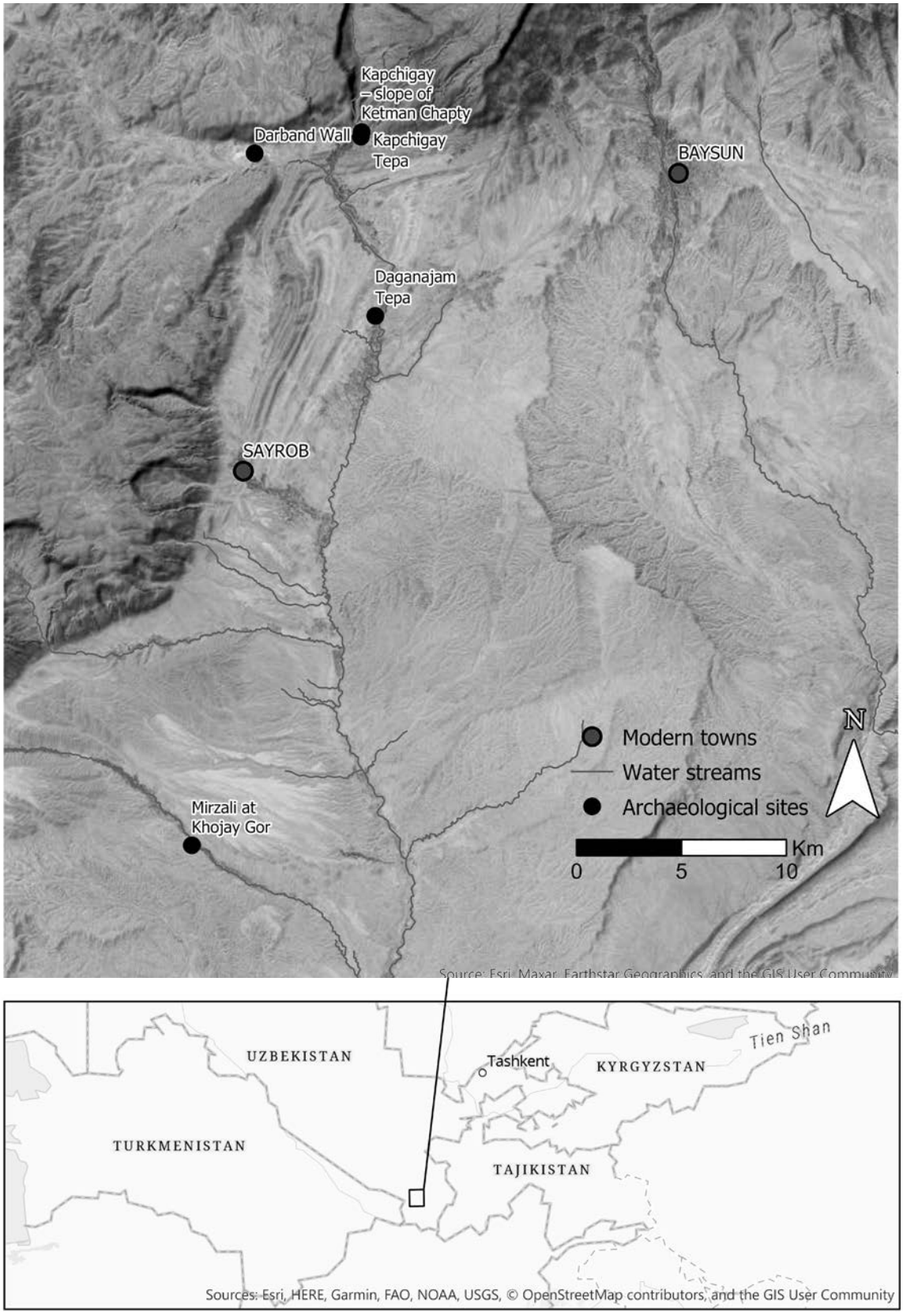

Fig. 1: Map of the western part of the Baysun District with all the sites mentioned in the text.

TRIAL EXCAVATIONS AT THE HELLENISTIC SITES AROUND DARBAND

The excavations of the 2019 campaign concentrated as a rule on sites identified or confirmed as Hellenistic[3] ones during earlier surveys. The aim of these digs was not to gain exhaustive information but to obtain some basic data concerning the sites' inner chronology (number of occupation horizons, presence of pre- and post-Hellenistic occupation), the nature of Hellenistic occupation, and the state of preservation of archaeological structures. The principal objective was therefore to sample the highest possible number of sites in the study region with focused small-scale interventions. Among the known sites were thus selected Daganajam Tepa, Kapchigay Tepa, Kapchigay – the slope of Ketman Chapty, Mirzali at Khojay Gor, and to a certain degree also the Darband wall itself, the research on which however was approached differently (see below). All the excavations were documented by photography with some selected features and the final situation captured by a 3D photogrammetric model from which precise ground plans were generated. The details on the location, topography, and preliminary interpretation are summarized in an earlier article (Stančo 2021), hence we limit ourselves here only to the description of the recent excavations and their results accompanied by the ground plans of the trenches and pottery drawings.

DAGANAJAM TEPA

The hillock of Daganajam (or Dakhna-i-jom) Tepa overlooking the river valley of Sherabad Darya was identified as a potential Hellenistic settlement during L. Stančo's surveys in 2018 (Stančo *et al*. 2019, 150–151; with the description repeated and elaborated in Stančo 2021, 69). The Hellenistic occupation was suggested by finds of characteristic pottery and of Seleucid and Greco-Bactrian coins (Seleucus I or Antiochos I, Euthydemus I, Demetrius I; see Stančo *et al*. forthcoming). The roughly circular summit of the hill served as a children's cemetery until the recent past and is currently covered with thick grassy vegetation. Now the summit is widely occupied by tortoises whose deep burrows disturb the subsurface layers. All these circumstances led us to open a 2×4 m trench (longer axis E-W) on the very eastern edge of the hill facing the river valley, in an area outside the densest undergrowth and devoid of traces of recent graves (**Fig. 2**). The excavation was carried out by one archaeologist and two workers over six working days.

The first spit (top-soil) [001] was followed by a sterile layer of eroded eolic deposits [002]. Already at this level a red-burnt stain [003] was visible in the E half of the trench. At a depth of a mere 5 cm a straight line of reddish burnt soil [004] crossing the entire trench in the SSW-NNE direction appeared beneath it. It turned out to be the E edge of a mudbrick wall.

