

## THE ACHAEMENID PERIOD IN THE SAMARKAND AREA (SOGDIANA)<sup>1</sup>:

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### *Introduction*

Under the invitation of the Italian Archaeological Mission (IAM) of Is.I.A.O. in Uzbekistan, directed by Prof. Maurizio Tosi (Università degli Studi di Bologna)(USB), and thanks to the availability of Dr. Shakirdjan Pidaev, director of the Institute of the Archaeology of Academy of Sciences of Uzbekistan (IAASU), a joint working group of IAASU and Università degli Studi di Napoli, L'Orientale di Napoli (UNO), composed by Dr. Alexej Gricina, Prof. Bruno Genito, Dr. Luciano Rendina and Dr. Maria D'Angelo, spent few weeks in the Samarkand area in May-June 2007 and 2008. The work, financially supported by the IAM and UNO, put the bases for a new archaeological project, starting from the topographic data collected by the IAM from 1999-2008, and aimed at investigating the archaeological horizon of the Achaemenid time (6th-4th century BC) in the Samarkand area.

The new project, under the suggestion of Dr. Shakirdjan Pidaev, director of IAASU, has been inserted within the frame of a new official agreement between IAASU and UNO signed in October 2008 by the IAASU and in March 2009 by UNO.

### *The Joint Uzbek-Italian project*

The joint Italian-Uzbek activity aimed at realising an Archaeological Map of the Middle Zeravshan Valley, started in 1999 (Shirinov and Tosi 2001; Mantellini, 2001; Tosi, Rondelli, Menghi, Mantellini 2002; Rondelli, Mantellini, Bonora, e Franceschini, 2002; Mantellini and Rondelli in corso di stampa), identified and documented (1999-2008) the archaeological evidences in the area and a series of significant canalization works, originated by the river. Among these, the Dargom canal<sup>2</sup>, already mentioned by Tolomeus in his *Geografikà* as the main water restocking of

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<sup>1</sup> Sogdiana (Sogd/Sugd in old Persian) is recorded for the first time in the inscription of Bisutun of Darius I (522-486 BC); much probably the area had a historical-regional consistence even before. Herodotus (*Histories*) tells that the people of the Sogdians, together with the Parthians, the Corasmians and the Areans constituted the sixteenth province of the Achaemenid Empire and that they paid a tribute of 300 talents (III, 93). Samarkand is quoted instead for the first time in the accounts of the campaigns of Alexander the Great in Sogdiana between 329 and 327 a.C. Arrian (*Anabasis Alexandri*) and Quintus Curtius (*Historiae Alexandri Magni*, VII, 6: 10, 24; VII, 9: 20; VIII, 1: 7; VIII, 1: 7, 19; VIII, 2: 13), uses the name of Μαρακάνδα. With regards to the foundation of the city, a pre-Achaemenid dating, between 650 and 550 BC, would seem confirmed (Pugachenkova and Rtveldze, 1985). Arrian defines it βασιλεια τῆς Σογδιανῶν Χώρας (III, 30, 6). Alexander occupied it many times during the clash with Spitamenes and, according to Strabo (XI, 11, 4), did he also razed it to the ground. During the time of the Diadoches the city became the capital of Sogdiana, that belonged at that time to Bactriana. The Seleucids lost their control of Bactriana (and therefore of Sogdiana) when Diodotus proclaimed its independence and founded the Greek-Bactrian Kingdom (250-140 BC). Since then up to the Islamic conquest Bactriana and Sogdiana do not seem to have had very much in common with the history of the Iranian plateau, both from the economic, and the historical-cultural points of view (Schaefer and Bosworth, 1995).

<sup>2</sup> It originates from the Zeravshan, east of Samarcanda, flows to south of the city to rejoin to the same Zeravshan, west, in the line called Kara Darya, for a general length of 100 kms. In its initial trait the Dargom distributes in three distinguished courses: Starj (old) Dargom, of undetermined epoch; Jangj (new) Dargom, built among 1926-1930; or Dargom Obvodnoj ("that it revolves"), dating back to the beginning of the 60s. The complexity of the Middle Zeravshan valley from the geomorphologic and hydrologic point of view made it necessary, since the most ancient times, an intense work of reclaiming the whole territory in order to increase the cultivable surface and to consolidate the sharp water network, also in virtue of a very low rain precipitations regime (around 320 mms per year). The greater part of these interventions occurred in the 20s century during the Soviet time, particularly in the '20-30 and '60-70 decades: the first period belongs to the time of the construction of the 1st May Dam, realised through the use of the new technical engine and the exploitation of a large amount of manpower. The strong erosion practiced by the channel on the surrounding territory is a clear sign of an unstable water regime and only the construction of the dam has allowed a best exploitation of the water

Μαρακάνδα (Afrasyab) was certainly the most important; in the list of the rivers in the middle-Persian sources, the Dargom is recorded as well<sup>3</sup>. The Italian-Uzbek activity was aimed at protecting and valorising the archaeological-environmental patrimony of the area on one hand, and to analyze, in details, the ancient settlement scheme, from the early phases up to now (Fig. 1) on the other.

Unfortunately the continuous agricultural interventions of the last decades (creation of artificial balconies and great canalization works, aimed at increasing the cultivable surface and consolidating the sharp water network, because of the low annual regime of the rains, around 320 mms), and specially those of the Soviet period (in the 20s - 30s and 60s - 70s of last century), have seriously damaged both the state of conservation of the archaeological areas and, in some cases, even the existence of a large amount of them. It has been decided, thus, to proceed through systematic surveys over the territories and to study the historical maps (above all the Soviet of 50s) and the satellite images. To every recognised site an electronic card has been associated then, aimed at documenting all the essential information for a complete understanding of the archaeological features (every card is referred to the activities effected in the previous years, to the materials collected in the surface, to the topographical information and the state of conservation of every single described element).

