

UNIVERSITÀ DEGLI STUDI DI NAPOLI “L’ORIENTALE”

DIPARTIMENTO ASIA, AFRICA E MEDITERRANEO

INSTITUTE OF ARCHAEOLOGY, SAMARKAND

(NATIONAL CENTRE FOR ARCHAEOLOGY)

UZBEK ACADEMY OF SCIENCES

ISMEO - ASSOCIAZIONE INTERNAZIONALE DI STUDI

SUL MEDITERRANEO E L’ORIENTE

Series Minor
XCV

**The Archaeological Project
in the Samarkand Area (Sogdiana):
Excavations at Kojtepa II (2013–2015)**

Edited by

BRUNO GENITO AND MUHKITAR PARDAEV



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Table of Contents

Farhad Maksudov <i>Preface</i>	9
Фархад Максудов <i>Предисловие</i>	11
Andrea Manzo <i>Preface</i>	13
Adriano Rossi <i>Preface</i>	15
<i>Acknowledgements</i>	17
Bruno Genito, Muhktar Pardaev <i>Introduction</i>	21
Бруно Генито, Мухктар Пардаев <i>Введение</i>	25
<i>Editors' notes</i>	29
Bruno Genito <i>The Excavation: Interpretations and Future Research Perspectives</i>	31
Muhktar Pardaev <i>Ancient Sogdiana</i>	53

Simone Mantellini <i>Kojtepa and the beginning of irrigated agriculture in the Samarkand Oasis</i>	63
Bruno Genito, Muhktar Pardaev <i>Field Activities in 2013</i>	103
Bruno Genito, Muhktar Pardaev <i>Field Activities in 2014</i>	209
Bruno Genito, Muhktar Pardaev <i>Field Activities in 2015</i>	353
Fabiana Raiano <i>Pottery from 2013-2014</i>	419
Lucia Cerullo <i>Pottery from 2015</i>	431
Eduardo Cefariello <i>A Black Stone Palette. A residual evidence of a tattoo toolkit?</i>	451
Lucia Cerullo <i>Pottery Discs</i>	475
Lucia Cerullo, Dominika Kossowska-Janik <i>Spindle-Whorls</i>	503
Elena Maini, Eleonora Serrone <i>Animal Exploitation and Breeding Strategies</i>	521
Sabatino Laurenza <i>List of Stratigraphic Units and Matrix</i>	543
Enzo Cocca <i>Drawings</i>	605
<i>References</i>	625

Kojtepa and the Beginning of Irrigated Agriculture in the Samarkand Oasis

SIMONE MANTELLINI
(Alma Mater, Università di Bologna)

Introduction

The first approach of the Uzbek-Italian Archaeological Project – UIAP at Kojtepa dates back to 2003.¹ At that time, the Archaeological Map of the Middle Zeravshan Valley was in its earliest stage and the attention of the UIAP was mostly addressed to the survey of Urgut and the excavation of Kafir Kala (Bonora *et alii* 2003; Tosi *et alii*, 2002). Interest in the development of the ancient irrigation system of Samarkand, nonetheless, brought the UIAP team to the steppe, West of the city. There, topographic maps and satellite images showed evidence of a large abandoned oasis with an extended network of artificial canals and hundreds of anthropic mounds (*tepa*) (Fig. 1). Among them, Kojtepa was certainly one of the most promising due to its peculiar morphology and its location in the middle of an irrigated micro-oasis.

¹ The UIAP is based on a 5-year scientific agreement between the Università di Bologna, Dipartimento di Storia Culture Civiltà – DISCI and the Institute of Archaeology, Samarkand, National Center for Archaeology, Uzbek Academy of Sciences (hereafter IANCAUAS).

Although the UIAP scheduled the investigation of the steppe for the following seasons, it was decided instead to assess Kojtepa with an accurate GPS survey (Figs. 2a–b) and the collection of surface scattered ceramic potsherds. The pottery ranged mostly from the Hellenistic and post-Hellenistic (4th–1st centuries BCE) to the Early Medieval periods (7th–8th centuries CE) and some fragments were supposedly earlier, i.e. to the Achaemenid period (6th–5th centuries BCE).² The scarcity of Achaemenid evidence in the archaeological record around Samarkand (Mantellini 2018, 178) addressed the Università di Napoli ‘L’Orientale’ and the IANCAUAS to start a long-term stratigraphic exploration at Kojtepa (Genito 2014, 37–39).³ Around the same years, the entire Pasdargom district, including the surroundings of Kojtepa, was the subject of a territorial study by an expedition from the State Museum of Oriental Art of Moscow, Russia.

The steppe of Samarkand

The semi-arid steppe of Samarkand, or *Zadargomskoj/Pridargomskoj stepi*, is located West of the city and it falls within the administrative districts of Nurabad, Pasdargom and Samarkand Selki (Fig. 1). It stretches South-West-North-East between the Karatyube foothills to the South (800/1000 m asl), the modern Eskì Angar canal to North (ca. 700 m asl) and the modern Dargom canal to East.

This is a flat loess plain marked by a sharp hydrography consisting of natural seasonal streams (*sai*) and irrigation networks. *Sai* descend from the Karatyube mountains to the South to the lowland plain to the North where they flow into major artificial canals (Fig. 3). They are dry for a large part of the year and during the rainy season they may increase the discharge of artificial canals (Fedčenko 1870, 453). Along the mountain foothills, *sai* originate

² The preliminary study of the pottery from Kojtepa was done by M.Kh. Isamidinov. On the hypothesis of an early Iron Age occupation of this area see Isamidinov 2005, 59.

³ The expedition is currently directed by B. Genito (Università di Napoli ‘L’Orientale’, Dipartimento Asia, Africa e Mediterraneo) and M. Pardaeve (IANCAUAS). For results of the first campaigns at Kojtepa see Abdullaev, Genito eds., 2014).

small fertile fan-shaped oasis-villages that usually have the same name of the stream (East to West) (Fig. 1): Agalyk, Mirankul, Terakul, Egrikul, Sazagan, Tavakbulak, Erikul, Aksai, Ingichka-Bolo, Sarykul, Karatepa, Andjirli, Ibraimata, and Jam.⁴ Downstream, their debris-flow activity creates deep incisions and ravines into the substrate. Due to their intermittent supply, these streamlets are not useful for a systematic agricultural exploitation. However, in ancient times some of them were reused as artificial canals, such as the lower section of the Agaliksai with the Dargom (Mantellini 2015, 6).

Conversely, major artificial canals run East to West because they originated at the May 1st Dam on the Zeravshan River, which is located ca. 50 km to the East.⁵ Today the main canal is the Eskì Angar (Fig. 4), which detaches from the Dargom canal just after the hydroelectric power station at Kishrau. Until a few years ago, it marked very clearly the border between irrigated cultivations (cotton, above all) on its right (North) and livestock and dry-farming in the steppe on its left (South) (Fig. 5, see also Fig. 1).

Since the 1960's, the territory North of the Eskì Angar has become the largest producer of cotton in the Samarkand Region and it caused the flattening of 60% of archaeological sites.⁶ On the contrary, the steppe preserved quite well its archaeological landscape from anthropization. During the last few years, however, dry and irrigated farming, as well as the installation of photovoltaic plants, has become more intensive and has destroyed several archaeological sites. It is remarkable on this matter the damages done around Kurgan Kadirbeg, where tens of sites disappeared after the UIAP survey in 2010–2011 (Fig. 6).

⁴ According to the 1:100,000 Soviet topographical maps there are some exceptions: the name of the *sai* in Terakul village is Kaptarkhansai upstream and Tepakulsai downstream; downstream, the Mirankulsai changes its name into Kapakulsai; downstream, the Erikulsai changes its name into Aksai (which is the same name of the *sai* in the closest homonymous village to the West).

⁵ The dam was built in the early 20th century in the village of Ravatkhodja, at the same location of the 'hydraulic' site of Waraghsar well-known from Arab historical sources (Barthol'd 1928, 83; Bartol'd 1965, 196–187; Muhamedžanov 1972).

⁶ The average rate of destruction in the Samarkand area is attested to be around 40% (Genito, Mantellini 2017, 125).

Expedition of the State Museum of Oriental Art of Moskva

After very sporadic investigations in the first half of the 20th century, the Pasdargom area was the subject of a systematic study in the mid-1980's thanks to the *Sredneaziatskoj Arheologičeskoj Ekspedicej Gosudarstvennogo Muzeja Vostoka* - SAE GMINV (Central Asian Archaeological Expedition of the State Museum of Oriental Art, Moskva) under the direction of G.V. Šiškina.⁷

This research addressed first the excavation of Durmentepe/Isbisket (1986–1991), and it also included a first territorial investigation conducted by A.I. Naymark and T. Mkrtychev (O.N. Inevatkina, pers. comm.). A comprehensive study was at reconstructing the historical landscape of this area, with a specific attention to hydraulic facilities and typological classification of archaeological sites (Gal'eva & Inevatkina 2005). The SAE GMINV investigation covered a surface of ca. 1,200 sq. km and more than 700 anthropic evidences were detected on former USSR State aerial photographs (1970's) and topographical maps (Dmitr'eva *et alii* 2012; Gal'eva 2010, 37; 2017, 208–9). Only part of them, however, were validated on the field (Šiškina, Inevatkina 2012, 37).