The wall divided the trench into two distinct areas. The area E of the wall was filled in with a powdery, highly eroded layer [007] in which we failed to distinguish any stratigraphy, nor did we identify a clear walking horizon. This part of the trench was interpreted as an outdoor zone while the zone W of the wall is to be considered the interior of a building. The latter was topped up with a wind driven deposit [006] apparently resulting from the gradual filling-in of the abandoned structure. The deposit [008], underlying [006] in the entire area inside the wall and beginning at a depth of ca. 40 cm from the W edge of the trench, was clearly more

3 By the vague term 'Hellenistic' we understand here all settlements dated according to the finds to the period from Alexander the Great to the late 2nd century BC, including the Seleucid and especially the Greco-Bactrian period.

Fig. 2: Daganajam Tepa, satellite image of the site taken during the excavation. The trench is clearly visible (indicated by the arrow). Source: Google Earth.

Fig. 3: Daganajam Tepa. The abandon horizon. Photo: J. Kysela.

Fig. 4: Daganajam Tepa. The destruction horizon. Photo: J. Kysela.

heterogeneous both in colour and composition (disordered fragments of mudbricks; numerous cavities; patches of sand and small pebbles) suggesting its origin as being the eroded and disintegrated destruction of a building (**Fig. 3**).

After a depth of some 20–30 cm, this previously sterile deposit grew considerably richer in pottery fragments. This horizon was distinguished as stratigraphic unit [009], i.e. the lowermost portion of the destruction, overlying the actual frequentation horizon. At the same depth of ca. 80 cm from the W edge of the trench there was a grey crumbly layer [014] (remains of a floor?) in the S section near the wall [004] (**Fig. 4**) and a clear concentration of sherds from a single storage vessel nearby; mudbrick outlines were clearly visible in the W section though none of them could be outlined in order to be measured.

At a depth of 92 cm (while no apparent changes appeared in the stratigraphic unit [009] in the central part of the trench), the W part could be distinguished as a solid stony layer [011] in the N and a crumbly layer [012] consisting mostly of mudbrick fragments in the central and southern part of the trench. Roughly from this level, some degree of charcoal and rubified soil and stains of a white crust could be clearly observed, continuing to the layer [013] starting at a depth of 103 cm from the W edge (**Fig. 5**).

Although we failed to identify the actual floor (the remains of which could be represented by the crust [014]) we can confidently assert that the horizon of [009]–[012] represents the remains of a settlement horizon – possibly disturbed by elements after the abandonment of the building but before the final collapse of the structures. The deposit [013] could have been the levelling layer.

The wall [004] was heavily eroded – only a single row of mudbricks was preserved. The base of the wall was built of a solid block of pakhsa with bricks preserved only along the N portion

of the W edge. The S part of the unearthed portion of the wall does not seem ever to have been covered with bricks and it even features patches of [014] continuing from the interior. It is therefore probable that there was a doorway in this part of the wall. The dimensions of the three (partly) preserved bricks are 23×23, 23×33/36, and 23×46 cm. Their thickness could not be stated with any confidence.

Fig. 5: Daganajam Tepa. The destruction horizon. View from the north. Photo: J. Kysela.

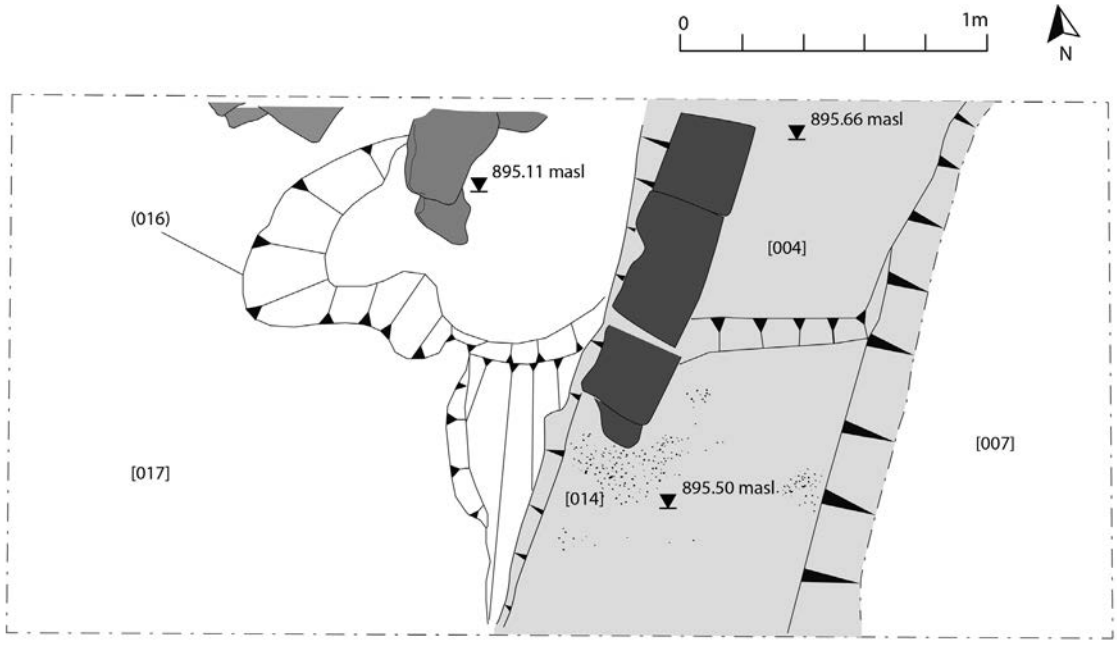

Fig. 6: Daganajam Tepa. The final plan. Photogrammetry based drawing: T. Votroubeková, J. Kysela.