These preliminary investigations have allowed one to identify numerous sites related to the Sogdian period (4th-7th century AD) representing, for number and dimensions, the majority of the archaeological evidences. It is poorly documented, up to now the proto-historic period, the Bronze and the early Iron Age as well, whilst there are well visible the Mesolithic and Neolithic sites (Rondelli et alii, 2003).

### *The New Project*

Any archaeological perspective related to the Achaemenids in Sogdiana should be preliminarily inserted in the very scarce, though complicated historical framework given and left by the ancient sources dealing with the region and the related peoples.

Sogdiana was populated by a people speaking and writing in an eastern Iranian language: the Sogdian. According to the Greek and Roman authors, the region was located between the territories comprised by two rivers, the Oxus (Amu Darya) and Iaxartes (Syr Darya)<sup>4</sup>, and the southern border was running along the Zeravshan mountain range. It is not clear, however, whether the Sogdians populated all the lands which Greek and Roman authors attribute to the region. It is possible that the sources referred only to the administrative boundaries of the Achaemenid Empire, without taking in consideration the real distribution of the villages, towns, regional walls etc. and the population in the area. Sogdiana indicates, thus, the region including the Zeravshan and Kashkadarya river basins, and its archaeological remains are generally dated no earlier than the 1st millennium BC, when the people of the Sogdians emerged at the historical level<sup>5</sup>. Urban

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and the conversion of unsuitable grounds to cultivable. In the second period the areas neighbouring to the Dargom have been, instead, reclaimed.

<sup>3</sup> In Ptolemy (*Geography*) and on his map is mentioned the left inflow of Amu Darya (Oxus), called Dargoman (*Dargamanis flumen*), originated in the Hindukush (Paropamisus) mountains. In the medieval sources the canal is mentioned as Dirgam, running near Hulma in the Tocharistan (al-Tabari, ser. II, p. 1590; Ibn Khordadbeh, p. 33; 66), identified with the river Aksarai (Kunduzdarya) (Lazard, Grenet, de Lamberterie, 1984, p. 202). In antiquity it may have been also called Dargoman (Gumbah, 1975, p. 72). During the Early Middle Age epoch amongst the Türks of Fergana was popular the name Dargman (al-Tabari, ser. III, p. 1562, 1595) or Tardjuman (Ibn al-Fakih, 1968, p. 19).

<sup>4</sup> The region of Khoresm, which occupied the Amu Darya delta, was not part of Sogdiana, which later, beginning, at least, in the first and second centuries AD, constituted a rather smaller territory.

<sup>5</sup> The most ancient archaeological finds on the territory of Sogdiana date back to the Middle Paleolithic period. There are a few Upper Paleolithic settlements (in Samarkand, for example) as well; at the same time, nothing from the Neolithic period has yet been found. Sarazm, located between Samarkand and Panjikent, is an Eneolithic site dated to the 4th and 3rd millennium BC. Isakov, Roland Besenval and Bertille Lyonnet studied this monument consisting of several settlements that occupy hundreds of hectares. Sarazm pottery combines characteristics of northern Iran (Tepe Hissar), southern Turkmenistan (Geoksjur), southern Afghanistan (Mundigak), Khoresm (Kel'teminar), and even southern Siberia (Afanas'ev). Besenval attributes such a "multiculturalism" of Sarazm to the re-settlement of people coming from different lands to this area, attracted there by the mineral resources of the upper

development in Sogdiana began sometime in the early 1st millennium BC, i.e., in the early Iron Age, when a new culture emerged in Samarkand and Kashkadarya. Some characteristic features of this culture look like more archaic than those of the Bactrian-Margian cultural complex or even than those of the more ancient culture of Sarazm. The use of semi-huts as normal dwellings replaced that of rooms and houses made of unbaked brick, the plain pottery, sometimes decorated with simple painting, replaced as well the wheel-made pottery found in the sedentary settlements. The emergence of the Iranian speaking tribes in the 1st millennium BC, including the antecedents of the historical Sogdians in the regions where the latter lived, has been often put in relation to the arrival of the nomadic Andronovo tribes. In this case, indeed, one must suppose that these tribes populating the steppe during the late Bronze Age, arriving or reaching Sogdiana, lost their earlier pottery tradition. In the beginning of the 1st millennium BC, nomadic pastoralism developed in the steppes in the original area of the Andronovo culture, and also there replaced the early herding agricultural type of economy. Most likely, it was the invasion of the nomads that reduced the achievements of the Bactrian-Margian complex, although it did not eliminate completely the old traditions. Some invaders settled on the deserted and fertile lands and took up agriculture. Mountain people, always in need of additional land, participated in this process as well. Pottery has always been a typical product among them, right down to modern times.

The Iron age in Central Asia, still, say the truth, is very little known, including the Achaemenid period, of which it should have constituted the final result. The quantity of the sites and archaeological rests attributable to the Iron and Achaemenid age is still very small, and there are not available always reliable chronological elements for a secure dating. Nevertheless the documentation is everything anything else other than negligible, even if this does not mean that it can fully draw elements for a general synthesis. They stay open still a lot of matters and different interpretative hypotheses<sup>6</sup>.

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reaches of the Zeravshan river. The Bronze Age is not well studied. The Andronovo steppe culture penetrates the Zeravshan basin somewhat later, in the first half of the 2nd millennium BC, as evidenced in the Muminabad tomb in the Samarkand region and the Dashti Kozy tomb to the east of Panjikent.

