

کاوش و پژوهش در شهر سوخته ۳
به کوشش: سید منصور سید سجادی - انریکو اسکالونه



Edited
Seyyed Mansur Seyyed Sajjadi
Enrico Ascalone

EXCAVATIONS AND RESEARCHES
AT SHAHR-I SOKHTA 3



پژوهشگاه باستان شناسی



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Enrico Ascalone
Seyyed Mansur Seyyed Sajjadi



TEHRAN 2022

In the Name of God

Excavations and Researches at Shahr-i Sokhta 3

edited by

Enrico Ascalone
Seyyed Mansur Seyyed Sajjadi



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 پست الکترونیکی: pishinpajouh@yahoo.com

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Preface

Enrico Ascalone and Seyyed Mansur Seyyed Sajjadi

The Iranian-Italian collaboration initiated with the 2016 agreement has, to date, allowed for a deeper understanding of the main historical dynamics of Shahr-i Sokhta, adding new knowledge to the extensive and fruitful excavation campaigns carried out by the Iranian mission between 1997 and 2015. The collaboration has resulted in the publication of three volumes in the series *Excavations and Researches at Shahr-i Sokhta* that are the fruit of the studies carried out to date.

This third volume presents the excavation and research activities carried out in Shahr-i Sokhta in 2018 and 2019, with contributions from researchers in the fields that make up the MAIPS core (archaeology, palaeoenvironmental studies, bioarchaeology and topography).

This volume is divided into three sections, the first on the excavation and reconnaissance activities, the second on the study of the material collected during the excavations and the third presenting the bioarchaeological studies.

In the first section, the contributions by S.M.S. Sajjadi, H. Sarhaddi Dadian, M. Keikha, J. Marashi, H. Moradi and M. Saadatian open up new horizons on the understanding of the settlement and its hinterland. Specifically, the survey carried out to the east and south-east of Shahr-i Sokhta enables significant considerations on the growth of the complex societies of Sistan. Similarly, the excavation reports

on the 2018-2019 excavations in Area 33, necropolis and Areas 20 and 33, S.M.S. Sajjadi and H. Moradi respectively, provide new data that have allowed us to draw a new stratigraphic grid for the entire settlement.

The second section presents the materials from the excavations, in particular the ceramic corpus from Area 33 (P. Vecchio) and the catalogue of its artefacts (R. Rivoltella), the analysis of the so-called 'Emir Ware' found throughout the settlement (S.M.S. Sajjadi) and separate studies of the marble and alabaster vessels from Area 33 (S. Festuccia) and the rest of the site (S.M.S. Sajjadi and S. Amini). This part of the volume includes the presentation of the stone, wooden and reed objects from the Iranian excavations (S.M.S. Sajjadi) and a study on the animal iconographies on pottery vessels (S.M.S. Sajjadi). This section also provides reflections and analysis on the enormous amount of material excavated by the Iranian mission from the settlement's necropolis (over 1000 graves) (R. Krvavac) and on the Iron Age ceramics from Sistan and eastern Iran more generally (V. Cardini).

The third section of the volume contains bioarchaeological studies by G. Fiorentino, M. Madella and I. Minervini, whose research aims at a re-reading of the various stratigraphic units on the basis of the sampling and analysis of botanical macro-remains (charcoals and seeds/fruits) and micro-remains (phytoliths); by P.F. Fabbri and G. Vincenti, who present the study of 69 skeletons from the necropolis of Shahr-i Sokhta; and by C. Minniti and A. Potenza who, on the basis of 800 animal remains, examine the evolution of husbandry strategies over time.

The dissemination of the research carried out aims at publishing a fourth volume of the series on Shahr-i Sokhta and its neighbouring regions, trying to place Sistan within a broader historical framework that recognises contacts, trade and relations of various kinds with the Iranian plateau, Central Asia, Mesopotamia and the Greater Indus Valley.

Introduction to the Multidisciplinary International Archaeological Project at Shahr-i Sokhta of the University of Salento

Enrico Ascalone

Università degli Studi di Roma Tre

Dipartimento di Studi Umanistici

enrico.ascalone@uniroma3.it; ascalonenrico@gmail.com

The International Multidisciplinary Archaeological Project at Shahr-i Sokhta, which began in 2017, and the Shahr-i Sokhta and Dahan-ye Qolaman Archaeological Project (launched in 1997) have worked together on four successive research and excavation campaigns. Their endeavours, aimed at improving our historical understanding of the settlement of Shahr-i Sokhta, have now produced the first significant results. The establishment of a topographical grid, the reconstruction of the settlement's sequences of occupation, the formulation of a new chronological proposal based on isotopic analyses, the determination of a vascular sequence associated with other classes of materials and an assessment of the relationship between the old interpretations and the new stratigraphic sequences are only some of the aims we set ourselves at the beginning of the research. Much of this information is presented in this volume, and other works are being printed.

Within a broader framework, various publications have sought to understand the historical framework in which Shahr-i Sokhta developed began, as part of research activities aimed at:

1. Chronological determination of cultural developments in the Hyrmand valley between the fourth and second millennia BC.
2. Identification and study of proto-urban and urban socio-economic patterns in eastern Iran between the end of the fourth and the beginning of the second millennia BC.
3. Identification of the models of storage, processing and production of the artefacts found in the craft areas of Shahr-i Sokhta.
4. Identification of cultural and commercial interactions between Shahr-i Sokhta and the Jiroft valley, the Takab plain, the Fars highlands, the Makran coast, the Oxus oases, the Mesopotamian alluvium and the Indus Valley.
5. Synchronisation of local sequences with other areas (Baluchistan, Turkmenistan, Indus, Jiroft and Mesopotamia).
6. Understanding daily life in the settlement, as well as its urban development and topography.

To achieve these macro-objectives, a multidisciplinary approach to the excavation activities and the archaeological material was adopted, specifically involving:

1. *The study of materials.* Typological, functional, comparative, distributive and quantitative analysis of the individual classes of materials collected (ceramics, seals, stone and clay objects, metals, etc.), classified by phase and periods. Functional study to establish a relative chronology and a synoptic framework encompassing the main settlements of eastern and south-eastern Iran;
2. *Surface analysis.* Collection and study of surface finds, assisted by remote sensing and geo-magnetic methods, with particular attention to specific concentrations, emerging structures and the relationship between topographical and chronological clues;
3. *Petrographic analyses.* Petrographic analyses of alabaster and calcite samples in order to determine their chemical composition, reconstruct individual

production processes and distinguish between imported and exported materials. From these preliminary analyses, it was possible to identify distinct, homogeneous, regional and cultural contexts, the relationships between them and the contacts between eastern Iran and its neighbouring regions;

4. *Isotopic analyses.* Isotopic analyses with C14 calibration of 44 charcoal samples collected during the 2017-2019 campaigns, with a view to determining an absolute chronology. The results, as mentioned above, have enabled the construction of a new archaeological grid and chronological sequence.

5. *Archaeological excavations.* Excavations aimed at the reconstruction of the settlement's stratigraphic and cultural sequences. The field research includes the registration and digitalisation of data collected in the form of Stratigraphic Unit records, stratigraphic cross sections, detailed and schematic plans, architectural elevations and cross sections, photographic documentation, etc. Every single piece of data was processed with a view to the creation of a digitalised platform.

6. *Bioarchaeological analyses.* Collection and analysis of animal and plant remains for the reconstruction of the bio-botanical and bio-zoological environments.

Specifically, the archaeozoological work is mainly based on:

- Osteological and taxonomic analyses for species identification.
- Quantitative analyses for the determination of domesticated species.
- Statistical biometric analyses for the determination of differences between the various groups analysed.
- Mortality and sex analysis.
- Study of animal breeding practices.
- Study of pathological, morphological and genetic factors.
- Biometric analysis.
- Study of possible secondary deposits arising from uses unrelated to feeding practices (e.g. sacrifices and other cultic and/or funeral activities).
- Study of the approaches to breeding and domestication.

Each type of analysis will be conducted diachronically, in order to give historical depth to the results.

Similarly, the palaeobotanical studies entail:

- Analysis of anthracological remains in order to determine the area's environmental history, dynamics and transformations.

- Carpological analyses to identify individual crop types and their transformations.

- Isotopic analyses aimed at gathering further information on environmental conditions and the technologies used for food production and consumption. Plant $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values allow the identification of specific agricultural practices, the origins of food products and any climatic variations.

- *Anthropological analyses*. There have also been anthropological studies of the vast necropolis of Shahr-i Sokhta based on:

- Palaeo-demographic analyses to establish the occupants' sex and age, partly by means of radiological analyses of the dental crown in order to determine the exact tooth/pulp ratio.

- Palaeo-anthropological analyses involving the division of the human remains, burial type, grave goods and orientation of the deceased.

- DNA analysis to identify, from a historical perspective, the possible presence in each of bio-anthropologically distinct human groups and to correlate them with the different funerary, and more generally cultural, traditions of the site.

- Morphological analyses that can be correlated with socio-political developments via the study of linear enamel hypoplasias, dental wear and periostitis. When associated with the individual contexts of provenance, such analyses can make very significant contributions to the study of ancient settlements such as Shahr-i Sokhta.

The results of all these analyses have been the subject of scientific publications (9 books and 162 articles), congresses (55) and doctoral theses (2), including recent updates enabled by the organisation of congresses in Munich (2017) and Lecce (2021). Obviously, there is still a great deal of work to be done, and the next step will be a new volume presenting the excavation and research campaigns of 2020 and 2021, followed by a new series of monographs on the archaeological material from Shahr-i Sokhta.

In conclusion, the International Multidisciplinary Archaeological Project in Shahr-i Sokhta has continued its research activities over the last few years, both in the field and in its own laboratories at the Department of Cultural Heritage of the University of the Salento, to whose staff I extend my warmest thanks for their fruitful cooperation and support for our activities.

The difficulties encountered, which have been compounded in this by the pandemic, have been overcome mostly thanks to the contribution of human resources, which have made this research group a solid base on which to set up and implement new projects (Fig. 1). The list of people to whom I am indebted is even longer than it was for the first preliminary excavation, whose results were published in 2019. On one hand, I would like to express once more my gratitude to those with whom I started this project; on the other, I must take this opportunity to thank all those who, in various ways, have enriched our research by contributing significantly to the achievement of the results presented in this volume.

First of all, I would like to thank the Rector of the University of the Salento, Prof. Fabio Pollice, who made it possible to overcome every obstacle by supporting our activities in Iran. In the same way, I would like to thank the Director of the University of the Salento's Department of Cultural Heritage, Prof. Raffaele Casciaro, who enthusiastically followed our research, allowing us to fulfil the initial proposal for a multidisciplinary project with a strong international dimension, which four years later we can claim to have achieved: an international project that saw the contribution of the Seminar für Ur- und Frühgeschichte of the University of Göttingen, the Ludwig Maximilian University of Munich and the Universitat Pompeu Fabra of Barcelona in a range of scientific endeavours.

In this international context, the present author has initiated numerous forms of cooperation in search of a broader contribution to this research, not only focused on the historical reconstruction of the regional dynamics of Sistan, but also oriented towards the historical understanding of the Bronze Age relationships between eastern and south-eastern Iran, Greater Indus and Central Asia. In this regard I would like to thank the Archaeological Survey of India in New Delhi (and its branches in Purana Qila, Jodhpur and Baroda), the National

Archaeological Museum of India, the Maharaja Sayajirao University of Baroda, the Deccan College of Pune (Vadodara) and the Louvre Museum in Paris for the establishment of agreements that have already enabled broader forms of scientific cooperation and will continue to enable them in the future.

We would also like to thank the Iranian Research Institute for Cultural Heritage and Tourism (= RICHT) for always enthusiastically accepting our research proposals, his staff and Dr. M. Kholghi, who has always provided us with extraordinary support for the implementation of our project. Thanks are also due to the Iranian Centre for Archaeological Research (= ICAR) without which any work in Sistan would have been impossible, and Dott. G. Mancuso without whom this project would have been difficult to develop. With the same gratitude, I would like to mention His Excellency G. Perrone, the Italian Ambassador to Tehran, and the Italian Cultural Attaché, Dr. Y. Romanova, for assisting us, supporting our research and helping to disseminate our results in both Iran and Italy.

In conclusion, I (E. Ascalone) express my special gratitude to our Iranian colleagues and their director, S.M.S. Sajjadi, for sharing their research with us and supporting ours, for hosting us and for always making us feel at home (Fig. 2).



Fig. 1: some members of Iranian-Italian joint mission at Shahr-i Sokhta.



Fig. 2: archaeological mission at Shahr-i Sokhta in 2019.

Part I
Archaeological Field-Works

Excavations at Shahr-i Sokhta (Graveyard 2006-2007)

Seyyed Mansur Seyyed Sajjadi
Iranian Center for Archaeological Research
m_sajjadi@hotmail.com

Abstract

This article presents the preliminary report on the 10th campaign of excavations in the graveyard of Shahr-i Sokhta. The excavations of this campaign were carried out in various parts of the site, including the cemetery, the ‘Craftsman Area’, the ‘Monumental Area’ and the ‘Eastern Residential Area’.

The excavations of the graveyard consisted of 12 trenches. Six of these measured 25 square metres each, making a total of 150 square metres, and were empty of any cultural material or skeletons. The remaining six trenches yielded 54 graves, 19 of which were found in Trench NAW. The grave structures found are of three main types: 33 bipartite burials; 18 simple pits; 2 catacombs and one unidentified structure. A total of 56 human skeletons were recovered.

1. The excavation

This is a preliminary report on the tenth campaign of excavations in the graveyard of Shahr-i Sokhta conducted in 2006-2007. Preliminary reports of the excavations of previous campaign are published in (Sajjadi 2003; 2004; 2005; 2006; 2007; 2008; 2009; 2014; 2020).

During the 2006-2007 excavations, six of the 12 trenches (CMW, HLC, LEI, MIE, NHG and NKP), each with an area of 25 square metres, making a total of 150 square metres, were found to be completely empty. The remaining six trenches contain 54 graves, with trench NAW having the highest number (19).

The three main types of burial were bipartite tombs (33 cases); simple pits (18); and catacombs (2). One grave was of an unidentified type. 56 human skeletons were found.

No.	Trench	Trench No.	Number of graves	Grave structures				Area in square metres	Number of skeletons	Number of objects	Number of surface finds	comment
				Simple pit	Bipartite	Catacomb	Other types					
1	MJN	6700	11	2	9	-	-	100	11	134	13	-
2	NGL	6800	9	2	6	1	-	50	9	35	3	-
3	NFR	6900	6	1	4	1	-	25	7	12	1	-
4	NFM	7000	1	-	1	-	-	50	1	-	3	-
5	CMW	7100	0	-	-	-	-	25	-	-	-	-
6	HLC	7200	0	-	-	-	-	25	-	-	-	-
7	LEI	7300	0	-	-	-	-	25	-	-	-	-
8	MIE	7400	0	-	-	-	-	25	-	-	-	-
9	NHG	7500	0	-	-	-	-	25	-	-	-	-
10	NKP	7600	0	-	-	-	-	25	-	-	-	-
11	NAM	7700	8	4	4	-	-	50	8	27	6	-
12	NAW	7800	19	9	9	-	1	100	20	62	22	-
Total	12	-	54	18	33	2	1	525	56	270	48	-

Tab. 1: statistical information on excavated graves.

Trench MJN

This trench, measuring 10 × 10 metres, is located about 60 metres east of the

central part of the cemetery. In the first stage, a space 5×5 metres in the northeast corner was prepared and excavated. Subsequently, considering the density of the graves, the entire area was excavated. In this trench, eleven graves were brought to light, of which two are simple pits and nine are bipartite pits (Fig. 3). From the 11 graves, 10 human skeletons were recovered, along with 134 grave goods. Grave No. (from now G.N.) 6703 had the most artefacts and G.N.6701 the least (only one item). G.N.6704 had three human skeletons and G.N.6701 and G.N.6702 were without skeletons, meaning that the graves were ready for burial but no burial had taken place in them. In addition to the grave goods, a number of pottery vessels scattered on the surface of the trench were collected (Fig. 4). One of the most important objects found in G.N.6705 was a hemispherical artificial eye made of a type of bitumen, on which blood vessels inside the eye had been reconstructed with golden metal wires. The human skeletons found in the graves consisted of eight females, two unidentifiable individuals, one child and one infant.

G.N.	Age	Age range	Gender
6700	22 months	20-24 months	Child
6701	?	?	?
6702	?	?	?
6703	22.5	20	Female
6704/1	55	50-60	Female
6704/2	7.5 months	7-8 months	Infant
6705	30	28-32	Female
6706	22.5	20-25	Female
6707	30	25-35	Female
6708	21	20-22	Female
6709	45	40-50	Female
6710	20	18-22	Female

Tab. 2: gender and age of skeletons (Forouzanfar 2010: 64).



Fig. 1: Shahr-i Sokhta, aerial photo.

G.N.6700

Of the bipartite type, attached to the western wall of the trench (Fig. 3). The partition wall is in the southern part of the grave, built in such a way that it collapsed towards the adjacent walls over time. The grave is oval in shape and measures 120×87 cm (Fig. 6: 6). The grave contains a human skeleton lying on its left side, oriented southwest-northeast and facing south. Only the skull and parts of the scapula remain. The skeleton is 120 cm below the surface of the trench and the floor of the grave 137 cm. The grave goods consist of seven items.

G.N.6701

Of the bipartite type, attached to the western wall of the trench. The grave is oval in shape and measures 100×110 cm. The floor of the grave is 141 cm below the surface of the trench. The grave has no skeleton but there is a Buff Ware bowl at a depth of 60 cm.



Fig. 2: Shahr-i Sokhta, topographic map and approximate location of the graveyard.

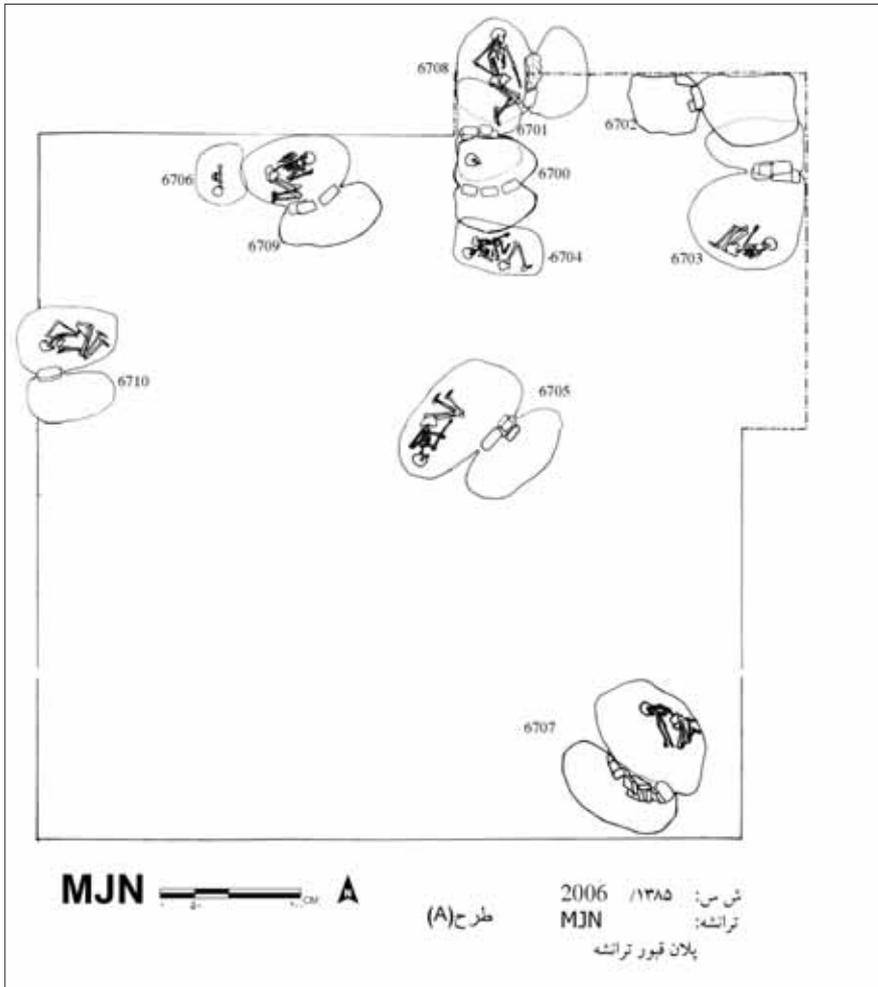


Fig. 3: Trench MJN. Distribution of graves.

G.N.6702

Of the bipartite type, attached to the northern side of the trench, with the partition wall on the western side of the grave. The grave is oval in shape and measures 110×145 cm. The grave is 167 cm below the surface of the trench. It contained neither skeleton nor grave goods.

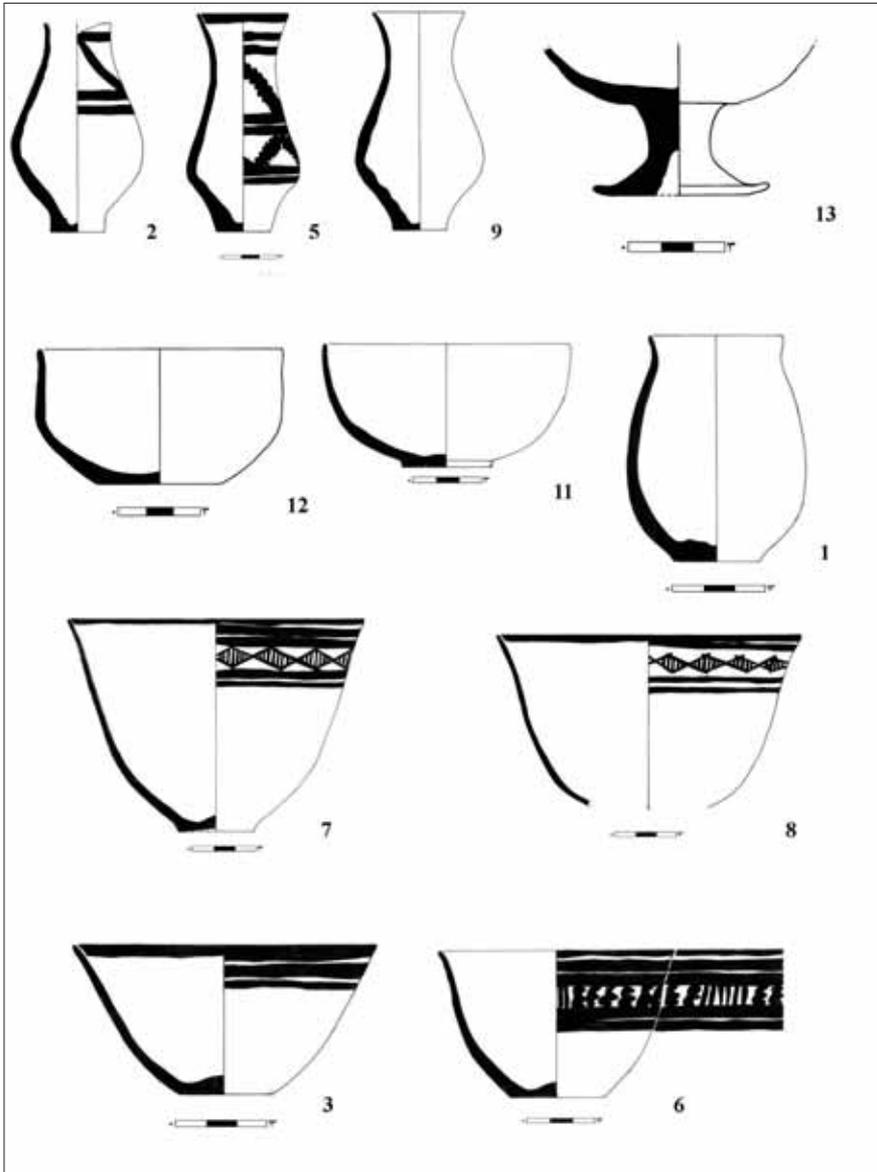


Fig. 4: Trench MJN. Surface objects.



1



2



3



4



5



6

Fig. 5: Trench MJN. 1. G.N.6703; 2. G.N.6704; 3-4. G.N.6705; 5. G.N.6707; 6. G.N.6709.

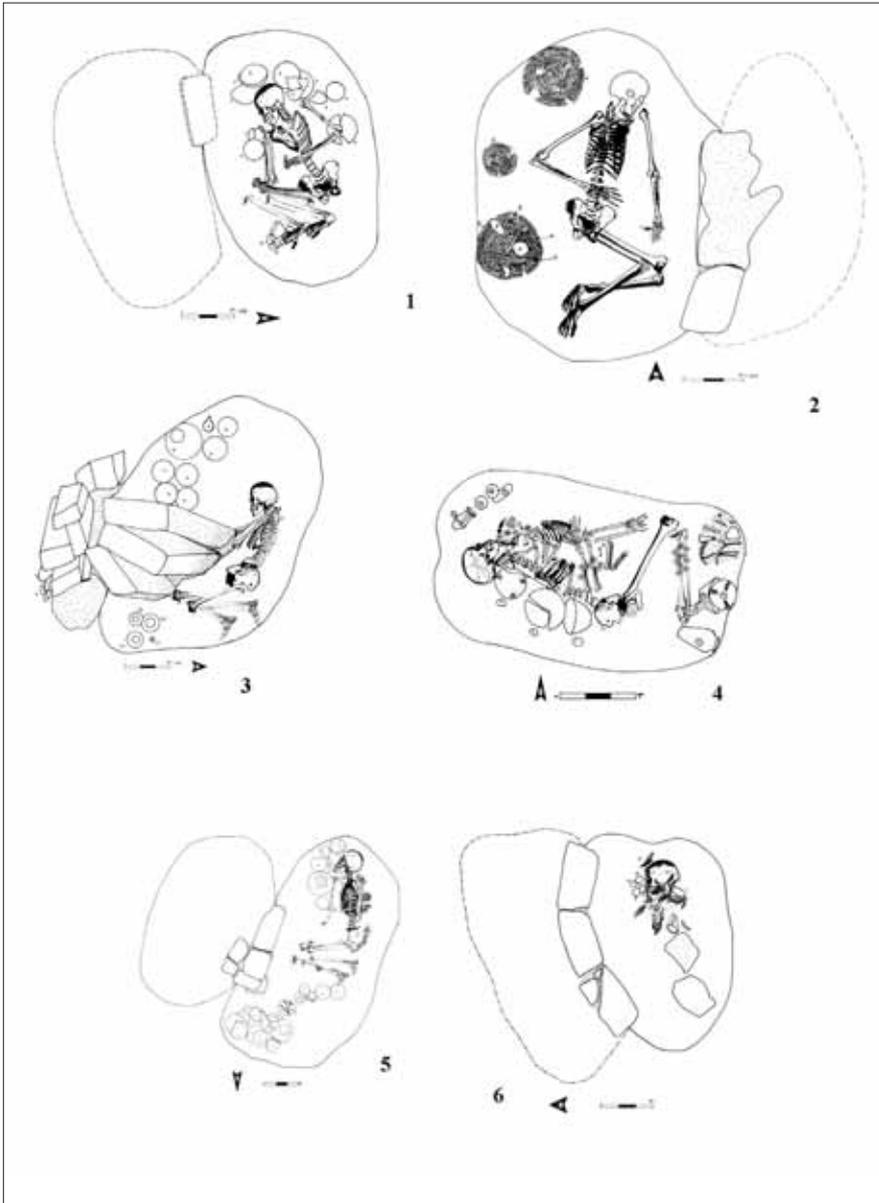


Fig. 6: Trench MJN. 1. G.N.6710; 2. G.N.6708; 3. G.N.6707; 4. G.N.6704; 5. G.N.6705; 6. G.N.6700.

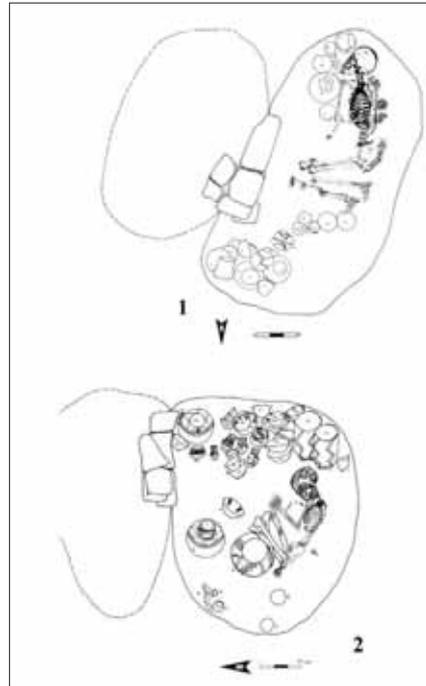


Fig. 7: Trench MJN: 1. G.N.6705; 2. G.N.6703.



Fig. 8: G.N.6700. Objects.



Fig. 9: G.N.6701. Buff Ware bowl.

G.N.6703

Of the bipartite type, attached to the eastern side of the trench, with the partition wall on the northern side of the grave. It is oval in shape and measures 165 × 138 cm (Fig. 7: 2). It contains one human skeleton lying on its right side oriented east-west and facing north. The skeleton is 224 cm below the surface of the trench. The grave goods consist of 41 items (Figs. 10-12).

G.N.6704

Of the simple pit type, located near the western side of the trench (Fig. 3). It is oval in shape and measures 121 × 77 cm (Fig. 6: 4). The grave has three human skeletons: skeleton A is lying on its left side, oriented west-east and facing north. The right hand of skeleton A is lying on the pelvis of skeleton B. Skeleton B is buried in a curved position, lying on its right side, oriented west-east and facing south. Its right hand is under the head of skeleton A. The remains of skeleton C are buried in the northeast corner of the grave at the foot of skeleton B. Traces of fabric can be seen on skeleton A. Skeleton A is 189 cm below the surface of the trench, skeleton B is 193 cm, and skeleton C and the floor of the grave are 203 cm. The grave has 11 objects: 3 medium-sized bowls behind skeleton A, 1 jar and 2 bowls at the foot of skeleton A, 3 pear-shaped beakers and 1 stone item behind the skull of skeleton B and a mass of clay under skeleton B. The grave is relatively well preserved (Fig. 13).

G.N.6705

Of the bipartite type, located in the middle of the trench (Fig. 3), with the brick partition wall in the eastern part. The grave is oval in shape and measures 218 × 105 cm (Fig. 7: 1). It has a human skeleton lying on its right side, oriented south-north and facing east. The skeleton is 152 cm below the surface of the trench and the bottom of the grave 166 cm. The grave goods consist of 30 items: 1 bowl and 1 open-mouth beaker above the skull, 2 bowls and 1 pitcher in front of the face,

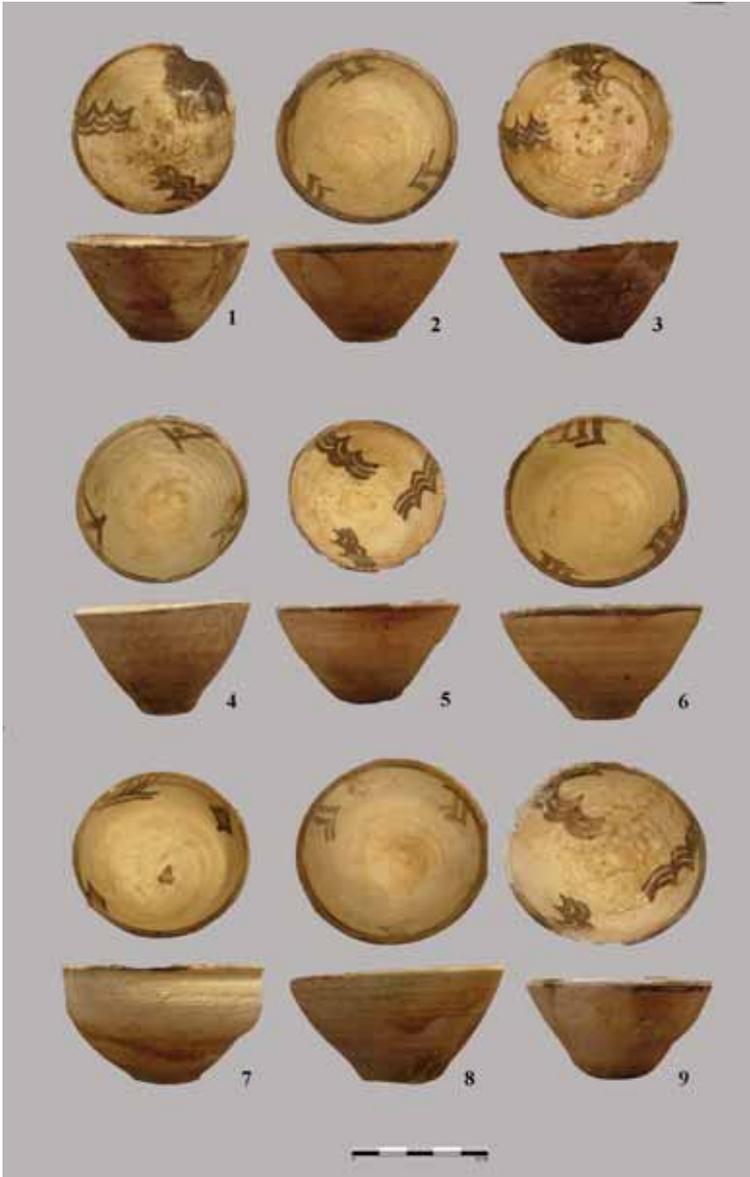


Fig. 10: G.N.6703. Painted Buff Ware bowls: 1. G.N.6703/5; 2. G.N.6703/17; 3. G.N.6703/19; 4. G.N.6703/21; 5. G.N.6703/25; 6. G.N.6703/26; 7. G.N.6703/33; 8. G.N.6703/22; 9. G.N.6723/35.

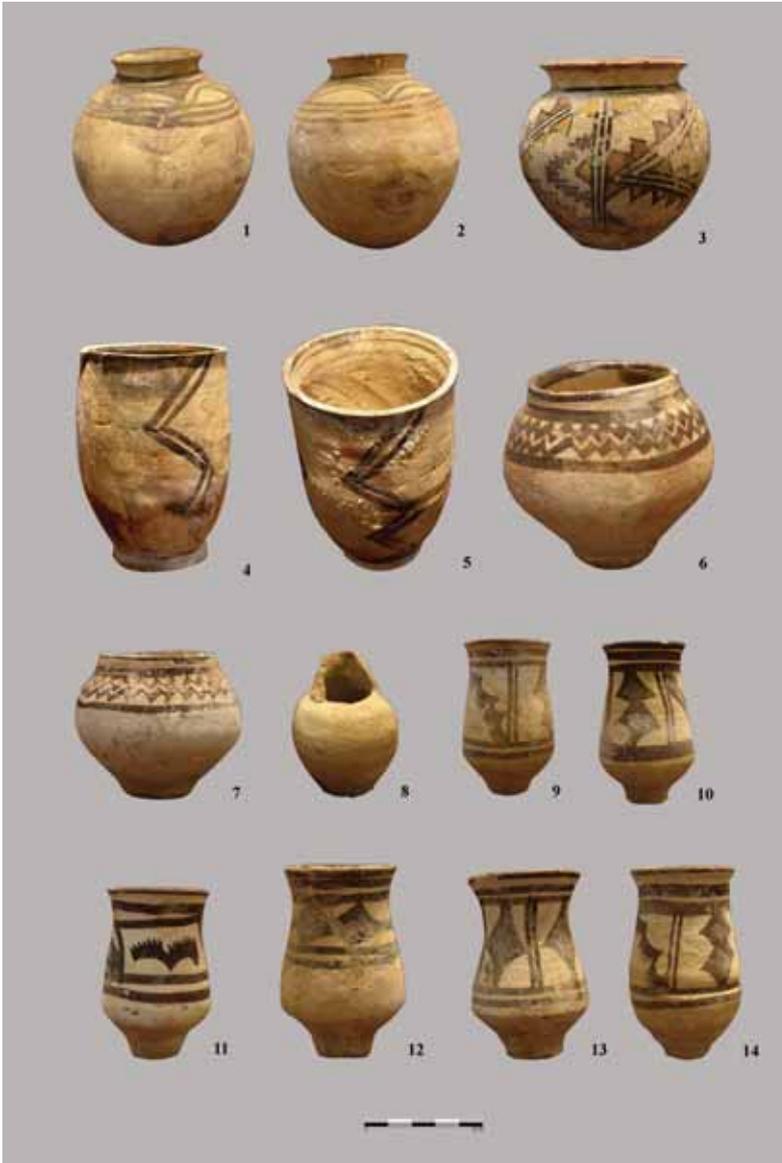


Fig. 11: G.N.6703. Painted Buff Ware jars and beakers: 1. G.N.6703/2; 2. G.N.6703/37; 3. 6703/3; 4. G.N.6703/11; 5. G.N.6703/22; 6. G.N.6703/36; 7. G.N.6703/1; 8. G.N.6703/10; 9. G.N.6703/30; 10. G.N.6703/31; 11. G.N.6703/24; 12. G.N.6703/39; 13. G.N.6703/29; 14. G.N.6703/30.



Fig. 12: G.N.6703. Metal, marble and clay objects: 1. G.N.6703/7; 2. G.N.6703/6; 3. G.N.6703/4; 4. G.N.6703/41; 5. G.N.6703/40; 6. G.N.6703/9.



Fig. 13: G.N.6704. Grave goods.

1 large jar and 3 bowls in front of the right hand, a hemispherical object in the left eye, 2 bowls, 2 small jars, 1 open mouth beaker, 1 large bead, 1 leather bag, 2 medium-sized jars, 6 bowls and 2 open mouth jars at a distance of 50 cm from the knees, a number of small beads around the neck and 1 bronze mirror inside the bowl. Two small jars, 1 leather bag and 1 large bead were placed in a wicker basket at a distance of 50 cm from the knees, but the wicker basket itself was completely destroyed (Figs. 14-15).

The artificial eye of G.N.6705 is perhaps the most valuable discovery in the Shahr-i Sokhta graveyard to date. Preliminary observations on the left eye socket of a large woman indicate she had an artificial eye. In addition, abscesses can be seen under the arch of the eyebrow and inside the left eye socket. Since the lower part of this artificial eye has been in contact with the eyelid for a prolonged, organic debris has probably remained on it. The eye is made of bitumen mixed with some kind of animal fat. On this artificial eye, the smallest capillaries inside the eyeball are reproduced by very fine golden wires. The pupil is drawn in the middle and a number of parallel lines and rhombuses are visible around it. Two holes on either side of this artificial eye were used to attach it to the eye socket. Anthropological studies have shown that the woman was most likely between 28 and 30 years old. This tomb and the artificial eye date back to about 2800 BC (Fig. 16).

G.N.6706

Of the simple pit type, located near the northern side of the trench (Fig. 3). The grave is oval in shape and measures 85 × 75 cm. It contains a human skeleton lying on its right side, oriented south-north and facing east. The skeleton is 45 cm below the surface of the trench and the floor of the grave is 60 cm. The grave goods consist of 3 medium-sized bowls placed around the skull. In terms of preservation, the grave is not in good condition. Due to its location in the surface layers of the graveyard, it is badly eroded and only parts of the skull have survived.



Fig. 14: G.N.6705.



Fig. 15: G.N.6705. Grave goods.



Fig. 16: artificial eye and protective leather bag.

G.N.6707

Of the bipartite type (Fig. 5: 5), attached to the southern side of the trench (Fig. 3), with the brick partition in the south-eastern part of the grave. It is oval in shape and measures 163×116 cm. The skeleton is 147 cm below the surface of the trench and the floor of the grave is 159 cm. This burial has a human skeleton lying on its right side, oriented northwest-southeast and facing south. The legs are fully folded and the heel is close to the pelvis (Fig. 6: 3). The grave goods consist of: 4 medium-sized bowls, 2 jugs, 1 medium-sized jar and 1 olla-like pot at the top of the skull, 3 small jars and 1 large bead in front of the knee, 1 conical beaker and 1 bowl behind the bricks, 1 medium-sized bead around the wrist and a small bead around the neck (Fig. 17).

G.N.6708

Of the bipartite type, located next to the northern wall of the trench (Fig. 3), with the partition wall on its eastern side. It is oval in shape and measures 110×110 cm (Fig. 6: 2). It contains a human skeleton lying on its left side, oriented northeast-southwest and facing south. The legs are slightly drawn up and the right hand is placed on the end of the spine. The left hand is open and next to the body. The skeleton is 178 cm below the surface of the trench and the bottom of the grave is 203 cm. The grave goods consist of: 1 seal in the left hand, 1 bronze



Fig. 17: G.N.6707. Grave goods.