As a main conclusion, the SAE GMINV identified the Hellenistic period as the most represented in the archaeological record of this area (Šiškina & Inevatkina 2012, 55). Moreover, this was possibly the period of major development of the irrigation systems (Gal'eva 2010; 2017), especially in the section between Sazagansai and Mirankulsai (Gal'eva 2017, 212).

Archaeological sites were classified in seven major types on the basis of their morphological features (Šiškina & Inevatkina 2012): A) residential structure; B) military architecture; C) cult building; D) burial structure; E) hydraulic structure; F) agricultural land; G) mines working. Afrasiab/Samarkand—the capital of ancient Sogdiana—is the 'city' on the first tier of the urban hierarchy (Inevatkina 2017, fig. 1). Other settlements with significant urban character were (Šiškina, Inevatkina

⁷ For a short overview on the research history in this area, see Gal'eva (2010, 38), Šiškina, Inevatkina (2012, 37), Inevatkina (2017, 249–50). See also a detailed account, including O.V. Obel'čenko's work (1973) on the *kurgan* burials (Abdullaev 2014, 49–51).

⁸ In the UIAP survey: Kumarik = Pas-790; Naubag = Sam-103 (located within Samarkand City district); Šahartepe = Pas-242; Bakrak = Pas-210; Durmen = Pas-104.

2012, 38–40): Kumarik, no. 61 (ca. 28 km North-West of Afrasiab); Nau-bag, no. 484 (ca. 10 km North-West of Afrasiab); Šahartepe, no. 616 (ca. 34 km West of Afrasiab); Bakrak, no. 627 (ca. 36 km West of Afrasiab); and, Durmen/Isbisket, no. 700 (ca. 24 km West of Afrasiab).⁸

Kojtepa (site no. 282) belongs to military settlements (Type B). They are distinguished between fortresses (*krepost*) and outposts (*zastava*), sharing these basic features: i) a defensive wall with a single entrance; ii) prevalence of a clear geometric layout of the plan (square, circular, rectangular or polygonal); iii) the *keshk*, i.e. the residential building of the commander of the fortress that possibly also had other functions. More in detail, Kojtepa was a fortress with a square plan and a sort of circular citadel (*keshk*) inside a defensive wall (Gal’eva 2010, 40; Inevatkina 2017, 258). This sub-type is dated to the Hellenistic period (4th–3rd centuries BCE) with later remakes in the Early Middle Ages (5th–8th centuries CE). Sites with a layout similar to Kojtepa are nos. 53, 116, 227, and 322 (Inevatkina 2010, 13 and fig. 7.4–7; Šiškina, Inevatkina 2012, 55, 59, figs. 3, 5–6).⁹

The UIAP investigation

The UIAP investigation in the steppe was principally aimed at improving knowledge on the origin of the irrigation system and the development of human settlement in this part of the ancient Samarkand oasis (Fig. 7).

Dataset	Code	Date
<i>Topo map 1:10,000 scale</i>	J-42-14-Ab-3	1997
<i>Topo map 1:25,000 scale</i>	J-42-14-Ab	1962 (aerial photo 1961)
<i>Topo map 1:100,000 scale</i>	J-42-14	1986
<i>Aerial photo</i>	n/a	1972
<i>CORONA Satellite image</i>	DS1011-1039DF128	1964/10/08

Table 1 - Spatial datasets used for Kojtepa.

⁹ For analogies between Kojtepa and site no. 322 see also Abdullaev (2014, 53, 54, 56, Figs. 8a–b).

¹⁰ Unlike other Samarkand districts surveyed by the UIAP, 1:10,000 scale maps for this area were recent (1990’s). The spatial datasets concerning Kojtepa and its surroundings are listed in Table 1.

The research approach was the same used in the other districts of Samarkand, where the ground investigation followed a preliminary detection of anthropic evidence on topographical maps and satellite imagery of different periods and scales (Mantellini 2017a; 2017b; 2018; 2019) (Table 1).¹⁰

Field activities in this area also concerned geo-archaeological investigations and sampling for ¹⁴C dating (Malatesta *et alii* 2012), as well as the excavation of the low-mound Sam-486 in the complex of Kurgan Kadirbeg (Mantellini 2019, 198–99).

After a preliminary geo-archaeological survey in 2010–2011 a systematic exploration of the Samarkand steppe was undertaken in September-October 2012 and May-June 2013 on the left of the Eski Angar and in May-June 2014 on the right of the Eski Angar.

Survey in the steppe: settlements and irrigation

A topographical map dated to 1891 (Fig. 8) and the Soviet series (see the 1:100,000 scale map in Fig. 5) were particularly useful for the remote detection of both canals and anthropic mounds (*tepa*). Two canals are especially well preserved and worth noting for their dimension. The first, mapped as ‘Odyldysay’, is little longer than 18 km and it starts at the height of the modern Dargom near the village of Kishrau. It runs parallel to a second canal, mapped as ‘Iskì Angar’, and together they defined a sort of *mesopotamia* that still evidences minor canals, cultivated fields and human settlements (Fig. 7). ‘Odyldysay’ and ‘Iskì Angar’ were fed by the Zeravshan and were part of an extremely articulated irrigation network that supplied water to the city of Samarkand and its southern territory (Mantellini 2003; 2015). ‘Odyldysai’ corresponds to the earliest course of the Dargom, which was abandoned and channeled into the natural bed of the Agalyk sai. It is unknown whether the ‘Iskì Angar’ shared the same fate of the Odyldysai/Dargom in the past. During the 1950’s, its bed, especially the first stretch, was largely reused for the construction of a new canal by the same name of the ancient one.¹¹

Where the canals are still preserved it is possible to measure very accurately the distance between their levees: Odyldysay/Dar-

¹¹ On the archaeological surveillance during the construction of the modern Eski Angar see Kabanov 1978.

gom reached ca. 950 m and Iskì Angar/Eskì Angar more than 1,300 m (Fig. 9). The bed of these canals was not dug as a unique basin, but many earth remains were left in order to arrange for bridges and passages between banks (Fig. 10). Remarkable widths and shallow beds suggest that these canals were also suitable for navigation, and the earth remains inside the canals may have therefore served as docks for mooring. This would confirm Arab written sources, according to which the largest canals of Samarkand, including the 'Barsh' (almost certainly corresponding to the Dargom), were navigable (Barthol'd 1928, 83).

The irrigation system of Samarkand was therefore more extended than expected. Evidence of fine grey sand typical of the Odyldysai/Dargom, as well as other canals fed by the Zeravshan, were found up to the archaeological complex of Uch-Yagach (Nur-015, Nur-016, Nur-017) (Fig. 7), which is located ca. 15 km West of Kojtepa in association to many ancient settlements (Mantellini 2015, 5–6).¹²

Evidence of a third canal, possibly the Yanghì Aryk mentioned in the historical sources (Barthol'd 1928, 83), was even found at a higher elevation (ca. 750 m asl). It was the uppermost canal, which supplied water to villages and fields along the Karatyube foothill.

The UIAP covered over 300 sq. km in the steppe, by combining targeted visits to the anthropogenic marks detected by remote sensing, with an intensive field-walking aimed at recognizing barely visible evidence such as low mounds and flat sites (Mantellini 2018, 177–79). The number of sites recorded in the steppe amount to ca. 700 units (Fig. 7), which testify to a systematic and deep occupation of this territory in ancient times. *Tepa* and low-mounds are prevailing (ca. 50% each class), while flat sites characterized by pottery scatters and without architectural evidence are around 10. The typical dome-shaped burial (*kurgan*), so abundant along the Karatyube foothills, is apparently absent in the lowland.¹³ This could be due to the difficulty in their identification since they usually rise slightly from the ground and sometimes they lack stones on the surface. In that sense, the use of the toponym *kurgan* for many low-mounds in the

¹² On the hypothesis that the Dargom reached the Kashkadarya see Muhamedžanov 1975, 279.

¹³ A survey of the kurgan graveyards along the Karatyube piedmont is nearing completion (Fig. 7).

steppe can be misleading. The excavation of one of them (Sam-486 in the complex of Kurgan Kadirbek) proved in fact that it was not a burial but a small site used for seasonal agricultural activities (Mantellini 2017a, 17).¹⁴ Even when underground burials are covered by an earthen mound (*tepa*) it is difficult to establish their original function without an inner inspection. It must be noted, for example, that O.V. Obel'chenko could interpret as *kurgan* some mounds (*tepa*) between Agalyk and Sazagan only after archaeological excavation or information from lootings (Obel'chenko 1966; 1973).¹⁵

Chronology of the sites indicates that occupation in the steppe had a significant growth in Early Antiquity, especially during the Late Hellenistic period (3rd c. BCE).¹⁶ Then, settlements increased regularly until reaching their peak during the Early Middle Ages (5th–6th c. CE). The later decline can be connected with historical events and possible changes in the local hydrography that brought about the turn of the main course of the Dargom northward (Mantellini 2015, 5–6). As a consequence, this area was progressively abandoned and settlements dated to the Middle Ages are very few.