<sup>6</sup> The most important works dealing with these aspects are those of [Frumkin \(1970\)](#), [Masson and Sarianidi \(1972\)](#), [Francfort \(1988\)](#), [Vogelsang \(1992\)](#), [Koshelenko \(1985\)](#); a certain number of other contributions constitutes a whole very detailed study, but unfortunately only of regional character ([Tolstov, 1948a; 1948b; 1953; Rtveldze, 1981; Sagdullaev, 1987a; Gardin, 1998; Gubaev, Koshelenko, and Tosi, 1998; Lyonnet, 1997; Sulejmanov, 2000](#)). It is very difficult to recognize an Achaemenid period in this large amount of data at disposition; that phase, is included fully in the Iron age and, therefore, around 1500 years are described as constituting an only one temporal time span, beginning from the final Bronze up to the Hellenistic epoch, and, sometimes, even ([Koshelenko 1985](#)) later in the 3<sup>rd</sup> - 4<sup>th</sup> century AD. This approach has tried to put in evidence, the type-functional structures of the occupation phases of a given territory, including the Achaemenid, Greek and Kusan period. Obviously this can be explained partly for the enormousness of the related geographical extension, distributed in the different territorial entities, as Afghanistan, Turkmenistan, Uzbekistan, Tadjikistan, a part of Kazakhstan, but also for the character of the much diversified and very unequally published and often little accessible archaeological documentation. In more than one case in the published works can be defined the nature of the traces of the Achaemenid period and it is not of little importance to know if the boundaries of a given site are built during the Achaemenid period or not. To characterize the traces of the two centuries of the political Achaemenid dominion in a given territory would have required and it would generally ask for the use of a very more refined stratigraphical archaeology of that, instead in use. On the other hand it is matter of crucial importance to be able to know what role had the Achaemenids in Central Asia, but the absence of specific information deserves a brief reflection and analysis to answer, time by time, to precise questions. It can be considered, as a starting point, that the Persian/Achaemenid material presence was in the peripheral regions analogous to that of the other provinces, but in this case, however, in turn, it should be explained, how the qualitative and quantitative consistence of the relative remains is still so little convincing. Main difficulties are those to establish typologies of the reliable chronologies that also could have a sense for the history of both the political and the cultural events. In any case, at the level of the study and the analysis of the ceramic production it is difficult to characterize the arrival or any ethnic presence of the Persians. The Italian work in Margiana ([Cattani and Genito, 1998](#)) arrived to sustain that "meanwhile the distinction between Yaz and the two others horizons is rather evident, the differences between Yaz II and III is, instead, still to be completely detected. Dark complicated and difficult is, at the moment, actually, to say how many Yaz II or Yaz III horizon sites distributed over the area investigated" ([Genito 1998c, 91](#)) and therefore it is rather deceptive therefore, for the time being, with such uncertainties, to try to know with precision the number of the sites of the Achaemenid period in central Asia. In the eastern Bactriana contains 60-70 sites, to which 40 sites of the catalogue of [W. Ball](#) must be added (1982, 374 and paper 60). For Afghan central Asia to the 46 sites ([Lyonnet, 1997, fig. 26, p. 365](#)), it is worthwhile to add a certain number of other sites of the other provinces of central Asia, an additional about 10 recovered in the piedmont band of the Kopeth Dagh or in Chorasnia and about 70 in the Murghab in the Italian work. One can arrives, so, to a total of 250 sites around. This respect can be considered, nevertheless, already old when it will be published only a precise regional archaeological paper including a number of small sites and layers datable among the Yaz II/III and Yaz III horizons ([Stride, 2001](#)). Besides, these sites are not useful if they are not provided with characters chronologically founded. In fact, of these almost 250 sites,

Among the data already so few abundant, and those that allow us to define and circumscribe some materials of local morphology, those related to the shapes of the ceramic production, must be certainly mentioned even if, as already said, often is missing a precisely definable period in relationship to that of the dynasty: chronology always is rather fluid and the phases of transition are very vanished. To sum up, it can be said that, amongst the ceramic forms the carinated / cylinder - conic cup and the jar with flattened rim, do not constitute enough evidence to define the archaeological consistence of a political unit and this type of difficulty can be found similarly in the greatest part of the material culture. It alone, in fact, is not connoted of ethnic values, neither so much less of dynastic character and for the typologies of particular objects that can be related to "imperial" characteristics, it is obvious that only those coming from the dynastic capitals are able to be indicative of a true imperial presence. Since the objects travel in the space and in the time, it would be necessary to know how much reliable is the archaeological context which the objects come from and if the related archaeological layer can be indeed datable to the 5<sup>th</sup> and the 4<sup>th</sup> century BC.

One is able, naturally, to not only consider the whole central-Asian material of the Achaemenid epoch, or of Iron II and III age, but also to consider what morphologically can be considered or defined "Achaemenid/Dynastic" or "Political/Imperial" (Genito 1988a, fig. 1), and that has been recovered inside or out the frontiers, mainly in the steppe areas, even if it is datable to a period back to the end of the empire. One is able to deal with defining better what can be intended for an "Archaeology of the Achaemenid Empire", as aspect of particular merit in the field of Central Asian archaeology (Genito 1996). Such considerations impose, however, some methodological precautions that can shortly be synthesized in the priority demand in order to know the places and the dates of the manufacture of the "Achaemenid" objects. If these two data are not acquirable, it is evident that they are had to define zones of uncertainty.

It would certainly need to make a distinction among that type of artificial more properly "Achaemenid" and those, that, somehow, prolong, often deforming and transforming the technical, decorative and stylistic Achaemenid tradition. Reasonably it always needs to consider the dates of manufacture and the stratigraphical contexts, considering reliable also those dated back until toward the half of the 3<sup>rd</sup> century, more rarely those later which do not go in every case, over the conquest of the Yüezhi and the beginning of the Kushan period.