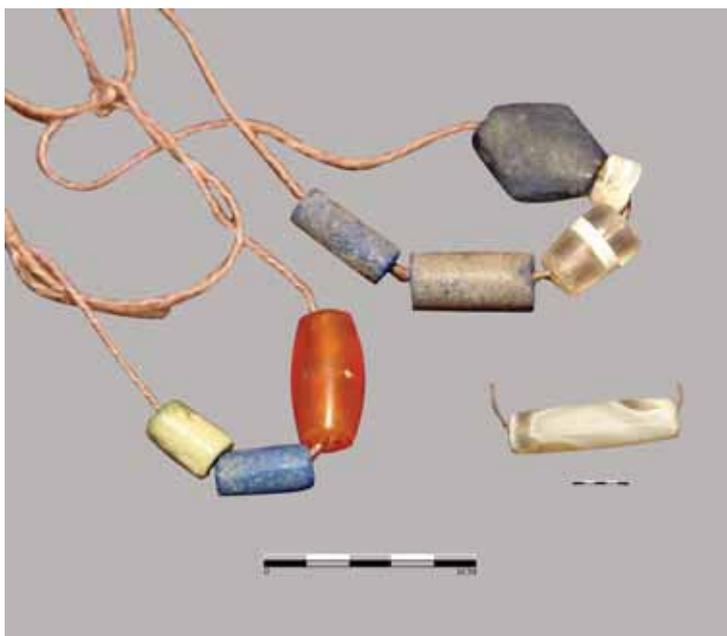


Fig. 18: G.N.6707. Semi-precious beads.

pin, 1 large bead, 1 stone tool and 1 bone tool all inside a wicker basket behind the pelvis, another wicker basket behind the ribs and a third wicker basket behind the skull. The skeleton is in relatively good condition and in some parts, traces of the shroud have been observed (Fig. 19).

G.N.6709

Of the bipartite type (Fig. 5: 6), attached to the northern side of the trench (Fig. 3), with the partition wall in the southern part. The grave is oval in shape and measures 150×87 cm. It has a human skeleton lying on its left side, oriented east-west. The hands are drawn together on the chest in front of the face and the legs are fully folded with the heel close to the hip. The skeleton is 192 cm below the surface of the trench and the floor is 204 cm. The grave goods consist of: 1 bead, 1 bronze pin and 1 wooden comb placed inside a wicker basket in front of the forehead touching the skull (Fig. 20).

G.N.6710

Of the bipartite type, attached to the western wall of the trench (Fig. 3), with the partition wall in the south-eastern part of the grave. This grave is oval in shape and measures 140×90 cm (Fig. 6: 1). It has a human skeleton lying on its left side, oriented southwest-northeast and facing southeast. The legs are drawn up and the heel of the foot is touching the pelvic bone. The right hand is folded and the forearm is placed on the end of the ribs. The left hand is open next to the body. The skeleton is 185 cm below the surface of the trench and the floor is 192 cm. The grave goods consist of 13 items: 6 medium-sized bowls and 1 open-mouth beaker behind the skull, 1 stone tool and 1 small bowl at the back of the right arm, 1 medium-sized bowl under the right elbow, 1 open-mouth beaker and a small jar placed near the face. The skeleton is in relatively good condition (Fig. 21).

Trench NAM

This trench is located in the north-eastern part of the cemetery and outside the central area. Of the total area of 10×10 m, the 5×10 m eastern half was selected and excavated to a depth of 180 cm (Fig. 22). The layers of the trench are as



Fig. 19: G.N.6708. Grave goods.



Fig. 20: G.N.6709. Grave goods.



Fig. 21: G.N.6710. Grave goods.

follows: layer 1 with a thickness of 5-15 cm; layer 2 with a thickness of 20-30 cm composed of compacted but soft soil; layer 3 with a thickness of 15-70 cm, composed of soft white soil, and layer 4 with a thickness of 60-110 cm composed of a compacted layer of sand. A total of eight new graves were found in this trench, of which four are structurally of type 1 (or simple pits) and 4 of type 2 (or bipartite graves) (Fig. 23). The graves contained a total of nine human skeletons and 27 objects. Most of the grave goods come from G.N.7707, while G.N.7704 and G.N.7700 had the fewest. In addition to objects found inside the graves, a number of objects were also found on the surface. The graves were relatively better preserved than the NAW trench due to the presence of the compacted sand layer. The human remains found in this trench include 4 females, 3 males, one foetus and one undetermined individual.

G.N.	Age	Age range	Gender
7700	-	-	Foetus
7701	37.5	35-40	Female
7702/1	16.5	16-17	Female
7702/2	35	30-40	Female
7703	55	50-60	Male
7704	22.5	30-35	Female
7705	35	30-40	Male
7706	?	?	?
7707	42.5	40-45	male

Tab. 3: gender and age of skeletons (Forouzanfar 2010: 65).

G.N.7700

Of the simple pit type, located near the eastern side of the trench (Fig. 22). The grave is oval in shape and measures 76 × 40 cm (Fig. 23: 8). It contains the remains of a foetus. The grave is 118 cm below the surface of the trench. In terms of grave goods, the only item found is a large bowl in the southern part of the grave at a distance of 10 cm from the skeleton.

G.N.7701

Of the simple pit type, located next to the western wall of the trench (Fig. 22). It is oval in shape and measures 117 × 107 cm (Fig. 23: 7). It has a human skeleton lying on its right side, oriented west-east and facing southwest. The legs are fully drawn up and the heel of the foot is touching the pelvic bone. The skeleton is 94 cm below the surface of the trench and the floor of the grave is 107 cm. The grave goods consist of 1 jar 20 cm in front of the face, three bowls at a distance of 20 cm from the chest and 3 beads around the neck (Fig. 24).

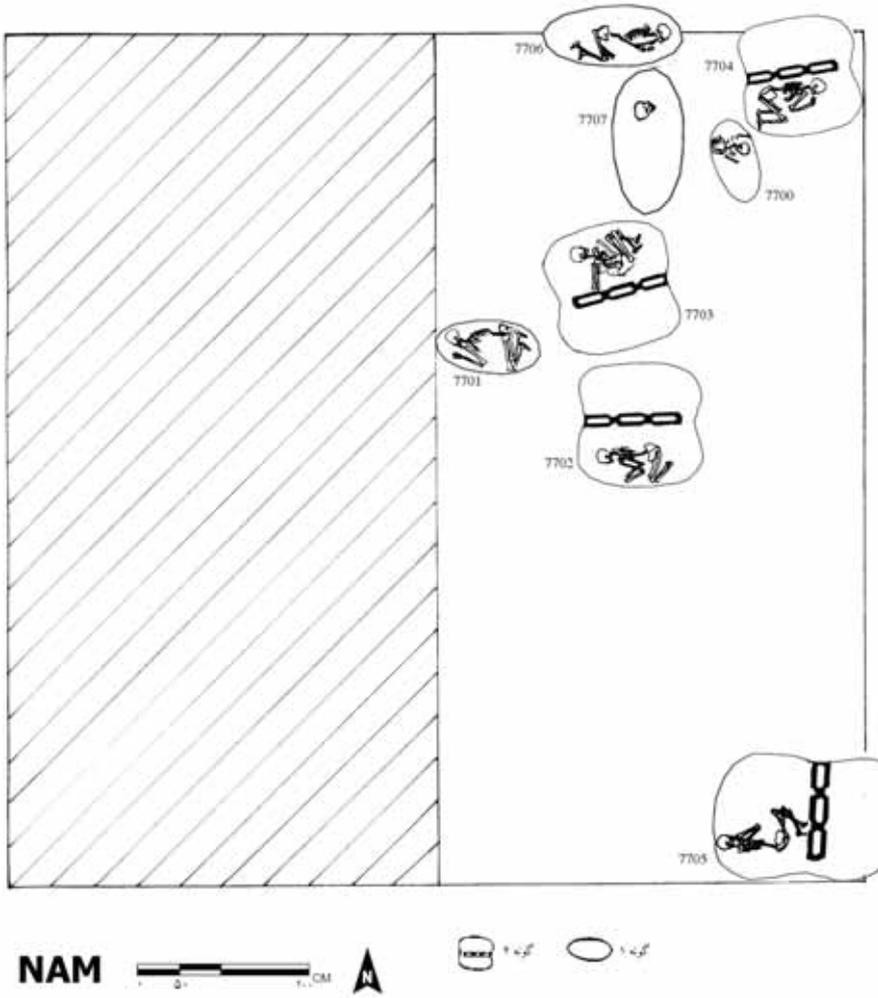


Fig. 22: Trench NAM.

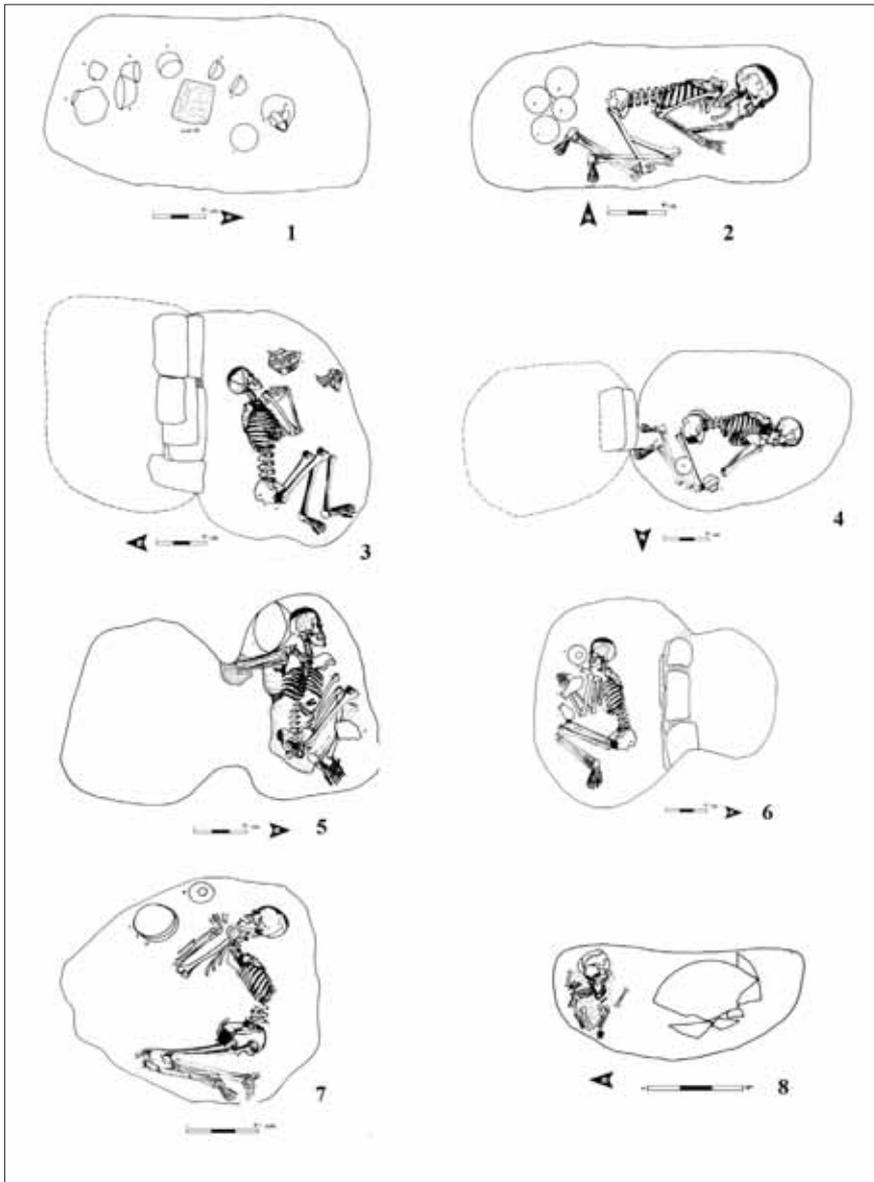


Fig. 23: NAM graves: 1. G.N.7707; 2. G.N.7706; 3. G.N.7704; 4. G.N.7705; 5. G.N.7703; 6. G.N.7702; 7. G.N.7701; 8. G.N.7700.



Fig. 24: G.N.7701. Grave goods.

G.N.7702

Of the bipartite type, located in the centre of the trench (Fig. 22), with the partition wall in the northern part (Fig. 23: 6). It is oval in shape and measures 135 × 86 cm. The grave contains a skeleton lying on its right side, oriented west-east and facing south. The legs are drawn up, the heel of the foot is close to the pelvic bone and the hands are gathered in front of the face. The grave goods consist of 1 medium-sized jar in front of the forehead and two pear-shaped beakers by the right hand. The skeleton is in relatively good condition (Fig. 5: 1-3).

G.N.7703

Of the bipartite type, located near the western wall of the trench (Fig. 22), with the partition wall on the south side of the tomb (Fig. 23: 5). The grave is oval in shape and measures 115 × 74 cm. The grave has a human skeleton lying on its left side, oriented west-east and facing north. The legs are fully drawn up and the femur is touching the chest. The left hand is folded and tilted to the south and the

right hand is on the chest. The skeleton is 155 cm below the surface of the trench and the floor is 167 cm. The grave goods consist of a medium-sized bowl placed behind the skull and a stone tool in front of the left leg (Fig. 25: 4-5).

G.N.7704

This grave is rectangular in shape and measures 150 × 100 cm. It has a human skeleton lying on its left side, oriented northeast-southwest. The arms and legs are folded and the right hand is placed in front of the face. The skeleton is 100 cm below the surface of the trench and the floor of the grave is 150 cm. The grave goods consist of fragments of two jars placed in front of the face (Fig. 25: 6-7).

G.N.7705

Of the simple pit type (Fig. 27), attached to the northern wall of the trench (Fig. 22). It is rectangular in shape and measures 165 × 85 cm (Fig. 23: 2). It has a human skeleton lying on its left side, oriented east-west and facing south. Its arms and legs are folded. The skeleton is 120 cm below the surface of the trench and the bottom of the grave is 140 cm. The grave goods consist of 3 medium-sized jars and 1 medium-sized bowl (Fig. 28).

G.N.7707

Of the simple pit type, located near the northern wall of the trench (Fig. 22). The grave is rectangular in shape and measures 184 × 100 cm (Fig. 23: 1). The grave contains a human skull. The grave is 158 cm below the surface of the trench. The grave goods consist of 2 open-mouth beakers, 3 small jars, a medium-sized jar, 1 medium-sized bowl and 1 jug, located behind the skull (Fig. 29).

Trench NAW (Fig. 30: 4-6)

The trench is near the central part of the cemetery, consisting of an area of 100 square metres excavated to a depth of 135 cm. From the beginning of the excavations in this trench, broken Buff Ware and reddish pottery were found scattered on the surface. In one case, traces of a large amount of broken pottery



Fig. 25: G.N. 7703 Grave goods; 4-5, G.N. 7704: Grave goods: 6-7.



Fig. 26: G.N.7705. Grave goods: 1. G.N.7705/1; 2. G.N.7705/2; 3. G.N.7705/3.



Fig. 27: G.N.7706.



Fig. 28: G.N.7706. Grave goods: 1. G.N.7706/1; 2. G.N.7706/2; 3. G.N.7706/3; 4. G.N.7706/4.



Fig. 29: G.N.7707; Grave goods: 1. G.N.7707/1; 2. G.N.7707/2; 3. G.N.7707/3; 4. G.N.7707/4; 5. G.N.7707/5; 6. G.N.7707/7; 7. G.N.7707/6; 8. G.N. 7707/8.

were found, possibly a dump. The layers of the trench are as follows: layer 1 on the surface has a thickness of 5-10 cm; layer 2, 25-40 cm thick, consists of soft soil mixed with salt; layer 3, 15-90 cm thick, is composed of compacted soft soil; layer 4, 20-80 cm thick, is composed of sand and soil; layer 5, 10-30 cm thick, is composed of soft sand. A total of 19 graves were found in this trench, of which 9 graves are of type 1 (simple pits), 9 graves are of type 2 (bipartite graves) and one is of a new type called a pottery grave. Twenty human skeletons were found in this trench. In terms of grave goods, 62 items were recovered. G.N.7817 had the most objects and G.N.7804 and G.N.7818 had the fewest. G.N.7800, G.N.7802, G.N.7807, G.N.7808, G.N.7811 and G.N.7813 had no objects. Of the skeletons, six were females, five were males, three were children, one was a foetus and five were of indeterminate sex and age (Figs. 31-33).

G.N.	Age	Age range	Gender
7800	4.5	4-5	Child
7801	50	45-50	Female
7802	?	?	????
7803	?	?	Female
7804	?	?	?
1/7805	?	?	Female
2/7805	?	?	Female
7806	?	?	?
7807	37.5	35-40	Male
7808	?	?	?
7809	?	?	?
7810	42.5	40-45	Male
7811	?	?	?
7812	40	35-45	Male
7813	9.5	9-10	Child
7814	55	50-60	Female
7815	3.5	3-4	Child
7816	32.5	30-35	Male
7817	35	30-40	Male
7818	30	25-35	Female

Tab. 4: gender and age of skeletons (Forouzanfar 2010: 65).

G.N.7801

Of the simple pit type, attached to the northern wall of the trench (Fig. 31). The grave is oval in shape and measures 157 × 120 cm (Fig. 32: 4). It has a human skeleton lying on its left side, oriented west-east with the face turned upwards. The skeleton is 64 cm below the surface of the trench and the floor of the grave is 84 cm. The grave goods consist of 1 large bowl behind the skull and 1 stone disc on the right leg (Fig. 34).

G.N.7802

This irregular grave is located in the middle of the trench (Fig. 31: 5; 32) and it contains a foetus. The skeleton is 55 cm below the surface of the trench. This tomb is without grave goods.

G.N.7803

Of the simple pit type, attached to the south side of the trench (Fig. 31). It is oval in shape and measures 165 × 90 cm (Fig. 32: 2). It contains a human skeleton lying on its left side, oriented southeast-northwest. The face is looking down, with the hands folded towards the face. The skeleton is 88 cm below the surface of the trench and the floor of the grave is 110 cm. The grave goods consist of 3 beakers above the skull and 2 small jars behind the skull (Fig. 35).

G.N.7805

Of the bipartite type, located in the centre of the trench (Fig. 31), with the partition wall in the southern part (Fig. 32: 6). The grave has two human skeletons. Skeleton A is lying on its left side, oriented southeast-northwest and facing southwest. The arms and legs are folded and the hands are placed in front of the chest. Skeleton B is oriented southeast-northwest, facing southwest. It has folded legs and the hands are placed crosswise next to the chest. The skeleton is 114 cm below the surface of the trench and the floor of the grave is 130 cm. The grave goods consist of 1 medium-sized bowl behind the skull of skeleton A, 1 marble bowl behind the skull of skeleton B and 1 marble bowl under the chin of skeleton A (Fig. 37).



1



2



3



4



5



6

Fig. 30: Trench NGL: 1. G.N.6805; 2. G.N.6808; Trench NFR: 3. G.N.6905; Trench NAW: 4. G.N.7805; 5. G.N.7816; G.N.7827.

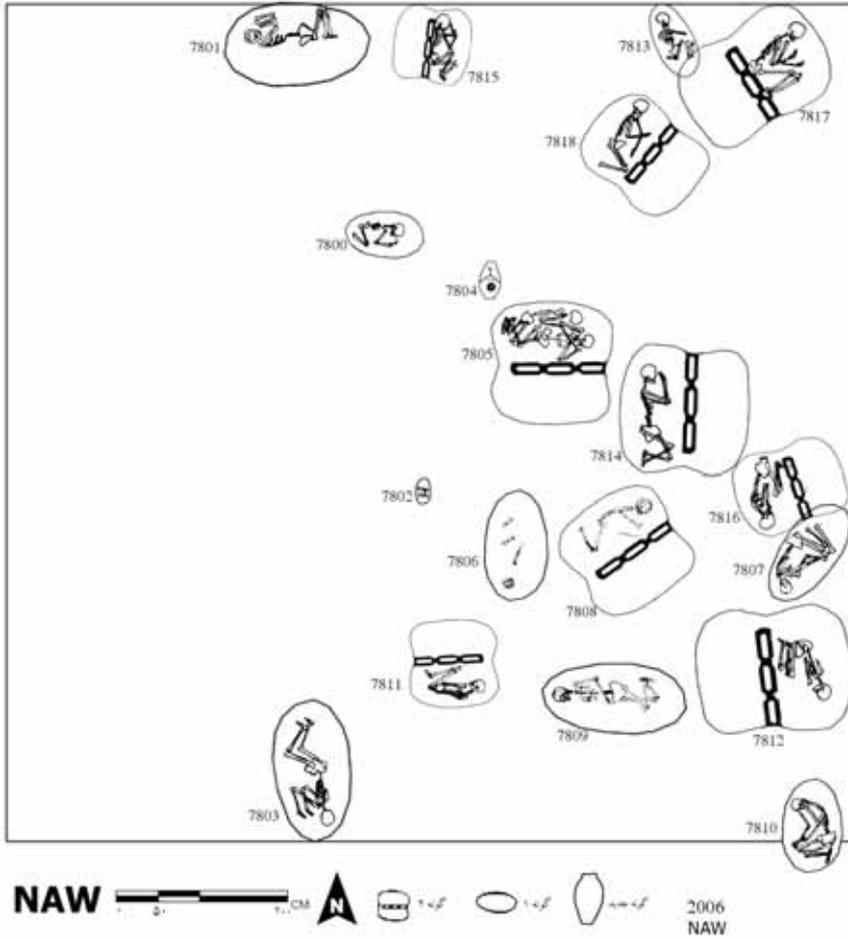


Fig. 31: Trench NAW.

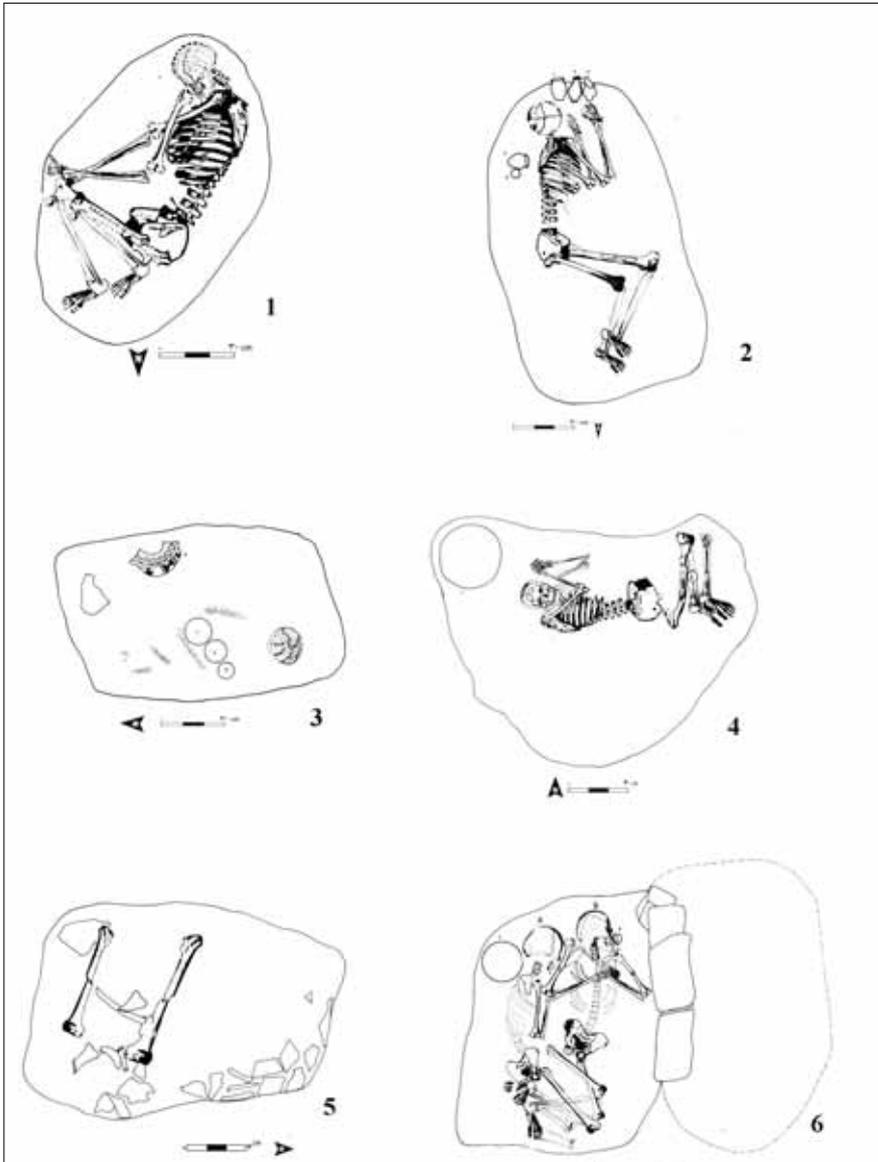


Fig. 32: 1. G.N.7807; 2. G.N.7803; 3. G.N.7806; 4. G.N.7801; 5. G.N.7802; 6. G.N.7805.

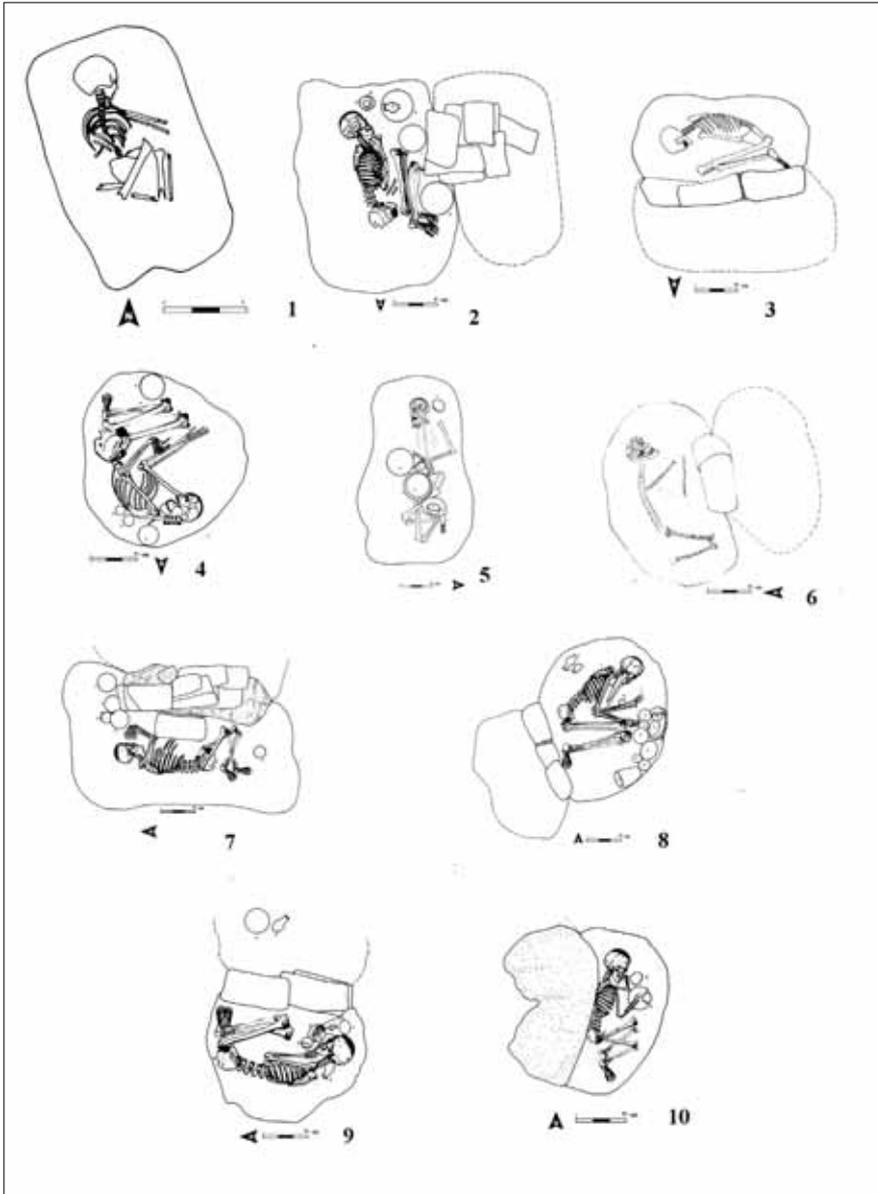


Fig. 33: 1. G.N.7813; 2. G.N.7812; 3. G.N.7811; 4. G.N.7810; 5. G.N.7809; 6. G.N.7808; 7. G.N.7814; 8. G.N.7817; 9. G.N.7816; 10. G.N.7815.



Fig. 34: G.N.7801. Grave goods: 1. G.N.7801/1; 2. G.N.7801/2.



Fig. 35: G.N.7803. Grave goods: 1. G.N.7803/4; 2. G.N.7803/3; 4. G.N.7803/1; 5. G.N.7803/5.

G.N.7806

Of the simple pit type, located in the centre of the trench (Fig. 31). The grave is oval in shape and measures 130 × 80 cm (Fig. 32: 3). The grave has a human skeleton oriented south-north, with indistinct features. The skeleton is 123 cm below the surface of the trench and the floor of the grave is 150 cm. The grave goods consist of 1 jar, 1 beaker and 1 small jar placed on the chest of the skeleton and some fragments of a large jar at a distance of 30 cm.

G.N.7807

Of the simple pit type, attached to the eastern wall of the trench (Fig. 31). This grave is irregular in shape and measures 120 × 85 cm (Fig. 32: 1). It has a human skeleton lying on its right side, oriented southwest-northeast and facing northeast. Its legs are folded. The skeleton is 82 cm below the surface of the trench and the bottom of the grave is 93 cm. There are no grave goods.

G.N.7808

Of the bipartite type, located close to the centre of the trench (Fig. 31), with a brick partition wall in the northern part. The grave is oval in shape and measures 130 × 57 cm (Fig. 33: 6). The grave has a human skeleton lying on its left side, oriented northeast-southwest and facing southeast. The skeleton is 109 cm below the trench surface and the floor of the grave is 130 cm. There are no grave goods.

G.N.7809

Of the simple pit type, located near the southern wall of the trench (Fig. 31). It is rectangular in shape and measures 170 × 90 cm (Fig. 33: 5). It has a human skeleton lying on its right side, oriented west-east and facing south. The skeleton is 124 cm below the surface of the trench and the floor of the grave is 135 cm. The grave goods consist of nine items: 1 small jar behind the skull, 3 large bowls, 1 marble cup and a stone object in front of the chest, 1 large bowl and a small bowl inside it on the legs and a number of beads around the neck.

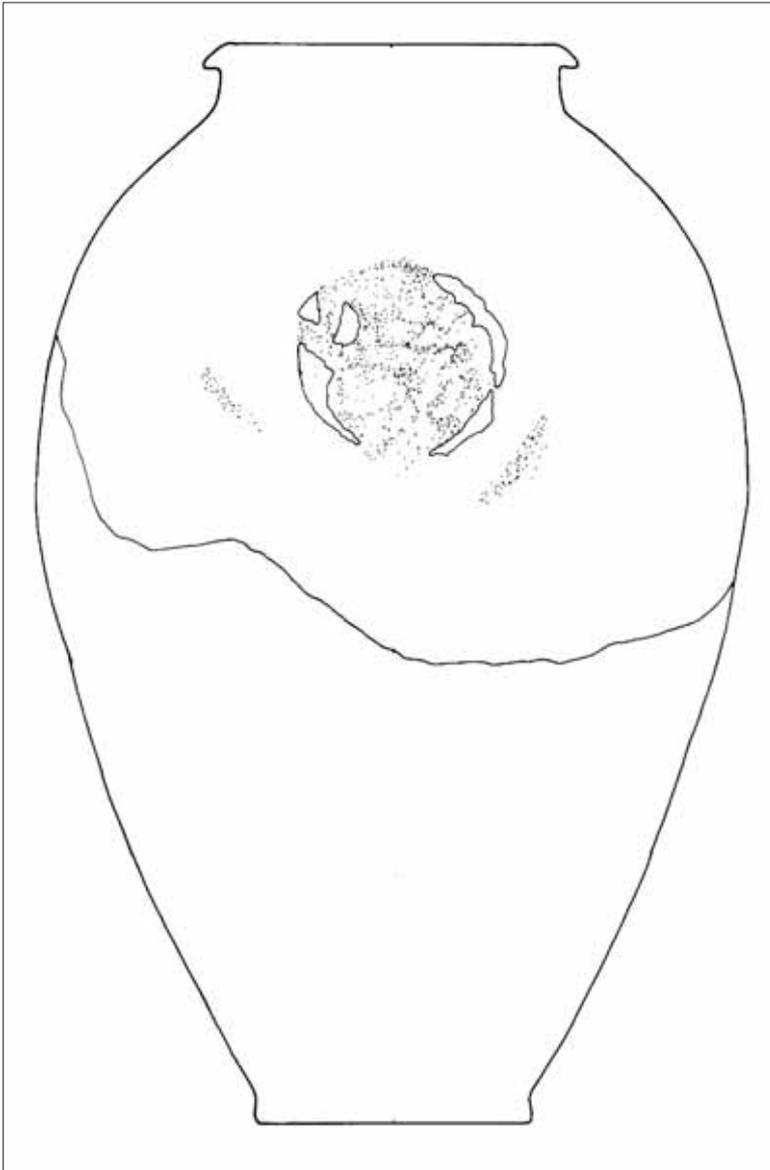


Fig. 36: G.N. 7804.



Fig. 37: G.N.7805. Grave goods: 1. G.N.7805/1; 2. G.N.7805/2; 3. G.N.7805/3.

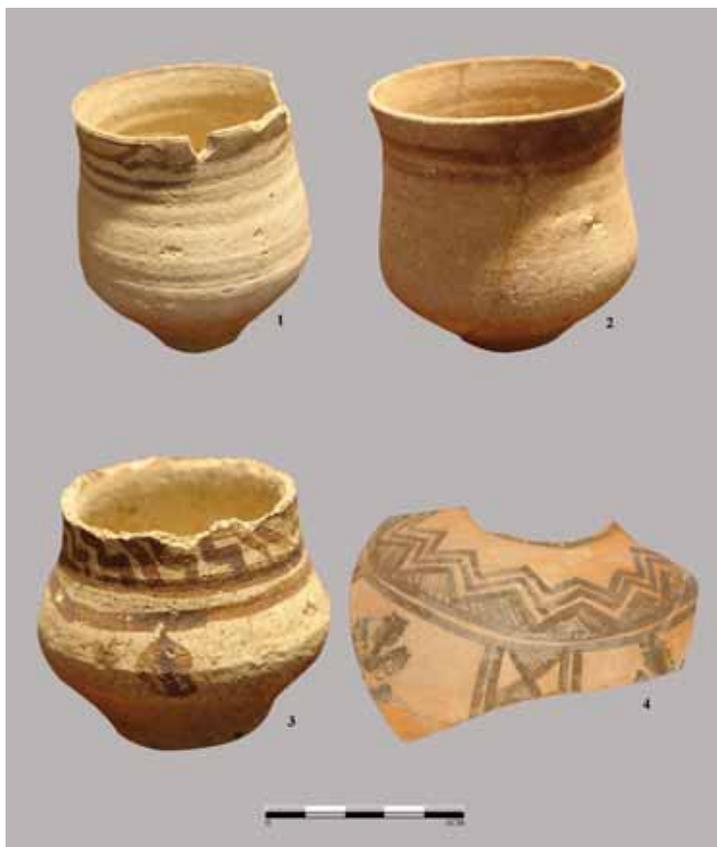


Fig. 38: G.N.7806. Grave goods: 1. G.N.7806/1; 2. G.N.7806/2; 3. G.N.7806/3; 4. G.N.7806/4.



Fig. 39: G.N.7809. Grave goods: 1. G.N.7809/1; 2. G.N.7809/2; 3. G.N.7809/3; 4. G.N.7809/4; 5. G.N.7809/5; 6. G.N.7809/6; 7. G.N.7809/7; 8. G.N.7809/8; 9. G.N.7809/9.

G.N.7810

Of the simple pit type, located next to the southern wall of the trench (Fig. 31). It is oval in shape and measures 100 × 90 cm (Fig. 33: 4). The grave has a human skeleton lying on its right side, oriented northwest-southeast. The legs are folded. The skeleton is 108 cm below the surface of the trench and the floor of the grave is 125 cm. The grave goods consist of 1 medium-sized bowl at the bottom of the foot, 2 pear-shaped beakers and 1 small bowl behind the chest and scapula.



Fig. 40: G.N.7810. Grave goods: 1. G.N.7810/3; 2. G.N.7810/2; 3. G.N.7810/1; 4. G.N.7810/4.

G.N.7811

Of the bipartite type, located near the southern wall of the trench (Fig. 31), with the partition wall in the northern part. This grave is oval in shape and measures 105×58 cm (Fig. 33: 3). The grave has a human skeleton lying on its right side, oriented east-west and facing northwest. The skeleton is 110 cm below the surface of the trench and the floor of the grave is 120 cm. There are no grave goods.

G.N.7812

Of the bipartite type, attached to the eastern wall of the trench (Fig. 31), with a brick partition wall in the eastern part (Fig. 33: 2). This grave is irregular in shape and measures 130×118 cm. The grave has a human skeleton lying on its left side, oriented southeast-northwest and facing southwest. The body and legs are fully folded and the hands are placed between the chest and legs. The skeleton is 102 cm below the surface of the trench and the floor of the grave is 118 cm. The grave goods consist of 1 medium-sized bowl, 1 small jar and 1 pear-shaped beaker in front of the face, 1 medium-sized bowl in front of the knee and 1 shallow bowl in front of the toes (Fig. 41).

G.N.7813

Of the simple pit type, attached to the north wall of the trench (Fig. 31). It is rectangular in shape and measures 85×53 cm (Fig. 33: 1). The grave has a



Fig. 41: G.N.7812. Grave goods: 1. G.N.7812/1; 2. G.N.7812/3; 3. G.N.7812/6; 4. G.N.7812/4; 5. G.N.7812/5; 6. G.N.7812/2.

human skeleton (infant) lying on its left side, oriented northwest-southeast with the face looking down. The skeleton is 53 cm below the surface of the trench and the bottom of the grave is 85 cm. There are no grave goods.

G.N.7814

Of the bipartite type, located next to the eastern wall of the trench (Fig. 31), with the partition wall in the eastern part. This grave is irregular in shape and measures 170 × 77 cm (Fig. 33: 7). The grave has a human skeleton lying on its left side, oriented north-south. The legs are folded and the hands are positioned in front of the face. The skeleton is 115 cm below the surface of the trench and the bottom of the grave is 127 cm. The grave goods consist of 1 small jar in front of the legs, 1 small polychrome jar, 1 small jar and 2 medium-sized bowls in front of the forehead, next to the bricks (Fig. 42).