This chronological trend finds a close comparison with the discoveries from the excavations conducted at Kojtepa by the Uzbek-Italian expedition. Stratigraphic activities evidenced the lack of any material classifiable as Achaemenid, while the earliest layers of Kojtepa are dated to the Hellenistic period (4th–3rd centuries BCE). Then, the site shows an uninterrupted occupation until its abandonment (Raiano 2014c, 298–302).¹⁷

The Mesopotamia of Kojtepa

Kojtepa (Pas-588) is located in the middle of two canals connecting the 'Odyldysai' and the Eski Angar (Fig. 11), which enclose the

¹⁴ A further confirmation is given by the presence of stone tools on the surface of many other low-mounds in the steppe (see also Conclusions).

¹⁵ One of them (Nur-065) is currently under excavation by an Uzbek-Chinese archaeological expedition headed by Jianxin Wang (Northwest University, Xi'an, China) and Muhtalib Hasanov (IANCAUAS).

¹⁶ Sites that did not yield any pottery were 121 and sites where ceramic potsherds were not useful in providing a date were 38.

¹⁷ On the definition and classification of the Hellenistic and Post-Hellenistic pottery from Kojtepa see also Raiano 2011; 2012; 2013; 2014a; 2014b; 2014c; 2016a; 2016b.

settlement in an artificial triangular-shaped *mesopotamia* of 2,6 sq. km (Fig. 12).

The site dominates the surrounding flat landscape and, not by chance, in the early 1950's the Soviet topographers placed an iron geodetic survey tower on top of the central mound.¹⁸ The layout of Kojtepa is characterized by a quadrangular earthen rampart of 175 m long × 150 m wide (26,250 mq. = 2,62 ha.) that encloses in its center a 9,94 m high circular mound (*tepa*), with a diameter of ca. 50 m (Fig. 13a-c). The site was surrounded by an outer moat, possibly filled with water. A CORONA satellite image and aerial photograph show the presence of two small canals from the South that fits this purpose. Trace of a fourth canal, whose bed was partially reused for digging a canal in modern times, bordered Kojtepa in the North.

The earthen rampart deserves a special interest because it appears as a unique architectural body on all the topographical maps and aerial photo available since the 1950's. Abdullaev (2014, 51–53, fig. 10) reported that damages on the northern side, and especially northeastern corner, were the result of modern operations (1980's) aimed at filling the moat and the ancient canals for agricultural purposes.¹⁹ He argued that a dark spot recognizable on the aerial photo would have been a break in the original wall in correspondence of a possible gate.

It is impossible to ascertain whether the drawing of Kojtepa on the topographical maps corresponds to the real situation found by the Soviet topographers once on the field or it was the result of their wrong remote photo-interpretation. The main point is that this site must necessarily have had access, either in its original setting and later refurbishment. On this matter, the CORONA satellite image shows a 'V-shaped' protrusion on the eastern side of the rampart (Fig. 14a). This feature is clear on the aerial photo of the early 1970's (Fig. 14b) and it is also visible on the earliest GOOGLE image available (2004), although here its appearance is partially altered by the excavation of

¹⁸ Coordinates measured on its top with a kinematic GPS are in 2018 300113 E, 4386583 N (UTM WGS 84, Zone 42N).

¹⁹ See the 1:10,000 scale topographical map J-42-14-A-b-3 (1997) in Fig. 10a. At the time of the map release, the northwestern corner was already largely damaged. However, this edition is based on an aerial photograph dated 1986, hence the destruction certainly occurred earlier.

a modern trench (Fig. 14c). In front of it, to the East, there is the trace of a ca. 350 m long linear holloway possibly referring to an ancient road. If we consider that Kojtepa was enclosed by canals on all sides but the eastern one, it looks plausible that the settlement gate was located to the East, i.e. oriented towards Afrasiab/Samarkand.

Except for the damages mentioned above, the state of preservation of Kojtepa is rather good (Fig. 15). Standing on the left side of the Eski Angar, which was less exploited than the northern one, it was only partially affected by anthropization. This pattern finds comparison also in the immediate surroundings of the site. Cultivation caused the destruction of a small mound (Pas-539),²⁰ ca. 100 sq. m and 1 m high, with a South-North elongated shape located less than 200 m South of Kojtepa. This site was available only on the 1:10,000 scale map (map code J-42-14-Ab-3, 1997) while it does not appear on the earliest GOOGLE Image available (2004) (Fig. 14b). It was therefore flattened for agricultural purposes before that date. Several ceramic potsherds scattered on the surface allow one to date this site to the Post-Hellenistic/Kangju period (2nd century BCE – 1st century CE). On the contrary, a typical circular *tepa* (Pas-538)²¹ located 400 m West of Kojtepa still exists. According to 1:10,000 and 1:25,000 scale maps it is ca. 0.15 ha. and 4 m high. Field investigations proved the presence of modern small *pakhsa* house built on its top and minor damages caused by two pits on its northeastern and southwestern sides. A few pottery remnants (five fragments) did not allow any chronological attribution.

Moving ca. 5,85 km South-West from Kojtepa, and almost at the same distance North of the village of Sazagan,²² there is an interesting archaeological complex (Fig. 16) made of a major, nameless *tepa* (Pas-330, ca. 1,5 ha)²³ and minor sites around it (Pas-229–332

²⁰ Pas-539 corresponds to site no. 283 in the SAE GMINV survey.

²¹ Pas-539 was apparently not surveyed by the SAE GMINV (fig. 8a in Abdullaev 2014, 72).

²² This distance corresponds to one ancient *farsakh/parasang* (Houtum-Schindler 1888).

²³ Site no. 322 in the SAE GMINV survey (Inevatkina 2010, 13; Šiškina, Inevatkina 2012, 55). This site is located almost at the border between the Nurabad and Pasdargom districts, thus some small sites South of it are coded as Nur-041 and Nur-063 (Fig. 15).

and Pas-334, Pas-335 the closest ones to it). This settlement shares many similitudes with Kojtepa. First, it was part of an important agricultural territory, established along the course of two North-South canals, each ca. 30 m wide between the levees, derived from the ancient Yanghì aryk and flowing downstream into the ‘Odyldy-say’. Secondly, its fortified layout recalls a ‘small’ Kojtepa, with a circular citadel (35 m in diameter) surrounded by a quadrangular earthen rampart (ca. 100 m SN × 100 m East-West). For this, like Kojtepa, it has also been classified as a military site (Inevatkina 2017, 257–58; Šiškina & Inevatkina 2012, 59. Thirdly, the pottery spread on the surface of this complex ranged from Antiquity (4th century BCE) to the Early Middle Ages (6th-8th centuries CE), with some potsherds supposedly from the Iron Age/Achaemenid periods (Fig. 17).²⁴

Settlement pattern around Kojtepa

The number of sites discovered in the environs of Kojtepa were several. Those inside the mesopotamia of Kojtepa are too few (seven) to better analyze the local spatial organization around it. In this perspective, an attempt was made by considering an equal spatial division with the homologous site Pas-330. The distance of ca. 6 km was divided into a three-ring buffer zonation of 3 km around each site, with each ring measuring 1 km (Fig. 18).²⁵

The number of sites concerned is similar: 61 for Pas-330 and 58 for Kojtepa (Table 2).

	Tepa	Low Mound	flat Sites	Total
<i>Kojtepa</i>	49	10	0	59
<i>Pas-330</i>	34	35	2	61
<i>Total</i>	83	35	2	110

Table 2 - Number and types of sites around Kojtepa and Pas-330.

²⁴ Chronology provided by M.K. Hazanov.

²⁵ The precise distance between the two sites is 5,86 km.

In the three buffer zones around Kojtepa, the distribution of sites is not uniform: six sites in the ring closest to Kojtepa (0–1 km); 41 sites in the middle ring (1–2 km); 12 sites in the outer ring (2–3 km). It is interesting to note how all the sites in the first buffer zone (0–1 km) are located right of the Odyldysai/Dargom, i.e. inside the mesopotamia of Kojtepa. On the contrary, 31 sites out of 41 in the second buffer zone (1–2 km) are placed beyond the Odyldysai/Dargom and they are clustered together, with two major concentrations South-West of Kojtepa. Sites in the third ring (2–3 km) are located in its eastern half and most of them (eight out of 12 sites) are distributed along minor irrigation canals. Most of the sites around Kojtepa are located along South-East/North-West canals and they shape a sort of alignment that divides almost symmetrically the buffer zone in that direction. Except for one site, on both sides of this alignment the outer buffer is empty of settlements.

The pattern around Pas-330 shows an almost regular distribution of sites among the three buffer rings: 18 sites in the first zone (0–1 km); 15 sites in the second zone (1–2 km); and 28 sites in the third zone (2–3 km). However, their spatial distribution is irregular and characterized by four major agglomerations. Two of them are inside the first buffer zone: one in connection with the major settlement Pas-330 and another one around Pas-341.