Going back to Sogdiana, in the 8th and 7th centuries BC, the scanty settlements with semi-huts were replaced by large cities, among them Kok-tepe (100 hectares) and Samarkand (220 hectares; the ancient town was Afrasyab). The studies, although preliminary, of these sites have demonstrated that the process of erecting city walls and shrines included large-scale works. According to some reasonable hypothesis, irrigation canals in Sogdiana, the length of which was more than 100 km, were probably built at about the same time as the cities. With some changes, these canals survived until the present time. Three important factors facilitated this socio-economic transformation: rapid population growth on fertile land, military organization of a newly established state ruled by those who not long before were nomads, and the advanced cultural traditions of the Bactrian-Margian complex, which to some degree still survived. A new stage in the cultural development in Sogdiana began in the 7th and the 6th centuries BC. Some pottery characteristics, found in Bactriana, Margiana, northern Parthia, and, somewhat later, in Khorasm as well (for example, cylinder cone-shaped wheel-made pottery and large, rectangular, unbaked bricks), did not spread beyond the territories in the northeast of Sogdiana. It has been argued that these lands were included in the same state in the 7th and the 6th centuries. However, it is not clear yet what was this state's major political and administrative centre. Even before this period, a new large urban centre, the remnants of which are now called Er-kurgan, emerged in southern Sogdiana. In 1950, Terenožkin developed relative and absolute systems of chronology for the Sogdian pottery and other specimens that were dated between the 6th century BC and the end of the 8th century AD.

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if the territory is analyzed in terms of irrigable zones or oasis, only about 30 will historically be really suitable for a comment of the traces of the Achaemenid period in central Asia.

Cultural change did not occur immediately after, Bactriana, Sogdiana, and Khoresm were conquered by Cyrus the Great and became part of the Achaemenid Persian Empire in the second half of the 6th century BC. New elements (in particular, open forms of pottery - cups and bowls, characteristic of Iranian culture) spread only in the 4th century BC during the late Achaemenid and the early Hellenistic periods. During this period, semi-huts were built along with unbaked brick constructions. The Kurgancha settlement in southern Sogdiana, which was excavated by M. Khasanov, dated to the 4th and the 3rd centuries BC, is characteristic of this trend. Neither Persian during the Achaemenid period nor Greek influences in the Hellenistic epoch had an immediate impact on the Sogdian culture. Greek forms in the Afrasyab pottery, including “fish plates” and kraters appeared in the 3rd century BC during the rule of the Seleucids, not right after Alexander the Great’s conquest of Sogdiana in 320 BC. Nomads conquered Sogdiana in the end of the 3rd century. Greeks may have returned to Sogdiana in the first half of the 2nd century, but by mid-century, the nomads took it over again. Ancient oriental elements prevail in the architecture of the Greek period. A typical example is the Afrasyab city wall, which was built from large unbaked bricks of a type unknown in Greece on which the names of the makers in Greek letters were written. Unbaked brick constructions were typical of Sogdiana during its whole history<sup>7</sup>.

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Up to now the archaeological joint Uzbek-Italian expedition in the Pastdargom district of the Samarkand province had pointed out its attention, among others, to the following sites preliminarily age-dated to the Achaemenid period:

1. Durmantepe, approximately 14 km to north-west from Samarkand. In 1975 it was first studied by a Samarkand province group of the IAASU. The site is more than 25 ha in size. The citadel 18 m high is placed in its south-eastern part. According to the data of the excavation, the walls encircling the site were constructed of mud bricks 60 x 40 x 12 cm wide and then strengthened with pakhsa blocks. Archaeologists identified two main periods: the first

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<sup>7</sup> The French-Uzbek expedition excavated at Afrasyab citadel a large storehouse for grain that belonged to the state or to a religious a system of activities. This storehouse had been built in the time of the Greek rule and then was burned, most likely during the nomadic conquest. Burial sites of the nomadic population near oases date from the 1st centuries BC to the 1st centuries AD. Artefacts produced by sedentary masters, including pottery made on the potter’s wheel, were popular among pastoralists. During the period between about the late 2nd and the 1st centuries BC and the 1st and the 2nd centuries AD, tall goblets became a widespread item, and iron arrowheads replaced those made of bronze. The urban culture of Samarkand, Er-kurgan, and other cities and settlements dating from this period are well explored. However, in contrast with the situation of Er-kurgan, the later period from the end of the 2nd to the 4th centuries is not well studied for Samarkand. The houses of peasants, who lived in the mountains, were different from urban dwellings, resembling the houses of Tajiks Mountain in the 12th century. In the plain, and especially in the proximity to the cities, there were houses which more or less corresponded to urban norms. The architecture of the fortified residences was similar to that of the houses of wealthy citizens. In the Sogdian decorative arts images of gods were realised under the Greek influence, to which both Iranian elements were added in the 5th century and Indian in the 6th century. Secular narrative painting was used to illustrate literature of different genres, such as epics, fairy-tales and fables that used local, Iranian, Indian, and Greek plots. Feasts and other celebrations, and equestrian hunts were favourite themes in this painting. Occasionally, artists utilized events of recent history. The mature Sogdian style of the 7th and the 8th centuries was dynamic, and featured a bright and harmonious palette. Among the mineral pigments ochre predominated, and Badakhshani ultramarine was used for the backgrounds. In the 8th century after several military actions the Arabs conquered Sogdiana, which became one of the richest parts of the Caliphate. However, economic prosperity was combined with cultural assimilation. In the 2nd half of the 8th and 9th centuries, urban citizens adopted Islam. Simultaneously Persian (Tajik) language replaced Sogdian, although for a long time afterwards, inhabitants of rural areas continued to speak Sogdian. The Uzbek-French expedition (Frantz Grenet, Ivanickyi, Iurii Karev) discovered in Samarkand two palaces of Arab vicegerents dated to 740 or 750. Their architecture is not Sogdian. Under the Arabs, local principalities gradually lost autonomy, and noblemen and wealthy merchants abandoned small towns such as Panjikent. However, it was a time of the rapid growth of large cities, such as Samarkand and Bukhara, which then became administrative centres. In the 9th century, Sogdiana lost its ethnic and cultural distinctiveness, although many elements of Sogdian material culture are found in materials dating from the 9th to the 11th centuries. This is why, starting with the 9th century, it is impossible to speak of Sogdian culture on the territory of Sogdiana itself at the same time that it survived until the 11th century among Sogdian immigrants who resettled in eastern Central Asia and China.