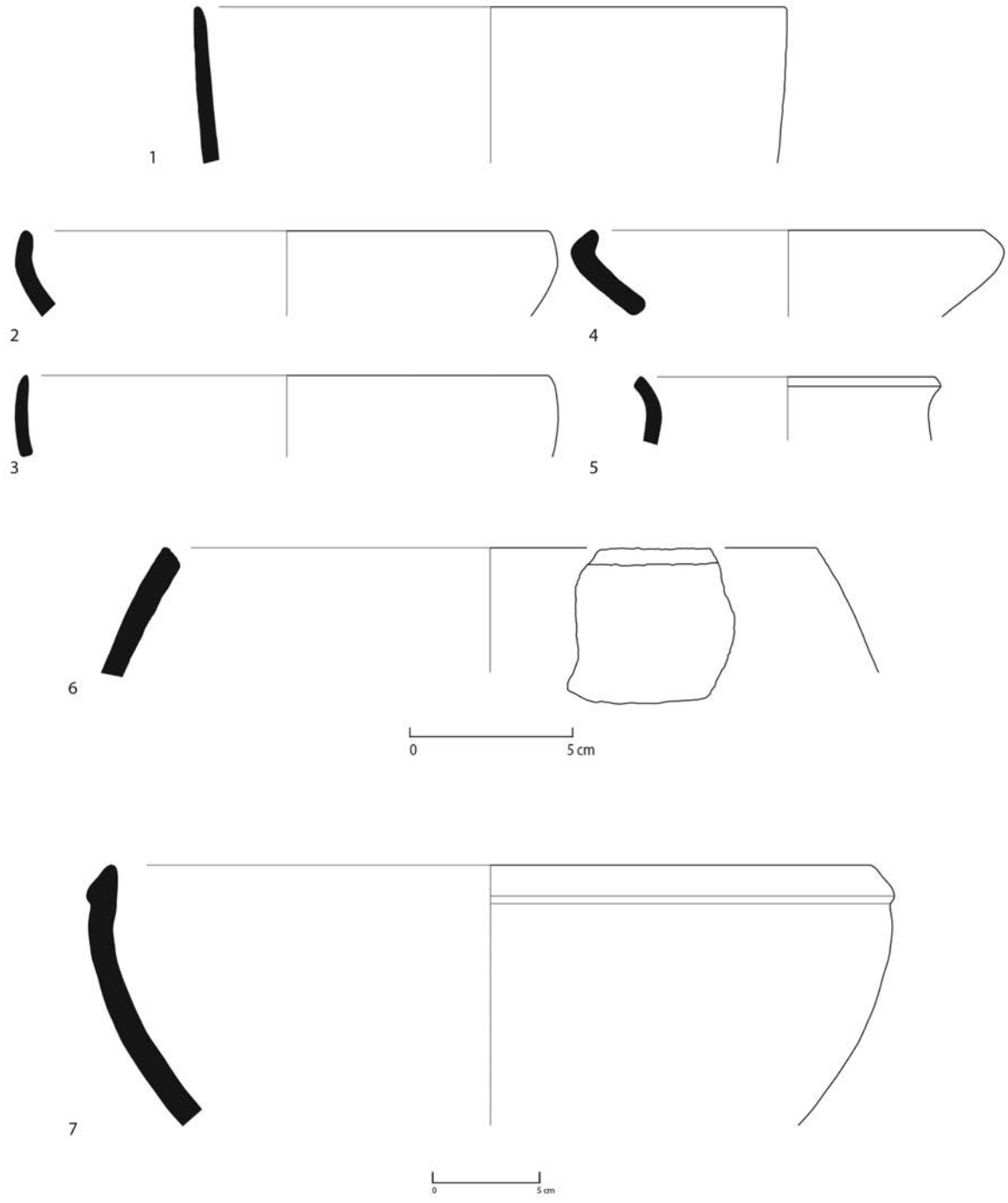

Fig. 7: Daganajam Tepa, pottery from the excavation. 1 – DGJ19_01_002.002; 2 – DGJ19_01_006.001; 3 – DJG19_01_015_002; 4 – DJG19_01_007_002; 5 – DJG19_01_014_002; 6 – DJG19_01_011_001; 7 – DJG19_01_013_002. Drawings J. Matznerová and T. Kolmačka.

In the N part of the trench, the wall covers a pit [015/016] in the geological soil [017]. Whether of anthropic or natural origin (should it be anthropogenic there are no clear hints of its original function), prior to the construction of the wall, the pit was filled in with large boulders and a sandy layer [019] and sealed with a hard calcareous layer containing numerous stones

[018] (**Fig. 6**). Though strongly resembling floor bases, this hard layer probably only served as a measure to solidify the foundations of the perimeter wall and was never visible or even present in a larger portion of the room.

To sum up, the excavation identified a simple settlement structure of a single phase whose abandonment was probably caused by a fire. The finds all date to the Hellenistic period, there are no hints of an earlier or later human presence in the site with the exception of the modern cemetery. The preservation of the archaeological structures and layers is not ideal but sufficient to permit a basic analysis of the unearthed features. The occupation/destruction layers [012] and [013] moreover proved a welcome source of burnt deposits, which are very useful for archaeobotanical sampling. Those (few) parts of the site that are not covered by the modern cemetery are suitable for further research.

KAPCHIGAY TEPA

The information we had on this site was summarized in a recent article (Stančo 2021, 72–73). Local people insisted that this site lacked any modern houses until the 1970s, since people knew that there was a burial ground here earlier, which they tried to avoid. The lack of space forced them to change their minds and to build up the area in the last 50 years. In order to get a better picture of this site's function and chronology, one small (2×4 m) test trench (trench 1, orientation of the longer axis N-S) was opened in literally the only part of the Kapchigay Tepa summit accessible for digging, i.e. in an open private courtyard in its centre (**Fig. 8:1**). The work, which lasted six working days (September 16–23) was supervised by Kahramon Toshaliyev with two local workers assisting him.

Fig. 8: Kapchigay, satellite image of the site. 1 – Kapchigay Tepa, trench 1; 2 – Kapchigay Tepa, trench 2; 3 – Kapchigay, slope of Ketman Chapti, masonry wall; 4 – 'tower' foundation. Source: Google Earth.