As attested for Kojtepa, settlements are located in proximity of ancient artificial watercourses and in this case without a prevailing orientation. Sites around Pas-330 lay along a South-West/North-East canal derived from the Yanghì Aryk, while four sites (Nur-089, Nur-090, Nur-091, Nur-092, Nur-093) are on the right bank of a South-North canal. Finally, a line of many sites (14) with an East-West orientation, South-East of Pas-330 suggests the presence of an additional canal that is not recognizable on satellite images.

Tepa is the prevailing settlement type in both areas: 49 Kojtepa and 34 Pas-330 (total 83). Low-mounds are less represented (25 for Pas-330 and 10 for Kojtepa), while *kurgan* burials are not attested.²⁶ Flat sites are only two (Pas-392 and Pas-393), both located on the left bank of the ancient Yanghì Aryk.

²⁶ On the problem of their identification see above.

Also sites chronology is similar in the two buffer areas and it reflects the general trends attested in the steppe (Table 3).²⁷

	Kojtepa	Pas-330	Total
<i>Iron Age 3/Achaemenid (6th-4th c. BCE)</i>	0 + 2	1 + 1	1 + 3
<i>Early Antiquity (4th c. BCE - 3rd c. CE)</i>	10 + 2	15 + 2	25 + 4
<i>Late Antiquity (3rd-5th c. CE)</i>	7 + 1	13 + 0	20 + 1
<i>Early Middle Ages (5th-8th c. BCE)</i>	14 + 1	8 + 7	22 + 8
<i>Middle Ages (10th-14th c. CE)</i>	0	5 + 0	5 + 0
<i>Late Middle Ages (14th-19th c. CE)</i>	0	1 + 0	1 + 0
<i>Unknown chronology</i>	30	29	59

Table 3 - Chronology of sites inside the buffer zones of Kojtepa and Pas-330 (certain + potential sites for each period).

Material dating to the Achaemenid period (6th-4th centuries BCE) comes from the complex of Pas-330, Nur-045 (1.4 km South-East of Pas-330) and potentially from two sites near Kojtepa (Pas-555 and Pas-568).²⁸ The Early Antiquity (4th-3rd centuries BCE) is attested in 22 sites plus 3 potential ones (14 plus two around Pas-330 and eight plus one around Kojtepa). Late Antiquity (3rd-6th centuries CE) shows a similar situation with seven plus one sites from Kojtepa and 10 certain sites from Pas-330. Inside the Early Antique period it is possible to distinguish 17 sites belonging to the Hellenistic/Post-Hellenistic period (4th-1st centuries CE): 10 from the area of Pas-330 and

²⁷ Chronological attribution of the archaeological material collected in the steppe has been done by M.Kh. Hazanov, M.Kh. Isamiddinov and Dj. K. Mirzaahmedov.

²⁸ Hereafter 'potential' is used when chronological attribution is possible but not certain. Sites without pottery were 38 (27 around Pas-330 and 11 around Kojtepa) and sites where pottery was not useful for establishing chronology seven (five from Kojtepa and two from Pas-330).

seven in the environs of Kojtepa. The Early Middle Ages is the most represented period, with 26 certain sites plus 8 potential ones (16 plus one around Kojtepa and 10 plus seven around Pas-330). Very few sites, all being around Pas-330, produced finds from later periods: two dated to the Middle Ages (10th–14th centuries CE) and one Late Middle Age (14th–19th centuries CE).

Conclusion

Although the latest anthropization became a concrete threat to the archaeological landscape in the steppe of Samarkand, this area provided for a long time a unique opportunity to study the development of human settlement and irrigated agriculture in Pre-Islamic Samarkand. Two main conclusions raised from this assessment of Kojtepa and its closest surroundings.

The first concerns the military function of this site for the control of the territory and the local economy based on irrigated agriculture. Located inside a blooming agricultural heartland, Kojtepa was a very important settlement in the periphery of the ancient Samarkand oasis. Inevatkina (2010, 13) suggested that it was one of the fortified sites shaping a defensive chain against the nomad raids from the steppe. Also Isamidinov (2005, 56) considered Kojtepa as the most striking example of a site controlling and securing the western outskirts of Samarkand during the Hellenistic period. According to the typological classification proposed by the SAE GMINV for the sites in the Pasdargom, military settlements were distinguished between fortresses and outposts (Šiškina & Inevatkina 2012, 55–60) and Kojtepa was included in the former. However, its location at the edge of Samarkand suggests that it was also an outpost addressing the fundamental control of these large agricultural areas. Hundreds of canals, regardless of their dimensions and age, and evidence of anthropic occupation (tepa, low-mounds, and flat sites) still visible on the ground testify to an intensive and systematic occupation of this area for farming purposes. Discoveries from the UNIOR-IANCAUAS archaeological excavation at Kojtepa confirmed the agricultural aim of this site (Abdullaev 2014, 53). Šiškina & Inevatkina (2012, 58) argued that Kojtepa was engaged in controlling the headwords of the canals. The local organization around the sites of Kojtepa and Pas-330 show even more clearly traces of the close

connection between human settlements and irrigation networks. They were made of major, minor and small canals for irrigation, as well as the fields reachable in a working-day. Several lithic stones, such as grinders, mortars and pestles, were found on the ground during the survey of the following sites around Kojtepa and Pas-330: Nur-063, Pas-331, Pas-333, Pas-336, Pas-392, Pas-393, Pas-406, Pas-554, and Pas-568. A further confirmation comes from the *mesopotamia* of Kojtepa, where settlements are distributed along the bank of the canals at the margin of the farming areas in order to maximize the cultivated area as much as possible (Fig. 12).

A second result regards the chronological data from the sites considered. On one hand, data available from the UIAP survey suggest a first systematic occupation of the steppe only since the Hellenistic and post-Hellenistic/Kangju periods (4th-1st centuries BCE). This finds a comparison with the results from the SAE GMINV, especially in dating the military fortresses like Kojtepa to the Hellenistic periods. The long-term excavations conducted at Kojtepa, where the earliest layers hitherto exposed, date back to Hellenistic period (Genito, Mantellini 2017, 138) also confirm the hypotheses advanced from the territorial investigations. Occupation of the site well reflects the regional trend attested in this area, with a progressive abandonment in the 9th-10th centuries CE (possibly as a consequence of the Arab conquest). This result is even worth noting in consideration of the good state of preservation of the archaeological landscape of the steppe, where the chronological record would be more reliable than other areas of Samarkand.

On the other hand, chronology established on the basis of the excavation at Kojtepa excludes, at the moment, the presence of Achaemenid period pottery and layers. This point emphasizes the uncertainty in the identification of the Achaemenid horizons and material culture in the Samarkand region/ancient Sogdiana.²⁹ Only about ten sites in the steppe provided Achaemenid pottery, and even less ones in the agricultural oasis formed by Kojtepa and Pas-330. This point would suggest the use of the ceramic seriation

²⁹ The question is a long debated issue; a recent information on the matter (Genito 2019, 1-20; Raiano 2019, 153-166) increases the doubts on the real dynastic presence in the area.

from the excavation at Kojtepa for a re-assessment of the pottery dated to the Late Iron Age/Achaemenid period from the survey (either certain or potential).

As a general conclusion from above points, it is arguable that the systematic occupation of this territory and its exploitation for agricultural purposes occurred only since the Post-Hellenistic/Kangju periods (4th–1st centuries BCE) thanks to the development of hydraulic management and techniques. Although some scholars dated the beginning of irrigated agriculture in the Samarkand Oasis in the first half of the 1st millennium BCE (Isamiddinov 2002, 226; Šiškina 1994, 82–83), it is possible that in that period artificial canals were developed only at a very local scale. Durmentepa, which is the largest settlement there and its origin goes back to the Achaemenid period, developed along a natural *sai* but also showing clear traces of canals around it. It is likely that the first step of irrigation was based on canals, very small in size and deviated from the *sai*, which could supply only individual settlements (Fig. 1).

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Otherwise stated in the captions, all the elaborations and photos in the figures were made by the Author.

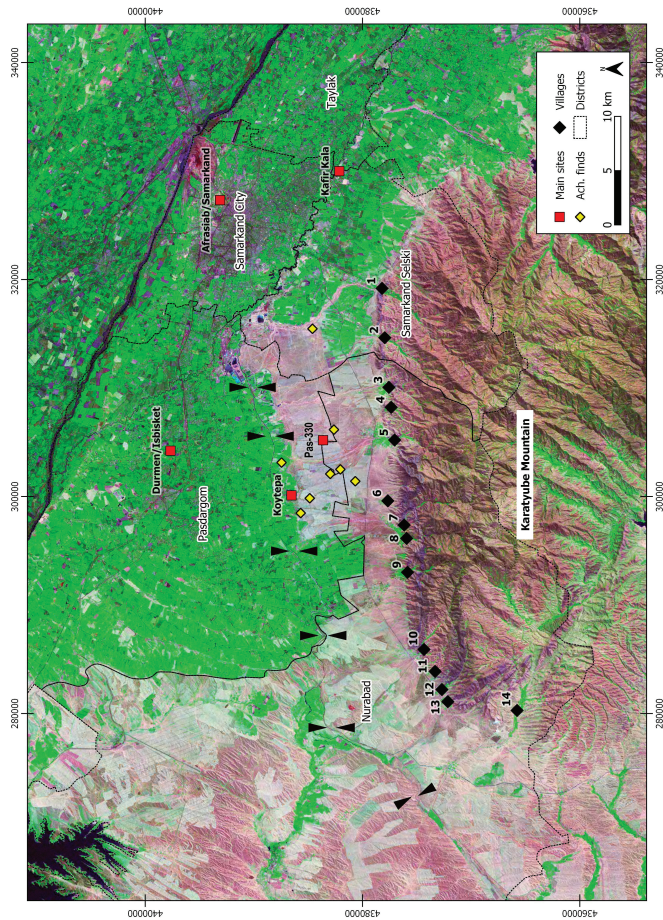


Fig.1 - Kojtepa and the major landscape features in the steppe of Samarkand. Villages are (from West to East): 1) Agalyk, 2) Mirankul, 3) Terakul, 4) Egrikul, 5) Sazagan, 6) Tavak-bulak, 7) Erikul, 8) Aksai, 9) Ingichka-Bolo, 10) Sarykul, 11) Karatepa, 12) Andjirli, 13) Ibraimata, and 14) Jam (basemap: 1987-1991 TM Landsat image).