from the 3rd century BC to the 2nd-3rd centuries AD, and the second from the 4th to the 12th centuries. The results were compared with those from Kasr-al'k of the 8th-10th centuries and Isbiket of the 11th-12th centuries (Rostovcev, Ivanickiy, 1976, p. 540). However, the sizes of the bricks seem to be typical for the earlier periods (Inevatkina, 1983, pp. 76-82; Inevatkina, 1995, pp. 16-17) and the ceramics for a period dating the construction of the site to the Achaemenid or earlier period (Fig. 2).

2. Laylaktepe site, located on a terrace above flood-lands of the left bank of the Karadarya, has a general area more than 100 hectares large. The citadel is located in the north-western part. The adjacent territory is divided into three parts. Every part has a fortified gate with walls and towers. Gates are fortified by towers. A large amount of ceramics was collected: unglazed, wheel made and molded. One exception is given by a glazed sherd of a jar of the 10th century. Definitely, the site is a multi-layered one. The earliest pottery is dated to the Achaemenid period (Fig. 3).
3. Kojtepe (Kendyktepe), a citadel encircled by walls, inside strongly destroyed. They are cut through by modern activity of bulldozers. Walls, though not clearly identified in the already opened sections, were encircling the citadel, typical system for ancient sites and settlements. Walls were also encircled in ancient Samarkand and ancient Ustrushana settlements (Inevatkina, 1995) (Fig. 4).
4. Laylakuytepe site, in the Guzalkent district, 40 km to the West from Samarkand on the left bank of the Zeravshan (Karadarya), is approximately 2 hectares. In the lower layers dwellings of semi - dugouts type with materials of Achaemenid period were found (Vafaev, Ivanitskiy, 1992, pp. 40-42) (Fig. 5).
5. Nameless tepe 1 (code PDX 92), located in the area of Chandyr village, is stretched from South to North and consisted of a citadel placed in the southern part and territory placed from the North. The site is strongly destroyed and cut through by a road from South to North. The scattered material is dated back to the Achaemenid, Hellenistic periods and Middle Ages (Fig. 6).
6. Nameless tepe 2 (code PDX 110), located in the area of Karasu village, on the right bank of the Urtayzsai, opposite to Kattatepe, is almost totally leveled. The numerous scattered ceramics date back to the Achaemenid period and to the Early Antiquity (Fig. 7).
7. Nameless tepe 3 (code PDX 93) is a round hill with flat top. The surface is tilled. Most of the collected ceramics date back to 4-3<sup>rd</sup> centuries BCE. It is possible that the base of the site can be earlier (Fig. 8).

In particular the activities of the joint working group of IAASU and UNO in May-June 2007 and 2008 were mainly effected in the western area of Samarkand, where, on the base of the topographical results till now achieved, could be, presumably, found the most consistent remains of the Achaemenid (6th-4th BC), Graeko-Bactrian (250-140 BC) and Kushan (1st-4th AD) periods. The trenches planned were aimed at singling out the cultural horizons related to the periods of the

ancient Iranian occupation of the territory and have represented a starting point in order to plan future extensive excavations.

*Field Activity (Springs 2007 and 2008)*

The "achaemenid" sites in the Samarkand territory, denominated Nameless nos 1 (code PDX 92) and 3 (code PDX 93), towards which was first oriented the attention of the field work did not seem very promising for extensive trial trenches; they present, in fact, very tall external sections and on the top, active fields of cultivation; the site denominated nameless 2 (code PDX 110), in the outskirts of the town of Chandyr, although partially destroyed, was the one which presented, instead, some interesting profiles, and is constituted from a tall and a lower part. The only possible section to be started to investigate was the southern.

It has been decided, therefore, to effect a long vertical section in this last site also known by the people with the name of Avlja Tepa. The section effected on the southern side of the tepe (already object of excavation in recent times) has evidenced stratigraphical units (Fig. 9), slightly southeast oriented, that seemed to be related, to a first observation, to ancient archaeological features.

A closer examination and study of the section has, nevertheless, revealed the presence of alternate strips of darker and clearer colour of ground, that can be interpreted as indicators of recent burglaries and earth movements. This has led one to think about recent interventions on the ground: they have come to the light, in fact, numerous human bones referable to a cemetery (hypothesis confirmed by people of the place) dated back to an epoch not yet defined. Besides, the recovery of a masculine complete grave on the eastern side of the section, with bones in correct anatomical connection and in excellent state of conservation, in supine position directed north-west/south-east and with the face slightly turned southwest, suggests a dating to a late Moslem epoch. The height of the individual is of around 1,60 m. and it is absent any type of grave good (only a small iron piece, light and very oxidized and a fragment of granite stone) (Fig. 10).

Given the situation of very high degrade also for the nameless site 2 (code PDX 110), it was decided to move on Koj Tepa (Kendyktepe), important site of the late iron age and of the Achaemenid period as well. The area large two hectares c. (175 m. x 150 m.; 26.250 mq = 2,62 ha.) was shortly again surveyed.