The subsurface layer turned out to be heavily compacted soil apparently due to the various recent activities involving heavy vehicles. The second mechanical layer did not reveal any traces of architecture, while ceramic finds of both the High Medieval and Hellenistic periods were numerous. The third layer with basically only Hellenistic pottery can be directly related to the occupation and abandonment of the area. In the northern part of the trench, this layer rested on a very hard level – probably a floor – while in the southern part it was possible to descend even further to the fourth level. It was characterised by the significant presence of large sherds of storage vessels (or of *a* storage vessel). Furthermore, in the southwestern corner, which already from the third excavation level presented a noticeable concentration of ash, the excavation of level four uncovered a hearth with its circumference built out of pakhsa. In summary, the excavation reached a depth of 80/85 cm in the southern part of the trench and ca. 75 cm in its northern part. The north-eastern part is occupied by what is clearly a floor built from compacted pebbles bound by clay (with possibly some limited presence of lime); its surface is so solidly made that it was impossible to excavate it with the tools available to us. This floor terminates – probably damaged – in an irregularly stepped NW-SE line. In the southern part of the trench, the excavation stopped at the level of the supposed bedrock (fifth level). An accumulation of storage vessel sherds and a complete fired brick were present in the central part of the trench close to its western wall (layer seven). The hearth in the southwestern corner was roughly circular/oval, delimited by a 5–10 cm thick pakhsa wall. It was not uncovered in its entirety (parts of the structure continue under the southern and the western profile) but – assuming its form was regular – its dimensions would be ca. 100×80/100 cm. As is visible in the section, the hearth (or perhaps more correctly a *tandyr*) was originally domed. The excavated area is clearly a kitchen area of a domestic complex with a hearth and a storage vessel which was probably originally partly sunk into the floor. Only one occupation phase was documented.

Fig. 9: Kapchigay Tepa, trench 1. Final situation. Photo J. Kysela.

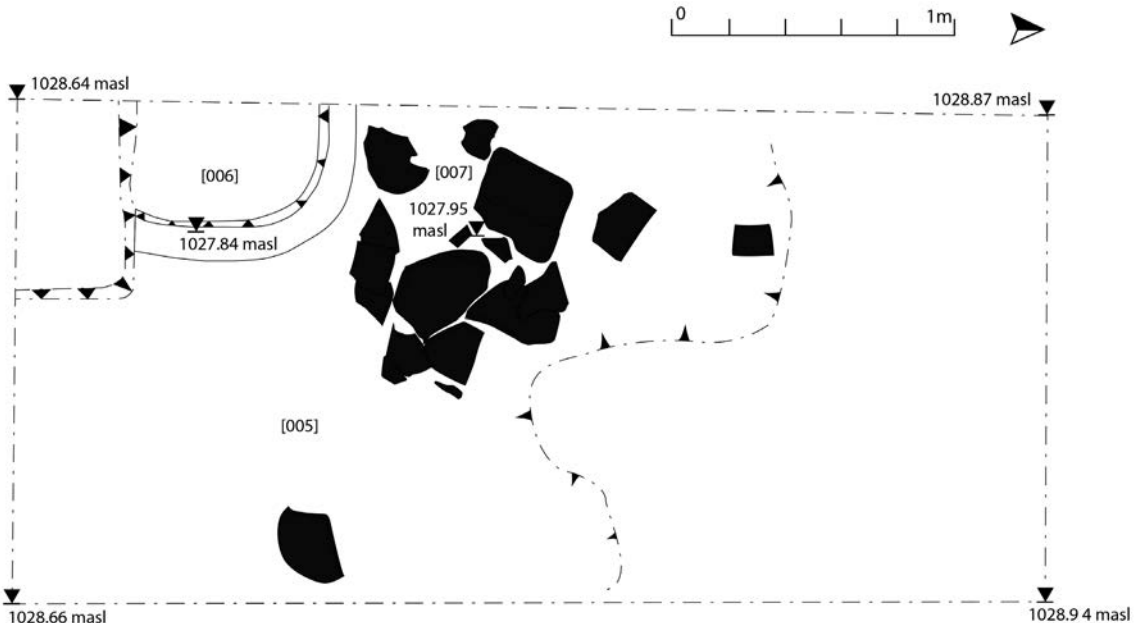

Fig. 10: Kapchigay Tepa, trench 1. Final plan. Photogrammetry based drawing: T. Votroubeková, J. Kysela.

At the edge of the Kapchigai plateau, where the slope was torn down revealing large stones that might be part of a construction, we found well preserved human skeletal remains (trench 2; **Fig. 8:2**). Among the bones, several fragments of pottery typical for the 3rd–2nd century BC, such as the so-called fishplates, were discovered. In order to prove the dating of these remains, the anthropologist Rebecca Kinaston excavated the bones and took samples. The AMS dating disclosed that the (two) deceased individuals were buried quite recently and the earlier objects happen to be mixed up with them only by chance. The odd placement of the two bodies together hints at some non-standard cirumstances of their death.

The site as a whole, despite representing a very important settlement of the Hellenistic period judging from the abundance and quality of the archaeological material, is not suitable for further systematic research being almost entirely covered by modern houses and in many places disturbed by recent activities of various kinds. Among the peculiarities of the site, the lack of metal finds of the period in question, especially coins, compared to the other similar sites, is worth mentioning.

KAPCHIGAY – SLOPE OF KETMAN CHAPTI

Again, a basic description of the site consisting of a long stone-built wall (ca. 100 m in length; **Figs. 8:3** and **12**), a gate-like structure, and a tower(?) (**Figs. 8:4, 15** and **16**) has been published just recently (Stančo 2021, 73), we thus limit ourselves here to a brief description of the excavations. Small scale test pits were excavated in two spots of the stone enclosure. A trench 120×60 cm was meant to test the nature of the human presence in the adjacent cave/rock tunnel (**Figs. 13** and **14**). With considerable effort we reached a depth of 70 cm. The uppermost deposits (down to a depth of ca. 25–30 cm) were relatively soft though stony; a charcoal concentration is probably the remainder of a fireplace. The few pottery fragments from these