KOITEPA

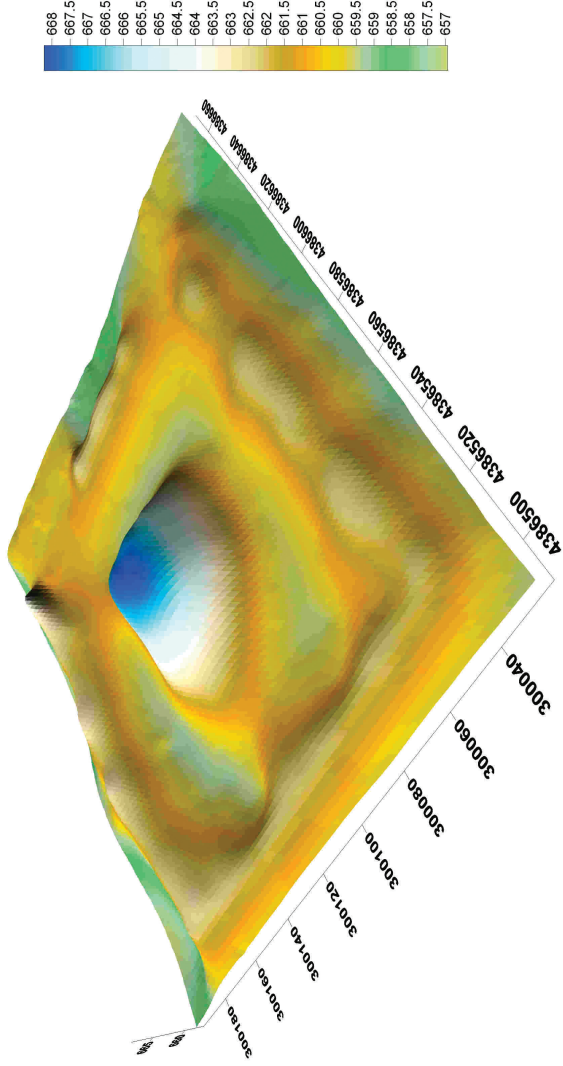


Fig. 2a - 3D model Kojtepa after the GPS survey of 2003 (Elaboration: V. Girelli, Luca Vittuari and B. Rondelli).

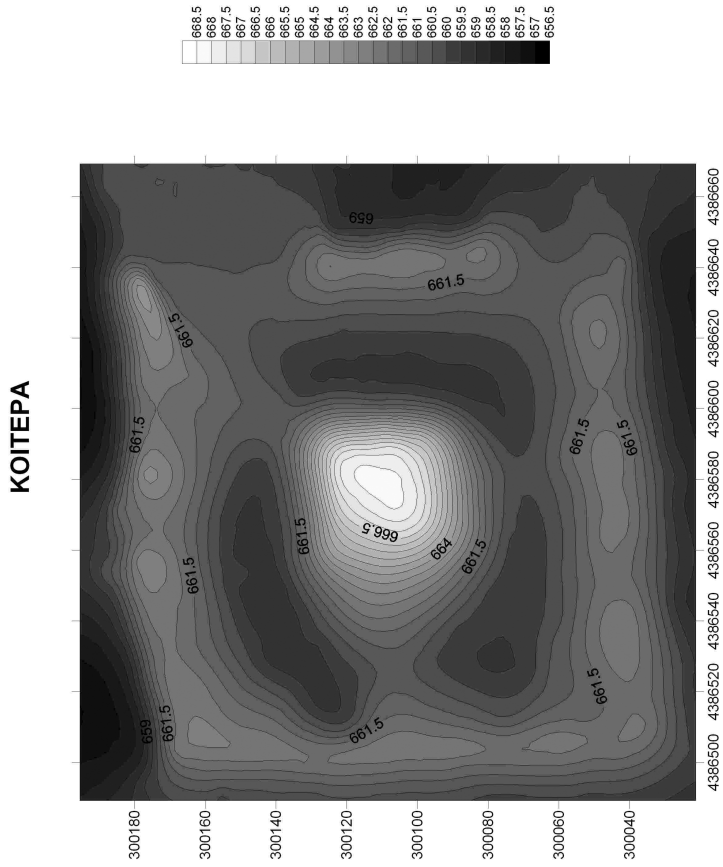


Fig. 2b - Plan of the site with 0.5 m contour lines
(Elaboration: V. Girelli, Luca Vittuari and B. Rondelli).

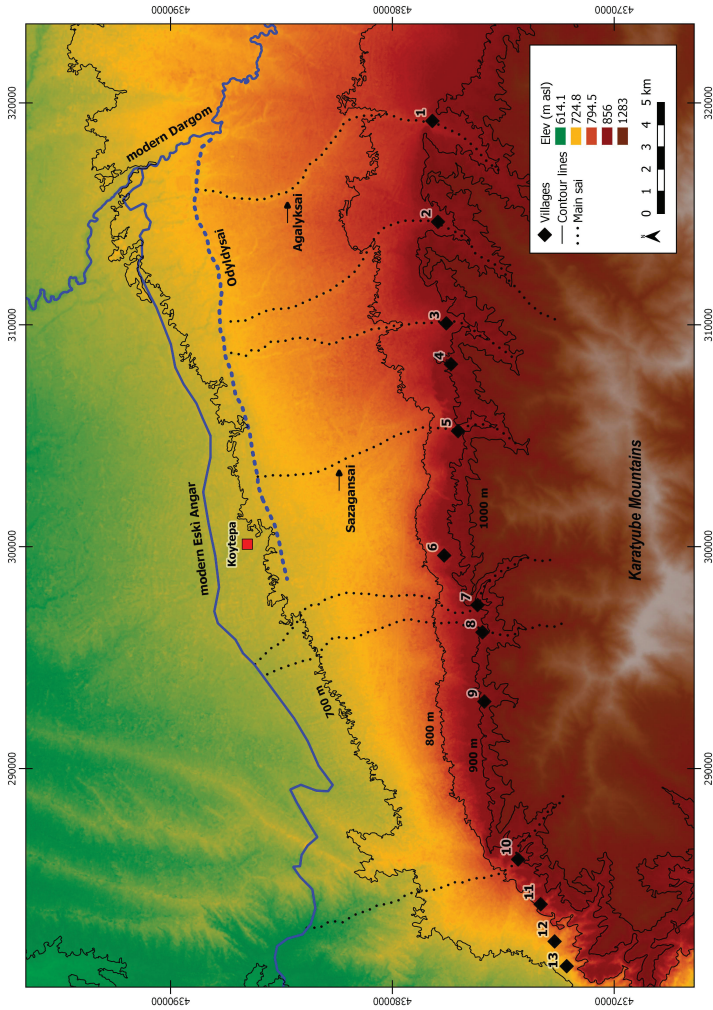


Fig. 3 - The steppe of Samarkand with 100 m contour lines, piedmont oasis-villages (see Fig. 1) and main watercourses (basemap: ASTER GDEM v.2, 2011).



Fig. 4 - The narrow and deep bed of the modern Eski Angor (Photo May 2014).