The few collected ceramic fragments on the surface, are, mostly related to closed forms (coarse and middle coarse ware); the recovery of 2 millstone stones (granite), basically behind the boundaries and in the area comprised between the top citadel and the surrounded walls constitute a probable sign of different phases of occupation.

Aim of the investigation at Koj Tepa was the singling out of a stratigraphical sequence to be evidenced through the excavation of a section denominated no 1 (Fig. 11), that has shown, very probably, the presence of two wall curtains, of notable thickness, in bricks and blocks in raw that, probably had to belong to the defensive system.

The site of Koj Tepa is constituted of a central quadrangular construction, around 12 meters high over the plain, and of a surrounding presumed wall, as well as from an external ditch, currently covered by sharp vegetation. The site had already been numbered in the last years (code PRC 147) and signalled for the find of numerous ceramic fragments related to the Achaemenid period and for its good state of conservation. Small towers (??) have been, besides, signalled at the time of the survey (Rondelli et alii, 2003) around the fortress, similar to those of Kafir Kala, even though in smaller scale.

It was decided to operate two contiguous sections along the boundaries of the great central citadel (Fig. 12) in the southern part. In the area some previous interventions had already been operated, may be for agricultural reasons. The trench of excavation has confirmed the presence of a

curtain and some cultural horizons with a large amount of ceramic material rather well datable back to the late Iron Age up to the Hellenistic epoch!

On the western side of the section, the recovery of a notable quantity of ceramic associated to fragments of millstone in pink granite and the remains still "in situ" of a big container for commodities (superior diameter larger than 30 cm) (Fig.13) has allowed one to make the hypothesis that the area, behind the boundaries, has been used for settling area. The huge quantity of ceramic material (523 fragments) recovered, above all, to west, gives confirmation of the hypothesis that can see in the area room turned to "domestic" use. To be signalled the conspicuous number of fragments of cooking vessels (above all walls), jars with intra-flexed rims and globular body (three different morphological types have been recognized, according to the inclination of the rim) with diameter varying from 22 to 26 cm. All the fragments bring clear burnt traces indicators of the cooking activity.

### *Preliminary study of the ceramics*

A preliminary study has been effected on the ceramic material located in the deposit of IAASU, coming from the survey effected in 2007 on three tepe of the area (denominated PDX 92 - 93 - 110). The analyses of the 91 fragments collected has revealed to be fundamental for making a preliminary observation of the ceramic, the forms and the most present types used. More than twenty different fabrics have been individualized, therefore, inside 14 families: each of these has been described in detailed way, signalling the most important following aspects: morphology and the compactness of the fracture, the superficial colour and in fracture, the frequency, the form, the greatness and the colour of the inclusions inside the ceramic body, the presence and the greatness of the hollows, the presence or the absence of the slip and colour, and at last the form. All these element constitute the basis for a morphological classification that can respect how much more faithfully possible also some technological characteristics.

The most frequent forms preliminarily recognized have been the big un-necked jars with particular rim and ovoid body (in some cases globular as well) of diameter varying from 32 to 38 cm (associated almost always to a middle purified body, fabric 4) and big jars with short neck with thickened rim to the outside and ovoid body or with thickened rim to the outside and globular body (diameter 30-36 cm, fabrics 1/4), but small containers with thin walls are also signalled.

The ceramics recovered along the section of the site nameless 2 (code PDX 110) (61 fragments) has revealed, above all, the existence of closed forms (necked jars) realized with middle coarse (fabric 3) and small open forms (cups) and realized, with purified thin walls (fabrics 6.1-6.2-11), almost always burnished and with patinas of red or brown dark colour (Fig. 14). One can signal the presence of only one fragment of glazed ceramic: the rim of a dish, purified (fabric 6.2), diameter 30 cm, with rounded and extra-flexed rim and traces of turquoise inside the rim. Important the recovery of a loom spindle-whorl (diameter ca. 6,5 cm) (Fig. 15).

The body clay (fabric 2.1), besides, collected in Koj Tepa it is enough different (even though imputable to the same family) from that identified in the other sites (fabric 2) and the walls are very thin, peculiar characteristic of the containers used on the fire. Other elements that confirm the "settled" hypothesis of the area immediately individualized behind the walls, are given by the recovery, amongst the non ceramic materials (468 fragments), of 6 loom spindle-whorls, 4 of small dimensions (ca. 2,5/3 cm), 1 of greater diameter (ca. 10 cm), 1 even in raw clay (ca. 5,5 cm), 4 millstones, various disks among which also some in raw clay and a plate in cooked clay. Besides to the production of big necked or un-necked jars for conservation (mostly with rounded off rims and thickened to the outside, often refolded also, with globular body or ovoid, coarse «fabrics middle coarse, 1 and 3 - diameter varying from 20 to 40 cm»), one can mention the conspicuous presence of small and middle containers with thin walls, above all small cups with rounded off rims and right-hand walls, more or less flared or carinated (diameter 8-16 cm, fabrics 6.1-6.2-7.1a-11.1), or small or averages jars with neck with rounded off rim and cylindrical neck or more or less flared

(diameters varying from 8 cm to 26 cm, fabric 6.2) (Fig. 16). Almost these containers bring traces of burnishing, both to inside and outside.

To sum up to the more than twenty fabrics identified analyzing the materials of the 2007 survey and of the trial trenches of these two last years led to think about the existence, therefore, of a homogeneous production. The next excavation seasons will be useful to have confirmation of these preliminary results. In the meantime, the data (of the ceramic material and not only) have been inserted in a database MS Access, with the addition of photos and sketches of the significant material, that can go back to the forms and types. This will constitute the fundamental support for the systematic study of the forms and fabrics and for the individuation of possible comparisons with the materials coming from the excavations already published effected in the area under examination and that can bring to relative dating. Besides they will be tried to conduct archaeometric analyses on some ceramic samples in specialized Institutes as the ISTEK of Faenza.