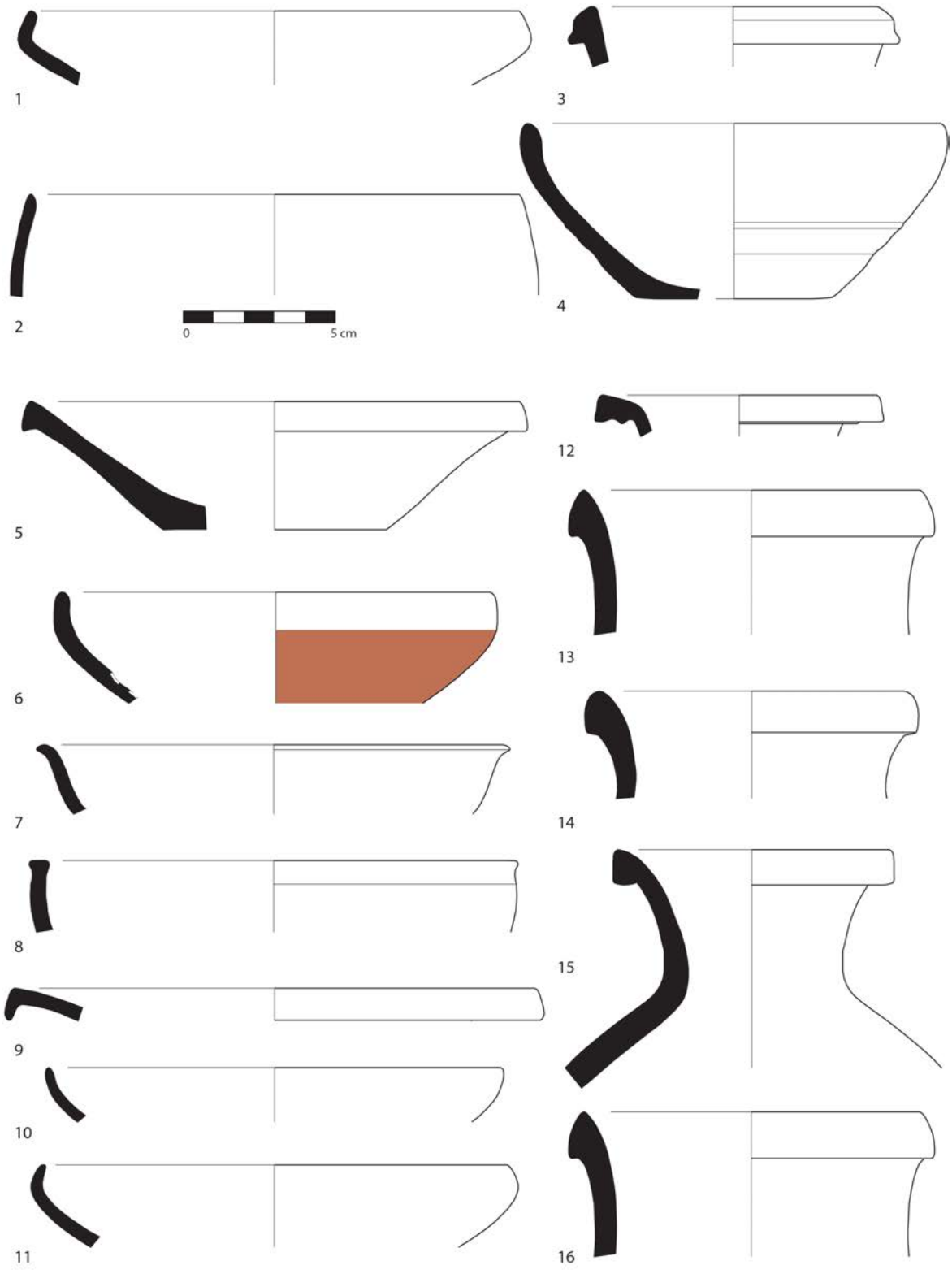

Fig. 11: Kapchigay, pottery: 1–4 – trench 01 (KCG19_01_005.003, KCG19_02_002_005, KCG19_01_001_011, KCG19_01_007_001); 5–16 – surface finds and trench 02. Drawings J. Matznerová and T. Kolmačka.

horizons were largely eroded and told us little while the metallic finds (a belt buckle and a few wire fragments) were all modern to recent. The layers below this level were extremely hard stony deposits of clearly natural origin.

Fig. 12: Kapchigay – slope of Ketman Chapti. A part of the wall on the slope. Photo T. Votroubeková.

Fig. 13: Kapchigay – slope of Ketman Chapti. Cave and the placement of the trench. Photo J. Kysela.

Fig. 14: Kapchigay – slope of Ketman Chapti. Section of the trench in the cave. Photo J. Kysela.

A trench of 160×80 cm in the centre of the horse-shoe shaped 'tower' (7×5.3 m) base was intended to study the architecture of the structure (**Fig. 15**). The affair turned out to be extremely simple as we only intersected natural layers in this area gaining no additional finds (**Fig. 16**). To sum up, the trial excavations at this site did not provide us with any further data on the site helping us to interpret it beyond our preliminary remarks (Stančo 2021, 73). The site situated on the steep rocky slope does not promise much in terms of further archaeological investigations, since most of the architectural features that once furnished this spot along with small finds are almost all gone due to the gradual erosion.

Fig. 15: Kapchigay – slope of Ketman Chapti. 'Tower' foundation. Photogrammetry and drawing: T. Votroubeková.

Fig. 16: Kapchigay – slope of Ketman Chapti. Trench in the foundations of the 'tower'. Photo J. Kysela.

MIRZALI KURGAN (AT KHOJAY GOR)

Besides a metal detector survey, the archaeological activities at Mirzali (Stančo 2021, 73–74) in the vicinity of the Khojay Gor hamlet (which in turn forms a part of the larger village of Loylagan) included an excavation of a trial trench (**Fig. 17**). Apart from the questions of the

Fig. 17: Mirzali Kurgan, Khojay Gor. Satellite image of the site with the location of the trench highlighted. Source: Google Earth.

site's chronology, function, and preservation, a significant objective was also the investigation of the rampart which was apparently preserved in some parts of the site. In order to address these diverse issues, we planted a 2×7 m trench in the southern part of the site, covering the entire width of the elevated ridge of the plateau assumed to be a rampart as well as a representative portion of the site's inner area. Moreover, it was precisely in this part of the site – close to the rampart – that an entire and intact bronze bowl was discovered during the preliminary metal detector survey. The findspot of the bowl was included in the trench in the hope of gaining further information on its original context.

The trench (**Fig. 18**) was excavated by one archaeologist and two workers over three working days. The results proved relatively unsatisfactory: from the topsoil to the bedrock (at a depth of ca. 100 cm) the deposits turned out to be entirely mixed up and homogenised with plant roots and insect nests appearing through the entire depth of the deposits. Stratigraphic units [001–003] were distinguished only as mechanical spits based arbitrarily on the degree of soil homogenisation which was extreme even in the lowermost horizon [003]. Although elements like mudbrick fragments, charcoal, and pottery were present (mainly in [003]), all the stratigraphy seems to be completely destroyed by the – for some reason extremely intense – humification processes.