G.N.7815

Of the bipartite type, attached to the northern wall of the trench (Fig. 31), with

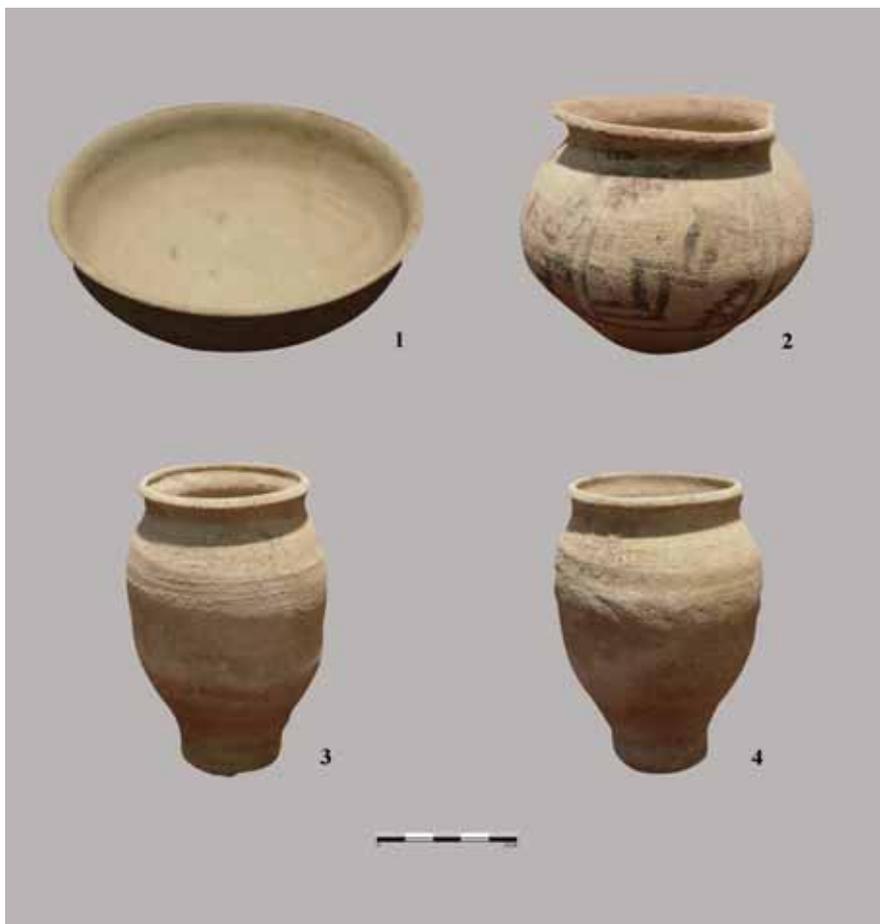


Fig. 42: G.N.7814. Grave goods: 1. G.N.7814/1; 2. G.N.7814/5; 3. G.N.7814/3; 4. G.N.7814/4.

the partition wall in the north-western part (Fig. 33: 10). It is oval in shape and measures 95×45 cm. The grave has a human skeleton lying on its left side, oriented northeast-southwest and facing southeast. The legs are slightly folded and the right hand of the skeleton is on a bowl. The skeleton is 73 cm below the surface of the trench and the bottom of the grave is 88 cm. The grave goods consist of 1 pear-shaped beaker placed in front of the chest and 1 bowl placed under the right hand (Fig. 43).



Fig. 43: G.N.7815. Grave goods: 1. G.N.7815/2; 2. G.N.7815/1.

G.N.7816

Of the bipartite type, attached to the eastern wall of the trench (Fig. 31), with a brick partition wall in the eastern part. The shape of the grave is irregular and it measures 100 × 80 cm (Fig. 33: 9). The grave has a human skeleton lying on its right side, oriented south-north and facing northeast. The legs are folded. The skeleton is 134 cm below the surface of the trench and the floor of the grave is 150 cm. The grave goods consist of 1 pear-shaped beaker behind the skull, 1 small jar, 3 pear-shaped beakers, 1 medium-sized bowl and 1 jar in front of the face and 1 pear-shaped beaker and 1 medium-sized bowl in the second pit (Fig. 44).

G.N.7817

Of the bipartite type, attached to the northern wall of the trench (Fig. 31), with a brick partition wall in the southwestern part (Fig. 33: 8). This grave is rectangular in shape and measures 132 × 94 cm. It has a human skeleton lying on its left side, oriented east-west and facing south. The legs are folded and the hands are



Fig. 44: G.N.7816. Grave goods.

placed in front of the face. The skeleton is 122 cm below the surface of the trench and the bottom of the grave is 142 cm. The grave goods consist of 13 items: 2 pear-shaped beakers behind the ribs, 3 medium-sized bowls, 5 jars, 1 pear-shaped beaker and 1 plate in front of the knees and 1 marble mortar placed under the forearm of the right hand (Fig. 45).

G.N.7818

Of the bipartite type, located in the northeast corner of the trench (Fig. 31), with a brick partition wall in the southern part. This grave is oval in shape and measures 120 × 60 cm. It has a human skeleton lying on its left side, oriented northeast-southwest and facing south-east. The legs are folded. The top of the grave is 110 cm below the trench surface and the bottom of the grave is 130 cm. One marble cup is placed in front of the face (Fig. 46).

Trench NFM

This trench measures 10 × 10 metres and is located outside the central part of the cemetery. The eastern half of the trench, measuring 5 × 10 metres, was selected for excavation. Seven layers were identified: layer 1 with a thickness of 15-10



Fig. 45: G.N.7817. Grave goods.



Fig. 46: G.N.7818. Marble cup.

cm, composed of surface soil; layer 2, 60-25 cm thick, composed of white soil and fine sand; layer 3, 70-50 cm thick, composed of a solidified crust of sand and salt; layer 4, 60-35 cm thick, composed of soil mixed with fine sand; layer 6, 5-8 cm thick, composed of soft white soil with grains of sand; layer 7, 40-55 cm thick, composed of gravel. One new grave was found in this trench.

G.N.7000

Of the bipartite type, attached to the eastern side of the trench, with a partition wall on the southwest side. The grave is oval in shape and measures 170 × 105 cm (Fig. 47). The tomb has a female human skeleton of about 50 years old, oriented west-east and facing south. The legs are folded. The skeleton is 125 cm below the surface of the trench and the floor of the grave is 138 cm. There are no grave goods.

Trench NFR

This trench measures 10 × 10 metres and is located outside the central part of the cemetery on its eastern side. Of the total area of the trench, an area of 5 × 5 metres in the northwest corner was selected for excavation. The aim of this selection was to determine the density and distribution of graves outside the central part of the cemetery. The trench was explored to a depth of 83 cm. The layers in this trench are as follows: layer 1 with a thickness of 5-10 cm, corresponding to the surface level; layer 2, 10-35 cm thick, composed of sand mixed with white soil; layer 3, 10-30 cm thick, composed of soft white soil; layer 4, 30-38 cm thick, consisting of a non-compact and relatively smooth crust of salt and sand; layer 5, 20-75 cm thick, consisting of a solidified crust of sand and salt; layer 6, 25-45 cm thick, composed of compressed gravel. Six new graves were found in this trench: one simple pit, four bipartite pits and one catacomb (Fig. 48). Seven human skeletons were found, along with 12 items of grave goods, G.N.6905 containing the most and G.N.6902 containing only one item. G.N.6900, G.N.6901, G.N.6903 and G.N.6904 had no grave goods. G.N.6905 had two human skeletons and one lapis lazuli stamp seal. In addition to the grave goods obtained from inside the graves, a number of objects were collected from the surface.

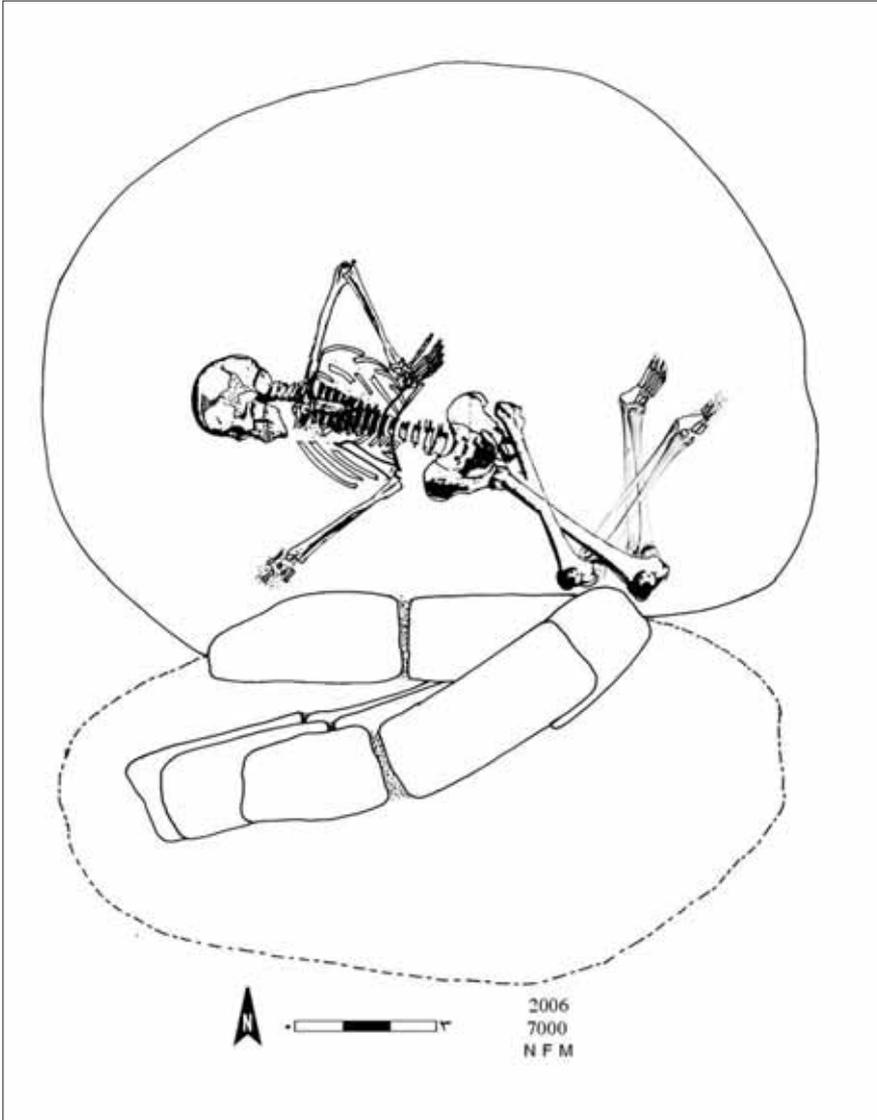


Fig. 47: G.N.7000.

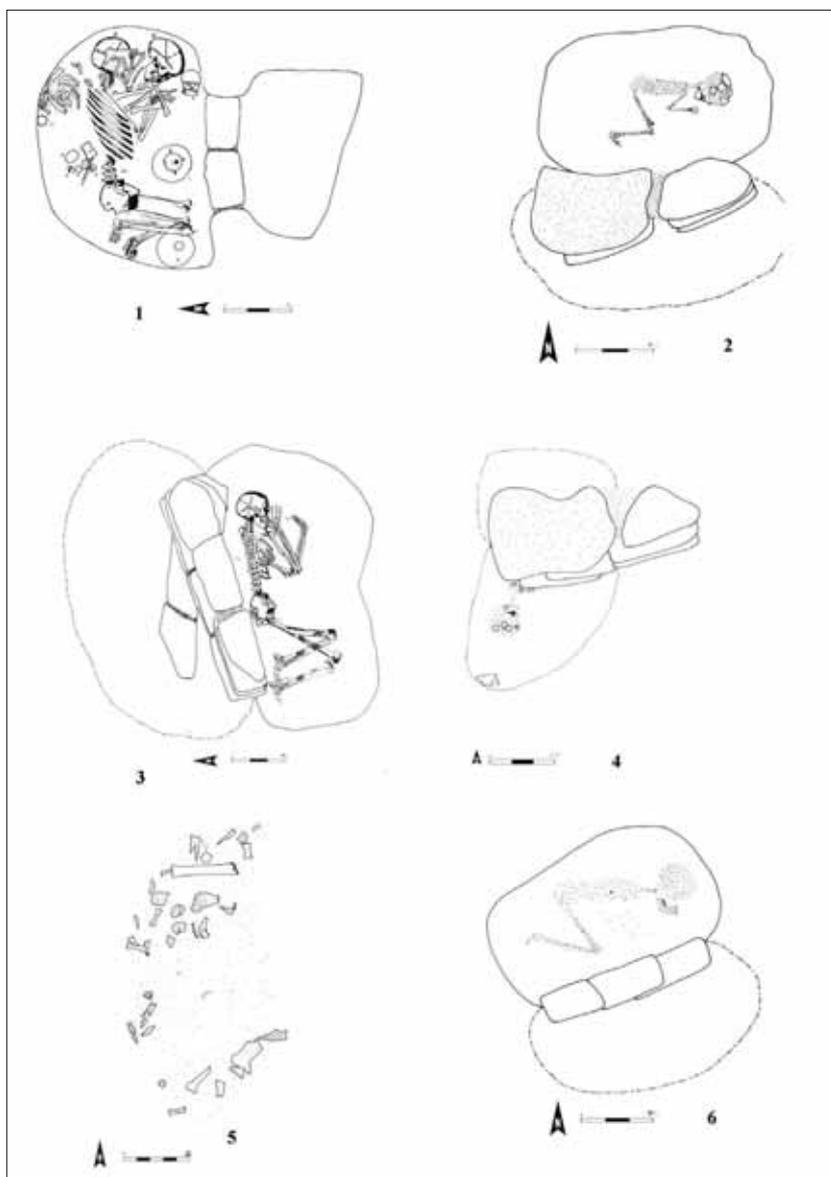


Fig. 48: Trench FRM: 1. G.N. 6905; 2. G.N. 6903; 3. G.N. 6904; 4. G.N. 6902; 5. G.N. 6900; 6. G.N. 6901.

G.N.	Age	Age range	Gender
6900	?	?	Infant
6901	?	?	?
6902	?	?	?
6903	?	?	?
6904	35	30-40	Female
6905/1	32.5	30-35	Female
6905/2	4	3.5-4.5	Child

Tab. 5: gender and age of skeletons (Forouzanfar 2010: 64).

G.N.6900

Of the simple pit type, attached to the western side of the trench (Fig. 48: 5). This grave has one human skeleton (infant). The skeleton is 58 cm below the surface of the trench and the floor of the grave is 67 cm. There are no grave goods.

G.N.6901

Of the bipartite type, located close to the western wall of the trench. The grave is oval in shape and measures 94 × 55 cm (Fig. 48: 6). It has a human skeleton lying on its left side, oriented northwest-southeast. The grave is 105 cm below the surface of the trench. There are no grave goods.

G.N.6902

Of the bipartite type, located on the northern side of the trench, with a brick partition wall in the northern part (Fig. 48: 4). The shape of this grave is irregular and it measures 55 × 30 cm. The grave has one human skeleton. The skeleton is 96 cm below the surface of the trench and the bottom of the grave is 100 cm. The grave goods consist of one bowl.

G.N.6903

Of the bipartite type, attached to the northern side of the trench, rectangular in

shape with a brick partition wall on the southern side (Fig. 48: 2). It has a human skeleton lying on its left side, oriented east-west and facing south. The skeleton is 99 cm below the surface of the trench and the floor of the grave is 105 cm. There are no grave goods.

G.N.6904

Of the bipartite type, attached to the southern side of the trench, with a brick partition wall in the northern part (Fig. 48: 3). It has a human skeleton lying on its left side, oriented northeast-southwest and facing south. The skeleton is 125 cm below the surface of the trench and the floor of the grave is 139 cm. There are no grave goods.

G.N.6905

Of the catacomb type (type 4), attached to the northern side of the trench. This grave is oval in shape and measures 100 × 77 cm (Fig. 48: 1). The grave has two human skeletons: skeleton A is lying on its left side, oriented east-west and facing south. Skeleton B (infant) is also lying on its left side but is oriented south-north, facing west. The grave goods consist of 11 items: 1 beaker attached to the skull of skeleton B, 1 large jar in front of the right elbow of skeleton A, 1 marble bowl, 1 mortar, 1 metal pin, 1 bead, 1 stone item and 2 shells behind the ribs of skeleton A and 1 stamp seal inside a large jar and 1 small marble cup behind skeleton A (Fig. 49).

Trench NGL

This trench measures 10 × 10 metres and is located outside the central part of the cemetery on its northeast side. The eastern half of the trench, measuring 5 × 10 metres, was selected for exploration. The layers are as follows: layer 1 with a thickness of 5-10 cm, composed of surface soil; layer 2, 35-15 cm thick, consisting of a solidified crust of sand and salt; layer 3, 45-25 cm thick, composed of soft white soil; layer 4, 75-110 cm thick, composed of soft soil; layer 5, 25-10 cm thick, composed of medium-grain sand; layer 6, 20-40 cm thick, composed of compacted fine sand; layer 7, 60-50 cm thick, composed of dune sand. Nine new



Fig. 49: G.N.6905. Grave goods.

graves were discovered in this trench: two simple pits (type 1), six bipartite pits (type 2) and one catacomb. From a total of nine graves excavated in this trench, nine human skeletons were obtained (Fig. 50). In terms of grave goods, 35 items were recovered.

G.N.	Age	Age range	Gender
6800/1	10.5	10-11	Child
6800/2	3.5	3-4	Child
6801	8.5	8-9	Child
6802	4.5	4-5	Child
6803	27.5	25-30	Male
6804	14 months	14 months	Child
6805	27.5	25-30	Female
6806			Female
6807	6-7 months	6-7 months	Infant
6808	27.5	25-30	Male

Tab. 6: gender and age of skeletons (Forouzanfar 2010: 64).

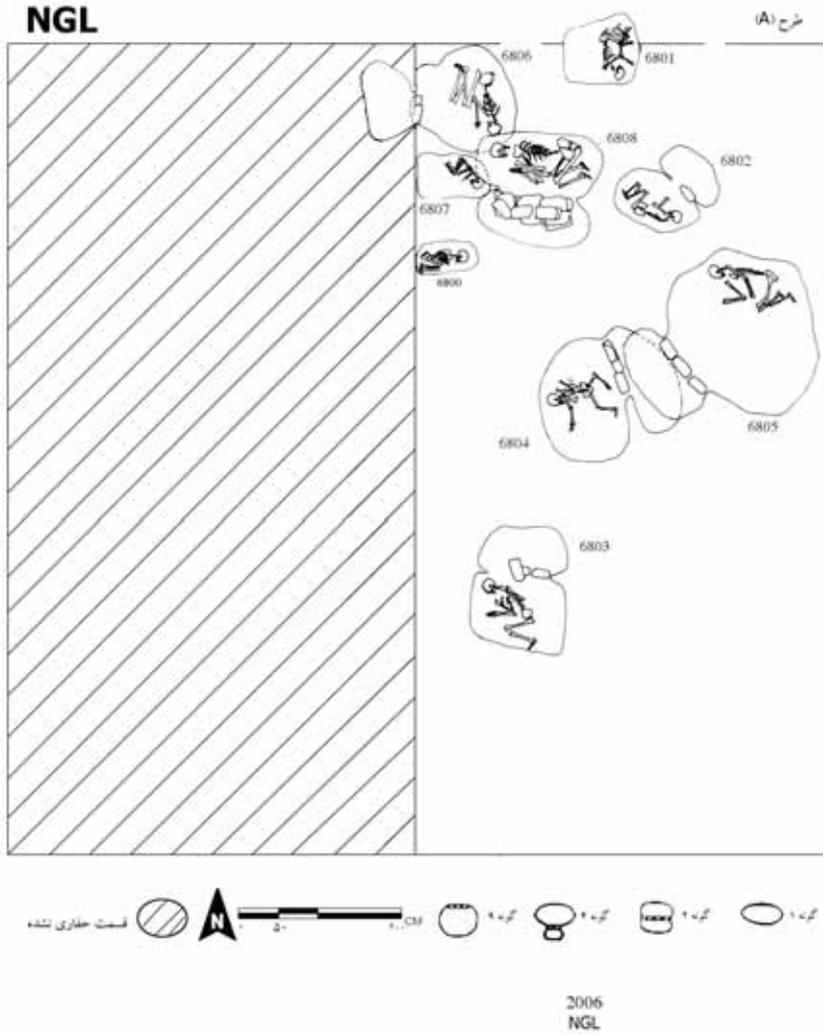


Fig. 50: Trench NGL.

G.N.6800

Of the simple pit type, attached to the western side of the trench (Fig. 50). It is oval in shape and measures 105×57 cm (Fig. 51: 1). The grave contains the skeleton of a child buried on its left side, oriented east-west and facing south. The skeleton is 108 cm below the surface of the trench and the floor of the grave is 119 cm. The grave goods consist of a marble cup on top of the skull and a number of beads around the neck.

G.N.6801

Of the simple pit type, located on the southern side of the trench (Fig. 50). It is rectangular in shape and measures 94×65 cm (Fig. 51: 9). It has a child skeleton lying on its right side, oriented southeast-northwest and facing northeast. The top of the grave is 134 cm below the surface of the trench and the floor of the grave is 146 cm. The grave goods consist of 2 bowls, 2 pear-shaped beakers, one beaker on the wall and a number of beads around the neck (Fig. 52)

G.N.6802

Of the bipartite type, located near the northern side of the trench (Fig. 50). The grave is oval in shape and measures 100×70 cm. It has a human skeleton lying on its right side, oriented south-north and facing east (Fig. 51: 8). The skeleton is 122 cm below the surface of the trench and the floor of the grave is 147 cm. The grave goods consist of 2 bowls, 2 pear-shaped beakers and 1 beaker on the wall and a few beads around the neck (Fig. 52).

G.N.6803

Of the bipartite type, located near the western side of the trench (Fig. 50), with a brick partition wall in the north-eastern part. It is oval in shape and measures 120×105 cm (Fig. 51: 7). The skeleton is lying on its right side, oriented west-east and facing south. The skeleton is 116 cm below the surface of the trench and the floor of the grave is 126 cm. The grave goods consist of 1 open-mouth jar above the skull, a grinding stone and a deep plate behind the skull and a medium-sized bowl behind the pelvic bone (Fig. 53).

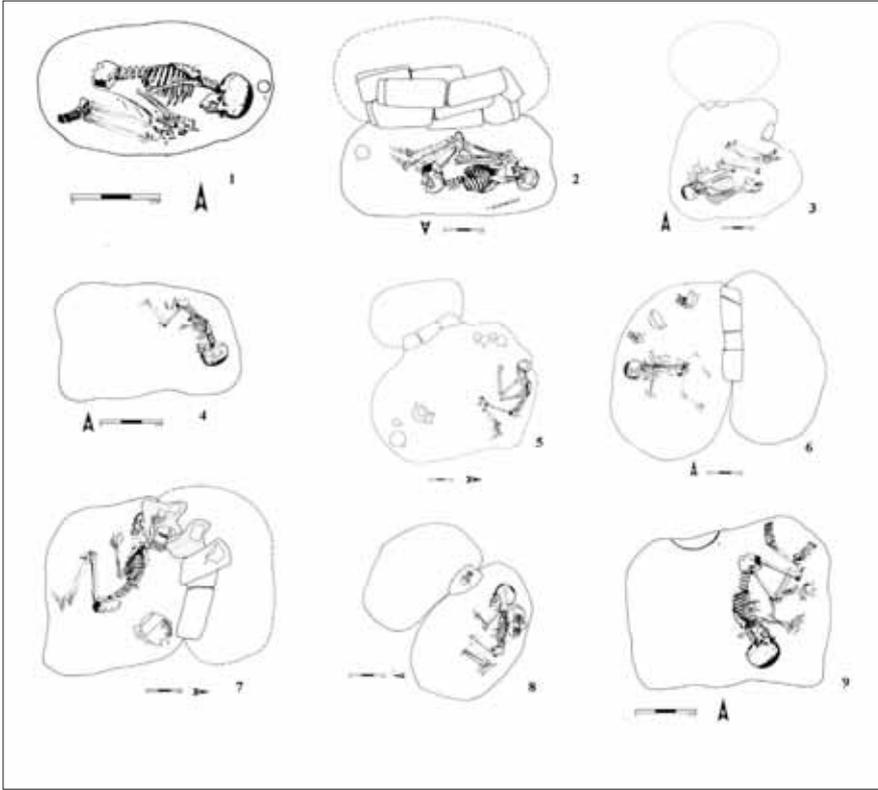


Fig. 51: 1. G.N.6800; 2. G.N.6808; 3. G.N.6806; 4. G.N.6807; 5. G.N.6805; 6. G.N.6804; 7. G.N.6803; 8. G.N.6802; 9. G.N.6801.

G.N.6804

Of the bipartite type, located almost in the middle of the trench (Fig. 50), with a brick partition wall in the eastern part. The grave is oval in shape and measures 160×100 cm. It contains the remains of a child, supine with open legs, oriented northwest-southeast and facing south (Fig. 51: 6). The skeleton is 176 cm below the surface of the trench and the floor of the grave is 183 cm. The grave goods consist of six items including a pear-shaped beaker behind the skull, 2 bowls and a pear-shaped beaker at a distance of 30 cm behind the skull, and a number of beads in different sizes around the neck (Fig. 54).

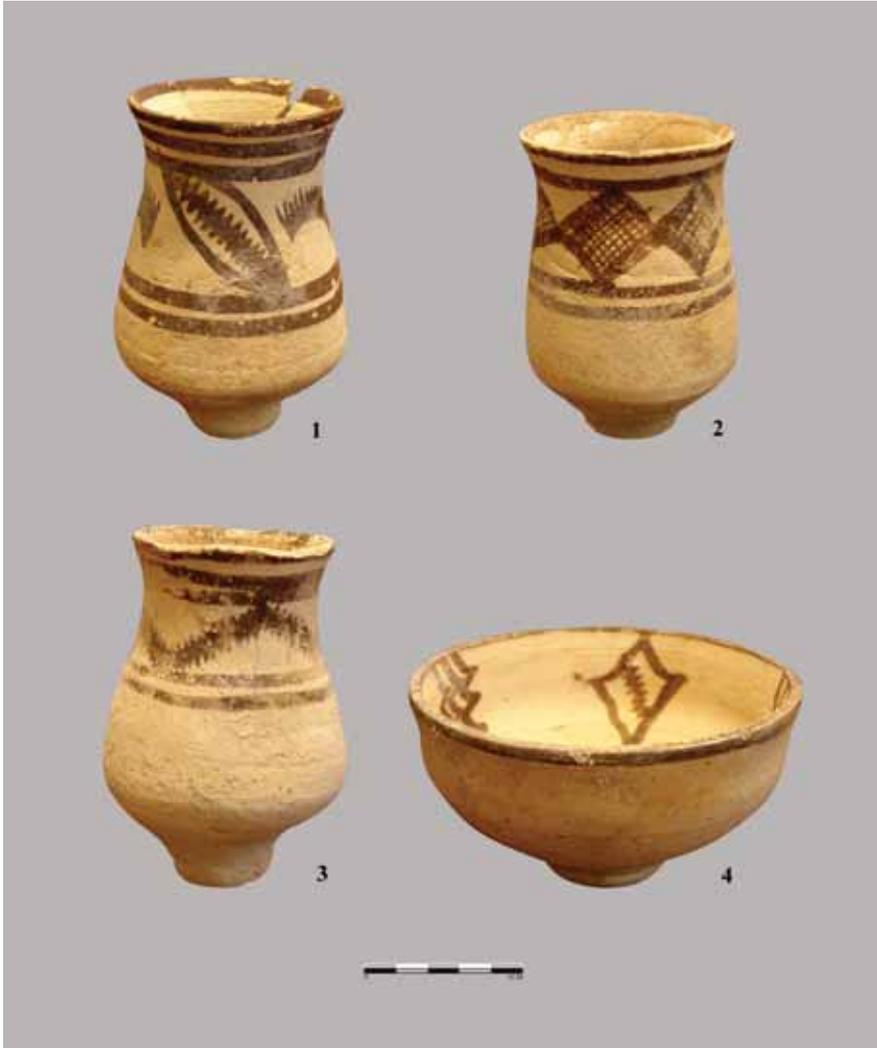


Fig. 52: G.N.6802. Grave goods: 1. G.N.6802/3; 2. G.N.6802/2; 3. G.N.6802/1; 4. G.N.6802/4.



Fig. 53: G.N.6803: Grave goods: 1. G.N.6803/1; 2. G.N.6803/2; 3. G.N.6803/3; 4. G.N.6803/4.

G.N.6805

Of the catacomb type, attached to the eastern side of the trench (Fig. 50, Fig. 51: 5). It is oval in shape and measures 217×180 cm (Fig. 30: 1). It contains one skeleton lying on its right side, oriented northwest-southeast and facing south. The skeleton is 157 cm below the surface of the trench and the floor of the grave is 173 cm. The grave goods consist of nine items: 2 small bowls above the right hand, 3 beads around the neck and 1 jar, 2 jugs and 1 large bowl at a distance of 50 cm in front of the knee (Fig. 55).

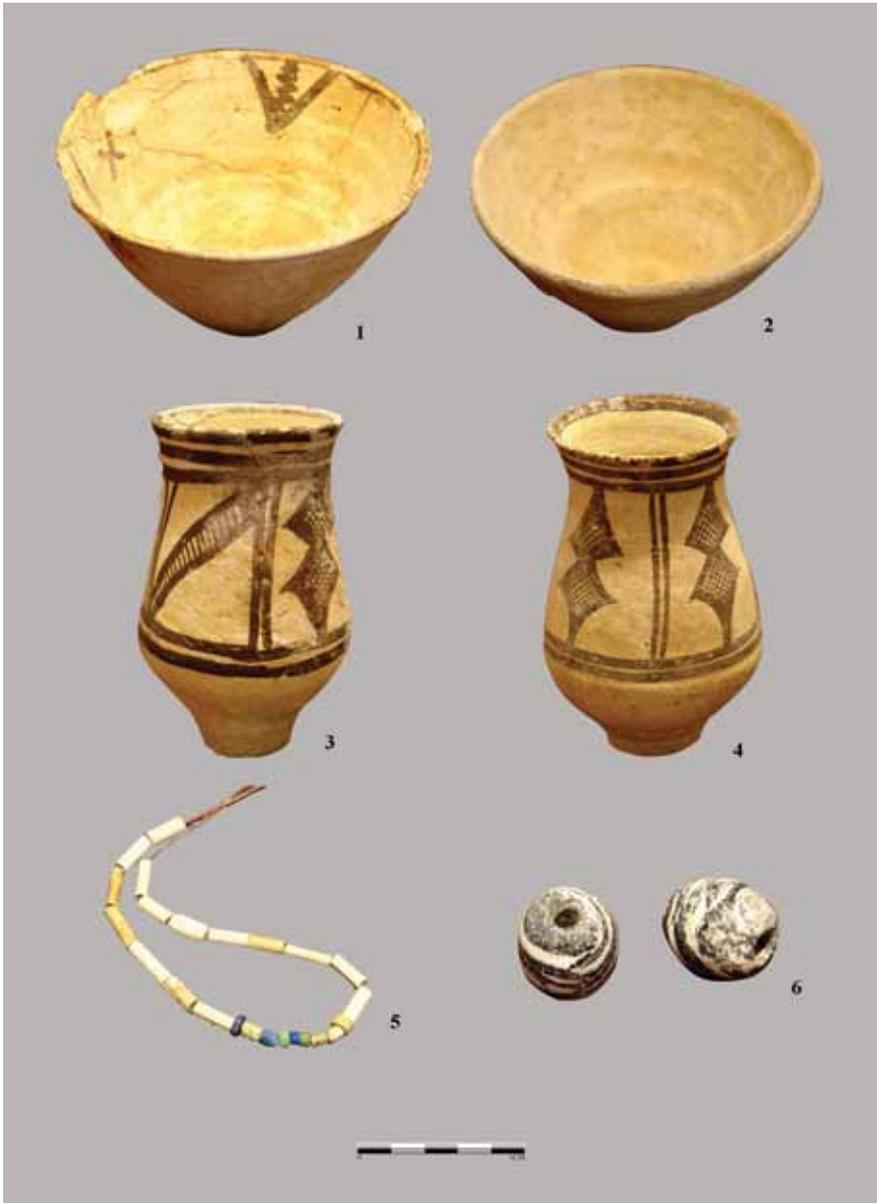


Fig. 54: G.N.6804. Grave goods: 1. G.N.6804/3; 2. G.N.6804/2; 3. G.N.6804/4; 4. G.N.6804/1; 5. G.N.6804/6; 6. G.N.6804/6a.

G.N.6806

Of the bipartite type, located in the northwest corner of the trench (Fig. 50), with a brick partition wall in the western part (Fig. 51: 3). The grave is oval in shape and measures 135 × 110 cm. The grave has a human skeleton lying on its left side, oriented south-north and facing west. The skeleton is 123 cm below the surface of the trench and the floor of the grave is 137 cm. The grave goods consist of four items: 1 small bowl, 1 small jar and 1 pear-shaped beaker in front of the face and 1 medium-sized jar in front of the left foot (Fig. 56).

G.N.6807

Of the simple pit type, attached to the western side of the trench (Fig. 50). It is oval in shape and measures 83 × 54 cm (Fig. 51: 4). It contains the remains of an infant. The skeleton is 100 cm below the surface of the trench and the floor of the grave is 110 cm. There are no grave goods.

G.N.6808

Of the bipartite type, attached to the western side of the trench (Fig. 50), with a brick partition wall in the southern part. The grave is oval in shape and measures 160 × 70 cm (Fig. 30: 2). The grave has a human skeleton lying on its right side, oriented west-east and facing south. The arms and legs are fully drawn up towards the chest (Fig. 51: 2). The skeleton is 159 cm below the surface of the trench and the floor of the grave is 173 cm. The grave goods consist of three items including 1 beaker and 1 bone tool behind the skeleton (Fig. 57).

2. Grave goods***Pottery***

A considerable quantity of pottery deposited as grave goods was recovered during this excavation campaign. The pottery included painted and unpainted Buff Ware, Grey Ware and Polychrome Ware.



Fig. 55: G.N.6805. Grave goods.



Fig. 56: G.N.6806. Grave goods.



Fig. 57: G.N.6808. Grave goods: 1. G.N.6808/1; 2. G.N.6808/2.

The plain Buff Ware includes beakers, bowls, trays, cylindrical jars, globular jars and teapots. The patterned Buff Ware includes beakers, bowls, small pots, large jars, cylindrical jars and globular jars. The Grey Ware is limited to three bowls. The unpainted Red Ware includes simple bowls, small pots and jars.

A. Unpainted Buff Ware beakers: beakers with flared rims, flat bases and bodies with S-shaped profiles, narrowing at the neck (Fig. 58: 1-3; 5-7). The second group includes beakers with almost the same shape, everted rims and almost cylindrical bodies (Fig. 58: 8). The third group have curved bodies and narrow necks flaring outwards at the top (Fig. 58: 4). Another group includes pear-shaped beakers with open mouths and wide bodies (Fig. 58: 9). Chronologically, they are attributed to periods II to IV.

B. Unpainted Buff Ware bowls: deep unpainted Buff Ware bowls with conical bodies and everted rims (Fig. 59: 1, 2), hemispherical bodies (Fig. 59: 3, 9) and conical bodies (Fig. 59: 4-6; 8). Another group of unpainted Buff Ware bowls are of medium depth and have hemispherical bodies (Fig. 60: 1) or conical bodies (Fig. 60: 2-3), are of a reddish buff colour (Fig. 60: 4), or have conical or short cylindrical bodies (Fig. 60: 5-6) or short conical bodies (Fig. 60: 7-8). There is also a tray in the style of Shahr-i Sokhta IV with a very short cylindrical body (Fig. 60: 9).

C. Unpainted Buff Ware jars: tall cylindrical jars with short necks and flared rims (Fig. 61: 1-4); jars with bodies that are narrow in the lower part and wide in the middle, gradually becoming narrow again towards a very short neck with

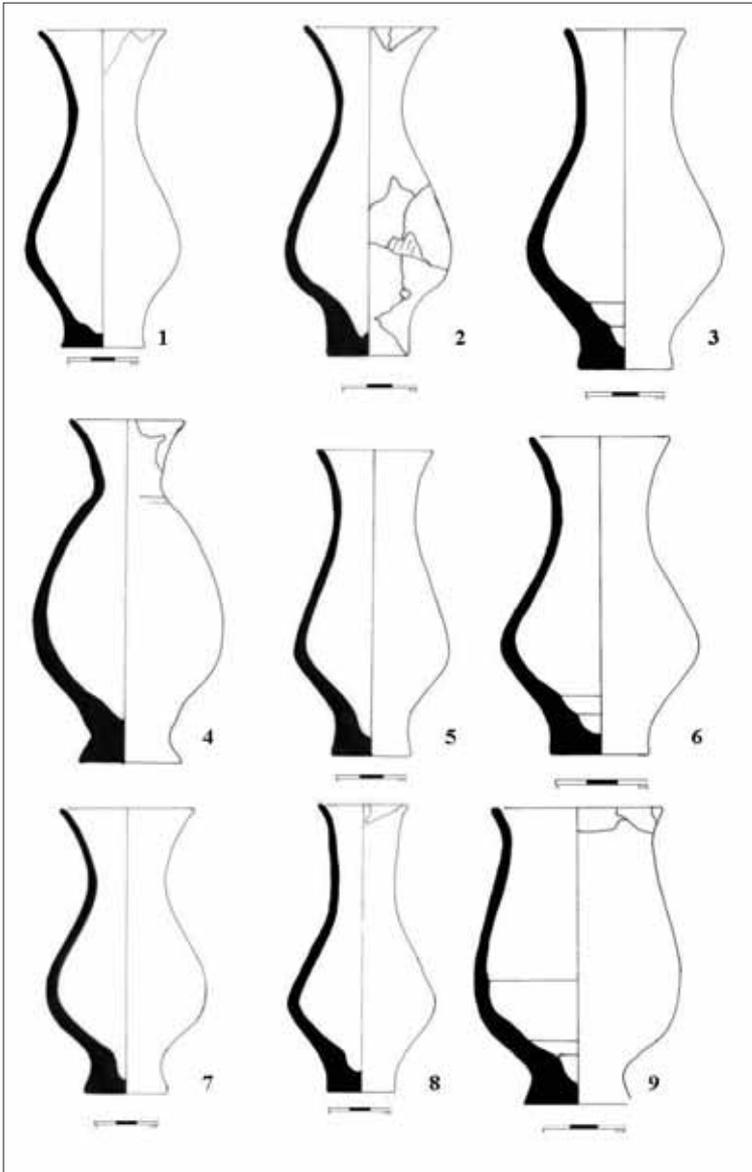


Fig. 58: unpainted Buff Ware beakers: 1. G.N.7803/2; 2. G.N.7817/4; 3. G.N.7816/3; 4. G.N.7817/1; 5. G.N.7810/3; 6. G.N.7816/2; 7. G.N.7817/2; 8. G.N.7816/8; 9. G.N.7815/2.

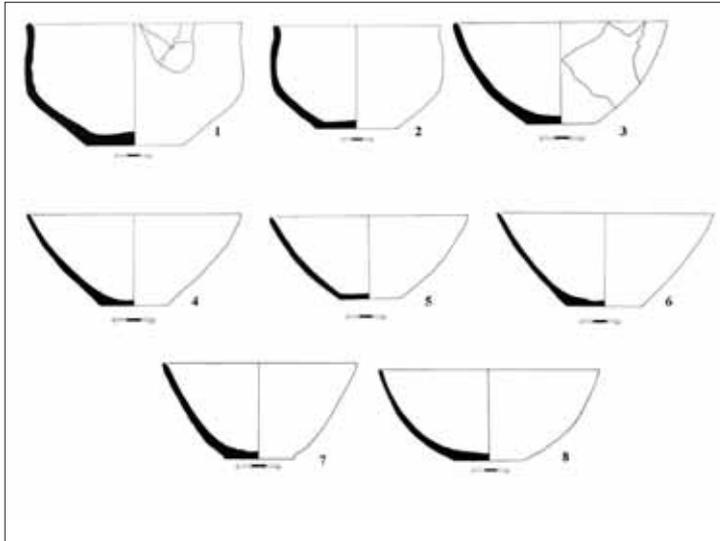


Fig. 59: unpainted Buff Ware bowls: 1. G.N.2810/4; 2. G.N.7812/1; 3. G.N.6710/6; 4. G.N.6705/3; 5. G.N.6707/7; 6. G.N.6710/11; 7. G.N.6710/13; 8. G.N.7701/2.

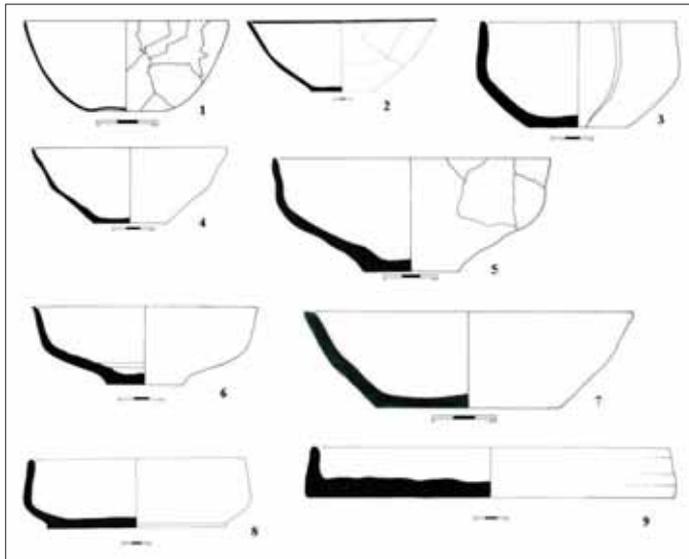


Fig. 60: unpainted Buff Ware bowls: 1. G.N.6703/7; 2. G.N.7700/1; 3. G.N.7816/7; 4. G.N.6707/10; 5. G.N.7706/4; 6. G.N.7814/1; 7. G.N.7817/22; 8. G.N.7812/6; 9. 7817/12.

an inverted rim (Fig. 61: 6, 8), ending with the rim jutting outwards (Fig. 61: 5-7; 9-12); tall jars whose shape recalls a bunch of grapes (Fig. 62: 1), biconical jars with short necks (Fig. 62: 2) or no neck (Fig. 62: 3). The other group of jars are small, conical, with necks that have an S-shaped profile (Fig. 62: 4) or are cylindrical (Fig. 62: 5).