It has been possible, besides, during this brief mission, to give a look also to the ceramic coming from Afrasyab, not yet published. The person responsible of the ceramics not only from Afrasyab but also from other sites among which Kok Tapa, is dr. Bertille Lyonnet of the French CNRS. Both sites have evidenced various settlement phases, starting from the Achaemenid period to the Islamic occupation. During this short period of work one has had, thanks to the availability of dr. Rita Di Martino, PHD student of the Bologna University, also the possibility to examine the ceramic coming from the most important Sogdian fortress of the area, Kafir Kala and from the kilns recovered in the proximity.

The ceramics can be dated to a late phase of the Sogdian period (7th-8th AD) and among its principal characteristics introduces a large amount of mica in the surface. In the future there is the hope to effect more precise comparisons at technological and more properly morphological level. To a first macroscopic analysis one the materials of Koj Tapa, picked up by the joint team of Naples and IAASU and those of Kafir Kala, there seems to be basic analogies both for technological level, and the formal repertoire. This could be brought back to particular regionalized forms of productions. It does not need to forget, in fact, that the common ceramic production, because of its functional character strongly has purely always a conservative character in as for morphologies and typologies, and is characterized, especially in the sites most distant from the great commercial circuits, from a almost exclusively local repertoire.

The next step to be done, is therefore, that to compare the materials recovered during the short activity in Samarkand, with those of Afrasyab. They will be very useful, in this phase, the drawings of the significant fragments and the photos of the individualized fabrics. It can be proceeded for a subsequently with comparisons long time ray, trying to geographically find possible productive affinities with sites and culturally near and less neighbours.

### *Topographic Survey*

During the investigation and documentation campaign in May-June 2008 of the archaeological sites of the Samarkand oasis the following interventions have been effected:

1. Kafir Kala: three-dimensional photogrammetric scanning of two furnaces excavated by Prof. Dario Giorgetti, in correspondence of the wadi on the western side of the main fortress;
2. Kafir Kala: three-dimensional photogrammetric scanning of the inner part of the city wall, in the northern portion;
3. Excavation and documentation of a stratigraphical section and a burial of the nameless site no 2 (Pdx 110);
4. Excavation and documentation of a stratigraphical section in the eastern portion of the city wall of Koitepa;
5. Plano-altimetry contour of a portion of Koj Tapa. Elaboration of the relief with the technique of the triangulation of the topographical points and restitution of the contour lines;

## 6. Three-dimensional photogrammetric scanning of the excavated section in Koj tepe.

Detailed description of the listed interventions:

1. In order to graphically document the furnaces excavated in the proximity of Kafir Kala the technique of the three-dimensional photogrammetric restitution has been experimented. This system, alternative to the use of the laser scanner, allows one to create three-dimensional models, using digital photos according to the principles of the "parallel three-focal correlation". To sum up, using a special support in steel, three photos of the object are done, three images are processed by the computer that, using a specific algorithm, proceeds to compare the single pixels in the three photos, recognizing the homologues, elaborating the reconstruction of the lines, defining simple geometries and returning the three-dimensional model, elaborated with the technique of the clouds of points. The files, thus produced, present characteristics of incomparable fruition and quality compared with those produced by the laser technologies. The aim, particularly, was to experiment the system under the conditions of extreme light and test its compatibility with the most widespread software of the virtual reality.

The particular climatic conditions, with temperatures higher than 40° and intense solar radiation, have not influenced the operability of the system. The camera utilised, a Nikon D80 with two optics calibrated by 20 and 50 mm has guaranteed a perfect operability, making photos with times next to 4/1000 of second and completely closed diaphragms. The drawings elaborated have always guaranteed a sub-centimetre precision and an excellent chromatic result. The elaborations, calculated with "Z-Scan and Z-Map" software have never required more than few minutes and resulted compatible, through the standard with extension ".obj", with the software "3D Study", unanimously recognized as the more widespread software for the elaboration of virtual animations.

2. The central area of Kafir Kala has been the subject of documentation in the northern portion of its walls. The particularly complex morphology of the structural remains of Kafir Kala, realized with raw bricks and exposed to a strong degrade, needed an accurate graphic and photographic documentation. The use of the scanner photogrammetric has allowed one to satisfy, with only one operation, all the two applications. For the complete drawing of the only northern side it has been necessary to make 72 separated photos in 24 triples. The clouds of points elaborated, returned with centimetre definition, have been dressed again with photos. The complete file of the evidences of the northern side has also been returned in the ".3dpix" format in order to allow one to easily utilize the 3dPix software in free concession on Internet. This particular software allows one to navigate inside the returned model, modifying the position of origin of the illumination. It is revealed particularly useful in the digital fruition of the details of an excavation.

3. The intervention of excavation of the site nameless 2 (Pxd 110) has foreseen the opening of a stratigraphical section in the southern portion of the tepe. The zone has been before strongly anthropized in the last century from the presence of an industrial establishment and from the construction of civil residences, probably during the dismissing of the establishment.

In the specific case the tepe appeared notched by small progressive stripping on every its four sides. The necessity to realize a parking lot, functional to a near house, had seen compromised the whole southern side, partially exposing sections of the tepe. The cleaning and the regularization of a section on the southern side has allowed one, to its eastern extremity, to single out a burial, orthogonal to the section, of an adult, of masculine sex, deposited in a ground pit, in supine position, west facing, without grave goods. The excavation of the burial, operated tracking the encumbrance of the pit on the superior part of the tepe down, has allowed one to determine that the same pit had been dug from the plan of actual stamping. The stratigraphical position and the absence of grave-goods allows one to hypothesize that the burial, probably goes up again to the Islamic epoch, and is relatively recent. The documentation has foreseen the photo profile and the three-dimensional

photogrammetric scanning of the section and the burial, and the GPS outline of the whole structural remains.