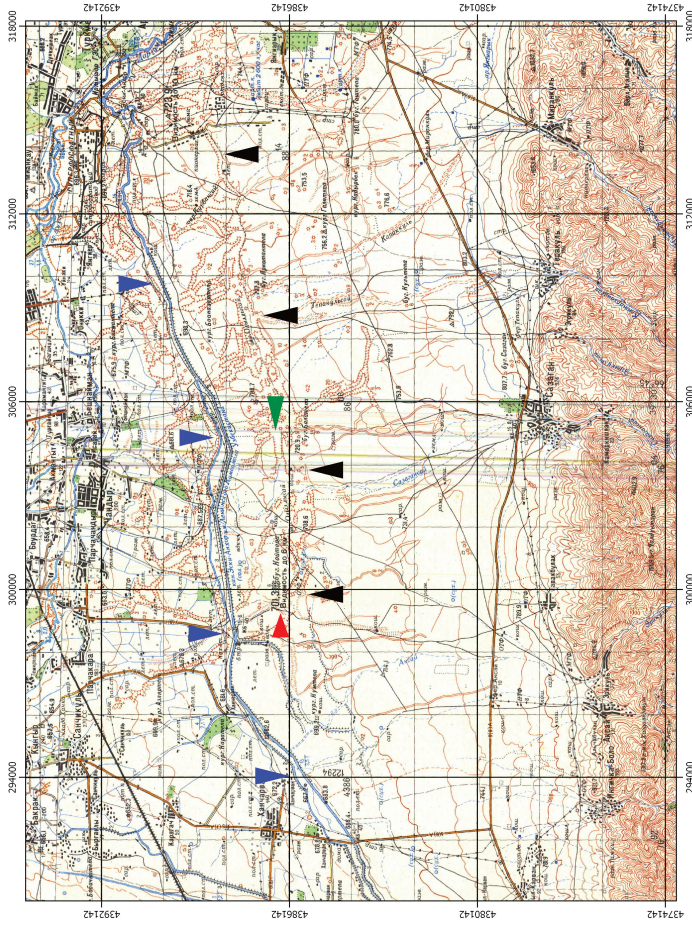


Fig. 5 - Kojtepa (red arrow), modern Eski Angor (blue arrow) and Odyldysai (black arrow) in the steppe of Samarqand (basemap 1:100,000 Soviet topo map, 1986). Green arrow refers to the picture in Fig. 9; red arrow refers to the picture in Fig. 11.

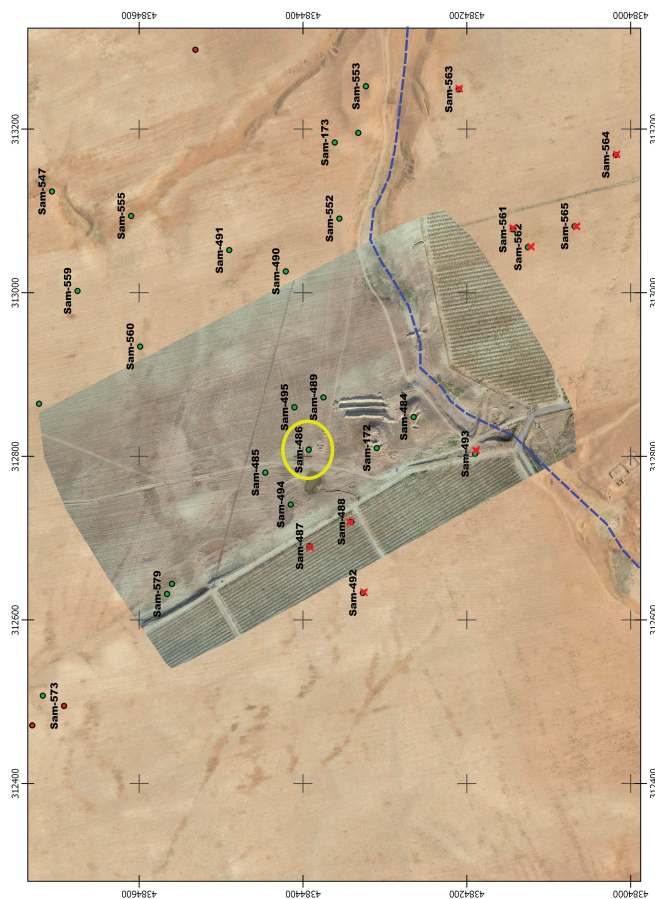


Fig. 6 - Drone survey over Kurgan Kadirbek (September 2018; data acquisition M.S. Kuckarović and U. Šermanov, data processing G. Luglio, elaboration Author) with the sites from the UIAP survey, ancient Yanghì Aryk (dashed blue line) and new cultivated fields around the site (basemap: BING satellite image 2016).

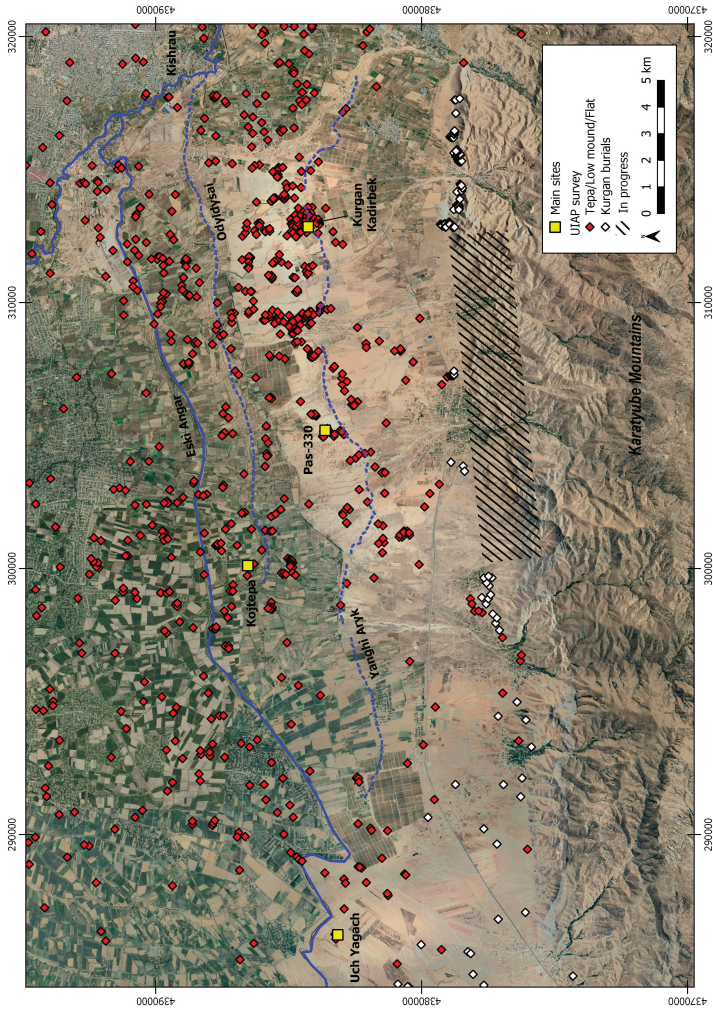


Fig. 7 - The UJAP survey in the steppe, with sites and traces of ancient canals (base map: Google Earth image, 2017).

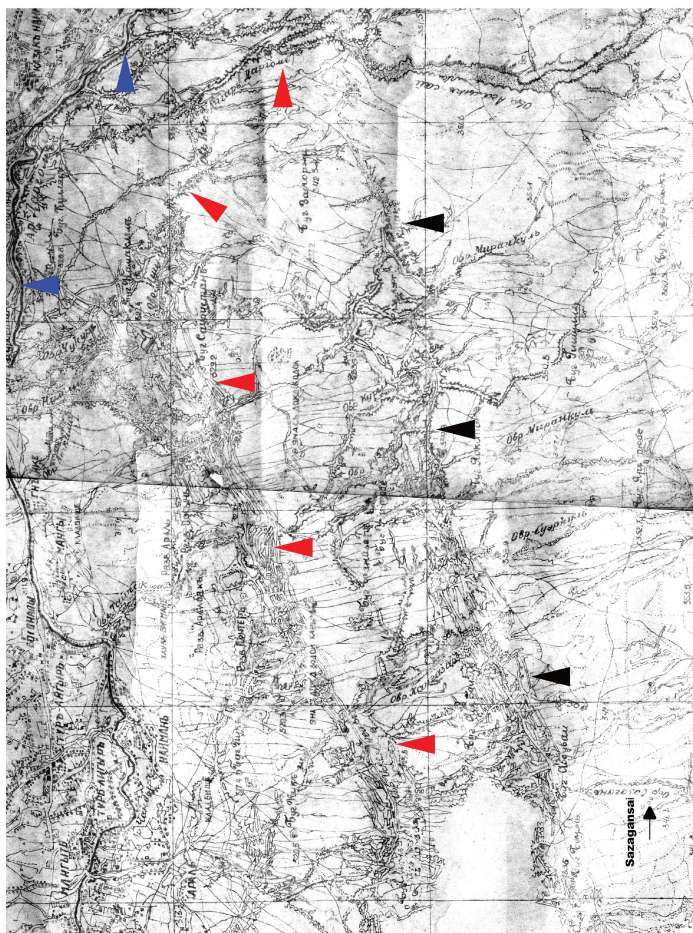


Fig. 8 - The steppe West of Samarkand on the 1891 topographical map with the main watercourses: blue = modern Dargom; red = ancient Eski Angar (then reused for the modern one); black = Odyldysai (ancient Dargom).



Fig. 9 - Near the site of Balatepa, the abandoned bed of the Odyldysai reaches ca. 300 m (Photo October 2012, from East, see positioning in Figure 5, green arrow). Position of the profile is marked by the dotted line in the box on the bottom-right.



Fig. 10 - The earth remains in the abandoned canals probably served for bridges and docking. The three profiles in the middle section of the Odyldysai measure (West to East): 440 m, 620 m, 800 m (basemap: Bing satellite image, 2016). Position of the profiles is indicated in the box on the bottom-left



Fig. 11 - The abandoned canal West of Kojtepa near the site Pas-534, from South (see blue arrow in Fig. 12; Photo September 2018).