D. The last group of vessels are teapots. The spouts of one group of teapots are pointing upwards (Fig. 62: 7) while in another group they are attached to the container obliquely (Fig. 62: 8-9). Some of these items belong to Phases 5-7 (II), while others belong to later periods and some even to IV period (Fig. 62: 3) and Phase 3 (Fig. 61: 5-7 and 9-12).

Painted Buff Ware vessels include: a. beakers, b. bowls, c. small pots, d. jars.

A. Beakers. Painted Buff Ware beakers are mainly pear-shaped, divided into two main groups. The first group are tall and pear-shaped, the bodies having an S-shaped profile, conical in the lower part and curved in the upper part, narrower at the neck. The patterns on these older Phase 5 beakers include straight and parallel wavy stripes (Fig. 63: 1-2), while later designs of the same phase include single hatched rhombuses filled in between parallel lines (Fig. 63: 9), two connected hatched rhombuses between parallel lines (Fig. 63: 8), hatched rhombuses and a ladder pattern (Fig. 63: 3) and two hatched rhombuses with serrated wavy motifs (Fig. 63: 4).

Another group of motifs seen in both Phase 5 and Phase 6 serrated wavy lines connected to each other in between parallel straight stripes and dentate stripes inside a diagonal oval with serrated stripes (Fig. 63: 5, 7). These designs are mostly related to Phase 5 and are found on the top two thirds of the beakers. The beakers of the next phase are smaller and sometimes their lower quarter is decorated. The main motifs on these beakers are narrow parallel stripes on the upper part, inside which are serrated stripes (Fig. 64: 1, 3). The same design, with oblique dentate stripes attached to one another, is repeated (Fig. 64: 2, 4).

The other group of pear-shaped beakers includes short beakers with open mouths. The patterns on these beakers consist of straight or oblique parallel stripes and semi-triangular lines (Fig. 5: 5-6, 8). Another older pattern associated

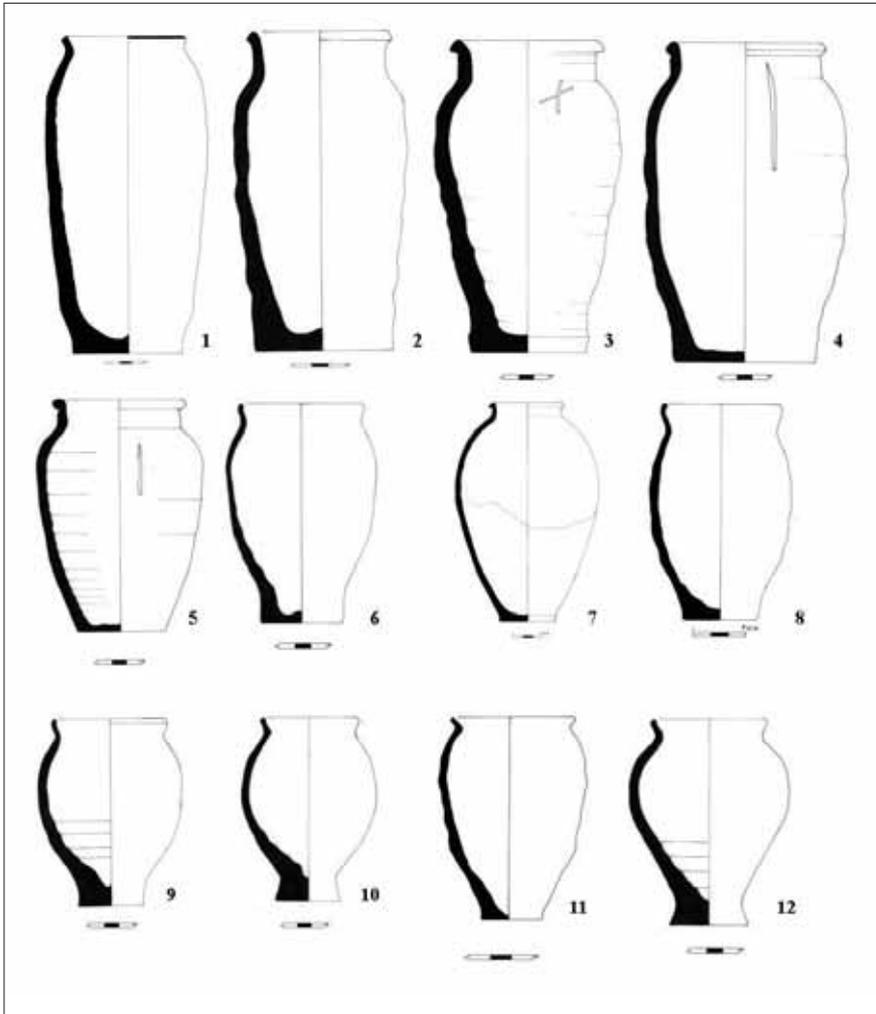


Fig. 61: various types of jars: 1. G.N.6704/1; 2. G.N.6806/1; 3. G.N.7818/7; 4. G.N.7706/1; 5. G.N.7817/9; 6. G.N.7814/3; 7. G.N.7804/1; 8. G.N.7803/1; 9. G.N.7814/4; 10. G.N.7817/10; 11. G.N.7803/4; 12. G.N.7817/5.

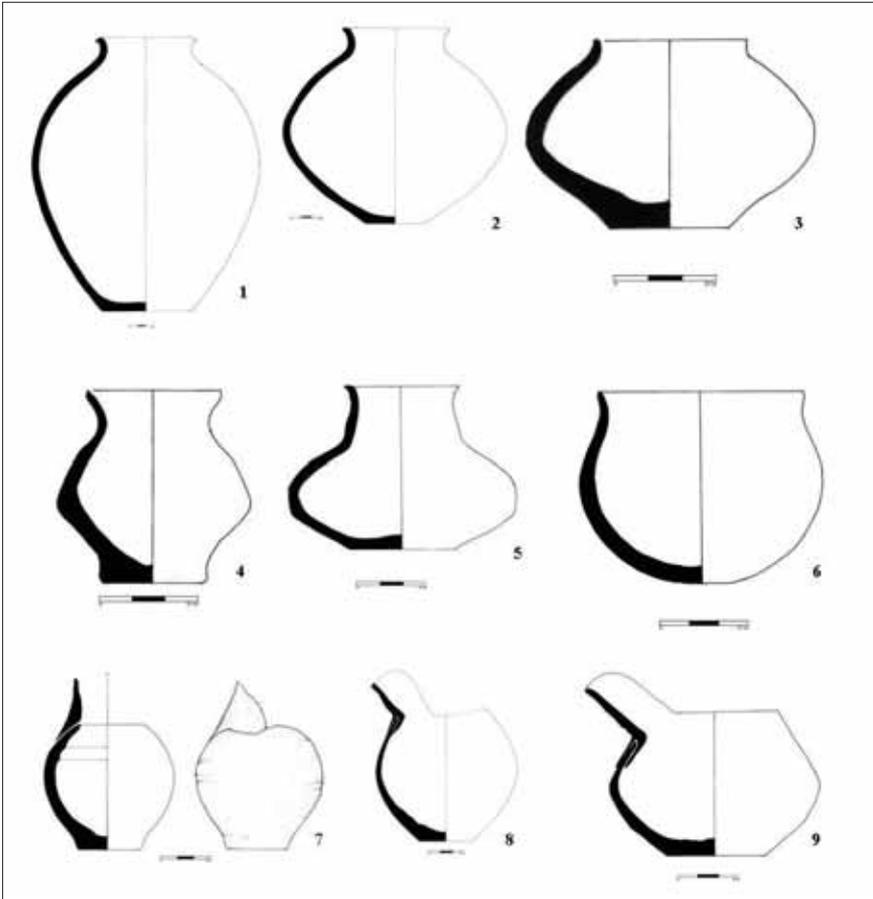


Fig. 62: various types of jars and teapots: 1. G.N.6705/22; 2. G.N.2707/8; 3. G.N.7812/4; 4. G.N.6705/14; 5. G.N.6700/1; 6. G.N.6703/10; 7. G.N.6705/25; 8-9. G.N.6707/6.

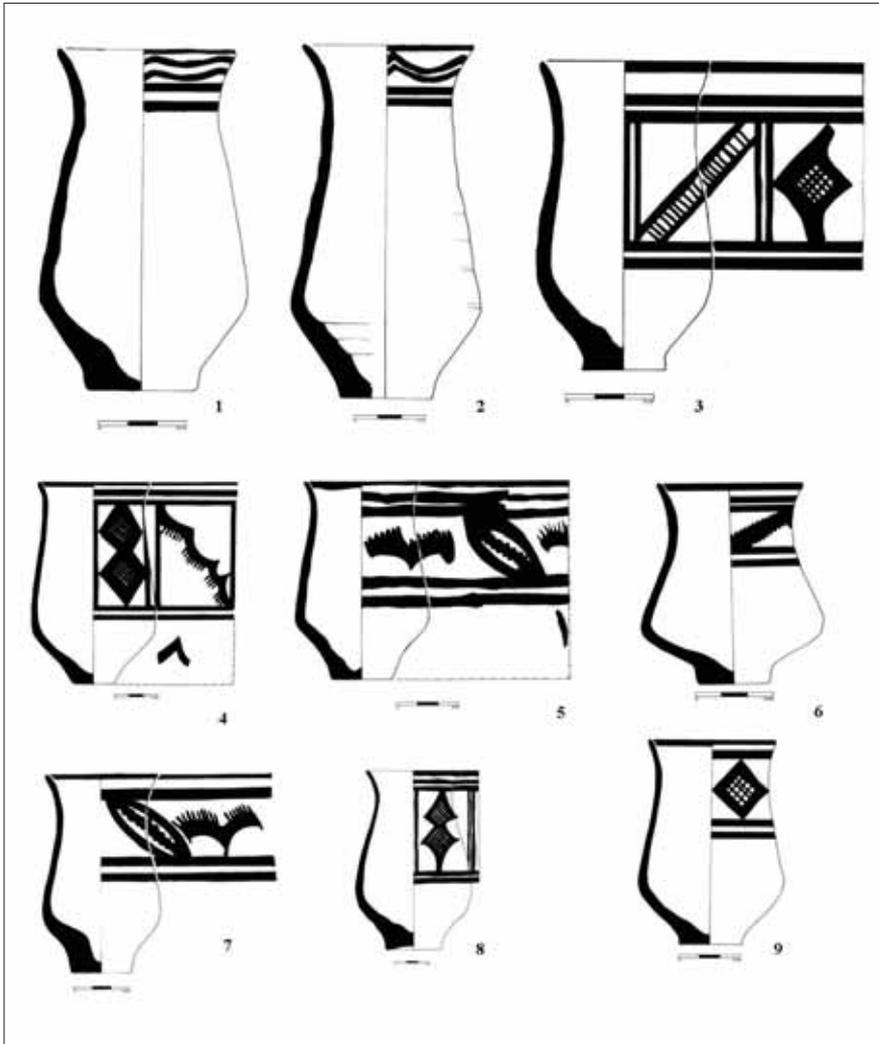


Fig. 63: pear-shaped beakers: 1. G.N.7702/1; 2. G.N.7702/2; 3. G.N.6704/5; 4. G.N.6703/23; 5. G.N.6703/24; 6. G.N.6802/1; 7. G.N.6804/1; 8. G.N.6804/1; 9. G.N.6802/2.

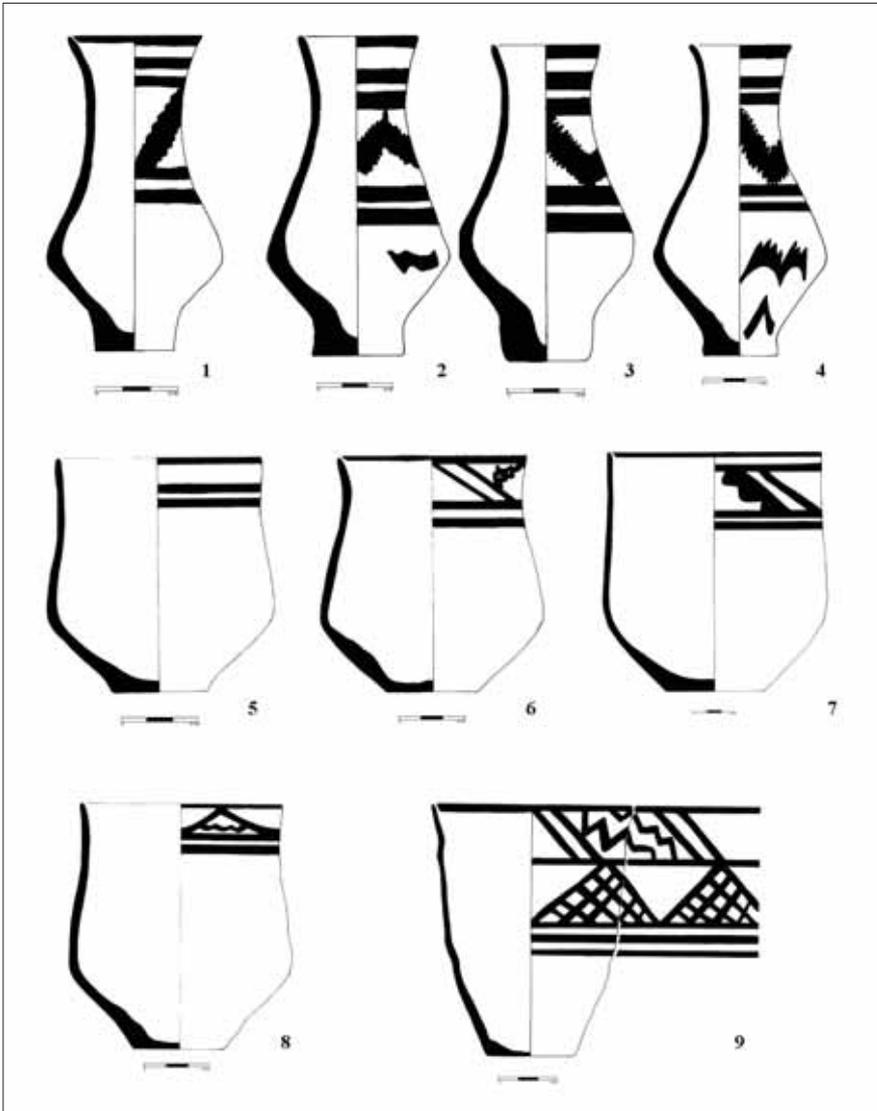


Fig. 64: pear-shaped beakers: 1. G.N.7810/2; 2. G.N.7812/2; 3. G.N.7816/1; 4. G.N.7816/5; 5. G.N.7806/2; 6. G.N.6905/2; 7. G.N.6707/4; 8. G.N.7801/6; 9. G.N.6707/1.

with Period I is straight parallel lines on which a simple oblique line is drawn parallel to a wide serrated band (Fig. 64: 7). The common drawing of a goat on pear-shaped beakers was not found during the present campaign. The last group of beakers, mainly dated to Phases 8 and 7, are tall and conical with horizontal and oblique stripes and hatched triangles (Fig. 64: 9).

B. Painted Buff Ware bowls. Most of the Buff Ware bowls found in this cycle of excavations are conical with geometric patterns consisting of a combination of oblique parallel, triangular and semi-circular lines with alternately wavy or simple stripes. As with the pear-shaped beakers, the rhombus motifs are filled with thin intersecting lines (Fig. 65: 1-8). These bowls belong to the first half of Phase 5 at Shahr-i Sokhta. Another group of bowls are deep with flat bases and everted rims. The main motif on these bowls is a vertical S-shape with two dentate stripes inside the loops (Fig. 65: 9). Another group of bowls have semi-

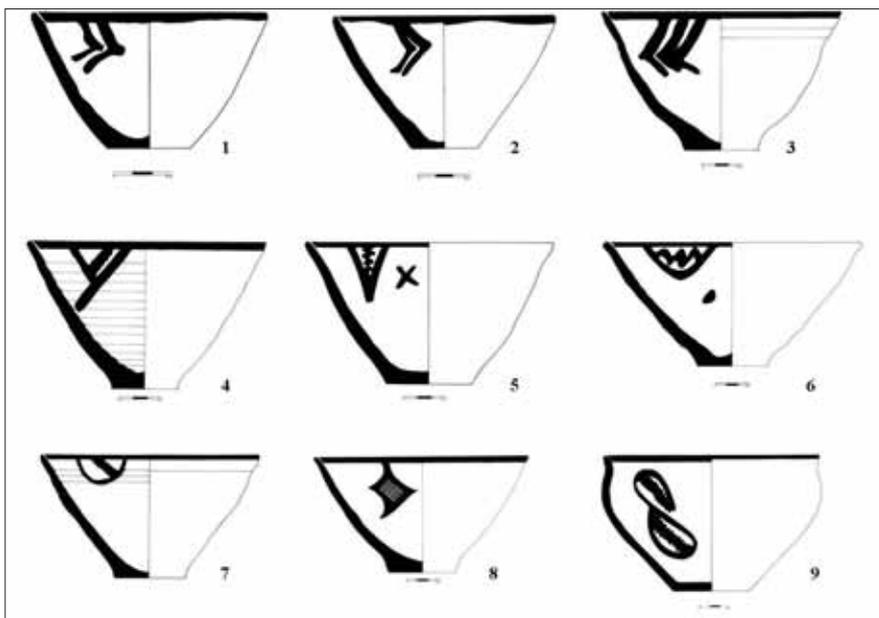


Fig. 65: painted Buff Ware bowls: 1. G.N.6703/38; 2. G.N.6703/16; 3. G.N.6704/2; 4. G.N.6704/10; 5. G.N.6804/3; 6. G.N.7805/1; 7. G.N.6704/9; 8. G.N.6802/5; 9. G.N.6701/1.

circular bodies with patterns that cover almost the entire inner surface. They have two groups of parallel wavy lines facing each other and two rhombuses filled with intersecting lines (Fig. 66: 1), or only one wide serrated band (Fig. 66: 2), facing each other inside the bowl. The bowls with short conical bodies are among the oldest vessels, the patterns inside them consisting of five 'staircase' motifs, each with an inner staircase filled in with black (Fig. 66: 3). This is the standard design of Shahr-i Sokhta I, similar to Geoksyur pottery in Turkmenistan and Quetta Ware in Damb Sadat II and III. Other older vessels include painted bowls with short patterns inside them: two parallel horizontal lines (Fig. 66: 8) and wavy stripes attached to the rim (Fig. 66: 9). Phase 3 painted bowls are conical in shape and are decorated internally with three vertical or diagonal stripes (Fig. 66: 5-6). A bowl with an almost cylindrical body, internally decorated with two parallel serrated horizontal stripes, is attributed to Shahr-i Sokhta II (Fig. 66: 7).

C. Small pots. The bodies of this group of vessels are generally cylindrical, carinated or straight. The motifs are all geometric and painted on the top third of the vessels, although sometimes they cover almost the entire body. Older designs on these vessels are usually associated with Shahr-i Sokhta I, consisting of frames of four horizontal and vertical stripes, inclined or serrated internally (Fig. 67: 1), or with the external body covered in geometric patterns: solid rhombuses inside concentric squares with parallel horizontal wavy lines filling the empty spaces.

These patterns are attributed to Shahr-i Sokhta Phases 8-10 (Fig. 67: 15). Some of the vessels in this group have bodies with blunt carination and have softer forms. The motifs on these vessels appear on the upper third of the body in the form of a triangle with a podium inside it (Fig. 67: 12). Other common patterns include parallel oblique lines enclosed between horizontal parallel stripes (Figs. 2: 67 and 3), parallel stripes (Fig. 67: 4, 6-8), inverted triangles enclosed between horizontal stripes (Fig. 67: 5), parallel wavy lines (Fig. 67: 9, 11), diagonal lines (Fig. 67: 10) and overlapping rhombuses (Fig. 67: 13-14).

D. Jars. These vessels are divided into two main categories: tall and short. The tall jars consist of two groups, spherical and cylindrical. The patterns on

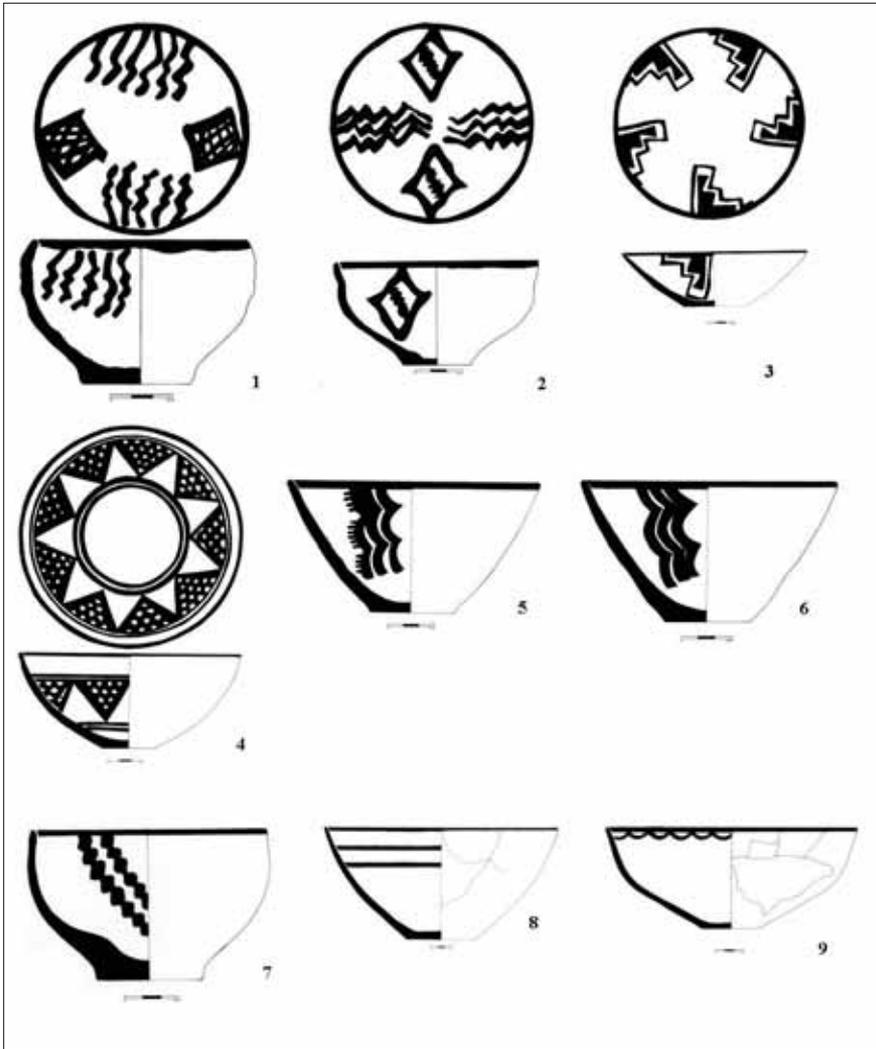


Fig. 66: painted Buff Ware bowls: 1. G.N.6703/28; 2. G.N.6802/4; 3. G.N.6803/4; 4. G.N.7707/6; 5. G.N.6703/6; 6. G.N.6703/35; 7. G.N.6806/4; 8. G.N.7801/1; 9. G.N.7809/2.

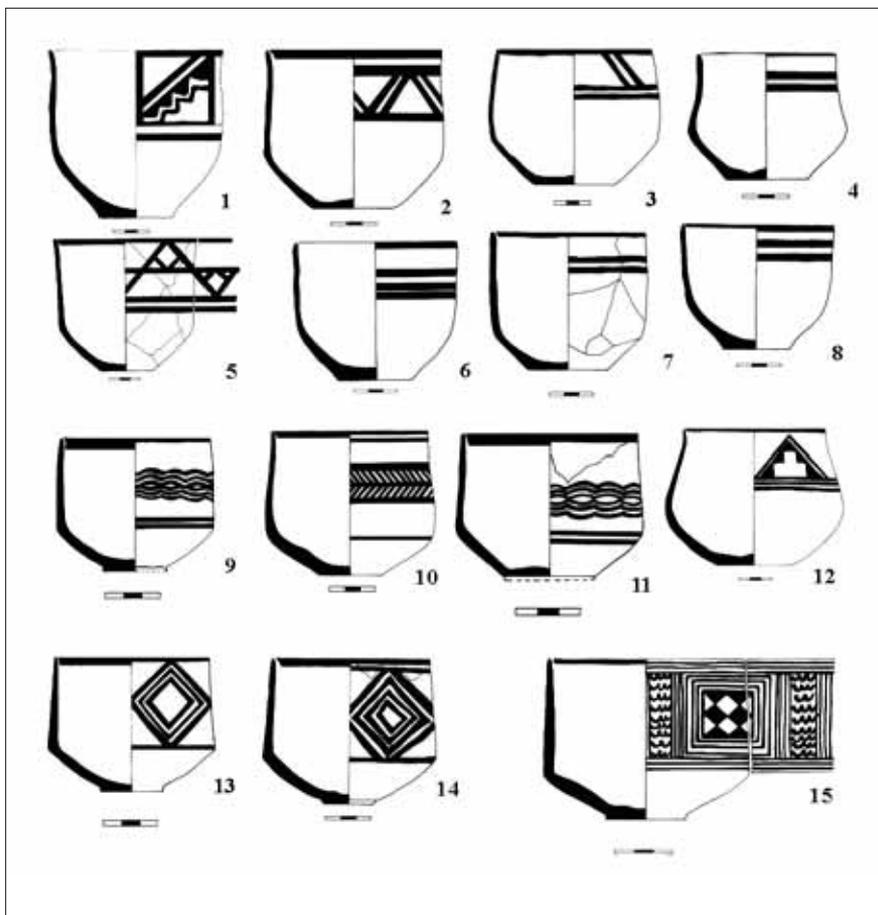


Fig. 67: small pots: 1. G.N.6705/4; 2. G.N.6707/2; 3. G.N.6707/5; 4. G.N.6705/17; 5. G.N.6710/2; 6. G.N.6705/26; 7. G.N.6710/7; 8. G.N.6808/1; 9. G.N.6707/7; 10. G.N.7707/5; 11. G.N.7707/2; 12. G.N.7707/1; 13. G.N.7707/3; 14. G.N.7707/4; 15. G.N.7705/2.

the shoulders of the spherical jars are a combination of parallel and curved lines and serrated diagonal lines (Fig. 68: 1-4). Cylindrical jar motifs are always a combination of parallel horizontal zigzags that start from the rim and extend to the lower parts and bases (Fig. 68: 5-6). Small jars are often biconical, globular or onion-shaped, all with everted rims and short cylindrical necks. The motifs on this group of vessels are either simple horizontal parallel stripes (Fig. 68: 7) or wavy zigzags enclosed in simple horizontal stripes (Fig. 68: 8-9). Other motifs include various types of triangle filled with inclined parallel lines (Fig. 68: 1, 3, 9) or triangles whose vertices are connected horizontally or vertically (Fig. 69: 7). Other designs include a combination of geometric lines: parallel stripes, triangles, wavy lines (Fig. 69: 4, 8) and parallel diagonal lines enclosed in simple horizontal parallel stripes (Fig. 69: 2, 10).

Red, Grey and Polychrome vessels are very small. Unpainted Red Ware bowls are hemispherical with flat bases and everted rims (Fig. 70: 5-6). Red Ware consists of two groups of jars and pots. Patterns painted on jars consist of parallel diagonal horizontal lines surrounded by simple horizontal stripes and triangular lines (Fig. 70: 1-3). The motifs on the pots consist of triangles and rhombuses filled with oblique parallel lines, enclosed in simple horizontal stripes from top to bottom (Fig. 70: 4).

The quantity of Emir Ware Grey vessels dated to Phase 8 is very also limited. In some case the motifs are both internal and external, covering almost the entire internal body and the upper part of the external surface, with either parallel diagonal lines or swastika patterns (Fig. 71: 1-2) or filled triangles (Fig. 71: 3).

The polychrome vessels are limited to biconical and hemispherical jars. The external surfaces are covered with a combination of geometric designs in yellow, dark red and black (Fig. 71: 4-6).

3. Other grave goods

During the campaign, in addition to pottery, a number of other items made of various materials were found. Among these is a very special object: an artificial eye from a female burial, G.N.6705 (Fig. 72) (Sajjadi - Costantini 2007; 2009)

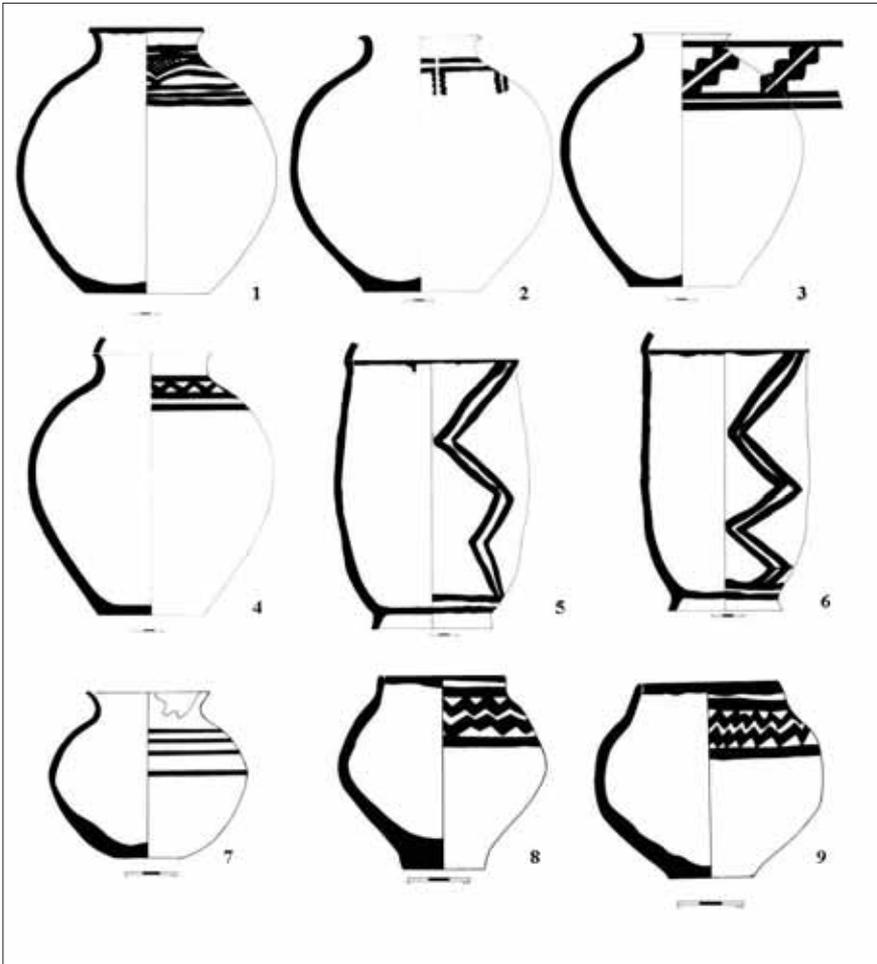


Fig. 68: Buff Ware jars: 1. G.N.6703/2; 2. G.N.6905/1; 3. G.N.6705/5; 4. G.N.6707/13; 5. G.N.6703/11; 6. G.N.6703/12; 7. G.N.7701/4; 8. G.N.6703/1; 9. G.N.6703/36.

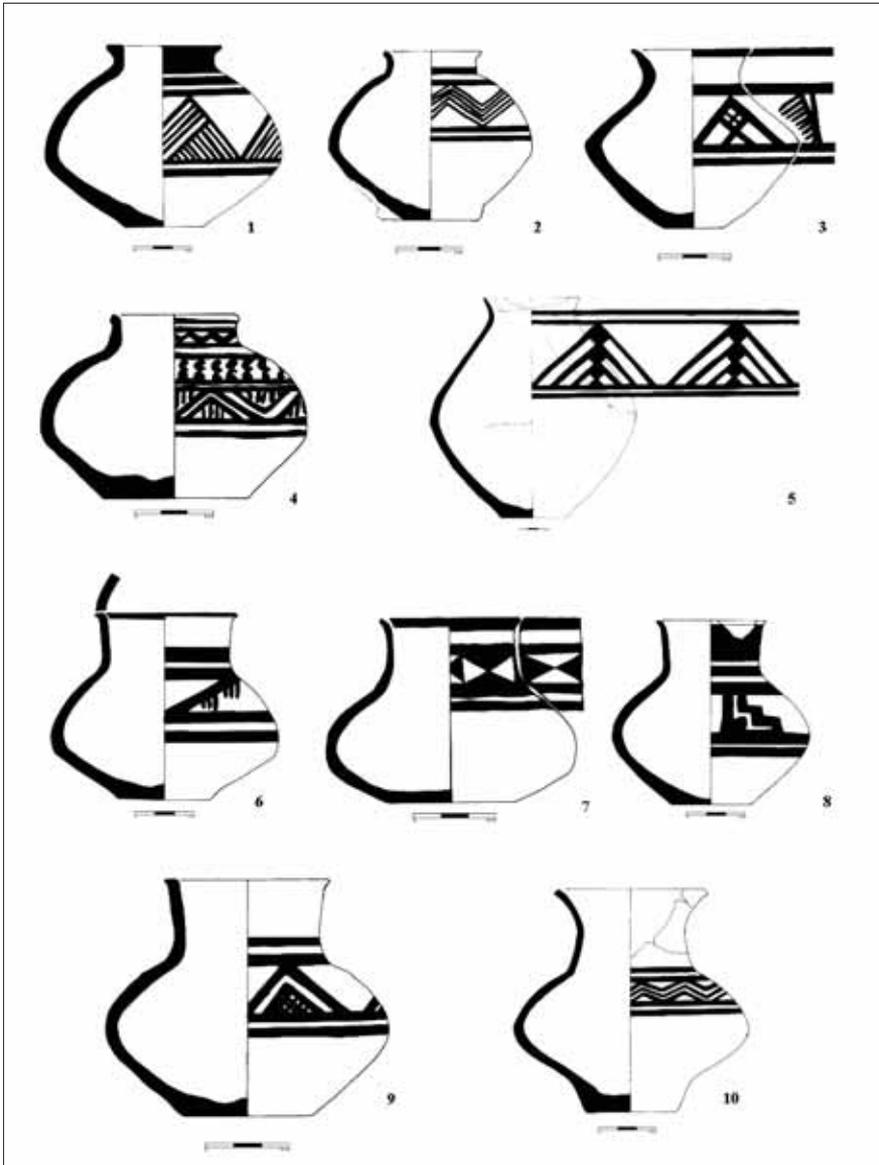


Fig. 69: Buff Ware jars: 1. G.N.7809/8; 2. G.N.7816/6; 3. G.N.6705/16; 4. G.N.6806/3; 5. G.N.6705/11; 6. G.N.6707/12; 7. G.N.6707/14; 8. G.N.6707/17; 9. G.N.6710/1; 10. G.N.7703/3.

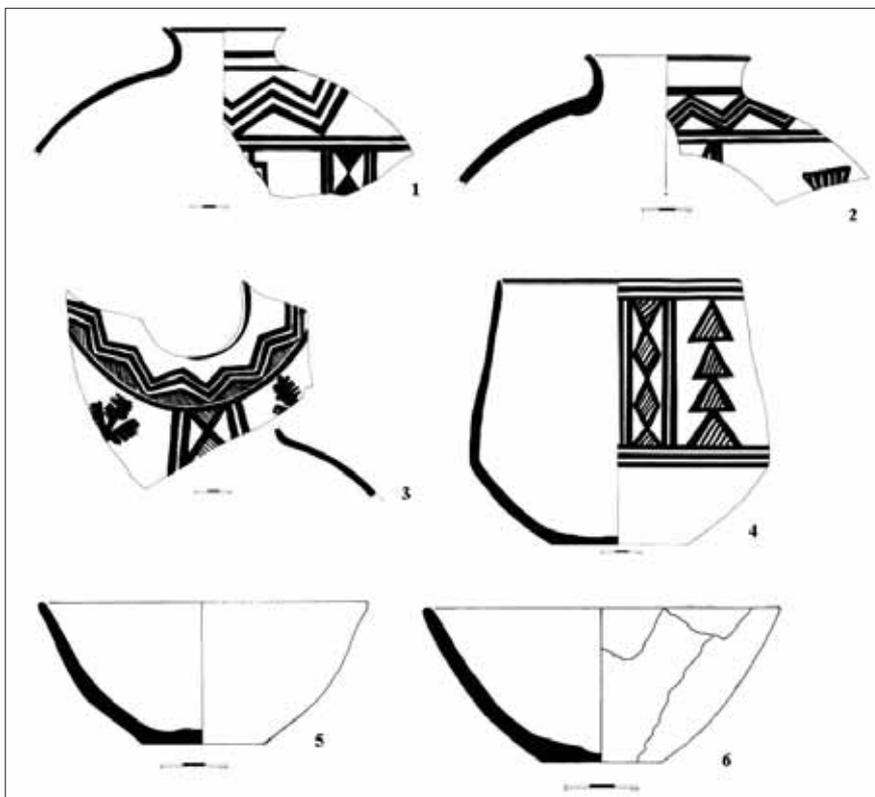


Fig. 70: Red Ware vessels: 1. G.N.7704/1; 2. G.N.7704/2; 3. G.N.7804/4; 4. G.N.6803/1; 5. G.N.6705/7; 6. G.N.6710/12.

Organic materials including reeds wood various plants, edible seeds, charcoal, shells (Sajjadi 2017), bone (Potenza 2019) and the like have survived well and hundreds of specimens have been found. There are also various metal objects such as mirrors and bronze pins. Other objects include cylindrical seals and stamp seals (Fig. 73: 12).

Another group of objects includes large stone and marble beads and various tools A number of clay objects were found, the most prominent of which are very small miniature vessels (Sajjadi 2017) (Fig. 74: 1-15).

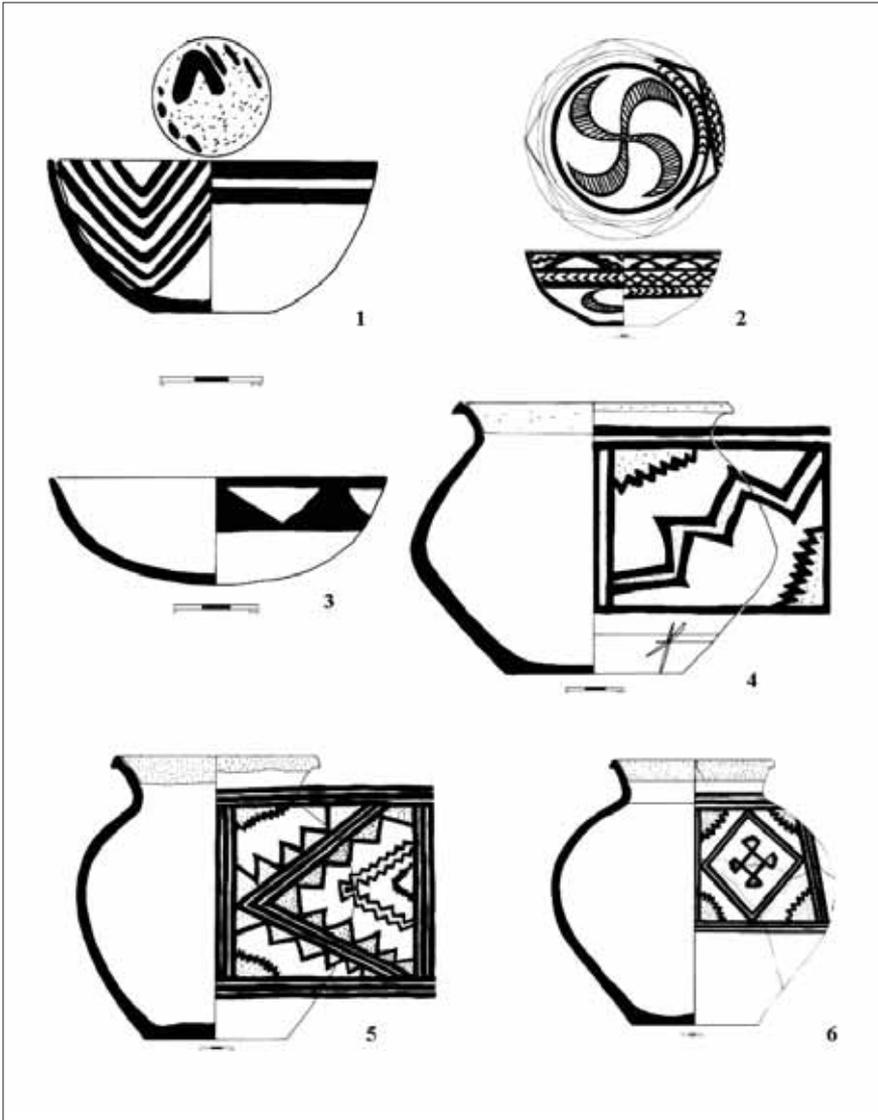


Fig. 71: Grey and Polychrome Ware: 1. G.N.6710/4; 2. G.N.7809/4; 3. G.N.7809/1; 4. G.N.7814/5; 5. 6703/3; 6. Trench NAW. Surface finds.