4. The investigations effected in Koj tepe, with the stratigraphical analysis of a small-size marginal site of Achaemenid age, has foreseen the same dynamics of approach of the preceding site: in this case the tepe is still perfectly surrounded by a wall legible from the reliefs on the level ground. The heavy agricultural works, conducted in the last years have notched the surrounded wall in more points in order to allow the passage of the tractors in the cultivated fields. Also in this case it has been preferred to use an artificial cut operated recently: a passage 6 meters wide sectioning the whole relief of the walls on the eastern side of the settlement.

The cleaning of the section, started from the inner side of the tepe, has shown a stratigraphical situation of middle size complexity, effect of a re-use of the area that, partially lost its defensive character and comes to be set by rooms or spaces destined to the production and transformation of commodities.

In the central part of the excavation the traces of the articulated wall are well visible on a double curtain, realized in raw bricks in plain located and tied by clay blocks. On the inner side, toward the tepe, the presence of a jar embedded in a clay bench and of millstones of granite of middle dimensions allows one to hypothesize that, in a second moment, close to the wall, structural remains were set up.

5. The investigation of the site, already documented of a GPS relief compiled during the "survey" and summarily returned with contour outlines, has foreseen the relief in detail of the encumbrance of the excavation and the re-elaboration of the map of the tepe returned with the technique of the geodimetric tachometry. A total station TOPCON has been utilised and 995 points of detail have been outlined, necessary to elaborate a new plan with contour lines with a distance of 10 centimetres.

6. The area of the section has been the subject of 3D scanning process, using the system of the parallel three-focal photogrammetric scanning. All the outlines have been geo-referenced on the cartography 1:10.000 of the zone.

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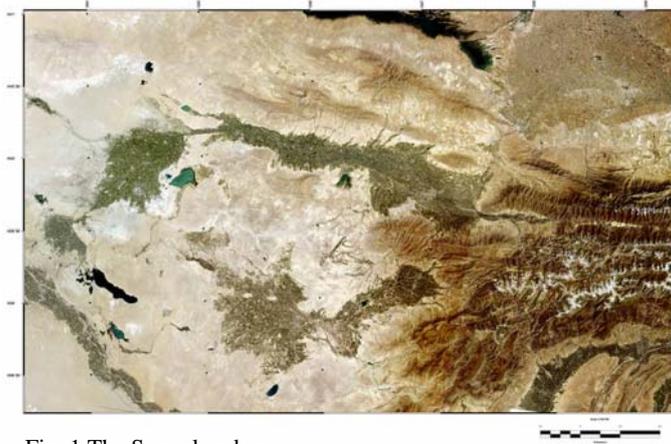


Fig. 1 The Samarkand area



Fig. 2 Durman Tepe, walls and settlements area

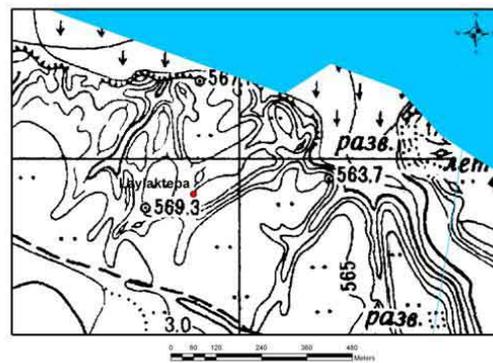


Fig. 3 Laylak Tepe. Along the river course and the related map



Fig. 4 Koj Tepe, general view as seen as from SE

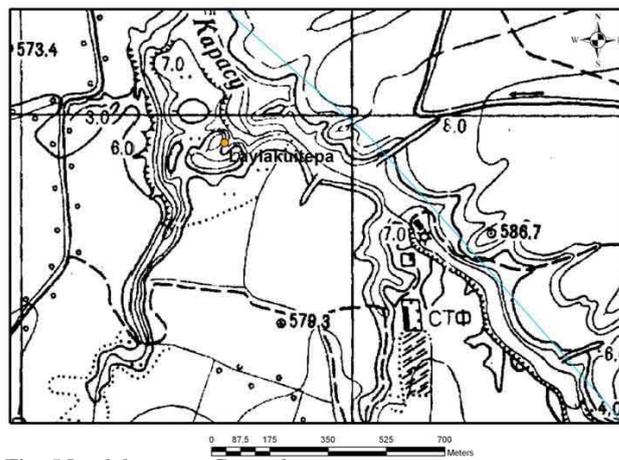


Fig. 5 Laylakuytepa, General map



Fig. 6 Nameless, 1 (PDX 92), general view



Fig. 7 Nameless 2 (PDX 110). The whole profile of the site as seen as from west



Fig. 8 Nameless 1, (PDX 93), the northern front of the site



Fig. 9 Nameless 2 (PDX 110), The section with stratigraphical units and the clear indicators of recent burglaries and soil movements



Fig. 10 The skeleton just along the eastern side of the section



Fig. 11 Koj Tepe, section before the excavation; at the back side of the central tepe.



Fig. 12 Koj Tapa, the section after the excavation; to the left the cultural layers and to the right the possible double line of wall



Fig. 13 Koj Tapa, the almost complete jar along the western side of the section



Fig. 14 Glazed dish



Fig. 15 Spindle-whorls, from Koj Tepe



Fig. 16 Different types of small bowls with monochrome red or brownish slip