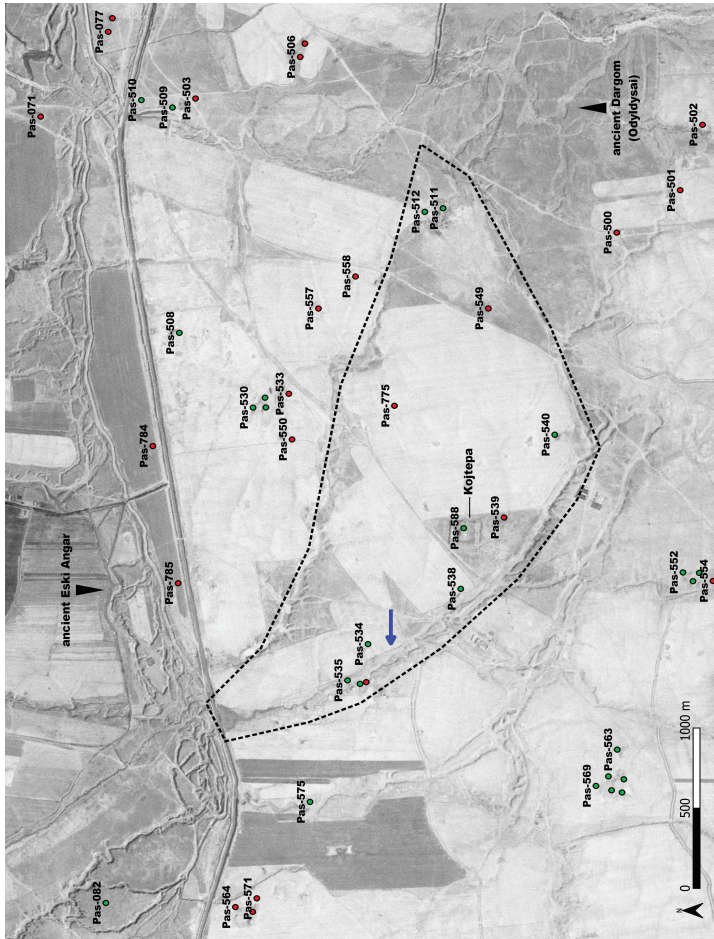


Fig. 12 - The triangular-shaped *mesopotamia* of Kojtepa (basemap CORONA satellite image, ID scene DS1011-1039DF128, 8 October 1968, courtesy of USGS-EROS Center).

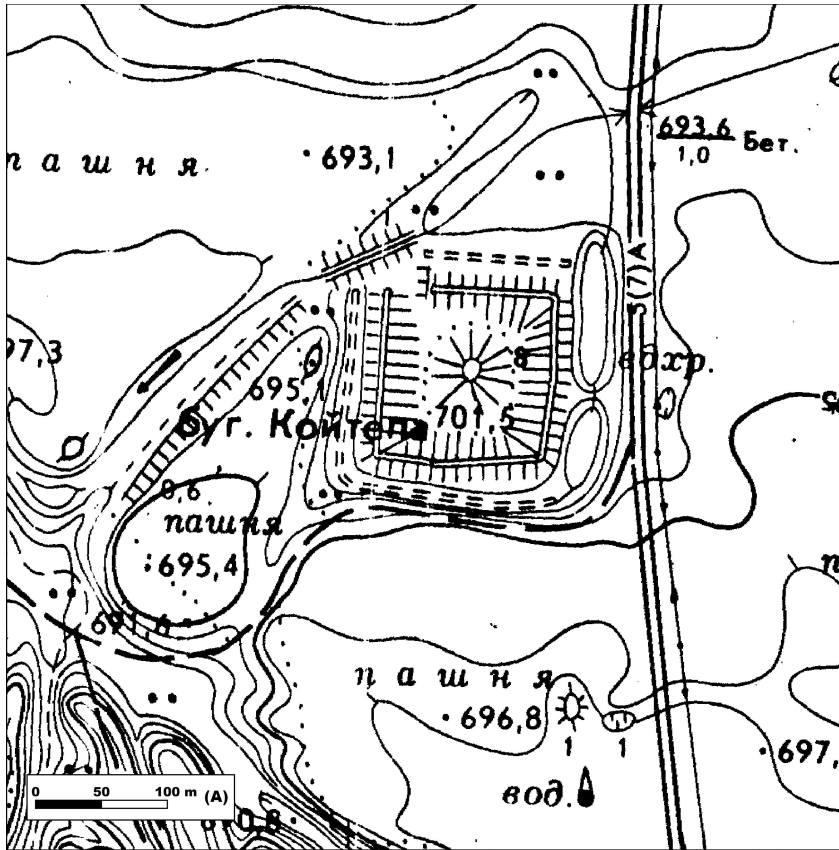


Fig. 13a - *Bugor* ('hillock') *Kojtepa* on the 1:10,000 scale topographical map (1997).

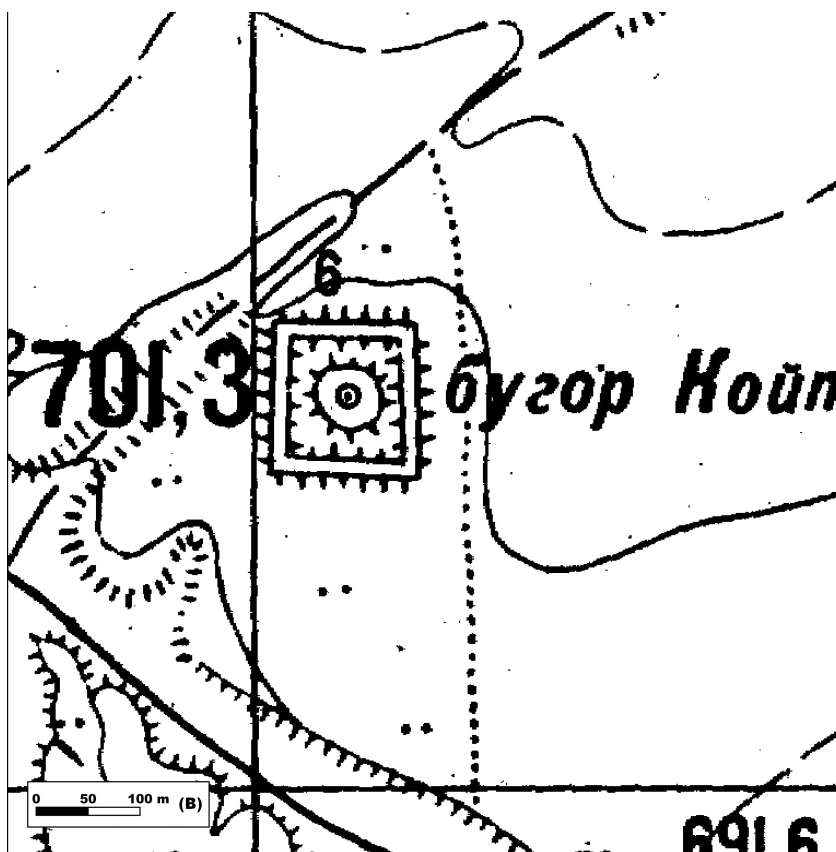


Fig. 13b - *Bugor* ('hillock') Kojtepa on the 1:25,000 scale topographical map (1962).



Fig. 13c - *Bugor* ('hillock') Kojtepa on the 1:100,000 scale topographical map (1986).

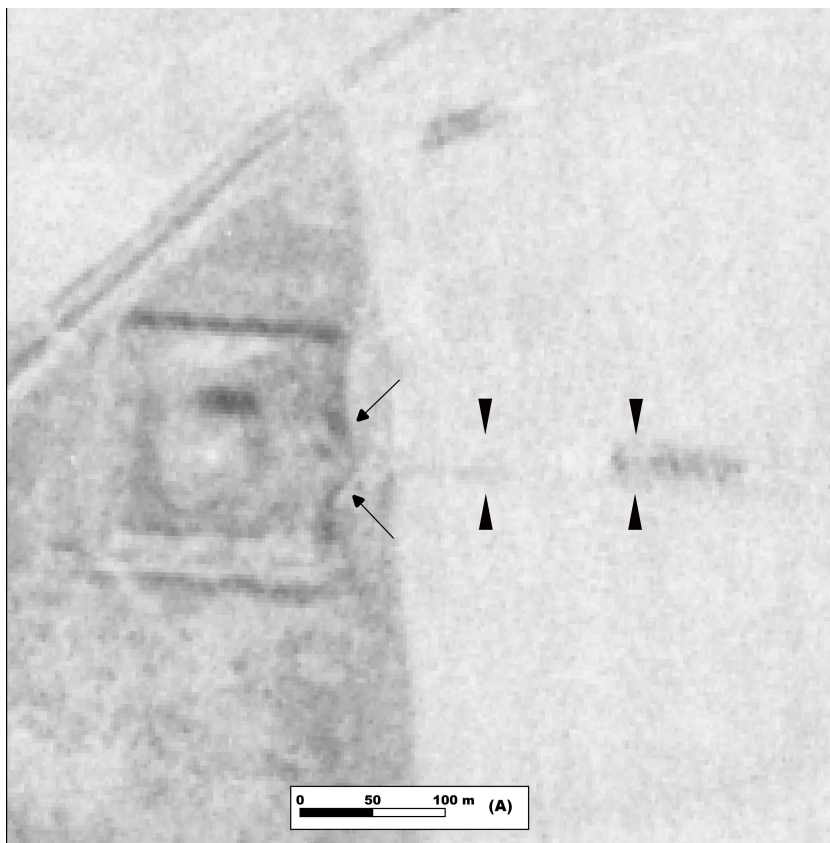


Fig. 14a - The possible gate of Kojtepa and the hollow way on the eastern rampart on the CORONA satellite image (8 October 1968, ID scene DS1011-1039DF128, courtesy of USGS-EROS Center).