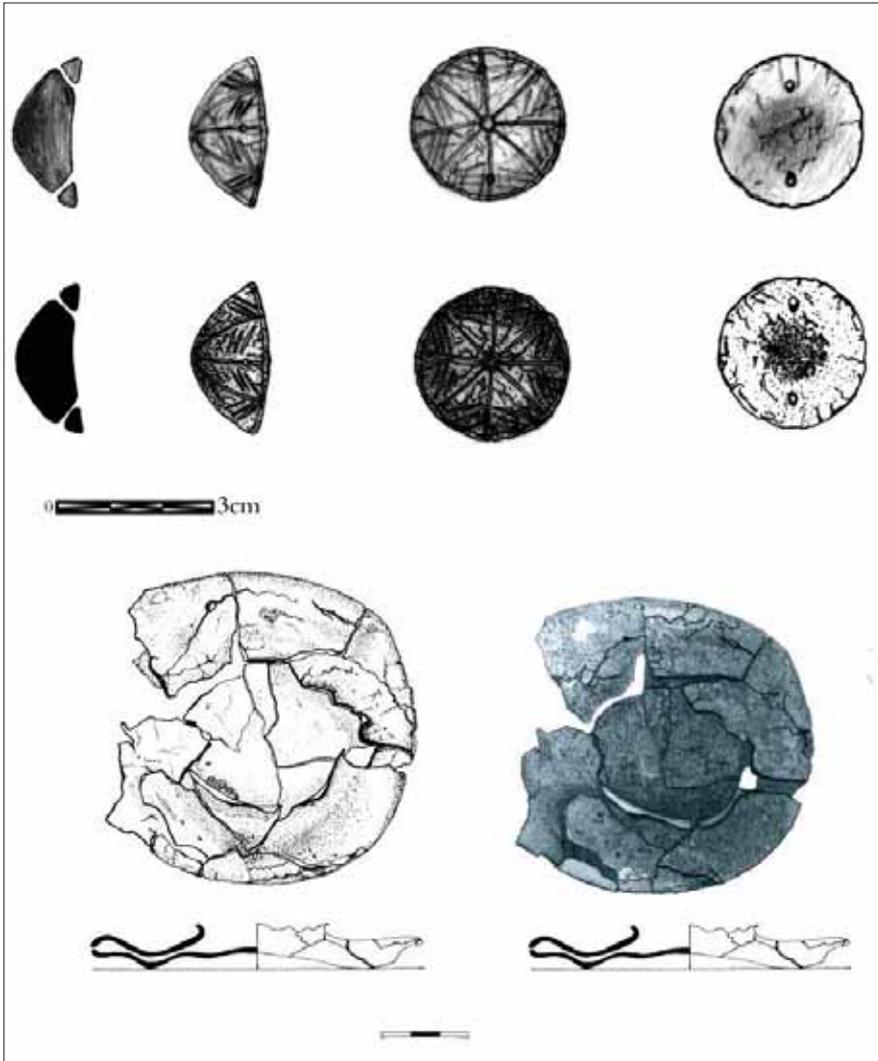


Fig. 72: G.N.6705. Above: artificial hemispherical eye; below: protective leather pouch.

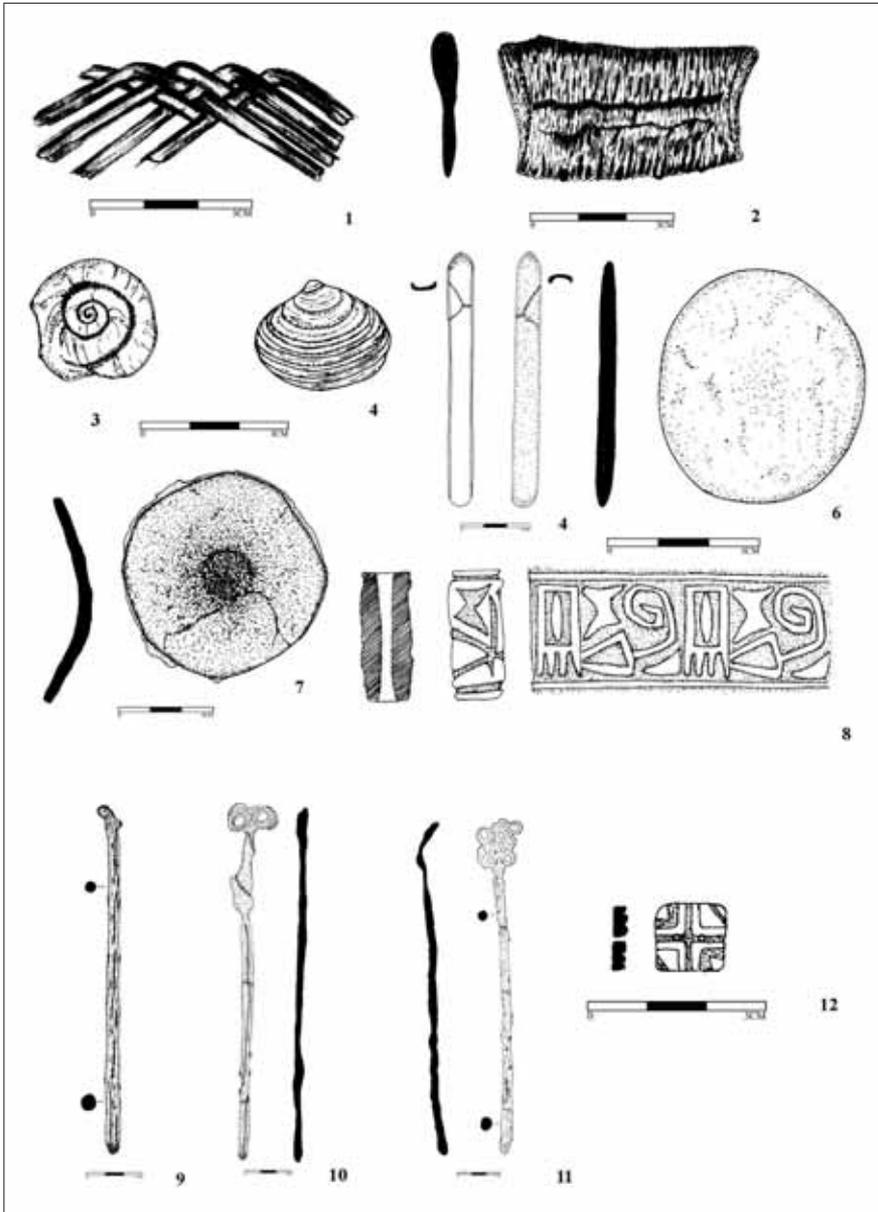


Fig. 73: 1. G.N.6700/7; 2. G.N.6709/3; 3. G.N.6905/8; 4. G.N.6905/7; 5. G.N.6708/3; 6. G.N.6905/4; 7. G.N.6705/30; 8. G.N.6708/1; 9. G.N.6709/1; 10. G.N.6808/2; 11. G.N.6905/6; 12. G.N.6905/10.

Other objects are made of marble. Most items in this group are bowls, tall and short cups and legged cups (Fig. 75: 1-9). The last group of objects recovered from the burials in the current season are beads made of various types of semiprecious stones, either individually or in combination with necklaces or wristbands (Fig. 76: 1-10). The materials include azure, turquoise, agate and calcite.

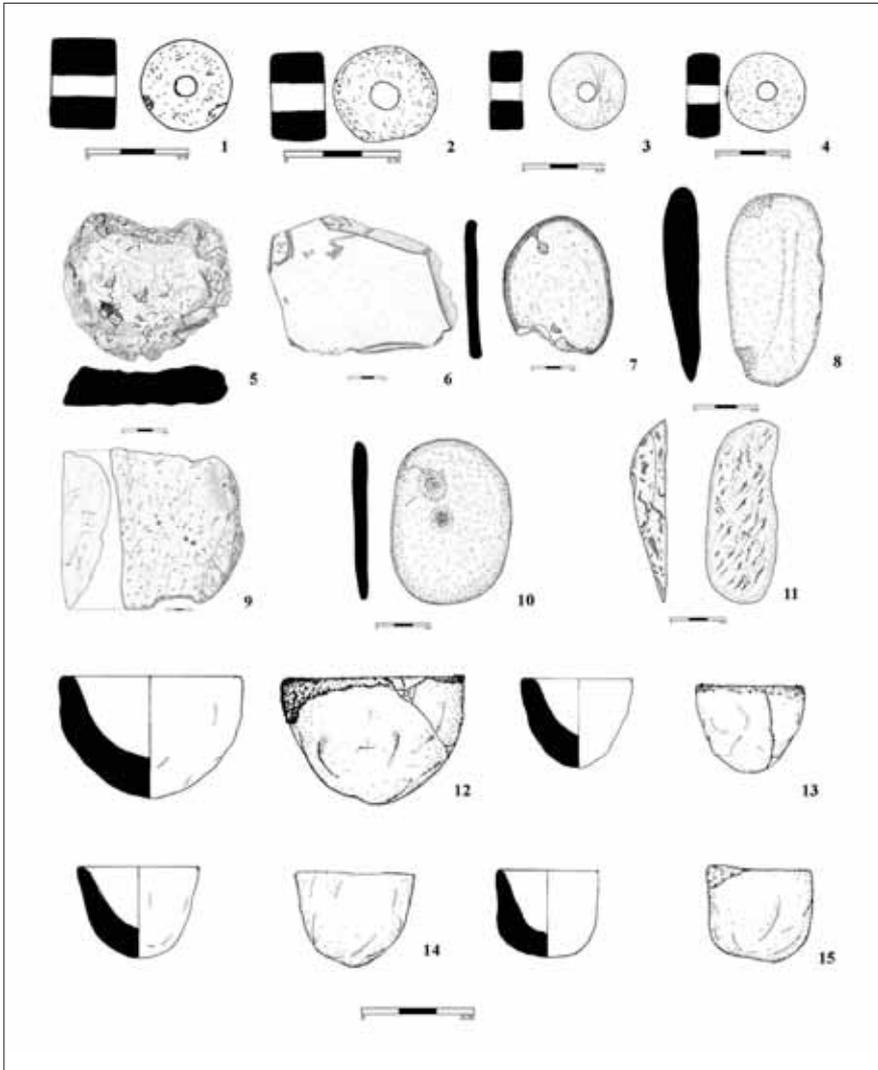


Fig. 74: 1. G.N.6705/15; 2. G.N.6808/5; 3. G.N.6905/5; 4. G.N.6704/11; 5. G.N.6704/0; 6. G.N.7703/2; 7. G.N.6710/5; 8. G.N.6708/4; 9. G.N.6803/5; 10. G.N.6809/7; 11. G.N.67041/4; 12. G.N.6700/2; 13. G.N.6700/3; 14. G.N.6700/4; 15. G.N.6700/5.

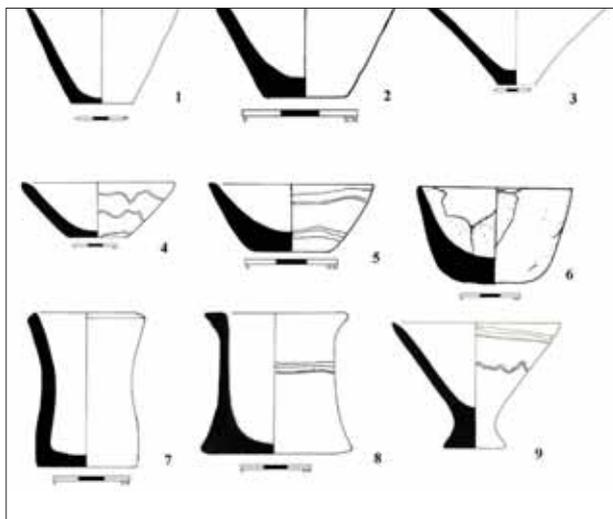


Fig. 75: 1. G.N.6703/4; 2. G.N.6700/1; 3. G.N.6905/9; 4. G.N.7818/1; 5. G.N.7805/2; 6. G.N.6703/15; 7. G.N.6905/3, 8. G.N.7817/13; 9. G.N.7809/6.

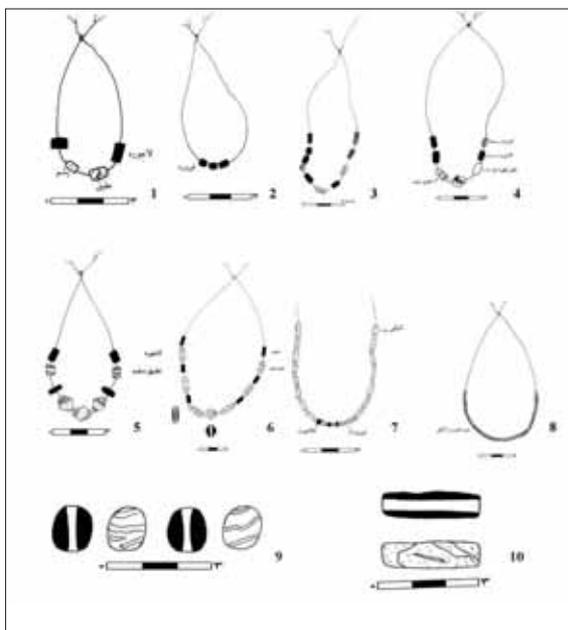


Fig. 76: 1. G.N.6700/6; 2. G.N.6802/6; 3. G.N.6705/28; 4. G.N.6709/16; 5. G.N.7705/3; 6. G.N.7809/9; 7. G.N.6804/6; 8. G.N.6800/2; 9. G.N.6804/5; 10. G.N.6707/15.

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Workshop n. 20: A Public House at Shahr-i Sokhta

Hossein Moradi

Iranian Center for Archaeological Research

h_moradi57@yahoo.com

Abstract

Building No. 20 is located 200 metres northwest of Building No. 1 in the east of the industrial sector, northeast of the cemetery, in squares K'NA, KNB, KNF and KMA. The building is a rectangular structure 20 by 15 metres oriented north-south. Excavations in this area revealed 12 rooms enclosed by mud brick walls with white and red coatings around the entrances, consisting of an ochre-red undercoat and a white top coat. This type of decoration has not been found in any other excavated building at Shahr-i Sokhta. In addition, there are two large fireplaces, one located in Room 4 and the other in Room 5, measuring 115 by 113 centimetres bounded by walls with a wavy profile. No particular cultural artefacts were found inside the spaces of this building, which was abandoned after a short period of occupation. The excavation shows that we are dealing with a public building, such as a small temple, in use in the late third millennium BC.

1. Preface

Shahr-i Sokhta is located in the Sistan plain in the southern part of the Hirmand

Delta with a residential area of more than 100 hectares. This ancient city witnessed four interconnected cultural periods from second half of the fourth millennium to the late of the third millennium BC. The 'Residential Area' of Shahr-i Sokhta is divided into the 'Eastern Residential Area', the 'Central Quarters' and the 'Monumental Area', with the 'Industrial Area' to the west and the necropolis to the southwest. Little evidence of industrial activity has been found in the 'Residential Area', although household activities did include craft production during periods III and IV. After more than half a century of excavations, by the Italian mission in the 'Eastern Residential Area' and 'Central Quarters' (Tosi 1983: 102-125; Salvatori - Vidale 1997: 8-25) and the Iranian expedition (Sajjadi - Moradi 2014; 2016; Moradi 2021a) in the 'Monumental Area', 'Central Quarters' and 'Eastern Residential Area', a relatively clear view of the architectural styles - in some cases with general and detailed features of construction - has emerged (Mariani 1992: 183-193; Moradi 2020a: 63-69). The work carried out in connection with the residential quarters includes research into Building No. 1, conducted within an area of 1600 square metres in the 'Monumental Area', located in the northern part of the 'Residential Area' from 1999 to 2009 (Sajjadi - Moradi 2014: 77-79); excavations of Building No. 5 within an area of 200 square metres in the north-eastern sector; research into the 'Industrial Area' in 2001 and 2002 (Moradi 2020b: 125); excavations in Building No. 20 within an area of 400 metres in the northern sector (Moradi 2020b: 127); excavations in Buildings No. 26 and No. 28 within an area of 1000 square metres in the 'Central Quarters' (Sajjadi - Moradi 2017: 152-164); and a number of smaller trenches and investigations of various structures in the 'Residential Area'.

2. Location

As mentioned, in the northern part of the 'Residential Area' (the 'Monumental Area'), evidence of settlement from the middle of period II to IV has been found. Workshop No. 20 is located on a semi circular mound with a diameter of 20 meters, in squares K'NA, KNB, KNF and KMA, and it corresponds roughly to a 20 × 15 metre-rectangle oriented north-south.



Fig. 1: location of Building No. 20 in Shahr-i Sokhta.



Fig. 2: Building No. 20 before excavation.

3. Excavation in Building No. 20

Building No. 20 is divided into 12 architectural spaces divided by walls made of raw clay bricks with white and red coating arranged on a north-south axis. The walls are right-angled and perpendicular to each other, coated with white soil and a layer of ochre at the entrances to the spaces. Some of these spaces have 2, 3 or 4 entrances. The main entrance to the building is blocked off with mud bricks (Figs. 4 and 5).

Except for a few cases, the walls with entrances have two layers of coating, which includes an undercoat of ochre-red and a top coat of white, which were probably applied in two periods separated by a short time interval (Fig. 9). Such decoration has not been seen before, and a very thick white coating is used only in Workshop No. 26 (Sajjadi - Moradi 2017). No special cultural artefacts were found inside the spaces of Building No. 20. It seems that the building was abandoned after a while for a specific motive, after which the building was filled with sand and roof debris that has protected this construction until the modern day.

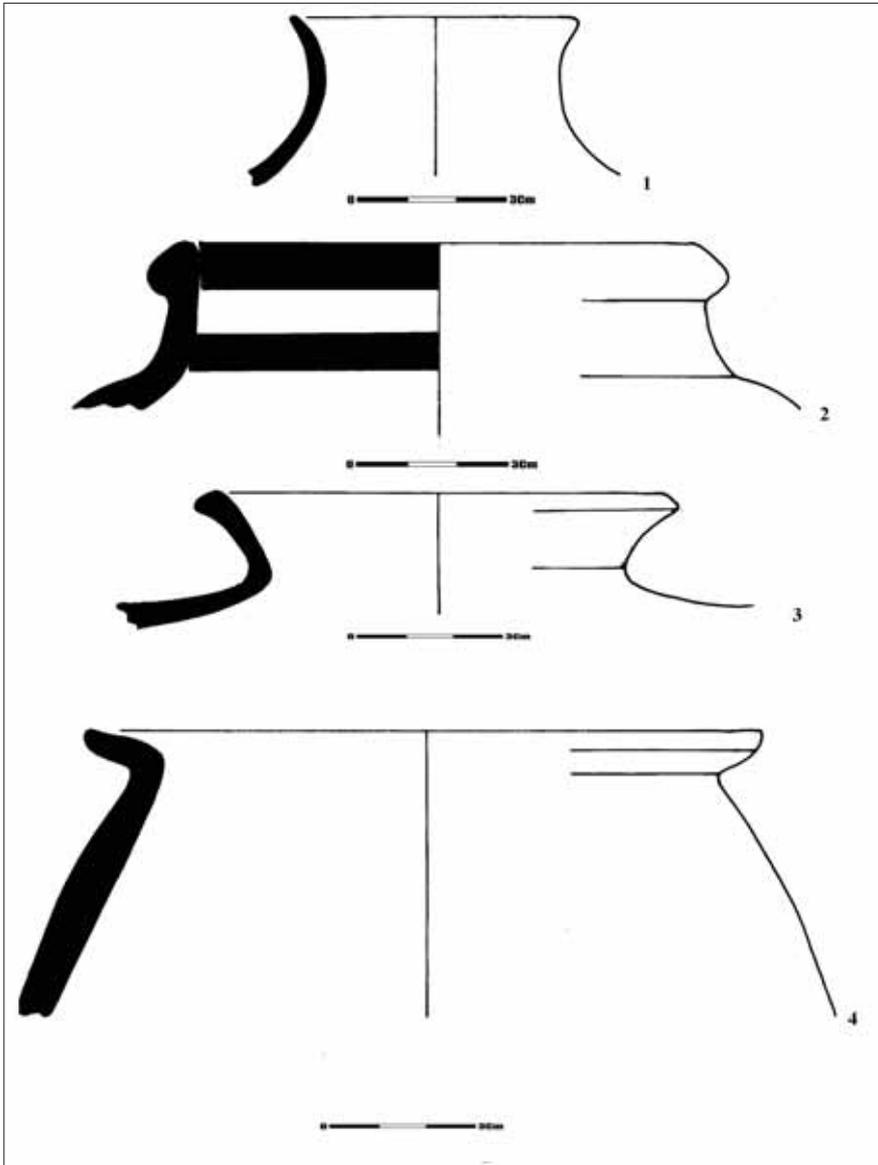


Fig. 3: pottery found on the surface. Wheel-made, soft sand temper: 1, 3, 4. Unpainted brick-coloured jars; 2. Painted brown on Buff Ware jar.



Fig. 4: Building No. 20, seen from the northwest.

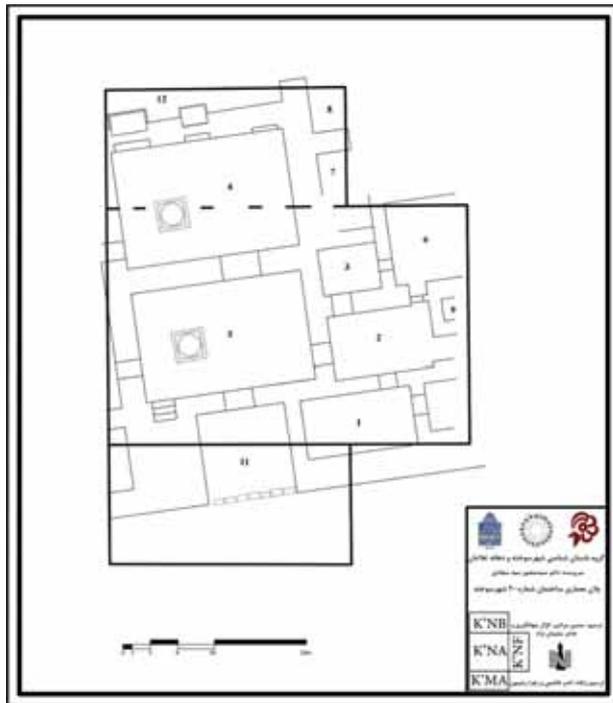


Fig. 5: the floor plan of Building No. 20.

Space No. 1

This rectangular space measuring 250×442 cm is located in the southeast corner of Building No. 20. Oriented east-west, its entrance on the north side connects it to Space No. 2, and another entrance on the east side connects it to Space No. 10. The interior walls of this room are covered in a white coating while the entrances are coloured with red ochre. There are two niches on the northern wall of this space and the main entrance to the building is located on its western side (Fig. 6).

Space No. 2

This space is located on the east side of Workshop No. 20 and is a rectangular room oriented east-west. All four main walls of the room have two entrances. The north wall has two entrances, of which the eastern entrance is blocked with a brick wall. The walls of the room have a white coating and the entrances have an undercoat of red ochre with a white coating on top. On the north side of Space No. 2 is a concavity with a depth of 8 cm. Space No. 2 is connected via entrances on the north side to Spaces No. 3 and No. 8, on the east side to Space No. 9, on the south side to Space No. 1 and on the west side to Space No. 5 (the central room) (Figs. 7-8).

Space No. 3

This space is a quadrangular room oriented east-west, connected by entrances to Space No. 2 on the south side and to room 8 on the east side (Fig. 9). It should be noted that the entrance in the eastern wall was probably blocked with mud bricks in the same period as the building was in use. The western wall is shared with Space No. 5 and the northern wall with Space No. 6, although there is no entrance on that side. In the southeast corner of this space, debris of fallen mud bricks with unknown dimensions can be seen. Among the debris in this space, a large quantity of animal bones was found.

Space No. 4

This space is located in the northern part of Workshop 20. It is a rectangular



Fig. 6: Spaces No. 1 and No. 11. Niches and ochre coating of the entrance.



Fig. 7: Space No. 2. A brick next to the entrance to mitigate the difference in height between the doorway and the floor.

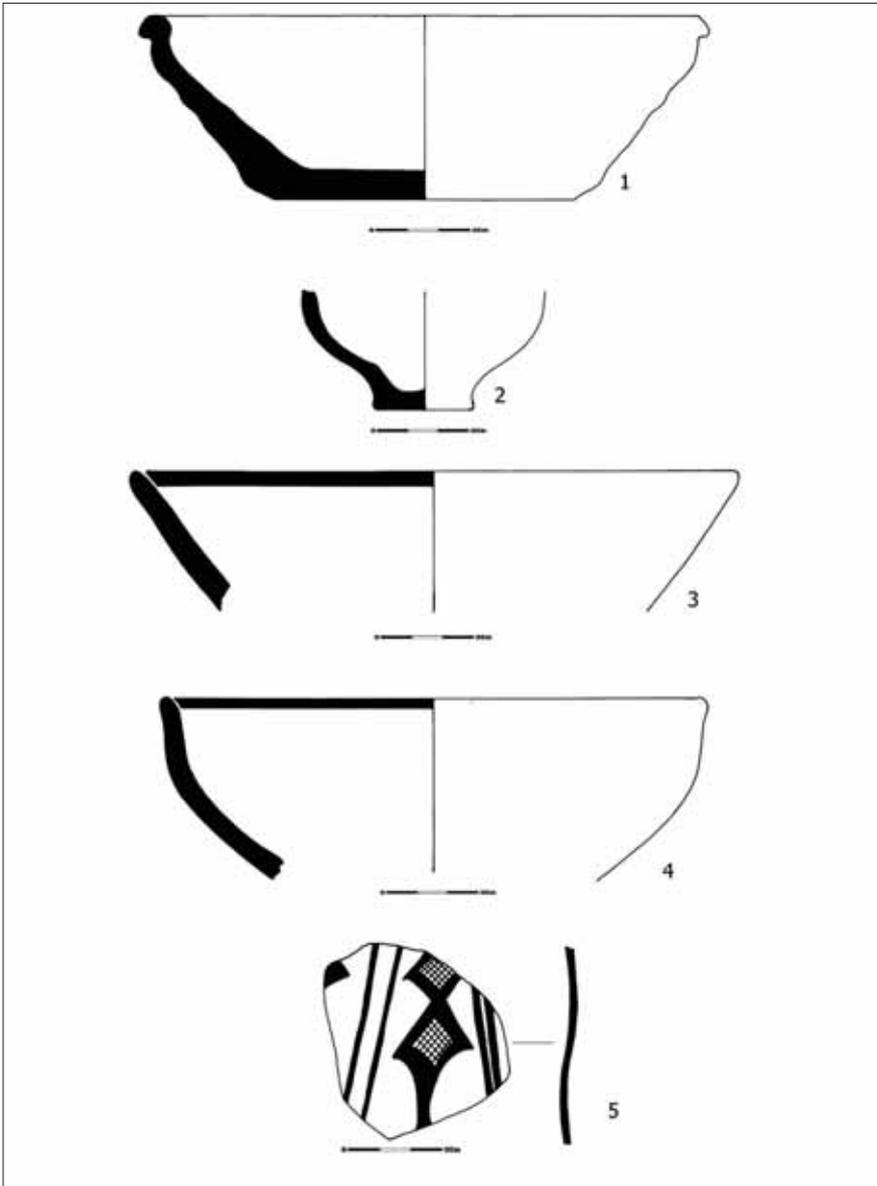


Fig. 8: pottery fragments from Spaces No. 1 and No. 2, layer 1. Wheel-made, fine sand temper. Space No. 1: 1. Unpainted Buff Ware bowl; 2. Unpainted Buff Ware beaker. Space No. 2: 3-4. Painted brown on Buff Ware bowls; 5. Painted brown on Buff Ware beaker.



Fig. 9: Space No. 3 next to a pottery deposit.



Fig. 10: doorway connecting Spaces No. 2 and No. 3 with ochre and white coating.

space oriented east-west, the north, south and west walls of which have entrances (Fig. 11). The north wall of this space has three entrances which seem to have been blocked with mud bricks at a later time and then covered with white mud (Fig. 14). The thresholds of all three entrances are approximately 15 to 20 cm higher than the main floor of the space. When the above-mentioned entrances were blocked off, the bricks were laid 20 cm from the inner surface of the walls, forming niches. No materials or objects or traces of heating are seen inside these niches. The walls of the space are coated with white mud and the entrances are coated with two different layers: The underlying layer is ochre-coloured and the upper layer is composed of white mud. Set in the southern wall of Space No. 4 is a large doorway measuring 160×107 cm, the largest entrance to Space No. 5. The threshold of this entrance is 30 cm above the main floor of Space No. 4 (Fig. 13).

In the southwest corner of Space No. 4, a rectangular hearth measuring 113×115 cm surrounded by a low wall rising in the corners made of rammed earth with a white coating, was located. The firepit, 20 cm diameter in the middle of the hearth, is much smaller than the hearth itself. No trace of ash or charcoal was seen around this hearth (Fig. 12). This is the largest hearth ever found at Shahr-i Sokhta, much larger than the standard-size hearths at the site. The shape of the outer edges of this hearth is also different from other hearths, which have a simple vertical protection wall. In Space No. 5, another, similar, hearth was discovered. Traces of heating are visible on the northern part of the floor of this space, next to the entrance to Space No. 4.

Space No. 5

This space is located in the centre of workshop No. 20 and is a quadrangular room that has entrances on all four sides. Due to its size and location in the building, it seems to be the main room, with access to other interior spaces (Fig. 17). Inside the space, very cohesive and compacted clay and mud debris with an approximate thickness of 85 cm was observed. Space No. 5 (the central room) has entrances in the walls on all four sides of the room: on the north side to Space No. 4, on the



Fig. 11: Space No. 4 and related structures.



Fig. 12: Space No. 4. Large hearth.



Fig. 13: the ochre coating of the doorway connecting Spaces No. 4 and No. 5.



Fig. 14: Space No. 4. North wall with wide niches.

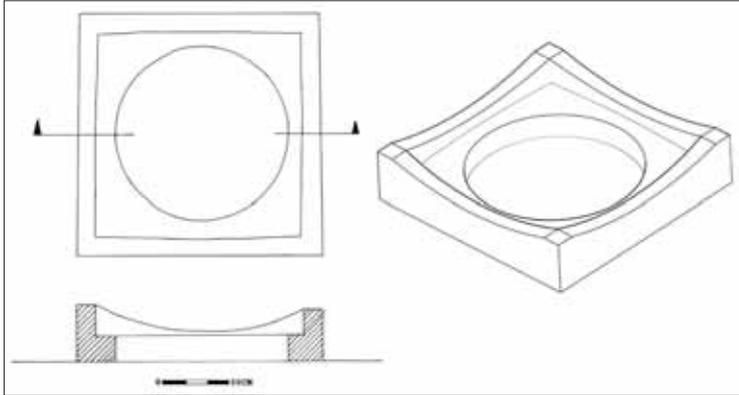


Fig. 15: Space No. 4. Drawing of the large hearth.

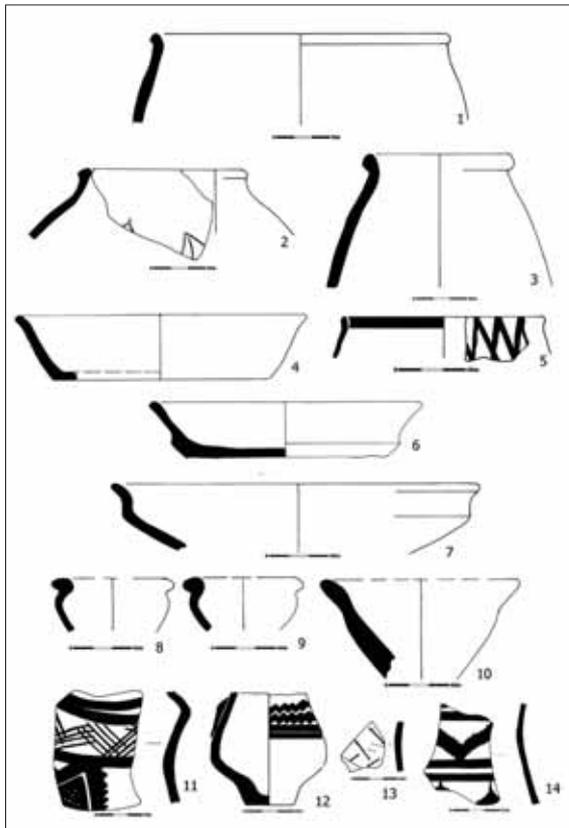


Fig. 16: Space No. 4. Pottery from Layer 1. Wheel-made, fine sand temper: 1-3. Unpainted brick-coloured/Buf Ware jars; 4, 6, 8-10. Unpainted Buf Ware bowls; 5. Painted brown on Grey Ware jar; 7. Brick-coloured bowl, red slip; 11, 14. Brick-coloured/Buf Ware, painted brown on body; 12. Buf Ware beaker, painted brown; 13. Buf Ware, painted brown on body.

east side to Space No. 2, on the south side to Space No. 11 (the entrance space) and on the west side to unexplored spaces (covered with mud bricks). The walls of this room are covered with white mud and the entrances have a layer of ochre covered by a layer of white. The thresholds of the entrances are located on a level above the floor of the room, almost facing each other. The entrance in the northern wall of the room is the largest of this space. In the southwest corner, three brick steps measuring 28×92 cm were excavated. They are probably part of a staircase connecting this space to the roof, although only clay and mud debris are visible. The width and length of the steps are the same but the height varies: $92 \times 28 \times 30$ cm, $92 \times 28 \times 34$ cm, $92 \times 28 \times 16$ cm. In addition, in the southwest corner, Space No. 5 has a rectangular hearth, like the one found in Space No. 4, with crescent-shaped walls 12 cm thick covered with white mud, 116 cm long, 120 cm wide and 20 cm high. Unlike the hearth in Space No. 4, inside the fire box of the hearth in Space No. 5, a large volume of ash and charcoal had accumulated (Figs. 18-19).

Space No. 6

This space is a square room in the north-eastern part of Workshop 20. The north-western section of this space, measuring 130×145 cm, and the south-eastern section, measuring 130×170 cm, have been excavated, while the eastern part remains unexcavated and its entrance has not been determined. Inside this space, which is filled with sand and alluvial deposits, charcoal, ash and pottery fragments have been found. The arrangement of pottery fragments on the floor of this space indicates that it was probably used as a storeroom for food (Fig. 21). As mentioned before, the pottery fragments belong to the vessels deposited in this building that were then buried due to the collapse of the roof. The pottery fragments form a layer 40 cm thick. The pottery is divided into some of which is comparable with specimens from Shahr-i Sokhta IV, particularly those of Phase 2 (Fig. 23).



Fig. 17: Space No. 5, central room. Stairs and large hearth



Fig. 18: Space No. 5. Large hearth.



Fig. 19: Space No. 5. Large hearth and stairs in the southwest corner.

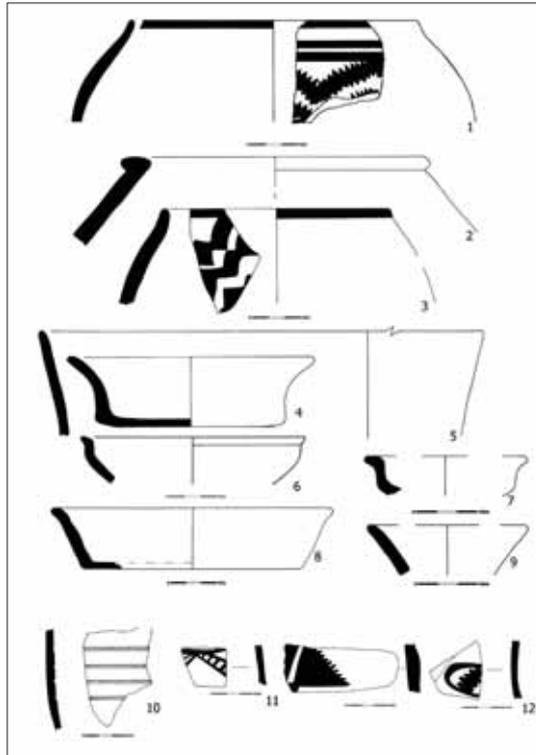


Fig. 20: Space No. 5. Pottery. Wheel-made, fine sand temper: 1, 3. Painted brown on brick-coloured pottery jars; 2. Unpainted Buff Ware jar; 4, 6. Unpainted brick-coloured bowls; 7. Unpainted brick-coloured bowl with red slip; 8-9. Unpainted Buff Ware bowls; 10. Unpainted Buff Ware body fragment with incised lines; 11-12. Painted brown on Buff Ware body fragments.

Space No. 7

This space is a quadrangular room oriented east-west. The southern side is connected to Space No. 6, while the other parts remain unexcavated. Inside the excavated parts, traces of heat, ashes and charcoal can be seen and next to the western wall a large Buff Ware jar was placed. The soil of this space is different from that of the other spaces and it consists of mud and debris with pottery fragments (Figs. 22 and 24).

Spaces No. 8, No. 9 and No. 10

Spaces No. 8, No. 9 and No. 10 are located on the east side of Workshop 20 and are rectangular rooms oriented east-west that have been washed away and destroyed due to being in the path of surface rainfall runoff. The western wall of Space No. 8 has an entrance coated with ochre and white mud, which connects this area to Space No. 3. The south wall had an entrance connecting it to Space No. 2 that was later blocked with mud bricks (Fig. 25). Space No. 9 is connected to Space No. 2 on the west side and to Space No. 8 on the north side and has not been fully excavated. Accumulation of ash and sand was observed inside the space. Space No. 10 is bounded by Space No. 2 to the north and its western wall is connected to Space No. 1 through an entrance (Fig. 26).

Space No. 11

Space No. 11 is a vestibule oriented north-south. The northern wall has an entrance that connects this room to Space No. 5. This entrance is 115 cm wide and is covered with a layer of ochre and a layer of white mud. This space was filled with dune sand and had no cultural material. Space No. 11 is also connected to Space No. 1 on the east side. The southern side of Space No. 11, which originally formed the main entrance to Building No. 20, is blocked with bricks measuring $12 \times 24 \times 47$ cm, in a single row without any mortar. This is a very special point concerning the abandonment of the building, because so far in Shahr-i Sokhta such a closure of the main entrance to a building has not been observed. Indeed, in all other cases, the entrances have been completely blocked with clay and



Fig. 21: Space No. 6. Pottery fragments mixed with collapsed debris.



Fig. 22: Space No. 7. The broken jar *in situ*.