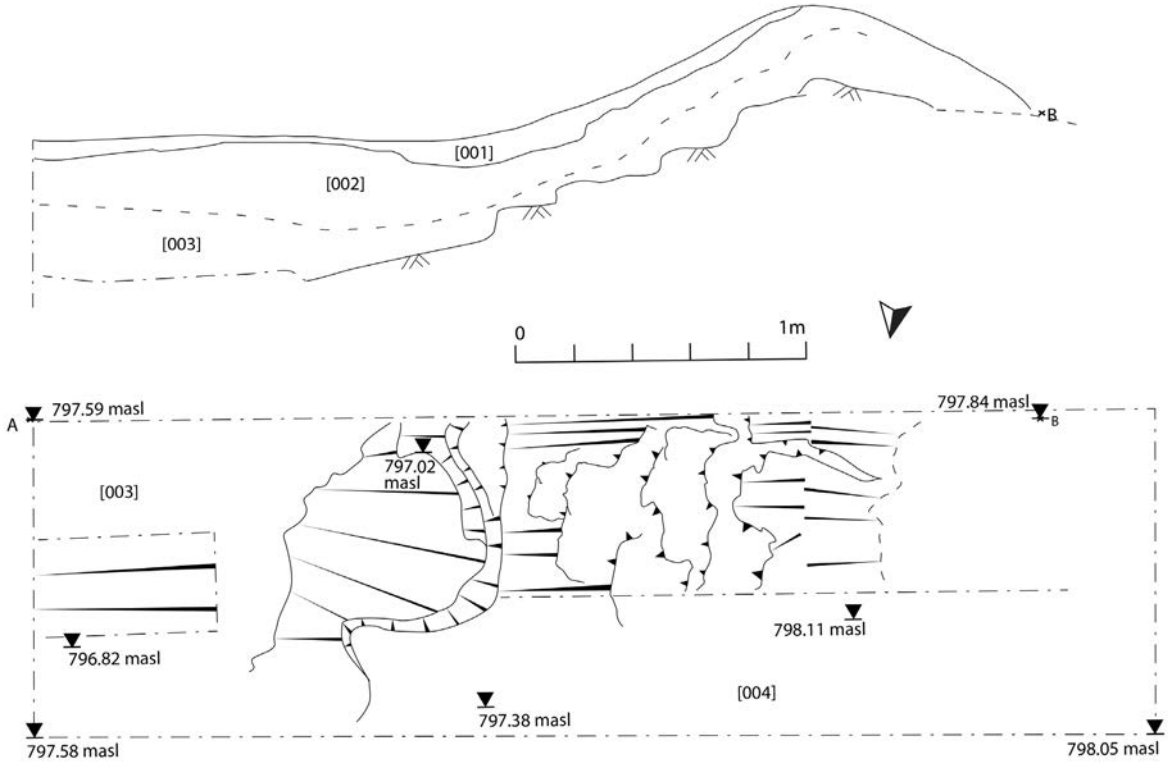

Fig. 18: Mirzali Kurgan, Khojay Gor. Plan and southern section of the 2019 trench. Photogrammetry based drawing: T. Votroubeková, J. Kysela.

The rampart is worthy of attention. Its main body – probably built of mudbricks (of which only extremely deteriorated blobs remained) – was laid on top of a bank carved of the local soft gypsum bedrock (**Fig. 19**). While the upper part – roughly stepped – has much eroded, the better protected area at the foot of the rampart produced an impressive image of a levelled area with a round niche densely covered with traces of chiselling (**Fig. 20**).

Fig. 19: Mirzali Kurgan, Khojay Gor. The rampart. Photo: J. Kysela.

Fig. 20: Mirzali Kurgan, Khojay Gor. Base of the rampart, detail. Photo: J. Kysela.