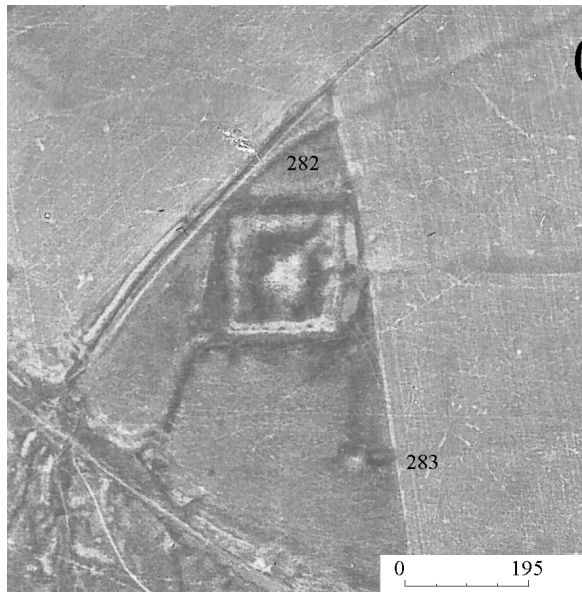


Fig. 14b - The possible gate of Kojtepa and the hollow way on the eastern rampart on the Soviet aerial photo (1972, courtesy of O.N. Inevatkina, SAE GMINV).

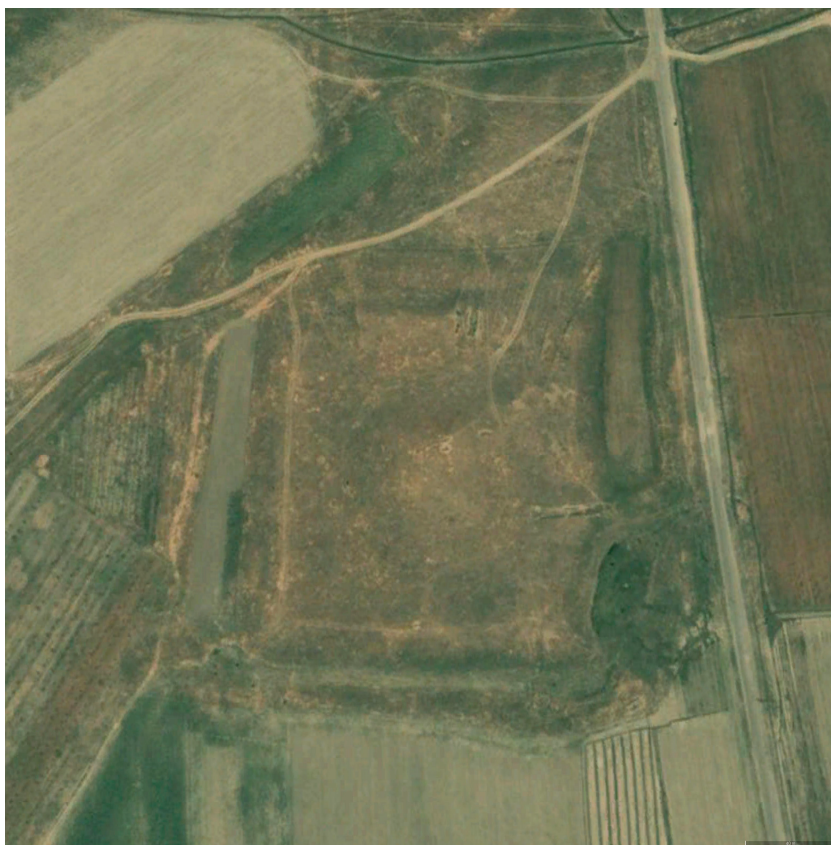


Fig. 14c - The possible gate of Kojtepa on the eastern rampart on the Google Earth satellite image (2004).



Fig. 15 - Drone survey of Kojtepa (September 2018; data acquisition M.S. Kučkarovič and U. Šermanov; data processing G. Luglio).



Fig. 16 - The archaeological complex of Pas-330 (basemap CORONA satellite image, ID scene DS1011-1039DF128, 8 October 1968, courtesy of USGS-EROS Center).

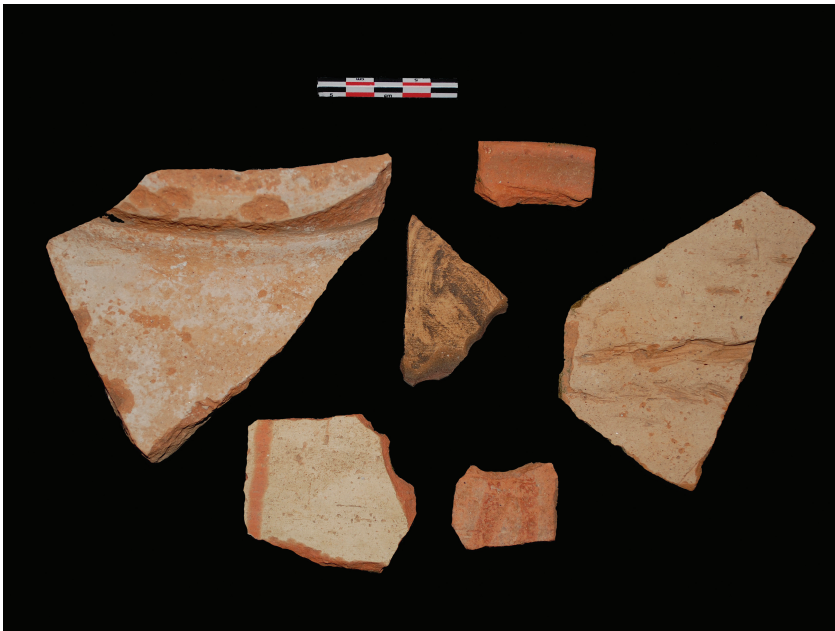


Fig. 17 - Early Middle Ages pottery from Pas-330 (Photo: E. Serrone).

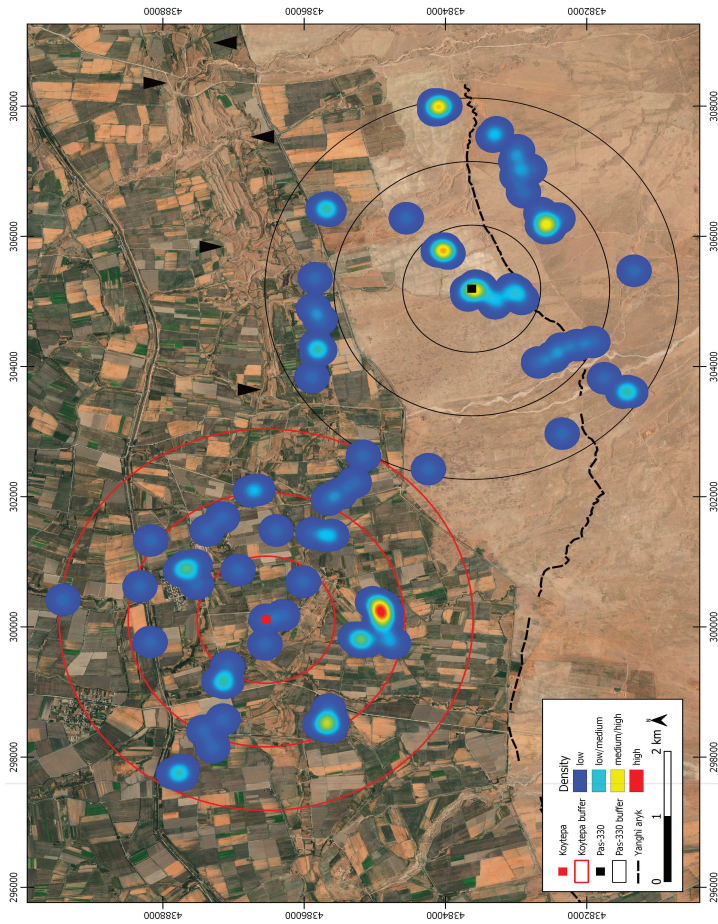


Fig. 18 - Buffer zonation and settlement density around Kojtepa and Pas-330 (basemap: Bing satellite image, 2016).

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