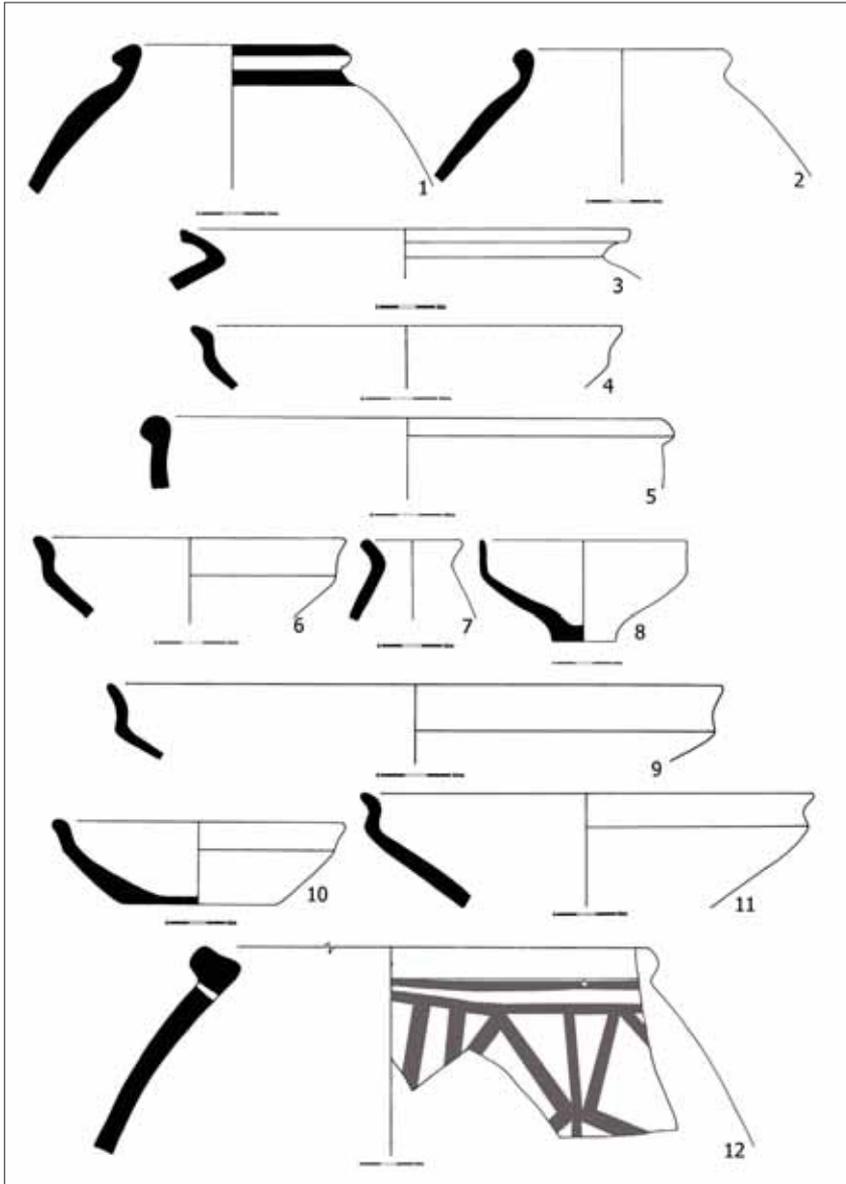


Fig. 23: Space No. 6 Pottery. Wheel-made, fine sand temper: 1. Painted brown on Buff Ware jar; 2. Unpainted Buff Ware jar; 3. Unpainted Buff Ware jar with brown slip; 4-6, 9, 11. Unpainted brick-coloured bowls; 7. Unpainted Buff Ware beaker; 8, 10. Unpainted Buff Ware bowls; 12. Polychrome jar.

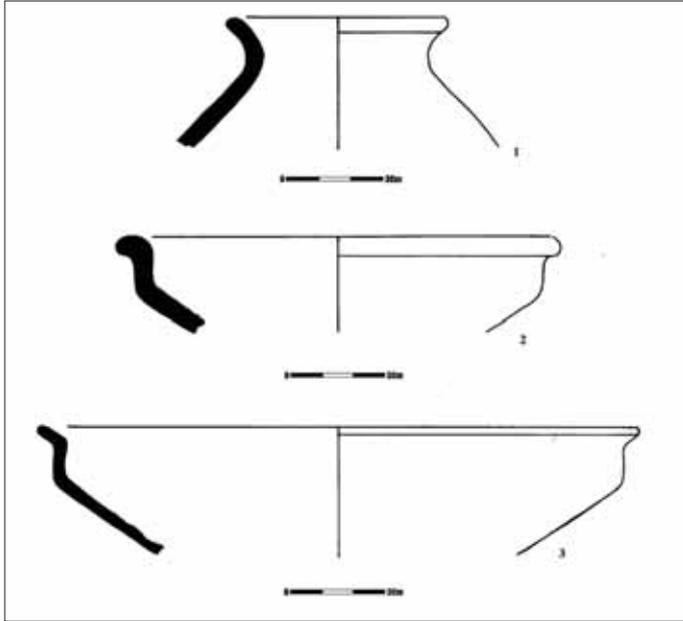


Fig. 24: Space No. 7 Pottery. Wheel-made, fine sand temper: 1. Unpainted Buff Ware jar; 2-3. Unpainted Red Ware bowls.



Fig. 25: Space No. 8. Filled with runoff sediments due to its proximity to a water course.



Fig. 26: Space No. 9. Unexcavated space.

mortar and masonry, while in the case of Building No. 20, it seems that a simple row of bricks was enough (Fig. 27).

Space No. 12

Space No. 12 is located at the northern end of Workshop 20, adjacent to Space No. 4 (Fig. 28). The southern wall of this space had three entrances to Space No. 4, which were subsequently blocked off. Next to these entrances were two buddle-like structures made of rammed earth, in which a few animal figurines (cows, pigs), a number of counting tokens made of baked clay and four clay fragments related to wall decorations were found (Fig. 29). In addition, a large volume of animal bones was found inside this space next to the buddles. It seems that these buddle structures lay outside the original building, in this case being built sometime after it was abandoned. They are probably related to the layer associated with the late period IV pottery found in the north-eastern part of the building. The type of closure of the three entrances is in line with those of other buildings at the site. It was executed not when the building was abandoned but



Fig. 27: Space No. 11. The main entrance to the building closed off by one row of mud bricks.

shortly afterwards, when the two related buddles were built just outside it. The shape of the two buddle is also different from the main construction style of the building, which is highly regular, geometric and based on the previous design, while the buddles were built irregularly and hastily.

4. Stratigraphy

Evidence from Building No. 20 indicates that it was deliberately abandoned and may have been used only in one short phase (Sajjadi - Moradi 2016: 104-107). For reasons that are not clear to us, the building was no longer used after this abandonment and was filled with sand over time. On the margins of the building, in Spaces No. 7 and No. 8, limited pottery evidence has been found which shows that a more recent layer, about which little is known, formed on the margins of the building after its abandonment, which probably corresponds to a very short period of occupation (Figs. 23, 24 and 30). Evidence of such a layer is documented on the basis of several Buff Ware and dark red pottery fragments



Fig. 28: Space No. 12. Baddles and other related structures.



Fig. 29: Space No. 12. Buddle No. 1 (Western wall) built just behind Niche No. 1 of Space No. 4, probably added at a later time.

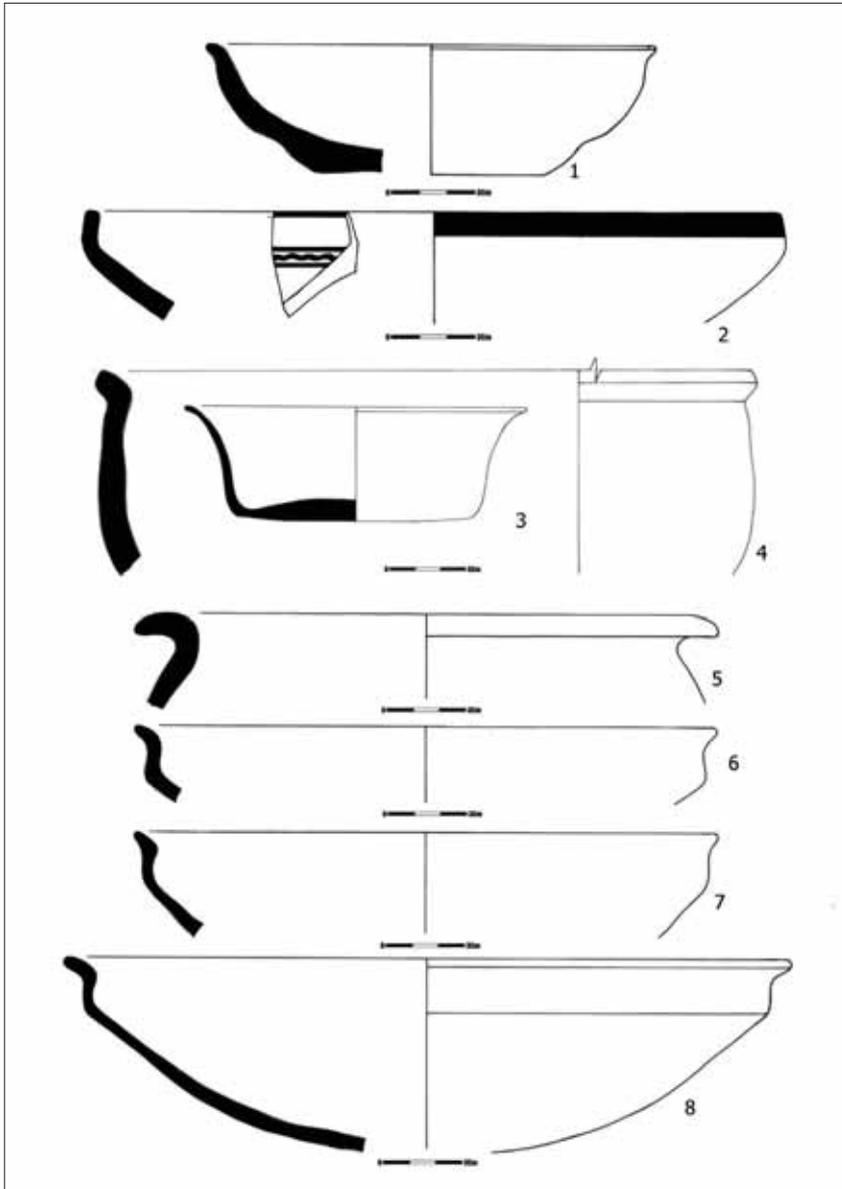


Fig. 30: Space No. 12, layer 1. Pottery. Wheel-made, fine sand temper: 1. Unpainted brick-coloured bowl; 2. Painted brown on brick-coloured bowl; 3, 4, 6, 8. Unpainted Buff Ware bowls with brown slip; 5. Unpainted Red Ware jar with brown slip.

which were later found on the outskirts of Building No. 26 and on a number of hillocks around Shahr-i Sokhta (Sajjadi - Moradi 2016: fig. 11). These pottery fragments are made from a dark reddish paste and belong to a shiny polished body that has vertical edges flaring outwards and is very similar in construction and shape to specimens of the Parthian in Sistan. This type of pottery has been recovered from the satellite areas to the southeast of Shahr-i Sokhta such as Tepe Taleb Khan, Tepe Yalda, Tepe Graziani (Kavosh *et al.* 2019: fig. 124. 14-17) and a number of other sites such as No. 19 and No. 20. Dating this pottery is difficult due to the lack of excavations in these layers. However, based on the shape of the pottery it can be concluded that it probably belonged to Phase 0 of Shahr-i Sokhta i.e. 2300-2000 BC, or even a little later (Moradi *et al.* in this issue).

Layer 1 in Workshop 20 is the only standard building layer that is identified with the floors of the excavated Spaces No. 4 and No. 5. The layer on these floors includes two sub-layers, of which the upper one consists of soil, debris, clay and mud and the lower one sand. As mentioned earlier, this is the result of the destruction and erosion of the building over time by rain, wind and other atmospheric agents, which has left a dense crust of clay, mud, soil, pottery and plant and bone remains. The thickness of this layer varies and in Spaces No. 4 and No. 5 it reaches approximately 60 to 70 cm, thicker than elsewhere. The cultural artefacts and materials of this stratum are very small and include only unpainted pottery fragments, clay slingshot bullets and a few stone tools. Excavation of Spaces No. 4, No. 5 and No. 12 did not reveal any traces of wooden roof beams, and the wide dimensions of these spaces rule out the possibility of them being covered. The debris on the building floor forms a thick layer of sand.

The architecture of layer 1 is one of the best examples in Shahr-i Sokhta, which is known for its double-lined and right-angled walls (Figs. 31-32). This architecture includes walls with a thickness of approximately 70 to 80 cm, which are covered with white mud, creating a very smooth and even surface. In the entrances to the building, a light ochre coating can be seen under the white mud, which most likely belongs to the unexcavated lower layer. This building has various elements such as the central room, side rooms, courtyard, storage room

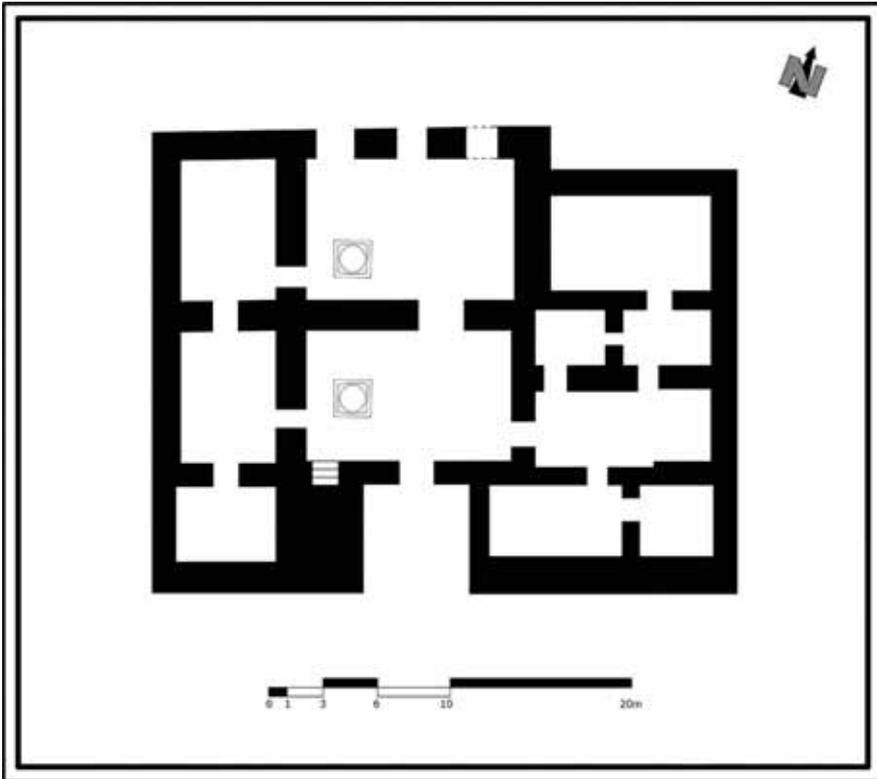


Fig. 31: reconstruction of the floor plan of Building No. 20.

and stairs that probably reach the roof, and in this respect it is very diverse and impressive. The material used to build this layer is unbaked clay. The architecture of this building includes a main entrance between two supporting walls on the south side, i.e. in the lee of the prevailing winds, preventing the wind from blowing into the space of the central room (Space No. 5). The main entrance opened on to a vestibule, which created a kind of initial separation from the surrounding spaces. From the vestibule, a doorway led to Space 5, from which all the other spaces in the building could be reached. There is a courtyard to the north with three recesses or false doors, which also marks the northern border of the building. On the east side there is a small space in the form of a storeroom and on the west side there is a staircase that leads to the roof.

5. Cultural materials

The only space containing cultural materials in any quantity is Space No. 12 in the north of the building, beyond the north wall, which contained two buddles. Here, five zoomorphic figurines, clay counting tokens and a large shell were found. The buddles do not seem to be related to the main context of the building and represent one of the extensions of the building after it was abandoned. Therefore, the only cultural material that can be examined in connection with Building No. 20 is pottery (Figs. 34-35). The cultural materials of Space No. 5 are more diverse than other spaces and include six pieces of cow figurine and one female figurine, a fragment of a cross-shaped stamp seal made of soapstone, a few pieces of beads made of lapis lazuli, calcite and limestone, a seal impression, a number of slabs, a perforated spindle whorl and clay counting tokens. Most of these objects were found on the surface layer of this space, and as we got closer to the floor of the building, the density of cultural materials decreased. Eight slingshot bullets and two clay counting tokens were found in Space No. 4. The density of slingshot bullets in Space No. 4 is significant compared to other spaces.

The pottery related to Layer 1 is in two spectra, i.e. Buff and Red Ware. Red Ware is one of the more significant products of Phases 3 and 2 of Period III and probably Period IV. It consists of shallow bowls with everted rims and a slight carination (Moradi in press). Samples of Red and Buff Ware without this carination, which are comparable to the final phases of Period III, have also been found. The Buff Ware of this layer is generally unpainted and the patterns are limited to linear geometric lines. Other notable pottery specimens found along the edges of this building include quasi-historical specimens that contain only a few fragments of Red and Buff Ware. Red Ware vessels have everted rims and a delicate texture with an ochre or brown slip. Two fragments of Buff Ware with grooves and parallel stripes were also found.

This type of pottery was not found in the main rooms but in a small area on the eastern side of the building, and it may belong to a later period of occupation on the margins of the building. It makes sense to assume that these ceramics are not related to the stratigraphic unit associated with the main Building No. 20.



Fig. 32: Building No. 20. Aerial image after excavations and preliminary restoration.



Fig. 33: Building No. 20. Reconstruction by N. Hashemi Golshanabadi.

Although this kind of pottery has not been found in any of the main rooms of the building, as mentioned above, it has been found in a large number of satellite sites southeast of Shahr-i Sokhta and in the Rud-i Biaban area (Tab. 1).

6. Conclusion

Building No. 20 is located on the north-western edge of the site, and in terms of location, it should be considered part of the 'Residential Area' of Shahr-i Sokhta, which seems to have been inhabited mainly in Period III. The location of the building in the 'Residential Area' helps to determine its date with reference to comparative studies of pottery. If we look at the development of the urban area in the various periods, we see that the 'Eastern Residential Area', on the eastern edge of the site, is where the pulse of life and urban trends flowed continuously from Periods I to IV. Settlement shifted to the west and northwest from the middle of Period II onwards, from the 'Eastern Residential Area' towards the 'Central Quarters' and the 'Monumental Area'. Later, with the gradual increase in population, the shift towards the northwest of the site increased. Another reason for this change is probably the use of a large lake located between the 'Industrial Area' and the 'Residential Area' in the west of the site. It seems that this lake supplied water to the inhabitants in all periods and had the same function as the modern Huotak in Baluchistan in the absence of rivers. Therefore, due to the increase in population and decrease in sources of water, the central lake became increasingly attractive and the dwellings tended to move towards it. On the other hand, the suburbs allowed the residents of Shahr-i Sokhta to build larger buildings due to the existence of suitable land. However, other issues may have been involved in the formation of the urban sector in the western section of the site. Considering the cultural materials found in this building, of which the pottery is the most important and significant, the construction of this building can be dated to the end of Period III or the beginning of Period IV, around 2300 BC. However, pottery sherds show that the area around the building was used shortly after this date and probably until the end of the occupation of Shahr-i Sokhta. Another reason for the importance of Workshop 20 is the particular architectural



Fig. 34: pottery samples from various spaces.

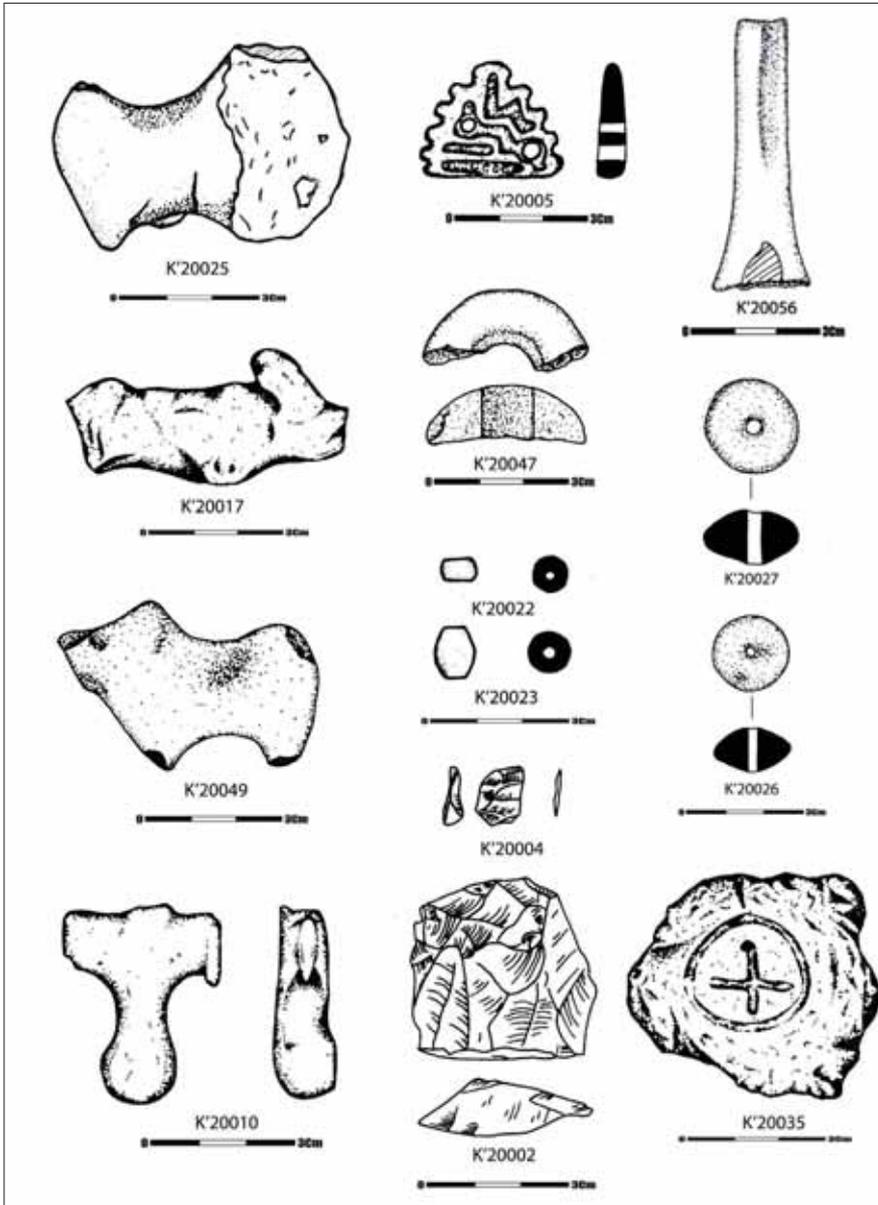


Fig. 35: Building No. 20. Cultural material found in various spaces.

N	Cat. No.	Object	Material	Length	Width	Thickness	Diameter	Space	Square	Depth
2	K20002	Stone Tool	Stone	41	38	16	-	-	K'NA	-
Core in the southern part of the space										
4	K20004	Blade	Stone	11	7	2	-	-	K'NA	10-
Stone blade (microlith)										
5	K20005	Seal	Stone	22	28	4	-	-	K'NA	-
Dentate seal made of soapstone										
10	K20010'	Figurine	Pottery	41	32	12	-	-	K'NA	-
Anthropomorphic figurine										
17	K20017'	Figurine	Terracotta	61	21	20	-	-	K'NB	-
Zoomorphic figurine made of terracotta										
22	K20022'	Bead	Lapis lazuli	5	3	-	5	5	K'NA	70-
Lapis lazuli										
23	K20023'	bead	stone	10	9	-	-	5	K'NA	75-
White stone										
25	K20025'	Figurine	Terracotta	60	21	20	-	5	K'NA	75-
Zoomorphic figurine made of terracotta.										
26	K20026'	bead	clay	19	9	-	19	4	-	85-
A buff-colour clay bead										
27	K20027'	bead	clay	22	12	-	22	4	-	89-
Buff clay bead										
35	K20035'	Seal impression	Clay	150	130	45	-	5	-	145
Cross pattern										
47	K20047'	Spindle whorl	clay	33	14	10	-	12	K044'	-
Spindle whorl										
49	K20049'	Figurine	terracotta	53	25	20	-	12	K 044'K;NB	-
Zoomorphic figurine										
56	K20056'	A tool handle	bone	59	10	5	12	-	-	-

Tab. 1: Workshop No. 20. Small finds from Layer 1.

style. It is a large building in which we encounter structures such as large hearths and ochre-lined walls, which are innovations compared to other buildings in the city. The geometric order and standard shape of its architecture shows the maturity of the architectural style, which is also reflected in Building No. 26, which was probably built at the same time (Moradi 2020b: fig. 19). Building No. 20 has thick walls coated with double layers and large hearths that are too large for daily use. It should also be considered that the abandonment Building No. 20 was deliberate and planned, and the evidence shows that in the after the abandonment, there was no attempt at modification. As in the case of Workshop No. 1, it was not re-occupied, and was simply abandoned, retaining its original form. The main entrance was closed off with just a few mud bricks, showing the inhabitants' respect for this structure.

Another issue is the evolution and transformation of architectural style in Shahr-i Sokhta. The main materials used are unfired clay and mud bricks. The vestibule of the structure is comparable to the Phase E entrance to Building No. 1 in the 'Monumental Area' (Moradi 2020a: 62). The presence of a quadrangular space enclosed on three sides, open only on the south side, and the large entrance on the northern side represent comparable features of the two buildings. The transfer of storage and residential spaces to the eastern or western edges of large buildings is another aspect that can clearly be seen in Building No. 1 (Sajjadi - Moradi 2014). It seems that the construction of this building is the result of the evolution of the architecture of residential structures in Shahr-i Sokhta during Periods II-III, which eventually took on a standard shape. This means that initially, a few rooms were built along the central axis of the structure, with smaller rooms, probably for storage, being built subsequently on both sides of the central building. The entrance is located on the south side, in the lee of the building, opening on to a space with three enclosing vestibule walls. The interesting point in this section is that when the building was abandoned, the main entrance was closed with only a single row of mud bricks placed on the ground: blocking the entrance in the simplest possible way, signalling a ban on entrance, shows the value of the building's location (Sajjadi - Moradi 2014: 84-88). The architecture of this

building includes a main entrance between the two supporting walls on the south side, in the lee of the building so as to prevent the wind flowing into the space of the central room (Space No. 5). After this entrance, the courtyard was located in the northern part, with three recesses or false doors that mark the northern limit of the building. Some spaces have two, three or four entrances, some of which are blocked off with bricks for unknown reasons. All the entrances, except in a few cases, are covered in a red ochre undercoat with white mud on top, which are the only colours used to decorate buildings in Shahr-i Sokhta. In the south-western part of Space No. 4, there is a rectangular stratified hearth, with walls rising in the corners, covered with white mud, measuring 115×113 cm, which probably had a decorative function. The fire box in the middle of this hearth is much smaller than the main volume (Fig. 18). It seems that this hearth, together with a similar example in Space No. 5, was not subject to ordinary usage, because both its dimensions and function are different from other specimens found at Shahr-i Sokhta. A similar example was found during excavations in 2017 in Workshop No. 26, in which the fire box was filled with mudbrick fragments (Fig. 19). The hearths of Building No. 20 are similar in size to the hearth in room number 56 in Building No. 26 and the hearth found in Workshop No. 33, the differences between them being in the shape of the embossed edges of the hearth and the diameter of the fire box. It is interesting to note that in both Workshops No. 26 and No. 33, the entrances to the rooms where the hearths were situated were filled and intentionally closed off.

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Preliminary Report on the 2018-2019 Excavations in Area 33 at Shahr-i Sokhta

Enrico Ascalone

Università degli Studi di Roma Tre

Dipartimento di Studi Umanistici

enrico.ascalone@uniroma3.it; ascalonenrico@gmail.com

Abstract

The MAIPS excavations at Shahr-i Sokhta in 2018 and 2019 revealed an unbroken stratigraphic sequence from Phase 6 to Phase 3. The archaeological evidence collected has allowed us to fully determine the site's paths of development and decline and to make some preliminary socio-historical considerations. Indeed, the aforementioned sequence, the numerous archaeological finds and the reconstructed archaeological associations provide a coherent picture of the site's role within a broader regional system. Area 33 has yielded evidence that cogently explains the historical dynamics affecting eastern and south-eastern Iran during the first half of the third millennium BC, making Shahr-i Sokhta one of the major settlements of the Iranian plateau.

1. Introduction

The excavation and research campaigns carried out in 2018 and 2019 at Shahr-i

Sokhta have given us a more complete picture of the function of ‘Building 33’ and the stratigraphic sequence of the entire area (Fig. 1). The investigations, carried out in November and December of both years, returned an unbroken sequence for the area, which was definitively abandoned during Phase 3 of the settlement (ca. 2450 BC).

Similarly, the recent research has expanded our knowledge of ‘Building 33’ (Ascalone 2019a; 2019b; 2019c), whose eastern extension has now been revealed, and the main buildings of the most ancient phases of the area, i.e. the ‘House of the Courts’ for Layer 3 and the ‘Western’ and ‘Eastern’ buildings for



Fig. 1: topography of Shahr-i Sokhta.

Layer 4. The excavations in Area 33 were combined with bioarchaeological research (palaeoenvironmental, archaeozoological and anthropological; see the relative papers in this volume) and employed non-invasive analysis techniques, including: (1) systematic reconnaissance of the area with the collection of ceramic material, (2) analysis of anomalies identified by geomagnetic survey in 2017 and (3) remote sensing with the aid of drones, satellite images (suitably processed) and Corona photogrammetric images (Figs. 2-8).

Excavations were also carried out throughout the campaign, based on the division of Area 33 into two sectors, thanks to the tireless work of Aida Torseh, Javad Marashi, Silvia Festuccia, Pierfrancesco Vecchio, Rosa Rivoltella, Vittoria Cardini, Ratko Krvavac, Alessia Leone, Giuseppe Minaya and Serena Siena.

2. Stratigraphic sequence, contextual analysis and archaeological associations

In addition to the two stratum units identified in 2017, two other architectural phases have been excavated, making a total of 4 Layers that are believed to have unfolded over a period of 6/7 centuries between 3000 and 2450 BC, as indicated by C14 analyses of material collected in clearly stratified contexts.

On the basis of what has been set out above, the sequence of Area 33 of Shahr-i Sokhta can be summarised as follows (Fig. 9):

Layer 1: 'Building 33'

Layer 2: Squatter occupation

Layer 3a-b: 'House of the Courts'

Layer 4a-b: 'Western Building' and 'Eastern Building'

Layers 3 and 4 each yielded two major architectural sub-phases (3a-b and 4a-b respectively) that are documented by at least two rebuilt floors and structural interventions that changed the internal circulation of the individual dwelling units (particularly in the 'House of the Courts').

This stratigraphic sequence, which occurred between the formation of the first complex socio-economic communities on the Iranian plateau (ca. 3000 BC) and

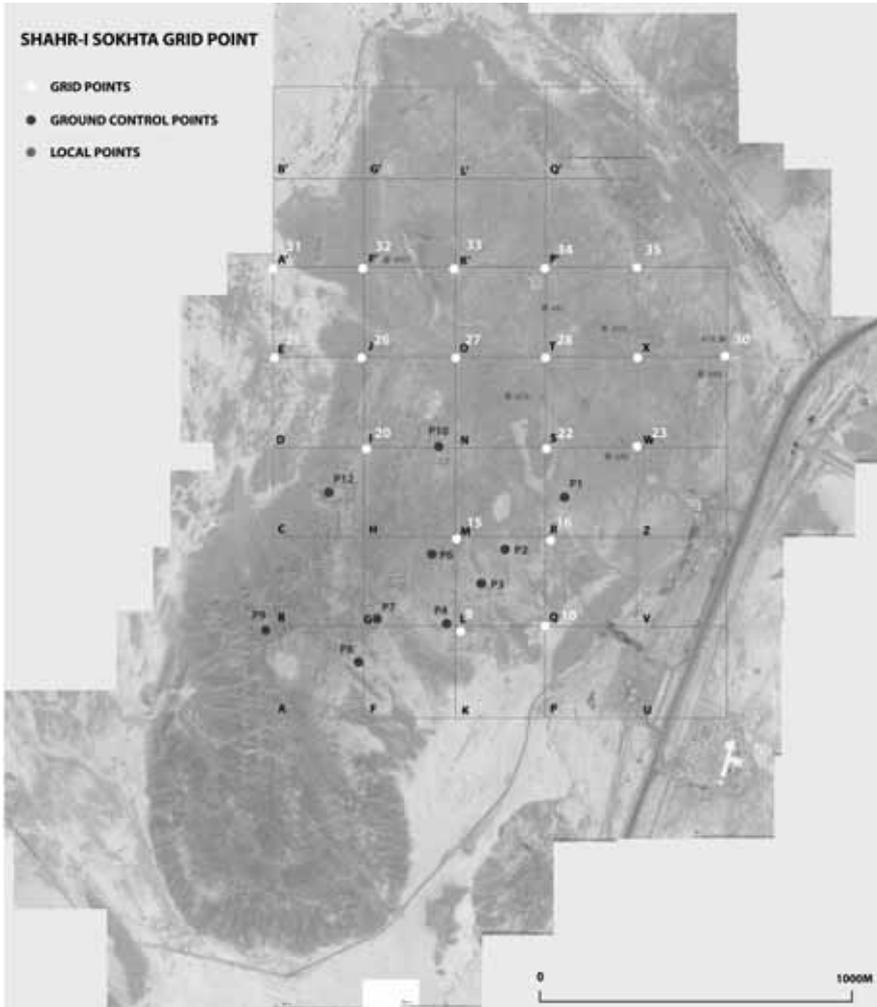


Fig. 2: Shahr-i Sokhta grid point.

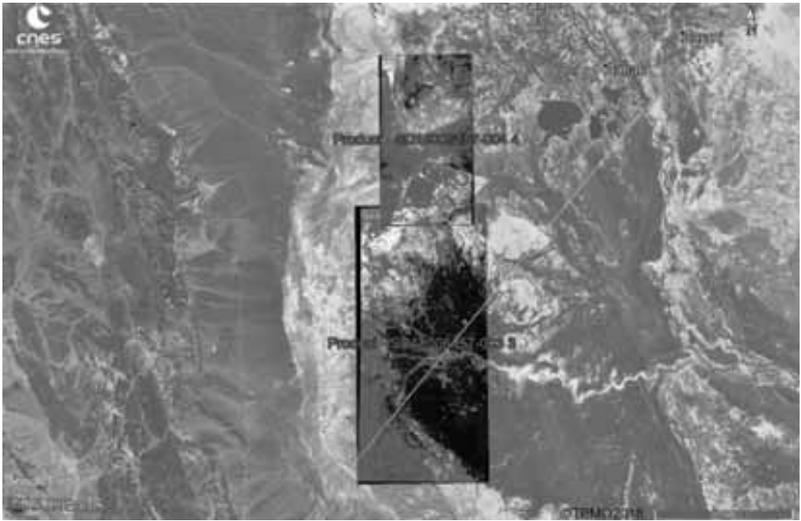


Fig. 3: satellite images of Shahr-i Sokhta areas.



Fig. 4: drone images of Shahr-i Sokhta.

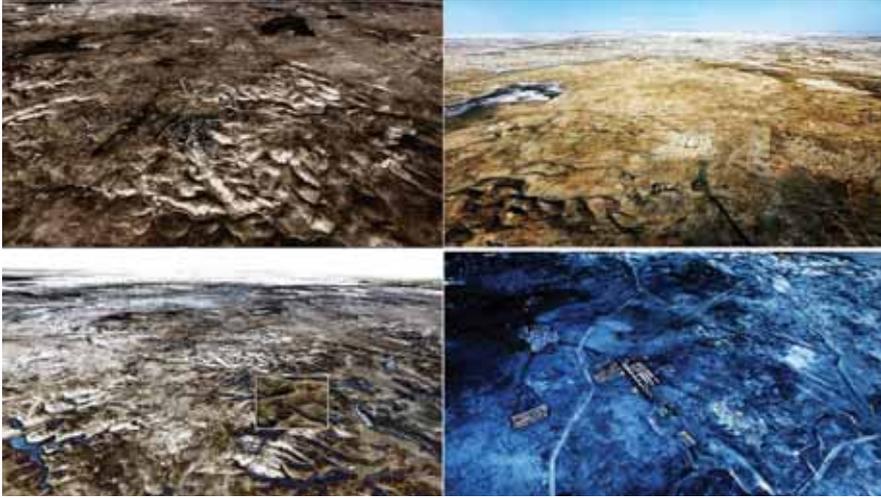


Fig. 5: drone images with filters applied.



Fig. 6: building reconstruction using not-invasive methods.

Geomagnetic Survey in Shahr-i Sokhta 2017

Sistan va Baluchestan Province, Iran, greyscale picture of the measurement results at workshop 33 (Square O) in november 2017 (Azar 1396), 256 linear greyscale, 5-channel fluxgate magnetometer FGM650B in gradiometer configuration, base distance: 0,5m, point distance: 0,1 x 0,5m, M 1:750, 25.02.2019, Georg-August-University of Göttingen, Tobias Scholz

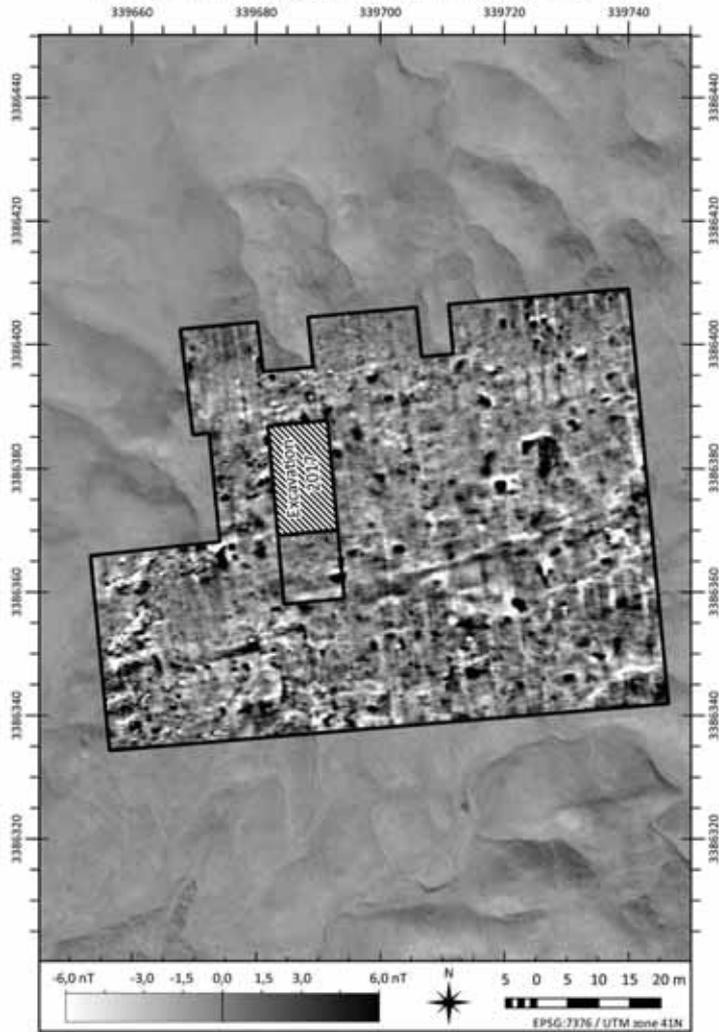


Fig. 7: geomagnetic survey in Area 33 at Shahr-i Sokhta.