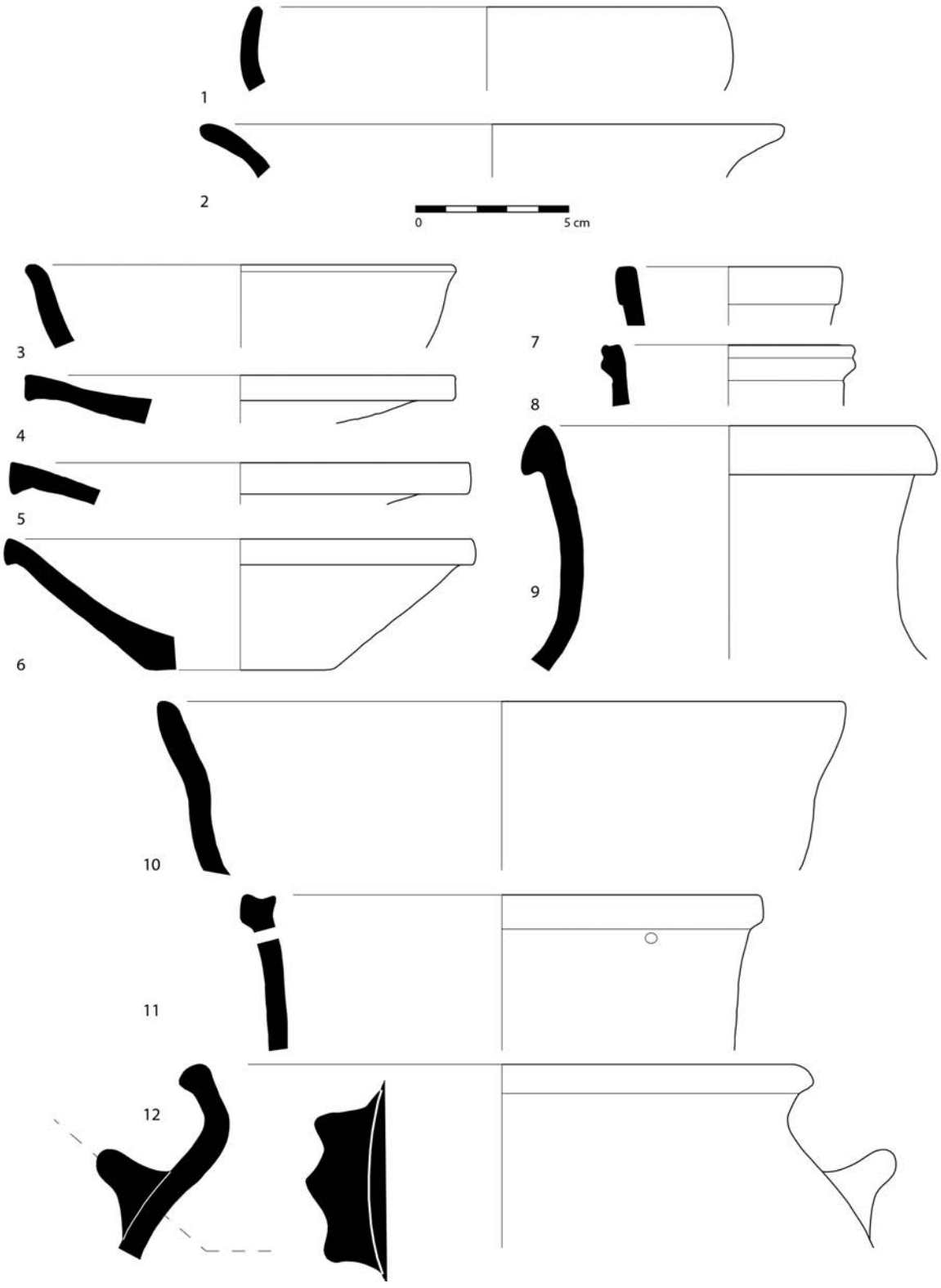

Fig. 21: Mirzali Kurgan, Khojay Gor. Pottery. 1–2 – finds from the excavation trench (CG2019_01_002.005–006); 3–11 – surface finds. Drawings J. Matznerová and T. Kolmačka.

The results do not much help our understanding of the site beyond what we already knew from the surface survey. We ascertained the presence of the rampart, albeit only enhancing the natural protection of the site and at least the finds from our excavation (**Fig. 21**) suggest that a human presence at the site was limited to the Hellenistic period (disregarding the numerous Medieval finds in the survey). Any closer information on the site's history is however extremely difficult to obtain by elementary archaeological means. Further focused archaeological excavations in different parts of the summit might contribute to our understanding of the site's chronology and function.

DARBAND WALL

The archaeological investigation of the Darband wall itself poses some major problems. A series of archaeological excavations at various parts of this large structure were carried out by a French-Uzbek team 20 years ago (Rapin – Khasanov – Rakhmanov 2022) and at present, we do not have any reason to resume or repeat it along similar methodological lines. As discussed above, we devoted much effort to the surface survey, mainly to the systematic metal detector survey. We also collected a large body (ca. 300 diagnostic fragments, mostly rims) of pottery material from various parts of the wall, since only a surprisingly few ceramic finds from the digs here have so far been made public.

Concerning the excavations, our effort focused on one singular task only, which was the cleaning and thorough documentation of the stratigraphic section that emerged by chance as a result of the recent construction works of the highway that connects central and southern Uzbekistan. The section is situated to the south of this new road and high above it, as the road is cut deeply into the former terrain. This spot lies at the northern end of what we consider to be the central part of the wall (**Fig. 22**). Our aim was to compare this new section with the one located further to the south that has already been published (Rapin – Khasanov – Rakhmanov 2022). The central part of the section that was documented was ca. 7–8 m long and more than 3 m high. Altogether, 22 stratigraphical units have been identified including four walls with the earliest phase of a stone wall, which is the best preserved one, being constructed upon a pakhsa substructure which itself lies on a gypsum subsoil. The second stone wall might or might not be related to the first one (as its *proteichisma*), again built in stone. Only the third wall was built of mudbricks. Since we only cleaned the section and did not excavate it extensively, we did not gain archaeological material sufficient for the relative dating. On the other hand, we took several samples of various layers that included organic particles, such as charcoals. The radiocarbon dating of the sample is underway. The final publication of the work at the Darband wall will deal with both the results of the analyses of these section samples and quantitative, qualitative, as well as spatial analyses of the material collected on the surface. Obviously, this complex fortification structure provides a rare opportunity to answer various important questions related to Greek and Yue-zhi / Kushan military control of this area. Further research, taking into account the rapid damaging of the site due to various construction activities as well as stone mining in the neighbourhood is highly recommended.

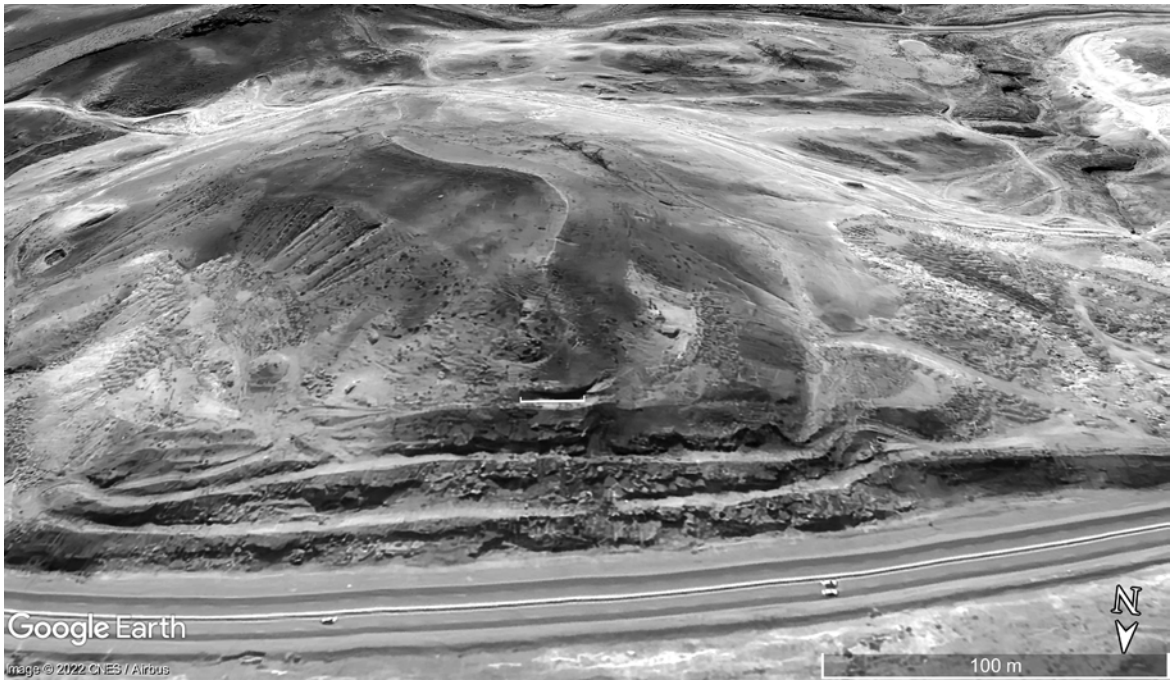

Fig. 22: The Darband wall. Satellite image of the site with highlighted location of the trench. Source: Google Earth.