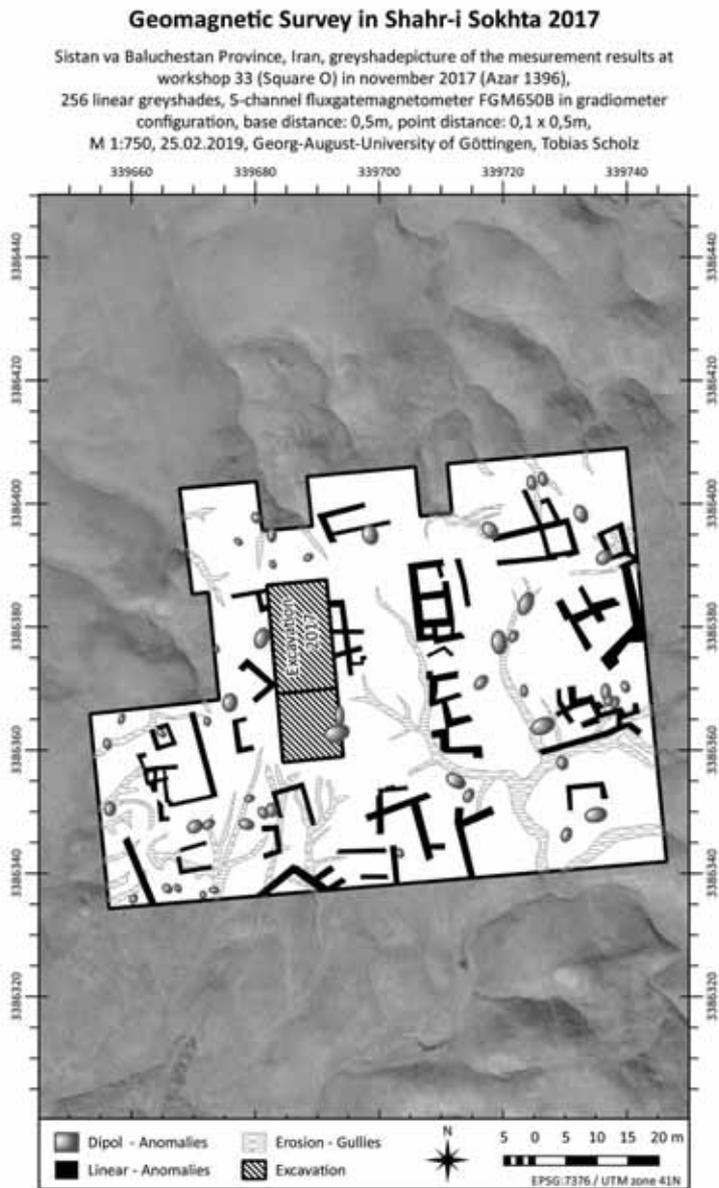


Fig. 8: preliminary results of geomagnetic survey in Area 33 at Shahr-i Sokhta.

Absolute chronology based on 14C analysis from Shahr-i Sokhta Ascalone - Moradi - Sajjadi - Vecchio In press	Shahr-i Sokhta Ascalone - Moradi - Sajjadi - Vecchio In press	Area 33 Ascalone 2021
PERIOD IA 3550-3350 BC*** 3525 BC (92.5%) 3338 BC	SIS I.10 (Early Uruk) (Harappa 1) SIS I.9 (Early Uruk) (Harappa 1)	
PERIOD IB 3350-3100 BC**** 3371 BC (93.7%) 3096 BC 3351 BC (87.1%) 3079 BC 2930 BC (56.4%) 2837 BC	SIS I.8 (Late Uruk) (Harappa 1)	
PERIOD IC 3100-3000 BC	SIS I.7 (Jemdet Nasr) (Harappa 1)	
PERIOD IIA 3000-2850 BC* 3017 BC (78.1%) 2857 BC 3017 BC (77.1%) 2856 BC 3021 BC (82.9%) 2857 BC 3030 BC (92.1%) 2874 BC 3029 BC (91.5%) 2871 BC	SIS II.6A-B (ED I) (Harappa 2)	Layer 4a-b Western Building Eastern Building
PERIOD IIB 2850-2620 BC* 2880 BC (92.0%) 2617 BC	SIS II.5A-B (ED II) (Harappa 2)	Layer 3a-b House of the Courts
PERIOD IIC 2620-2600 BC Abandon and sporadic occupation	SIS II.4 (ED II) (Harappa 2)	Layer 2 Squatter occupation
PERIOD IIIA 2600-2450 BC* 2635 BC (91.4%) 2437 BC	SIS III.3 (ED IIIa) (Harappa 3A)	Layer 1 Building 33
PERIOD IIIB 2450-2400 BC*****	SIS III.2 (Harappa 3B)	Abandon
PERIOD IV 2400-2300 BC** 2300 BC (80.7%) 2295 BC	SIS IV.1 (ED IIb) (Harappa 3B)	
GAP 2300-2100 BC		
PERIOD V (RUD-I BIABAN PHASE) 2100-2000 BC	SIS V.0 (RUR III) (Harappa 3C) (BMAC)	

*14C calibrated on Shahr-i Sokhta samples collected from Area 33 archaeological layers;

**14C calibrated on samples from Building 26;

***14C calibrated on Shahr-i Sokhta samples collected from Area 36 in Eastern Residential Area;

****14C calibrated on Shahr-i Sokhta samples collected from room 88 in Area 35;

*****14C calibrated on Tappeh Graziani samples in Helwing *et al.* 2019.

Fig. 9: chronological and stratigraphical sequence in Area 33.

the establishment of the Greater Indus Valley civilisation in Harappa 3A (ca. 2450 BC) coincides with the development of Shahr-i Sokhta's first commercial and cultural relations with the Early Dynastic period settlements of Mesopotamia, before the rise of the Sargonid dynasty.

2.1. Chronology and periodisation of Area 33

The new research in Area 33 has also profoundly changed the absolute chronological sequences of the settlement as a whole. Isotopic analyses carried out on organic material collected in Areas 26, 33, 35 and 36 have allowed us to create a new chronological grid that is the subject of more extensive and detailed presentations in publications currently in press (Ascalone *et al.* in press) (Fig. 10).

Absolute chronology based on 14C analysis from Shahr-i Sokhta Ascalone - Moradi - Sajjadi - Vecchio in press	Shahr-i Sokhta Ascalone - Moradi - Sajjadi - Vecchio In press	Area 33 Ascalone 2021	Area 35 and 36 Moradi - Sajjadi In press	Area 26 Moradi - Sajjadi In press
PERIOD IA 3550-3350 BC*** 3525 BC (92.5%) 3338 BC	SIS I.10 (Early Uruk) (Harappa 1)	Virgin soil	Layer 6-7	
	SIS I.9 (Early Uruk) (Harappa 1)		Layer 5	
PERIOD IB 3350-3100 BC**** 3371 BC (93.7%) 3096 BC 3351 BC (87.1%) 3079 BC 2930 BC (56.4%) 2837 BC	SiS I.8 (Late Uruk) (Harappa 1)		Layer 4-3	
PERIOD IC 3100-3000 BC	SiS I.7 (Jemdet Nasr) (Harappa 1)	Layer 5 Sounding in L.386	Layer 2	
PERIOD IIA 3000-2850 BC* 3017 BC (78.1%) 2857 BC 3017 BC (77.1%) 2856 BC 3021 BC (82.9%) 2857 BC 3030 BC (92.1%) 2874 BC 3029 BC (91.5%) 2871 BC	SIS II.6A-B (ED I) (Harappa 2)	Layer 4a-b Western Building Eastern Building		
PERIOD IIB 2850-2620 BC* 2880 BC (92.0%) 2617 BC	SIS II.5A-B (ED II) (Harappa 2)	Layer 3a-b House of the Courts		
PERIOD IIC 2620-2600 BC Abandon and sporadic occupation	SIS II.4 (ED II) (Harappa 2)	Layer 2 Squatter occupation		
PERIOD IIIA 2600-2450 BC* 2635 BC (91.4%) 2437 BC	SIS III.3 (ED IIIa) (Harappa 3A)	Layer 1 Building 33		
PERIOD IIIB 2450-2400 BC*****	SIS III.2 (Harappa 3B)	Abandon		
PERIOD IV 2400-2300 BC** 2500 BC (80.7%) 2295 BC	SIS IV.1 (ED IIIB) (Harappa 3B)		Layer 1	
GAP 2300-2100 BC			Layer 0	
PERIOD V (RUD-I BIABAN PHASE) 2100-2000 BC	SIS V.0 (UR III) (Harappa 3C) (BMAC)		Upper Layer	

*14C calibrated on Shahr-i Sokhta samples collected from Area 33 archaeological layers;

**14C calibrated on samples from Building 26;

***14C calibrated on Shahr-i Sokhta samples collected from Area 36 in Eastern Residential Area;

****14C calibrated on Shahr-i Sokhta samples collected from room 88 in Area 35;

*****14C calibrated on Tappeh Graziani samples in Helwing *et al.* 2019.

Fig. 10: chronological and stratigraphical sequence in the later excavations at Shahr-i Sokhta.

The Italian mission of the last century, directed by M. Tosi, had identified four periods and 10 archaeological phases that were not fully borne out by later research (Salvatori - Tosi 2005). Indeed, these chronological proposals, already contested by French studies (Jarrige - Didier - Quivron 2011), must now be revised on the basis of the new datings, which also explain certain inconsistencies in the work of the Italian mission (Fig. 11).

Specifically, the uranium isotope datings, which had been used to date Phase 10, Phase 5 and Phase 1, have margins of error ranging between ± 390 and ± 570 years and are thus not useful (Salvatori - Tosi 2005: 285-286 and 290). Equally problematic seem to be the C14 datings of Phase 7, which all fall between 2170

	Salvatori & Tosi 2005		Jarrige et al. 2011	Kavosh et al. 2019
Period I	phase 10	3100-2900	3100-3000	pre-2900?
	phase 9	2900-2800		
	phase 8	2800-2750		
Period II	phase 7	2750-2700	3000-2900?	7-2850
	phase 6	2700-2600		2850-2600
	phase 5 (A, B)	2600-2500		2600-2550
Period III	phase 4	2500-2400	2900-2800?	2550-2450
	phase 3	2400-2300		2450-2350
	phase 2	2300-2200		?
Period IV	phase 1	2200-2000	2800-2600	?
	gap			?
	phase 0	1900-1700		?

Fig. 11: French proposals for Shahr-i Sokhta chronology and its comparisons.

± 50 and 2080 ± 60 BC (Salvatori - Tosi 2005: note 8), which is not consistent with the datings subsequently proposed by the same authors (ca. 2800-2700 BC) (Salvatori - Tosi 2005: fig. 12). The chronologies obtained from the Carbon 14 decay of organic material from Period IV published by Raffaele Biscione are also not congruent with the chronologies assigned to the final phases of the settlement's life (Biscione 1979: note 2). Indeed, the 11 samples analysed return a chronological range of 2950 BC to 2110 BC, with a concentration of values (8 dates out of 11) between 2950 ± 70 and 2440 ± 70 , a chronological range too high to justify the dating to 2200-1800 BC as proposed by the author. To these results may be added those published in R.W. Ehrich (1992: tab. 1), where again the C14 dates seem to be higher, with Period III (28 samples) dated to 2665-2540 BC and Period IV to 2405-2180 BC, in line with our results. In addition to these results, which are also based on the same isotopic analyses carried out in the 1970s, there is the comprehensive review by J.-F. Jarrige, J.-F. Didier and G. Quivron, who, on the basis of comparisons with archaeological material found in Baluchistan, significantly raise the chronologies of Shahr-i Sokhta (Jarrige - Didier - Quivron 2011).

Our sequence, associated with the archaeological finds and the contexts of the samples subject to C14 analysis, yield a chronological range of 3000 to 2450 BC, which corresponds to M. Tosi's Phases 6-3.

The newly established sequence in Area 33, together with the work carried out by our Iranian colleagues in Areas 26, 35 and 36, also allows us to change the periodisation of the settlement as a whole. It is still organised into five macro-periods, but it is now divided into 11 phases (Tab. 1; see Ascalone *et al.* in press).

The first period (IA-C; SiS 11-7; Layers 7-2 in Area 35 and 36) was followed by the end of the settlement (SiS 7), clearly documented in the ‘Central Quarters’ (Layer 5 in Salvatori - Vidale 1997: 23-26), and its reoccupation coincides with the second period, which in Area 33 may be divided into three sub-periods (IIA, IIB and IIC in Layers 4-2) that correspond respectively to SiS 6A-B, 5A-B and 4. Period III is also clearly documented in Area 33 by the construction of a building (‘Building 33’), completely different from the architectural formulations of the

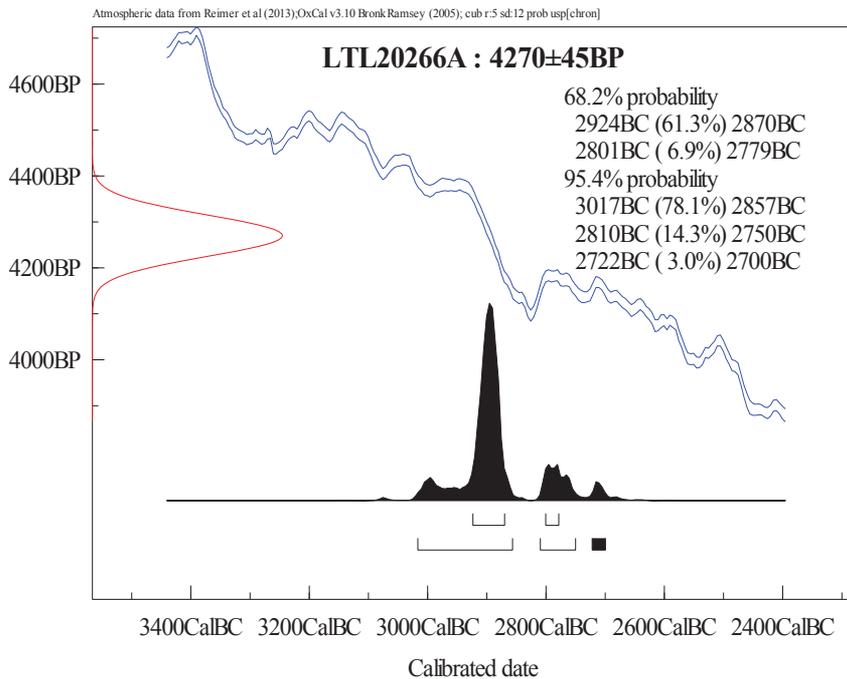


Fig. 12: calibrate date from Layer 4 of Area 33.

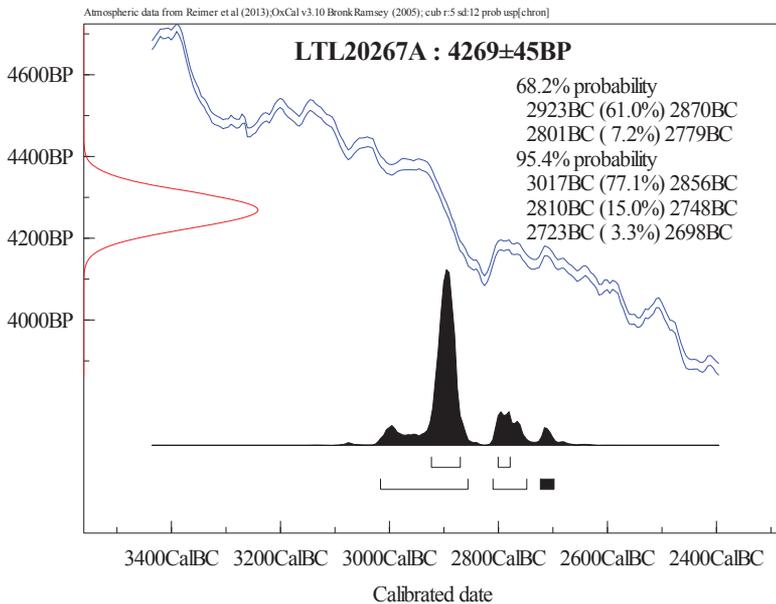


Fig. 13: calibrate date from Layer 4 of Area 33.

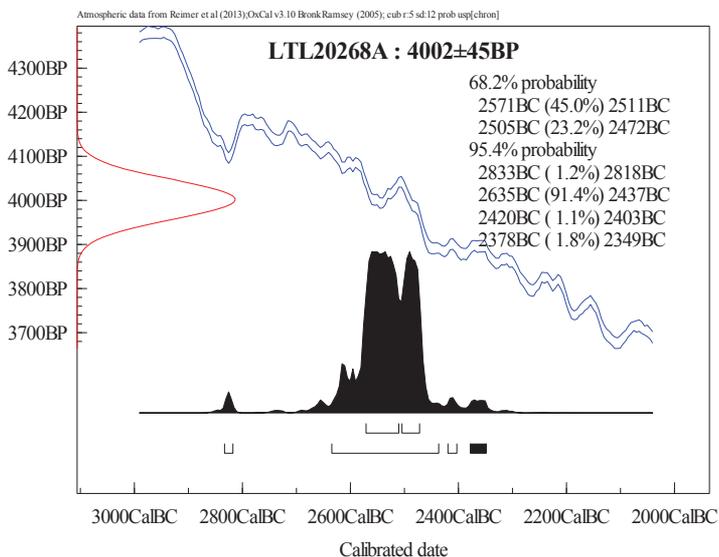


Fig. 14: calibrate date from Layer 2 of Area 33.

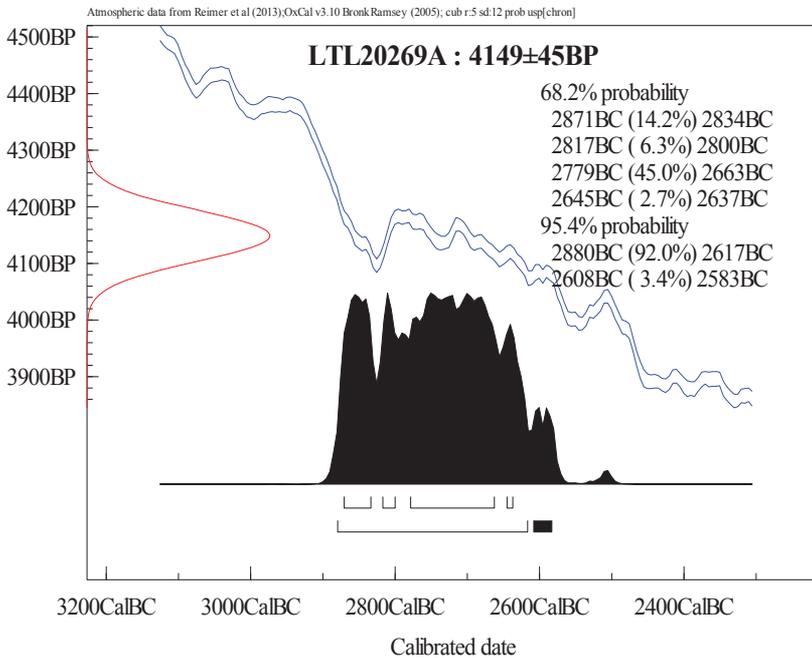


Fig. 15: calibrate date from Layer 1 of Area 33.

previous period, corresponding to a new occupation (IIIA, SiS 3 in Layer 1). After a period (IIIB) of definitive abandonment of both Area 33 (Ascalone 2019a) and the ‘Central Quarters’ (Salvatori - Vidale 1997), the fourth and final period is well documented in Area 26 (Sajjadi - Moradi 2015: 152-158), specifically in Layers 2-0 and the ‘Upper Layer’, where C14 datings have made it necessary to raise the date of definitive abandonment of the settlement to 2300 BC (Tab. 1).

To summarise, while Period IV of Shahr-i Sokhta must now be attributed to 2400-2300 BC, the earliest period of occupation (IA-C) must be ascribed to 3550-3000 BC. The data arising from the C14 analyses of Periods I and IV will be published by our Iranian colleagues who carried out the research in Areas 35, 36 and 26 (Ascalone *et al.* in press). Here, we offer preliminary details on the contexts of origin of the organic material subject to isotopic analysis in Area 33.

Absolute chronology BC	ICS period	Elam Miller-Shanzer 2003 and 2004	Jiroft Madjizadeh, 2008 Ekanderr 2021	Kerman Haralil 1997	Sistan	Greater Indus Mehrotra Kenoyer 1993	Central Asia Kozlov 1984	Baluchistan Ghoshal 2005 Jaridge et al. 2011 Carfi 1968	Susiana Aronson 2006	Mesopotamia Borchardt 1992
3550-3350****		Middle Bamesh	Mahoutabad II Varamin III		Early Chalcolithic Sistan IA SIS I.10-9	Ravi Culture Harappa 1	Late Amosolithic Namagga III	Sohr Damb I Mirri Qalat IIIA	Susa transition	Early Uruk
3350-3100*****		Late Bamesh	Mohoutabad III Varamin IV		Late Chalcolithic Sistan IB SIS I.8 Early Bronze I Sistan IC SIS II.7 Early Bronze IIA Sistan HA SIS II.6		Kara depe		Susa II	Late Uruk
3100-3000									Susa IIIA	Jemdet Nasr
3000-2850*	Pre-ICS	Transitional phase		Takab IV.2			Early Bronze Namagga IV		Susa IIIB	ED I
2850-2650*			Konar Sandal South Lower Town	Takab IV.1	Early Bronze IIB Sistan IIB SIS II.5 Early Bronze IIC Sistan IC SIS II.4	Early Harappa Harappa 2		Sohr Damb III Mirri Qalat IIB Bampur I-IV Nausharo II		ED II
2650-2600*							Shortugn I		Susa IVA	ED IIIa
2600-2450*	Proto-ICS		Konar Sandal South Citadel		Middle Bronze I Sistan IIIA SIS III.3	Mature Harappa Harappa 3A	Middle Bronze Namagga V	Mirri Qalat IIIC		
2450-2400**	Early ICS	?	Mohitatabad IV Varamin V	Takab III.2	Middle Bronze II Sistan IIIB SIS III.2 Middle Bronze III Sistan IV SIS IV.1	Mature Harappa Harappa 3B	Shortugn II	Sohr Damb IV		ED IIb
2400-2300								Nausharo III		
2300/2200-2000***	Late ICS	Kalhari	Konar Sandal North	Takab III.1	Late Bronze I Sistan VA SIS GAP (2300-2100) SIS V.D (2100-2000)	Mature Harappa Harappa 3C	Late Bronze Namagga VI Gour depe phase	Nausharo IV Mirri Qalat IV Bampur V-VI	Susa IWB Susa VA Susa VBI	Akkad Lagash II Ur III
2000-1800/1700					Late Bronze II Sistan VB	Late Harappa Harappa 4-5	Shortugn III		Susa VB2	Isin/Larsa

Tab. 1: Regional archaeological and historical periods in Sistan, Indus, Iranian highlands, Baluchistan, Mesopotamia, Susiana and Southern Central Asia on the basis of 14C dating analysis collected in Shahr-i Sokhta excavations and earlier publications (*14C calibrated on Shahr-i Sokhta samples collected from Area 33 archaeological layers; **14C calibrated on samples from Building 26; ***14C calibrated on Shahr-i Sokhta samples collected from Burnt Building, see Biscione 1979; ****14C calibrated on Shahr-i Sokhta samples collected from room 88 in area 36 in Eastern Residential Area; *****14C calibrated on Shahr-i Sokhta samples collected from room 88 in area 35).

The samples on which isotopic analyses were subsequently carried out were taken from furnace T.38 in L.33 for Layer 1, room L.142 for Layer 3 and L.176 for Layer 4 (Figs. 12-15).

On the basis of the foregoing, the chronological sequence associated with the stratigraphy and architectural units of Area 33 can be summarised as follows:

Period IIIA - ca. 2600-2450 BC - SiS 3 - Layer 1 - 'Building 33'

Period IIC - ca. 2650/2620-2600 BC - SiS 4 - Layer 2 - Squatter occupation

Period IIB - ca. 2850-2650/2620 BC - SiS 5A-B - Layer 3a-b - 'House of the Courts'

Period IIA - ca. 3000-2850 BC - SiS 6A-B - Layer 4a-b - 'Western Building' and 'Eastern Building'

The results achieved represent a middle ground between what was proposed by M. Tosi and S. Salvatori (Salvatori - Tosi 2005) and what emerges from the French historiographical tradition (Jarrige - Didier - Quivron 2011). However, they also find cogent confirmation in the results of radiocarbon analysis performed on material from Tepe Graziani, which show that the dates of Shahr-i Sokhta Phases 6-3 are very similar to those based on material collected during our excavation campaigns in Area 33 (Helwing - Vidale - Fazeli 2019: 151-156). The combination of the two results, obtained independently, seems to decisively confirm the correctness of our proposed chronology.

These chronological observations therefore seem to offer the most reliable basis for the reconstruction of a definitive sequence at Shahr-i Sokhta. The new proposal is based on the following data and considerations:

1) the absolute dates obtained from carbon isotope analysis by M. Tosi at the site for Phases 7 and 2-0 (respectively in Salvatori - Tosi 2005: note 8 and Biscione 1979: note 2);

2) the uranium-based dating given by M. Tosi and S. Salvatori is not useful for dating Phases 10, 5 and 1 of the site, given its very poor accuracy (to within ca. 5/6 centuries (Salvatori - Tosi 2005: 285-286 and 290);

3) the absolute chronologies based on C14 analysis given in R.W. Ehrlich (1992: tab. 1) regarding Periods III and IV of Shahr-i Sokhta are in line with our findings;

4) the absolute dating of 11 samples from Tepe Graziani returned chronologies that correspond closely to our final results (Helwing - Vidale - Fazeli 2019: 151-156);

5) There is very little BMAC material in the archaeological excavations of Shahr-i Sokhta; indeed, only sporadic material was found, in contrast to what is seen throughout Sistan and southern Iran in the late third and early second millennia BC;

6) the presence of Proto-Elamite material (seals and a tablet from Shahr-i Sokhta Period I) has recently been discussed on the basis of stratigraphic and chronological documentation; it seems likely that the rise of the Proto-Elamite cultural horizon occurred between 3400 and 2900 BC (Dahl - Petrie - Potts 2013: 360-365);

7) There is very little Nal pottery at Shahr-i Sokhta dated to period I, the majority of specimens being dated to Period II, with production seemingly of the regional type (see also the specimens from Grave 413 in Amiet - Tosi 1978: 22; Biscione 1984); this production is familiar from Mehrgarh VB and Nausharo IA-B (ca. 3000 BC), and it fits well into the new chronological contexts of Shahr-i Sokhta;

8) The Emir Grey Ware or Faiz Mohammed Ware recovered from Shahr-i Sokhta II also appears in Mehrgarh VI-VII (ca. 3100-2600 BC) and Nausharo I (ca. 3500-2800 BC) in chronological contexts higher than those previously assigned to Shahr-i Sokhta; similarly, it has been found in Miri Qalat IIIa (ca. 3600-2900 BC);

9) There are numerous similarities between Shahr-i Sokhta I and Namazga III pottery (ca. 3500-3000 BC) (Biscione 1973);

10) There are similarities between Shahr-i Sokhta pottery from Phase 5 and Namazga IV (ca. 3000-2500 BC);

11) The hook-like pierced handles (scorpion type) found in the 'Central Quarters' and dated to Phase 5b (Salvatori - Vidale 1997; Salvatori - Tosi 2005:

286, fig. 7) are also attested in Mundigak IV1-2 and Yahya IVC, which are dated to the late fourth and first few centuries of the third millennia BC (Mutin 2013: 292, tab. 1.2);

12) The Wet Ware associated with Shahr-i Sokhta Phase 3 (Salvatori - Tosi 2005: 287-288, fig. 10) is also seen in Mundigak IV.3 (Casal 1961: fig. 98.465) and Nausharo ID-II (ca. 2800-2500 BC; Quivron 1994: 636);

13) The ceramics from the final phase of Shahr-i Sokhta have similarities with Namazga V (ca. 2500-2200 BC).

14) Seal SiS.19.33.159 (Figs. 61-62 and Tab. 3) found in L.122 in Layer 3 has parallels with material from sites in the Greater Indus Valley, e.g. Damb Sadaat III, Mehrghar VII, Nausharo I, Rehman Dheri II, Harappa 2, Kunal III, Baror I and Tharkanewala Dera (Early Harappa) (Tabs. 5-6), in contexts dated to no later than 2600 BC.

On the basis of the new chronological grid, it is possible to resolve numerous problems that have arisen over the years and to propose new hypotheses on the historical role of Shahr-i Sokhta within a wider historical system involving Oxus, Jiroft, Baluchistan and the Indus valley (Tab. 1).

The earliest occupation of Shahr-i Sokhta is attributed to the second half of the fourth millennium BC, to which therefore the seals, seal impressions and the only tablet of Proto-Elamite origin must also be dated, along with the spread of Namazga III pottery.

The presence of artefacts linked to the Proto-Elamite tradition as early as the mid fourth millennium BC raises numerous considerations that unfortunately cannot be addressed in this paper. Clearly, raising the chronology of the spread of Proto-Elamite archaeological markers is fundamental for understanding the timing and mode of the development and dissemination of the Proto-Elamite presence on the Iranian plateau. Similarly, the presence of Namazga III and Baluchistan ceramics at Shahr-i Sokhta fits into a broader historical framework characterised by the foundation of the settlement around the middle of the fourth millennium BC.

The end of the settlement around 3000 BC (SiS 7), clearly documented in the stratigraphic sequences of the 'Central Quarters' (Layer 5), must have represented a break with respect to the first period. Its rebirth, as documented in Area 33, seems to be completely distinct from the cultural experiences of Period I, with a new pottery horizon that would continue to be used, with some variations, until the end of Period III (ca. 2400 BC). In Period II (ca. 3000-2600 BC), Shahr-i Sokhta seems to have played a fundamental role in the relations that were established throughout the Iranian plateau, especially with the alluvial settlements of Mesopotamia, which has yielded textual evidence that often recalls the commercial activities and relations with the major settlements of the lands east of the Zagros. It is precisely in this period that Shahr-i Sokhta saw the use of new accounting and economic recording tools. The cylindrical seal of proto-Elamite origin was abandoned in favour of locally produced stamp seals, often in steatite/chlorite, with geometric designs. Similarly, the presence of cretulae and clay blocks with numerical annotations on their surface, on the one hand, confirm the strong differences with respect to the accounting systems of the previous period and, on the other, reveal a previously unrecorded situation concerning the dynamics of socio-economic development in Iranian Sistan during the first half of the third millennium BC.

In Period III, although the pottery horizon remains mostly the same as period II, with some morphological variables, the production of a new red pottery (widespread during Period IV) increases and a new buff slip on Red Ware and a black on buff slip on Red Ware appear. The beginning of Period III (ca. 2600-2400 BC, Period IIIA), as also documented in the stratigraphy of Area 33, came after a major contraction during the second half of the XXVII century BC in Period IIC (SiS 4), when many sectors of the settlement appear to have been partially abandoned.

Its recovery, dated to between 2600 and 2400 BC, occurred in Period IIIA-B, just when new architectural forms (Ascalone 2019a: 36-62) and 'morphological-cultural western convergences' seem to be documented at Shahr-i Sokhta (Piperno - Salvatori 1982; 1983: 177; Ascalone 2019a: 68-69).

Period IV is marked by the total abandonment of the entire sector facing the small lake inside the settlement, and in particular of the two sectors excavated so far: Area 33 and the 'Central Quarters'. The suggestion is that the entire settlement in this period must have been confined to the central ridge, shifting its centre of gravity towards the east, which in any case represented its oldest sector. The drastic crisis hypothesised by M. Tosi (Moradi 2019: 24-117) can be ruled out, but the settlement must have undergone a contraction, perhaps due to changing environmental conditions and the over-exploitation of the site's lake, which must have been an important resource in Periods II and III. Indeed, the abandonment of all the neighbourhoods facing the lake suggests a reduction in the water supply of the entire district.

In conclusion, Shahr-i Sokhta seems to show five major collapses. The first, around 3000 BC (period IC, SiS 7), put an end to a cultural complex that is believed to have been responsible for the foundation of the settlement (the transition from Period I to Period II). The second historical break is documented around 2650/2600 BC (Period IIC, SiS 4), when the stratigraphy of Area 33 shows an abandonment of Area 33 followed by its reoccupation with the presence of new ceramic types, which however form a corpus that is directly related to the production of the previous period (the transition from Period IIC to Period IIIA, from SiS 4 to SiS 3). A third break corresponds to the abandonment of the sectors facing the lake (Area 33 and the 'Central Quarters') around 2400 BC, when the entire settlement seems to shift towards the central plateau. This coincides with the rise of a new red pottery that for the first time displaces the buff pottery of more ancient tradition as the dominant type (transition from Period III to Period IV, from SiS 2 to SiS 1). The final 'historical leap' entails the definitive abandonment of Shahr-i Sokhta around 2300 BC, the causes of which remain unresolved. After a period of about two centuries the site was again sporadically reoccupied (transition from Period IV to V, from SiS 1 to SiS 0) in the area of the Burnt Building (see in this volume Moradi *et al.*) to be abandoned again around 2000 BC.

From the historical point of view, the new absolute dates help to better understand the dynamics of the settlement's growth (Tab. 1): if Period I indissolubly links Shahr-i Sokhta to Turkmenistan and the Kopet Dagh, with clear links to Baluchistan, and Periods II and III seem to unfold in a context of strong internationalisation against a cultural background reflecting the tradition of Hirmand and western Baluchistan, then the raising by ca. 5 centuries of the chronology of Shahr-i Sokhta can also explain the total absence of BMAC material in the settlement, considering that the BMAC rose around 2200 BC, just after the collapse of the site in Sistan. In contrast to the large amount of Oxus/BMAC material found in recent surveys in Sistan by our Iranian colleagues (Shirazi in press), its absence in Shahr-i Sokhta seems to confirm that the occupation of Shahr-i Sokhta ended no later than 2300 BC, with a very brief reoccupation in the 'Burnt Building' area around 2100 BC which was immediately and newly abandoned around 2000 BC (see in this volume Moradi *et al.*). As to whether there was some connection between the end of Shahr-i Sokhta and the rise of the BMAC in eastern Iran, the question remains open, but in the absence of other clear evidence a scientifically valid theory cannot yet be formulated.

In the same way, one can explain the near absence of Harappan elements in the cultural horizons of Shahr-i Sokhta: the settlement in Sistan collapsed around 2300 BC, but it began a slow and inexorable decline around 2450 BC, when many sectors were abandoned: a decline that began just as the Greater Indus Valley civilisation (Harappa 3A) was beginning to lay the foundations of a new system of control over its territory and neighbouring areas. In this system, which has been called the 'Middle Asian Interaction Sphere' (Possehl 2002: 215-236), Shahr-i Sokhta played little part because of its slow decline, which prevented it from being an effective interlocutor with the Harappan market (Fig. 16).

In 2300-2200 BC, the entire Iranian plateau seems to show a clear break with the tradition of trade and cultural relations that had made Iran the main commercial interlocutor of the kingdoms of Mesopotamia in the first half of the third millennium BC. The rise of Sargon and the continuous wars throughout the area, at least up to the reign of Naram-Sin, must have undermined the longstanding

equilibria of Iranian-Mesopotamian trade, while the rise of the maritime market, developed and later monopolised by Akkad, also had an impact (Steinkeller 2013: 415). Sargon's wars against Hishep-rater and Luhhishshan (the ninth and eight kings of the Awan dynasty), Dagu (a brother of the king of Marhaši) and Ulul, Shidgau and Kundupum (the latter described as the 'judge' of Marhaši) are extensively described in royal inscriptions (Steinkeller 2021: 185). Later, Rimush describes Akkadian victories in the eastern regions against Abalgamash and his general Shidgau (Potts 1994: 28 and note 179). Furthermore, Rimush killed 16,212 men and captured 4,216 (among whom was the Elamite sovereign Emahsini) (Potts 1989: 128, no. 20). In addition, he returned to Babylon with a booty of 30 minas of gold, 3,600 minas of copper, 300 slaves and numerous vessels in diorite and *duhšu* stone (Steinkeller 2021: 186). After Rimush, Parakshum again allied with Elam to resist the Akkadian conquests of the region, although Naram-Sin claimed the conquest of 'all the land of Elam up to Marhaši. The rea

	MEHRGARH E NAUSHARO	cronologia assoluta (ceramiche)	HARAPPA	cronologia assoluta (14C)
età della localizzazione	Sibi, necropoli e abitati	ca. 1800-1700 a.C.	Periodo 5 'Cimitero H' (tardo)	1800-1700? a.C. e oltre
età della localizzazione	?	ca. 2000-1800 a.C.	Periodo 4 'Cimitero H' (antico)	1900-1800 a.C.
età della integrazione 3	Nausharo IV	ca. 2300-2000 a.C.	Periodo 3C	2200-1900 a.C.
età della integrazione 2	Nausharo III	ca. 2500-2300 a.C.	Periodo 3B	2450-2200 a.C.
età della integrazione 1	Nausharo II	ca. 2600-2500 a.C.	Periodo 3A	2600-2450 a.C.
età della regionalizzazione (fase tarda)	Mehrgarh Periodo VII Nausharo I (Lal Shah)	ca. 2800-2600 a.C.	Periodo 2 (fase Kot- dijana)	2900-2600 a.C.
età della regionalizzazione (fase media)	Mehrgarh Periodi IV-VI	ca. 3500-2800 a.C.	Periodo 1 (fase della cul- tura del Ravi)	3300-2900 a.C.

Fig. 16: Harappan chronology and periods (after Vidale 2005: 7).

relationships between the Akkadian kingdom and the Iranian plateau seem to have changed under Shar-kali-sharri, or perhaps his son, who may have subsequently travelled to Marhaši to marry a native princess of the Iranian region (Westenholz 1987: 97, nos. 133, 154). In the final years of the third millennium BC, during the Ur III period, people from Marhaši probably soldiers (Steinkeller 1982: 261; 1989; *contra* Francfort - Tremblay 2010, where it is suggested that Marhaši is located in Margiana; see also Guichard 2021: 73-75), were stationed in Mesopotamian outposts near the Zagros mountains.

In any case, the wars on the Iranian plateau between Sargon and Naram-Sin (ca. 2300-2200 BC) must have seriously damaged the long-established trade model that had been adopted throughout Iran by the mid third millennium BC. The political vacuum that was created following the collapse of the major Iranian settlements and the fall of Akkad around 2200 BC was filled in eastern and south-eastern Iran by substantial migratory movements from the north, involving peoples whose cultural horizons were closely connected to the BMAC.

In this context, it is useful to remember that around 2200 BC, several settlements show strong breaks in their stratigraphic sequences (Tab. 1): in the Kerman region in the Takab plain, there is a shift from Shahdad III2 to III1 (Hakemi 1997), in Jiroft itself the settlement seems to move northwards (from Konar Sandal South to Konar Sandal North) (Madjidzadeh 2008; Eskanderi in press), in Elam a new phase begins with the Kaftari period (Ehrich 1992; Miller - Sumner 2003) and in Iranian Baluchistan, a new stratigraphic sequence and a new cultural horizon (Bampur I-IV to V-VI) is documented at Bampur (de Cardi 1968). Similar historical shifts seem to be documented in Central Asia, at the Kopet Dagh (Namazga V to VI), Shortugai (from period II to period III of the site) and Geoksyur (Kohl 1984). A break is also documented in all the Indus settlements in the transition from Harappa period 3B to 3C (Meadow - Kenoyer 1993), while in neighbouring areas such as Makran and Pakistani Baluchistan, the sequences show a strong change in cultural horizons between Miri Qalat IIIC and IV (in Makran; Besenval 1994) and between Nausharo III and IV (in Kachi-Bolan; Jarrige - Didier - Quivron 2011), while at Sohr Damb/Nal (Görsdorf 2005),

as at Shahr-i Sokhta, the settlement disappears completely around 2300 BC.

In conclusion, the new chronology of Shahr-i Sokhta that we propose convincingly fits into a broader historical framework that helps on the one hand to better understand the reasons for the collapse of the Sistan settlement around 2300 BC and on the other to explain the almost total absence of BMAC material at Shahr-i Sokhta (but not in Sistan) during its life span. Moreover, the revised chronology enables new hypotheses regarding the settlement's formative periods in the second half of the fourth millennium BC, the dynamics of formation of the major proto-state settlements in eastern Iran and their relations with the Proto-Elamite phenomenon. Likewise, it explains the limited presence of the Indus culture of the Harappa civilisation, whose definitive rise occurred only when Shahr-i Sokhta seemed to be in sharp decline. In conclusion, the historical path followed by Shahr-i Sokhta seems to be much more similar to that of Sohr Damb/Nal, whose formation however is dated to the beginning of the fourth millennium BC, while both settlements were abandoned around 2300 BC. The only settlement in Baluchistan that seems to have survived is Miri Qalat, on the Makran coast, which however saw the replacement of its indigenous cultural experiences with new formulations clearly coming from the Indus valley. The suggestion is that inland settlements (such as Shahr-i Sokhta and Sohr Damb) suffered from the collapse of terrestrial trade as a result of the Akkadian campaigns, while the settlements along the coast (such as Miri Qalat) were able to survive because they were well placed to take advantage of the new maritime routes, which favoured new trading partners such as those in the southern Indus and Gujarat.