CONSERVATION, DOCUMENTATION AND ANALYSIS OF METAL FINDS

In total, 831 artefacts were found by metal detectors during the 2019 autumn expedition. These finds came from the sites of the Darband wall, Mirzali Kurgan (Khojay Gor), Kapchigay, and Daganjam Tepa. The set consists of various materials – copper alloys, lead, silver, gold, and iron (the last two materials were quite sporadic). They had to be properly treated and documented for further evaluation. They were gently cleaned by mechanical and in a few cases (selected silver coins) also chemical way, professionally conserved, and thoroughly documented by photography and measuring (weight and size). For this purpose, a field conservation and documentation laboratory were set up at Darband village.

PROCEDURE OF CONSERVATION

Because of the absence of an available permanent conservation laboratory in south Uzbekistan, a field one was set up. It consisted of restoration and documentation equipment brought from Europe (including e.g. an ultrasonic cleaner and precision hand drill/grinder with various inserts). The possibilities provided by this equipment were to some extent limited especially considering cleaning and desiccation of artefacts. Even so, it was possible to follow most of the contemporary standard conservation procedures. The objective of cleaning and conservation was to reveal the original surface of the artefacts, and to make the structural and decorative elements on the objects more legible (**Fig. 23**).

The artefacts were documented by photography before cleaning and after conservation. Soil dirt and cohesionless corrosion products were removed from the surface of the artefacts mainly by mechanical cleaning. It was done using cotton balls, acuminous wooden tools, a ny-

lon brush, a steel scalpel, ultrasonic cleaning in combination with water, and scouring with various inserts mounted on a precision hand drill/grinder (plastic, iron, and brass brushes, grindstone etc.). Selected silver coins were cleaned chemically by 5% dilution of Chelaton III in combination with mechanical cleaning by acuminous wooden tools and ultrasonic cleaning. The desiccation of artefacts was done by sunlight on a black plate for at least two days (estimated temperature over 60 °C). The individual cleaning procedures and tools were used with respect to the artefact material and condition and in a way to preserve its complex value.

Non-ferrous artefacts were conserved by two layers of acrylic lacquer Paraloid B72 dissolved in acetone (5 % and 10 % respectively). Corrosion products of iron artefacts were stabilized by a tannate solution and then also conserved by two layers of 10% solution of acrylic lacquer Paraloid B72 and one layer of microcrystalline wax Revax dissolved in gasoline. After the final documentation (photography, drawing, weight and size measuring), the artefacts were stored separately in lockable plastic bags made of polyethylene.

Fig. 23: A copper alloy coin before (left) and after cleaning and conservation (right).

ELEMENTAL COMPOSITION ANALYSIS

The metal finds were subject to elemental composition analysis by a portable X-ray fluorescence (pXRF) spectrometer Delta Professional[4] fixed in a field stand. Elemental composition analysis was carried out on all non-ferrous metal finds (alloys of copper, gold, silver, and lead) discovered during the 2019 season. A total of 792 artefacts were analysed in 1254 analyses. Some of the artefacts with separate parts and coins (obverse and reverse) were analysed on more than one spot.

Elemental composition analysis by pXRF allows for a completely non-destructive surface analysis which provides general information about the material composition considering the base metal, alloying elements, and also admixtures. The results of surface analyses have to be cautiously evaluated in light of the fact that surface layers are noticeably altered especially by corrosion processes and by soil contamination on the surface. For this reason, some of the artefacts were sampled for more advanced analysis (ED-XRF, ICP-MS, metallography). Sampling was done either by drilling of the material from the metal core by an Fe-TiN drill with a 1 mm diameter or by cutting off a small piece of material by jigsaw or pliers.

4 Rh X-ray tube, mode Analytical Plus, measurement time 30 s, collimator 8 or 3 mm, automatic evaluation of data

The set of non-ferrous finds acquired by metal detectors is very non-homogeneous in type, date, and even sites (**Tab. 2**). Therefore, its evaluation is quite complicated and the results of the material composition analysis will be published in thematically separated studies along with a thorough typo-chronological evaluation of the finds. Studies on Hellenistic coins and arrowheads are currently in preparation. An evaluation of the elemental composition of the artefacts in comparison with analogical finds can provide insights into long and even short--term trends in the metallurgy of non-ferrous materials and artefacts (especially alloying techniques and admixture signatures). It can offer an additional level of information with significant cultural, historical, and technical implications.

CONCLUSION

The field research of the Czech-Uzbek expedition in the Darband area of Surkhan Darya province in 2019 helped us to answer some of the important questions related to the Hellenistic settlement dynamics of the Bactro-Sogdian borderlands. Both a surface metal detector survey and targeted small-scale excavations brought to light a large amount of new archaeological data. While the former contributed to the confirmation of the systematic surface metal detecting method and its significance for the spatio-temporal archaeological record of a micro-region, the latter added further hard evidence for the dating of the given sites to the Hellenistic period previously being based only upon the surface material, as well as for their general characteristics. The trial excavations at the sites of Kapchigay Tepa and Kapchigay – slope, even though providing valuable data, attested also to the low potential for further research, while the other investigated sites: Daganajam, Mirzali, and especially Darband wall seem to offer – despite some limitations – an opportunity to study rural settlements or fortifications of the period in question in more detail. The informational basis for an interpretation of this micro-region grows even more, when we consider the aforementioned sites as related to both excavated forts in the area, those of Kurganzol and Uzundara. What especially remains to be evaluated is the function of both the individual sites in this cluster and of the cluster as a whole. And finally, a composition analysis of the metal finds, as an addition to the typological assessment, is going to provide a strong basis for further studies and robust comparative material.

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