2.2. Stratigraphic sequences

As previously mentioned, four archaeological phases can be distinguished in Area 33, two of which may be divided into at least two sub-phases (Figs. 17-18):

Period IIIA - ca. 2600-2450 BC - SiS 3 - Layer 1

Period IIC - ca. 2650/2620-2600 BC - SiS 4 - Layer 2

Period IIB - ca. 2850-2650/2620 BC - SiS 5A-B - Layer 3

Layer 3a - ca. 2850-2750 BC - SiS 5A

Layer 3b - ca. 2750-2650 BC - SiS 5B

Period IIA - ca. 3000-2850 BC - SiS 6A-B - Layer 4

Layer 4a - ca. 3000-2900 BC - SiS 6A

Layer 4b - ca. 2900-2850 BC - SiS 6B

The stratigraphic relations and the distribution of the material give a unified picture and allow us to form hypotheses concerning both the use of the individual buildings and the complex forms of social organisation that arose in Shahr-i Sokhta during the first half of the third millennium BC.

2.2.1. Layer 1 - Shahr-i Sokhta IIIB - Phase 3 (ca. 2600-2450 BC)

Layer 1 was the subject of study in the first preliminary excavation in 2017 (Ascalone - Sajjadi 2019), which explored the individual functional sectors of 'Building 33' (Ascalone 2019a: 36-49). The 2018 excavations increased our knowledge of the building, especially the eastern part, where new sectors were found. This entailed extending the dig eastwards by 10 m, bringing to light a total area of 550 m² (Figs. 19-20).

As in the sector excavated in 2017, the walls of the building are in poor condition, with heights not exceeding 30 cm, while in the central part of the trench, towards which rainwater naturally flowed (Fig. 21), the remains have been completely washed away.

The structural features remain the same as those already described, with the flooring (mostly simple walking surfaces) composed of a single layer of small stones, preserved only in a few places. The new excavation of the outer courtyard (still part of 'Building 33') and its enclosed part located further east seems to confirm previous assumptions regarding the importance of the building (Ascalone 2019a: 33). 'Building 33' can be recognised as an architectural unit which, given

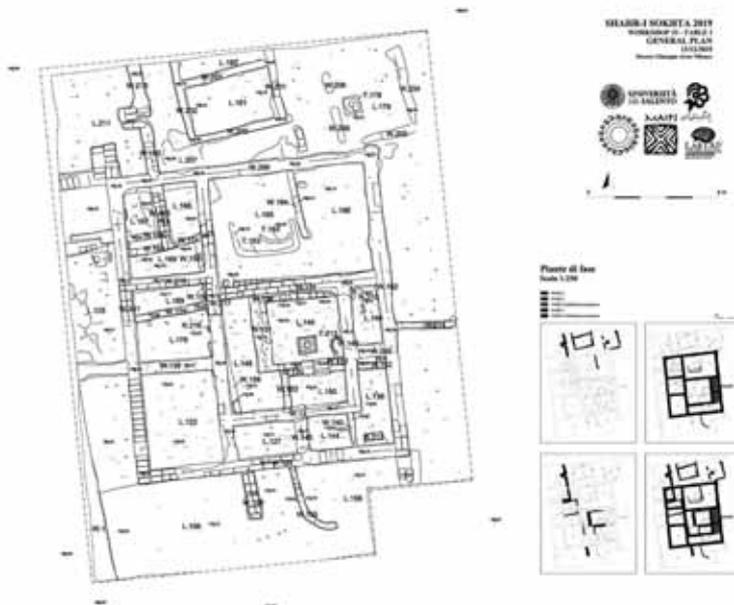


Fig. 17: detailed map of Area 33 excavations.

its topographical position (near the lake inside the settlement), dimensions and functional arrangement, must have played a significant role in the urban and social organisation of the site around the middle of the third millennium BC.

US - Layer 1 (Shahr-i Sokhta IIIA - Phase 3) (ca. 2600-2450 BC)

US 1; US 2; US 3; US 4 = P.65; US 5 = L.68; US 6; US 7; US 8 = L.35; US 9 = L.34; US 10; US 11 = P.65; US 12 = P.65; P.71; US 13 = L.5; US 14 = C.69; US 15; US 16 = L.34; US 17 = C.70; US 18 = L.77; US 19; US 20 = L.33; US 21; US 22 = P.84; US 23 = L.68; US 24 = L.81; US 25 = L.43; US 26; US 27; US 28 = L.85; US 29 = L.86; US 30; US 31 = L.16; US 32 = L.92; US 33 = L.85; US 34 = L.15; US 35 = L.15; US 36 = L.94; US 37 = I.98; US 38 = L.97; US 39.

Elevation: between 0 m and 0.35 m.

Artefacts: SiS.18.33.1; SiS.18.33.2; SiS.18.33.3; SiS.18.33.4; SiS.18.33.5; SiS.18.33.6; SiS.18.33.7; SiS.18.33.8; SiS.18.33.9; SiS.18.33.10; SiS.18.33.11; SiS.18.33.12; SiS.18.33.13; SiS.18.33.14; SiS.18.33.15; SiS.18.33.16;

Building 33 2018 excavation season



Fig. 19: detailed plan of 'Building 33'.

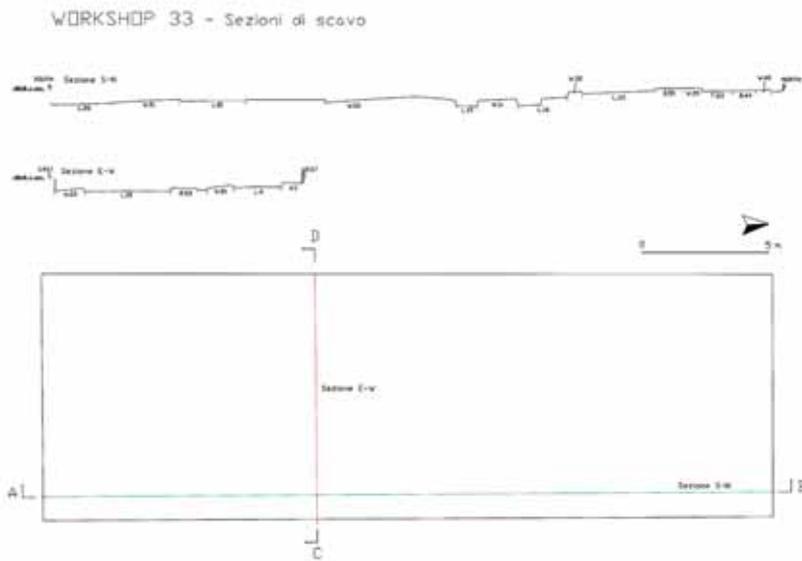


Fig. 20: archaeological sections of Layer 1.



Fig. 21: northern view of 'Building 33'

SiS.18.33.17; SiS.18.33.18; SiS.18.33.19; SiS.18.33.20; SiS.18.33.21;
 SiS.18.33.22; SiS.18.33.23; SiS.18.33.24; SiS.18.33.25; SiS.18.33.26;
 SiS.18.33.27; SiS.18.33.28; SiS.18.33.29; SiS.18.33.30; SiS.18.33.31;
 SiS.18.33.32; SiS.18.33.33; SiS.18.33.34; SiS.18.33.35; SiS.18.33.36;
 SiS.18.33.37; SiS.18.33.38; SiS.18.33.39; SiS.18.33.40; SiS.18.33.41;
 SiS.18.33.42; SiS.18.33.43; SiS.18.33.44; SiS.18.33.45; SiS.18.33.46;
 SiS.18.33.47; SiS.18.33.48; SiS.18.33.49; SiS.18.33.50; SiS.18.33.51;
 SiS.18.33.52; SiS.18.33.53; SiS.18.33.54; SiS.18.33.55; SiS.18.33.56;
 SiS.18.33.57; SiS.18.33.58; SiS.18.33.59; SiS.18.33.60; SiS.18.33.61;
 SiS.18.33.62; SiS.18.33.63; SiS.18.33.64; SiS.18.33.65; SiS.18.33.66;
 SiS.18.33.67; SiS.18.33.68; SiS.18.33.69; SiS.18.33.70; SiS.18.33.71;
 SiS.18.33.72; SiS.18.33.73; SiS.18.33.74; SiS.18.33.75; SiS.18.33.76;
 SiS.18.33.77; SiS.18.33.78; SiS.18.33.79; SiS.18.33.80; SiS.18.33.81;
 SiS.18.33.82; SiS.18.33.83; SiS.18.33.84; SiS.18.33.85; SiS.18.33.86;
 SiS.18.33.87; SiS.18.33.88; SiS.18.33.89; SiS.18.33.90; SiS.18.33.91;
 SiS.18.33.92; SiS.18.33.93; SiS.18.33.94; SiS.18.33.95; SiS.18.33.96;
 SiS.18.33.97; SiS.18.33.98; SiS.18.33.99; SiS.18.33.100; SiS.18.33.101;
 SiS.18.33.102; SiS.18.33.103; SiS.18.33.104; SiS.18.33.105; SiS.18.33.106;
 SiS.18.33.107; SiS.18.33.108; SiS.18.33.109; SiS.18.33.110; SiS.18.33.111;
 SiS.18.33.112; SiS.18.33.113; SiS.18.33.114; SiS.18.33.115; SiS.18.33.116;
 SiS.18.33.117; SiS.18.33.118; SiS.18.33.119; SiS.18.33.120; SiS.18.33.121;
 SiS.18.33.122; SiS.18.33.123; SiS.18.33.124; SiS.18.33.125; SiS.18.33.126.

2.2.2. Layer 2 - Shahr-i Sokhta IIIA - Phase 4 (ca. 2650-2600 BC)

This phase corresponds to a period of sharp contraction of the Area, which after the 'House of the Courts' appears to have been abandoned for a short period (20/50 years). The entire area 'leans' on the previous occupation, reusing, in certain sectors, the pre-existing walls to support furnaces and mobile installations (Fig. 22).

Indeed, the only structural evidence of Layer 2 appears to be the furnaces for processing metals, particularly copper, clearly attested by the numerous pieces of slag found. From a stratigraphic point of view, following its abandonment, the area was used sporadically, with the construction of installations including kilns and furnaces. A few isolated rooms (L.179, L.180, L.181), with very thin walls (ca. 60 cm wide), were also built, with an orientation differing from that of Layer 3.

US - Layer 2 (Shahr-i Sokhta IIC - Phase 4) (ca. 2650-2600 BC)

US 25; US 45; US 57 = L.180; US 58 = L.181; US 65 = L.185; US 66 = L.186.

Artefacts: SiS.19.33.220; SiS.19.33.230; SiS.19.33.259; SiS.19.33.265; SiS.19.33.281; SiS.19.33.282; SiS.19.33.283; SiS.19.33.284; SiS.19.33.286; SiS.19.33.290; SiS.19.33.336; SiS.19.33.380.

2.2.3. Layer 3 - Shahr-i Sokhta IIB - Phase 5A-B (ca. 2850-2650 BC)

Layer 3 is the best-known archaeological phase, for which our knowledge is most complete. The excavations revealed an architectural unit, typical of the Shahr-i Sokhta tradition, called the 'House of the Courts', characterised by two courtyards aligned with each other, with small rooms arranged around them (Fig. 23).

The entire area overlaps with the previous period, sporadically reusing the masonry structures of Layer 4. Specifically, the changes concern the orientation of the building, which, as can be seen from the superimposition of W.9 on W.158, is not aligned but rather deviates by approximately 20° from what was built in the previous period. Thus, while an alignment can be found between 'Building 33' and the 'House of the Courts' (see in particular the reuse of the large wall W.9 from Layer 3 to Layer 1), no structural relationship or reuse can be recognised between the building of Layer 3 and the older ones of Layer 4. The layer sequences make it clear that, with the end of Layer 4, filling and levelling work was performed

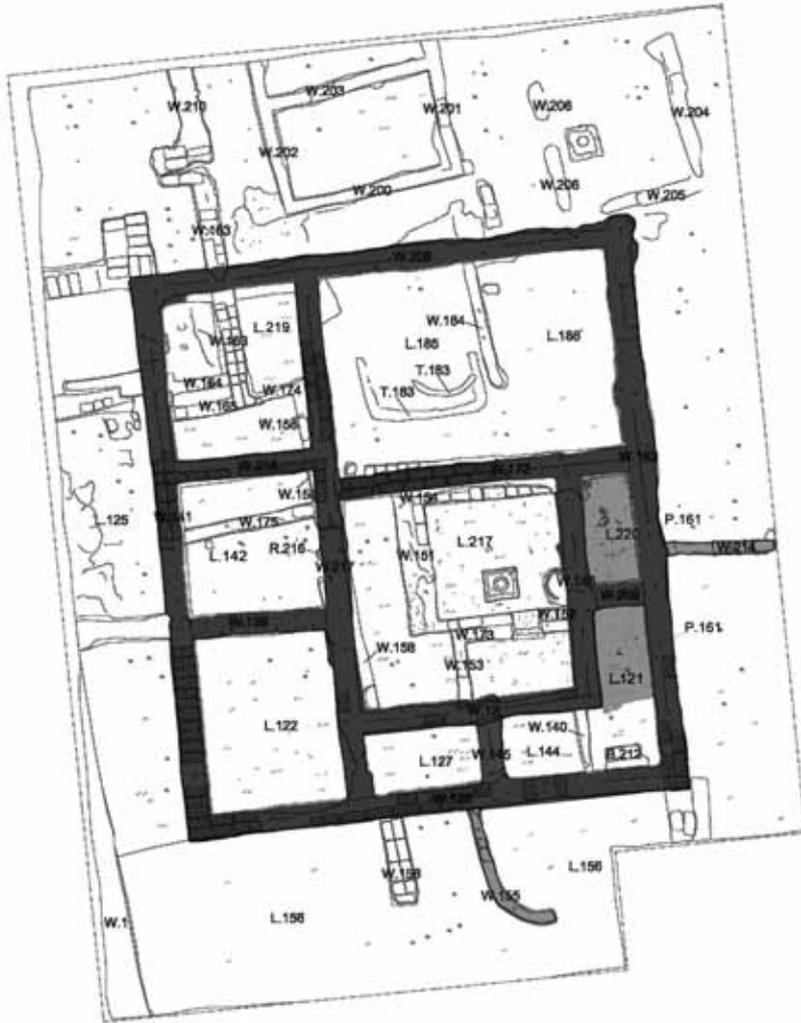


Fig. 23: schematic plan of Layer 3.

across the whole of Area 33 before the construction of a new architectural unit, whose orientation differed with respect to the past. The walls of the new building are made of bricks measuring 11x22x44 cm (1:2:4), while the paving is finely crafted, especially in L.122 and L.142, consisting of layers of plaster on a preparation of medium-sized pebbles. Two architectural phases (3a and 3b) have been identified on the basis of the discovery of two superimposed floor levels and structural changes mainly affecting the eastern sector of the building. Indeed, in the final phase (3b), the entire eastern wing of the complex, consisting of rooms L.138 and L.149, was covered with bricks forming a new long and narrow room that has been interpreted as a stairwell leading to a second floor.

US - Layer 3 (Shahr-i Sokhta IIB - Phase 5A-B) (ca. 2850-2650 BC)

US 2 = L.122; US 5 = L.125; US 7 = L.127; US 22 = L.138; US 23 = L.217; US 26 = L.142; US 27 = L.217; US 32 = L.156; US 34 = L.122; US 35 = L.127; US 36 = L.142; US 38 = L.142; US 39 = L.159; US 46 = L.142; US 47 = L.125; US 54 = P.161; US 60 = P.138; US 62 = L.159; US 64 = L.156.

Artefacts: SiS.19.33.1; SiS.19.33.2; SiS.19.33.3; SiS.19.33.4; SiS.19.33.6; SiS.19.33.7; SiS.19.33.8; SiS.19.33.9; SiS.19.33.10; SiS.19.33.12; SiS.19.33.16; SiS.19.33.17; SiS.19.33.19; SiS.19.33.20; SiS.19.33.21; SiS.19.33.24; SiS.19.33.25; SiS.19.33.26; SiS.19.33.29; SiS.19.33.31; SiS.19.33.34; SiS.19.33.35; SiS.19.33.36; SiS.19.33.37; SiS.19.33.39; SiS.19.33.42; SiS.19.33.43; SiS.19.33.44; SiS.19.33.46; SiS.19.33.49; SiS.19.33.51; SiS.19.33.53; SiS.19.33.54; SiS.19.33.79; SiS.19.33.80; SiS.19.33.81; SiS.19.33.82; SiS.19.33.83; SiS.19.33.84; SiS.19.33.85; SiS.19.33.86; SiS.19.33.87; SiS.19.33.88; SiS.19.33.90; SiS.19.33.91; SiS.19.33.99; SiS.19.33.100; SiS.19.33.106; SiS.19.33.108; SiS.19.33.109; SiS.19.33.115; SiS.19.33.118; SiS.19.33.120; SiS.19.33.123; SiS.19.33.126; SiS.19.33.128; SiS.19.33.129; SiS.19.33.130; SiS.19.33.132; SiS.19.33.133; SiS.19.33.134; SiS.19.33.136; SiS.19.33.145; SiS.19.33.146; SiS.19.33.147; SiS.19.33.148; SiS.19.33.154; SiS.19.33.155; SiS.19.33.156; SiS.19.33.157; SiS.19.33.158; SiS.19.33.159; SiS.19.33.160; SiS.19.33.161; SiS.19.33.162; SiS.19.33.163;

SiS.19.33.164; SiS.19.33.167; SiS.19.33.182; SiS.19.33.183; SiS.19.33.184;
SiS.19.33.186; SiS.19.33.187; SiS.19.33.188; SiS.19.33.189; SiS.19.33.190;
SiS.19.33.191; SiS.19.33.192; SiS.19.33.193; SiS.19.33.194; SiS.19.33.195;
SiS.19.33.196; SiS.19.33.197; SiS.19.33.198; SiS.19.33.199; SiS.19.33.200;
SiS.19.33.201; SiS.19.33.202; SiS.19.33.207; SiS.19.33.208; SiS.19.33.212;
SiS.19.33.213; SiS.19.33.216; SiS.19.33.224; SiS.19.33.226; SiS.19.33.228;
SiS.19.33.231; SiS.19.33.232; SiS.19.33.233; SiS.19.33.243; SiS.19.33.244;
SiS.19.33.248; SiS.19.33.251; SiS.19.33.252; SiS.19.33.253; SiS.19.33.257;
SiS.19.33.258; SiS.19.33.261; SiS.19.33.262; SiS.19.33.310; SiS.19.33.312;
SiS.19.33.313; SiS.19.33.314; SiS.19.33.315; SiS.19.33.316; SiS.19.33.317;
SiS.19.33.321; SiS.19.33.322; SiS.19.33.323; SiS.19.33.333; SiS.19.33.335;
SiS.19.33.337; SiS.19.33.340; SiS.19.33.342; SiS.19.33.343; SiS.19.33.344;
SiS.19.33.346; SiS.19.33.352; SiS.19.33.357; SiS.19.33.379; SiS.19.33.382;
SiS.19.33.383; SiS.19.33.391.

2.2.4. Layer 4 - Shahr-i Sokhta IIA - Phase 6A-B (ca. 3000-2850 BC)

The last phase investigated is represented by two architectural units separated by the road L.148 (the ‘Western Building’ and the ‘Eastern Building’). As previously mentioned, the orientation of the walls differs from that of the subsequent phase, as does the quality of the walls and plasters (Figs. 24-25).

Two sub-phases (4a and 4b) have also been identified for Layer 4 on the basis of the paving sequences and the change in internal circulation that occurred with the closure of the passage at W.152 and the addition of walls W.153 and W. 173. The bricks measure 11x22x44 cm, and the walls are now covered with a double layer of very well-preserved blue-grey plaster. The flooring is also finely crafted, with the addition of a layer of plaster over a bed of small stones, particularly in L.217, where the quality of the architectural solutions seems to be much higher than what is known from the western unit or ‘Western Building’.

US - Layer 4 (Shahr-i Sokhta IIA - Phase 6) (ca. 3000-2850 BC)

US 28 = L.149; US 29 = L.149; US 30 = L.150; US 31 = L.149; US 43 = L.167;

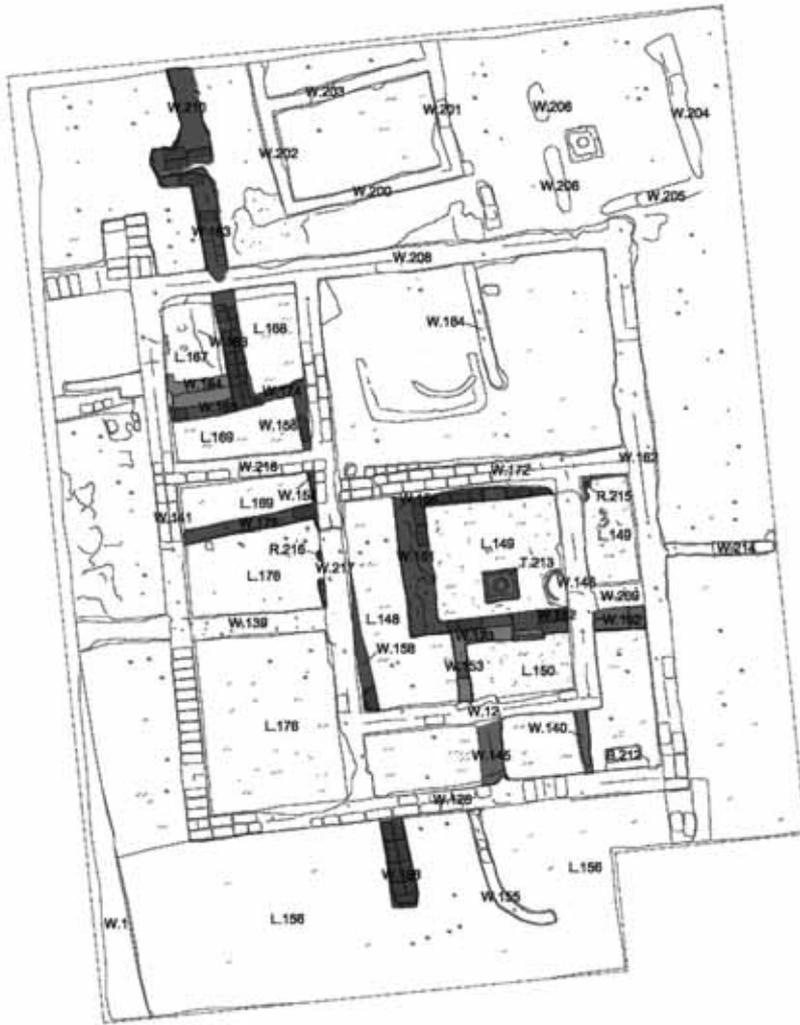


Fig. 24: schematic plan of Layer 4.

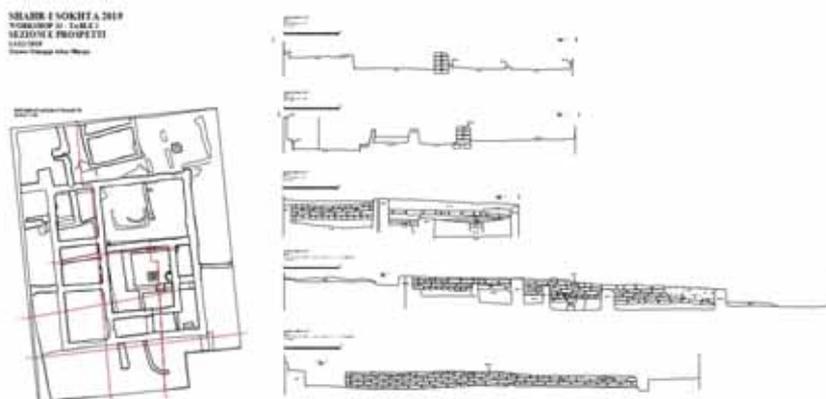


Fig. 25: archaeological section of Area 33 (Layers 2-4).

US 44 = L.168; US 48 = L.169; US 49 = L.169; US 51 = L.169; US 52 = L.169;
 US 53 = L.176; US 61 = L.149; US 63 = L.176; US 67 = L.149; US 68 = L.169.
 Artefacts: SiS.19.33.92; SiS.19.33.93; SiS.19.33.94; SiS.19.33.95; SiS.19.33.96;
 SiS.19.33.97; SiS.19.33.102; SiS.19.33.103; SiS.19.33.104; SiS.19.33.105;
 SiS.19.33.111; SiS.19.33.117; SiS.19.33.119; SiS.19.33.121; SiS.19.33.122,
 SiS.19.33.124; SiS.19.33.125; SiS.19.33.127; SiS.19.33.135; SiS.19.33.137;
 SiS.19.33.138; SiS.19.33.139; SiS.19.33.140; SiS.19.33.141; SiS.19.33.142;
 SiS.19.33.143; SiS.19.33.144; SiS.19.33.149; SiS.19.33.150; SiS.19.33.151;
 SiS.19.33.152; SiS.19.33.153; SiS.19.33.165; SiS.19.33.166; SiS.19.33.168;
 SiS.19.33.169; SiS.19.33.170; SiS.19.33.171; SiS.19.33.172; SiS.19.33.173;
 SiS.19.33.174; SiS.19.33.175; SiS.19.33.176; SiS.19.33.177; SiS.19.33.178;
 SiS.19.33.179; SiS.19.33.180; SiS.19.33.185; SiS.19.33.203; SiS.19.33.205;
 SiS.19.33.211; SiS.19.33.217; SiS.19.33.218; SiS.19.33.219; SiS.19.33.221;
 SiS.19.33.222; SiS.19.33.223; SiS.19.33.225; SiS.19.33.234; SiS.19.33.235;
 SiS.19.33.236; SiS.19.33.237; SiS.19.33.238; SiS.19.33.239; SiS.19.33.240;
 SiS.19.33.241; SiS.19.33.245; SiS.19.33.246; SiS.19.33.249; SiS.19.33.250;
 SiS.19.33.254; SiS.19.33.255; SiS.19.33.256; SiS.19.33.260; SiS.19.33.263;
 SiS.19.33.266; SiS.19.33.268; SiS.19.33.269; SiS.19.33.270; SiS.19.33.271;

SiS.19.33.272; SiS.19.33.273; SiS.19.33.274; SiS.19.33.275; SiS.19.33.277;
SiS.19.33.278; SiS.19.33.279; SiS.19.33.280; SiS.19.33.285; SiS.19.33.287;
SiS.19.33.288; SiS.19.33.289; SiS.19.33.291; SiS.19.33.292; SiS.19.33.293;
SiS.19.33.294; SiS.19.33.295; SiS.19.33.296; SiS.19.33.297; SiS.19.33.298;
SiS.19.33.299; SiS.19.33.300; SiS.19.33.301; SiS.19.33.302; SiS.19.33.303;
SiS.19.33.304; SiS.19.33.306; SiS.19.33.307; SiS.19.33.308; SiS.19.33.309;
SiS.19.33.311; SiS.19.33.318; SiS.19.33.320; SiS.19.33.324; SiS.19.33.325;
SiS.19.33.326; SiS.19.33.327; SiS.19.33.328; SiS.19.33.330; SiS.19.33.331;
SiS.19.33.332; SiS.19.33.338; SiS.19.33.339; SiS.19.33.341; SiS.19.33.345;
SiS.19.33.347; SiS.19.33.348; SiS.19.33.349; SiS.19.33.350; SiS.19.33.351;
SiS.19.33.352; SiS.19.33.353; SiS.19.33.354; SiS.19.33.355; SiS.19.33.356;
SiS.19.33.358; SiS.19.33.359; SiS.19.33.360; SiS.19.33.361; SiS.19.33.362;
SiS.19.33.363; SiS.19.33.364; SiS.19.33.366; SiS.19.33.367; SiS.19.33.368;
SiS.19.33.371; SiS.19.33.372; SiS.19.33.373; SiS.19.33.374; SiS.19.33.375;
SiS.19.33.376; SiS.19.33.377; SiS.19.33.378; SiS.19.33.381; SiS.19.33.384;
SiS.19.33.385; SiS.19.33.387; SiS.19.33.388; SiS.19.33.389; SiS.19.33.390.

3. Architectural, functional and distributive analysis

The four phases identified in Area 33 constitute an uninterrupted sequence covering more than half a millennium of the settlement's history. In addition, within each single layer it was possible to reconstruct the functions and activities carried out within the individual buildings. Indeed, the association of the material with its stratigraphic context helps on the one hand to diachronically reconstruct the typological evolution of the recovered material (first and foremost ceramics) and on the other to determine the functional and typological characteristics of the buildings.

'Building 33': Layer 1 - SiS 3 - period IIIA (ca. 2600-2450 BC)

Squatter occupation: Layer 2 - SiS 4 - period IIC (ca. 2650/2620-2600 BC)

'House of the Courts': Layer 3a-b - SiS 5A-B - period IIB (ca. 2850-2650/2620 BC)

‘Western Building’ and ‘Eastern Building’: Layer 4a-b - period IIA (ca. 3000-2850 BC)

The sequence of the excavated buildings shows a typological transformation from the first to the last Layer. Specifically, stratigraphic breaks are easily documented in the transition from period IIA to period IIB, when a new architectural concept is introduced in place of the plurality of buildings of the previous period. Indeed, Area 33 passes from the presence of two large architectural units (the ‘Eastern Building’ and the ‘Western Building’) not communicating with each other, inserted in a complex urban layout characterised by narrow streets (Layer 4), to a new urban concept in which the entire area is now occupied by the ‘House of the Courts’, which is surrounded by broad open spaces (Layer 3). The idea is that in the transition from period IIA to period IIB, in addition to the architecture, the way of thinking about the space in which the building was created, above all its topographical relations with the external spaces, also changed. While the ‘Western Building’ and ‘Eastern Building’ of Layer 4 are inserted in an apparently chaotic topographical context characterised by streets of limited width, the ‘House of the Courts’ is sited in a broad, open topographical layout, as evinced by the large open areas surrounding the complex.

This difference in urban layout between the two periods also seems to have affected the space inside the buildings themselves: although further investigations should allow us to broaden our knowledge of the buildings of Layer 4 in the near future, an initial partial typological reconstruction helps us to identify an architectural type that projects spaces within the architectural unit, rather than towards the surrounding urban environment, which is confused and lacks a true urban plan. While the ‘House of Courts’ of Layer 3 represents a well-defined unit in a broad open space, the ‘Western Building’ of Layer 4 seems to introject this spatiality inwards with the courtyard L.176, which has at least two very long sides, providing a refuge from the surrounding urban environment, apparently cramped and disorganised.

Similarly, the transition to Layer 1 and ‘Building 33’, after the abandonment of the Area in Layer 2, seems to express a profoundly different idea of the building’s inner space, which now appears to be multi-sectoral, autonomous and divided into functional sectors, as seen in coeval monumental buildings in Mesopotamia. Between Layer 3 (‘House of the Courts’) and Layer 1 (‘Building 33’) there seems to be a transition from a domestic to a large-scale economy, employing a large workforce with specialised craftsmen. ‘Building 33’ is an architectural structure that implies completely different social organisation from what is assumed for period IIB, when the family/tribal tradition seems to be organised around a single standardised architectural unit lacking the division into functional sectors seen in ‘Building 33’.

3.1. Layer 1 - Shahr-i Sokhta IIB - SiS 3 (ca. 2600-2450 BC)

‘Building 33’ has been the subject of previous publications that have highlighted its multifunctionality (Ascalone 2019a: 36-49; Ascalone in press a) (Fig. 26). The 2018 campaign confirmed the preliminary observations concerning the role that the building may have played within the urban fabric of the settlement (Fig. 27).

Specifically, the research focused on extending the limits of the 2017 excavation eastwards, revealing new sectors of ‘Building 33’ and confirming its status as a monumental complex that was completely autonomous with respect to the surrounding urban layout (Figs. 28-30).

The kitchen sector is divided into areas for food preparation (L.36+L.43), cooking (L.33+L.37), storage (L.68+L.80+L.81+L.120) and the public (court L.19), as well as a probable residential area, already addressed in the preliminary excavations report (Ascalone 2019a). In addition, the new investigations have allowed us to recognise a large open courtyard (L.119) whose relationship to the central nucleus is mediated by W.88, which represents the eastward continuation of W.67 and clarifies the stratigraphic relationship of the central complex excavated in 2017 and the slender wall W.93 that marks the eastern edge of the courtyard L.119 (Fig. 31). Indeed, courtyard L.119 divided the living area, with its multiple functions, from an enclosed area (L.92).

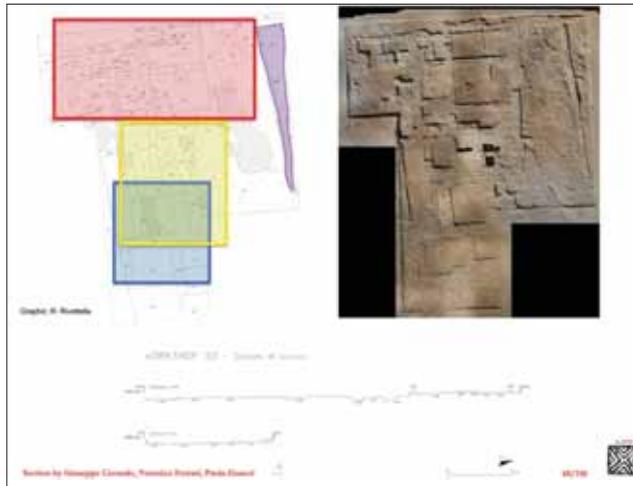


Fig. 26: functional division of 'Building 33'.



Fig. 27: 'Building 33' from drone.



Fig. 28: north-east view of 'Building 33'.

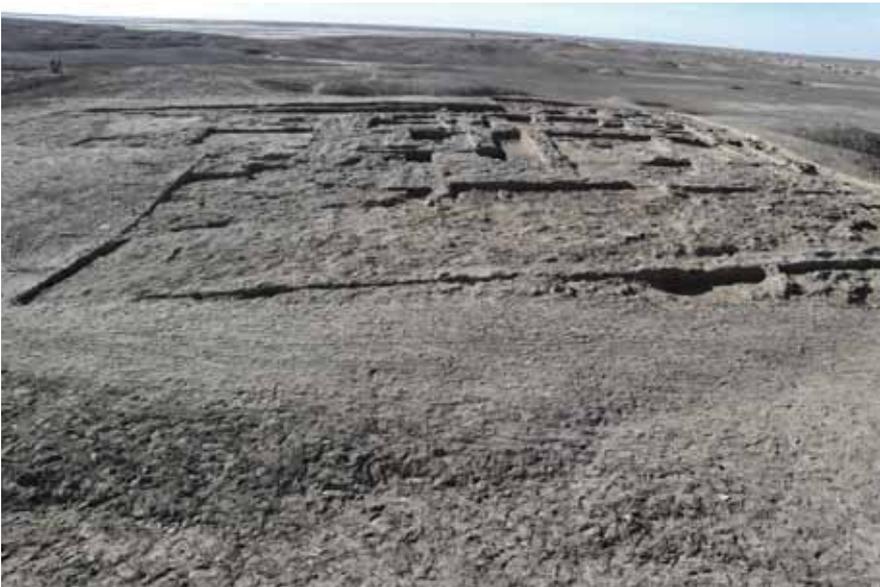


Fig. 29: east view of 'Building 33'.



Fig. 30: north-west view of 'Building 33'.



Fig. 31: north view of L.119.

Like the rest of the building, the courtyard L.119 is better preserved to the north, while it has been almost completely lost further south, due to a large pit for dumping animal bones (L.104) attributed to the later period, when the area was abandoned, and because the soil and structures have been completely removed by runoff in this sector. Specifically, M.121 seems to have been completely destroyed by erosion, to the point that the entire wall with its bricks has been completely washed away in the southern and south-eastern sectors of the trench. Given the state of preservation of these sectors therefore, it is not possible to know the layout of the building, preventing us from knowing the stratigraphic relations and the circulation between the probable staterooms around the court L.19. The presence of an open courtyard, i.e. an open-air space with no structural elements, must have contributed to the formation of drainage channels in this area, where there were no architectural remains and therefore no structural elements that could in any way counteract the flow of water. Although our understanding of the layout of the southern sector of the courtyard appears rather limited, its northern part has allowed us to study specific functional aspects: first of all, it was possible to see a relationship between this courtyard and the core of the building thanks to the doorway separating W.87 from W.89 represented by a threshold (L.113) that led directly to the cooking areas in L.33 and L.37. In addition, the courtyard yielded a basin lined with plaster for storing water (I.98, measuring 1.20x1.70 m), a circular silo (L.97 measuring 1.80 m of diameter; Fig. 32) delimited by a single row of bricks and a large oven (T.84, measuring 1.81 m of diameter; Fig. 33). The whole courtyard seems to be strongly linked to the storage functions recognised in L.68, L.80, L.81, L.94 and L.120 (as documented by silo L.97), but also to food preparation and cooking activities, as suggested by the presence of ovens (T.84 and T.99) and the basin for liquids (I.98).

This open courtyard divided 'Building 33' from an area enclosed by a low wall composed of mudbricks laid without mortar (one row) whose function remains uncertain, although some considerations can be made. The enclosed area, called L.92+L.107, was bounded to the west by a small wall running north-west/south-east (W.93) and was divided by a partition (W.96) that divided the enclosed



Fig. 32: silo L.97.



Fig. 33: oven T.84.



Fig. 34: mat from L.92.



Fig. 35: bowl I.100 from L.107.

area into two sectors (a northern one, L.92, and a southern one, L.107). The two sectors yielded distinct evidence: in L.92 several well-preserved mat fragments were found (Fig. 34), while in L.107 two bowls (I.100 and I.101) were directly embedded in the ground (Figs. 35-36). It seems possible that even within this enclosed area there was a specific intention to divide it into sectors on the basis of their use.

The bowls embedded in the ground and their moderate size suggest that space L.107 was used to keep goats or hens and represented a sort of enclosure for animals destined for the production of wool and food products (i.e. milk, eggs), where they were also slaughtered. In essence, we see documented in ‘Building 33’ the internal food cycle from conservation to consumption, including storage, processing, slaughter and cooking.

Locus	Artefacts
L.5	1 alabaster vessel body 1 smoother
L.33	1 alabaster vessel body 1 stone discard
L.34	2 indeterminate bronze objects 1 stone vessel rim 2 grindstones 1 smoother 1 token 1 stone discard
L.43	1 bead
L.77	1 perforated alabaster disc
L.81	1 spindle-whorl
L.85	2 grindstones 2 alabaster vessel bodies 1 alabaster vessel rim 2 smoothers 1 blade
L.86	1 stone discard 1 bronze vessel
L.92	1 bead 1 alabaster vessel base
L.107	1 alabaster vessel rim
P.65+P.71	1 piece of bronze slag with charcoal 2 indeterminate bronze fragments
P.84	1 piece of slag

Tab. 2: archaeological associations in ‘Building 33’.



Fig. 36: bowl I.101 from L.107.

The extension of the excavated area towards the east confirmed the building's clear division into sectors and its complete autonomy with respect to the urban fabric, as well as showing that it was responsible for an entire economic cycle of food production. Although 550 m² of the building has been excavated, its perimeter remains unknown, meaning that our typological analysis of the building is incomplete. However, given what we already know, it must be considered very far removed from the formulations of previous periods. The construction in accordance with a pre-established architectural plan devoid of later agglutinative additions, the functional division into distinct and specialised activities and its topographical location free from external urban conditioning are all characteristics not seen at Shahr-i Sokhta in its earlier periods (SiS 7-4). When analysed in its entirety, 'Building 33' appears to be an organic building, whose architectural and urbanistic characteristics seem to indicate a complex intended for one of the settlement's elite groups.

In conclusion, after the period of abandonment (Layer 2), the area seems to have returned to a new vitality in a period of numerous and frequent contacts



Fig. 37: north-east view of L.181.



Fig. 38: north-east view of L.179.



Fig. 39: furnace T.183 in L.185.



Fig. 40: furnace T.186

with other Iranian state and proto-state entities, the Indus (Harappa 3A) and Mesopotamia (the dynasties of Lagash and Ur). This lasted until around 2450 BC, when the settlement was struck by a sudden but clear crisis, exemplified by the end of the occupation of Area 33. The crisis continued until the settlement's final collapse around 2300 BC, when the Akkadian expansionist policy in Iran put an end to the longstanding commercial arrangements dating back to the first half of the third millennium BC.

3.2. Layer 2 - Shahr-i Sokhta IIIA - Phase 4 (ca. 2650-2600 BC)

This is a phase of abandonment of the entire area, which sees only sporadic structural presences (W.184, W.200, W.201, W.202, W.204, W.205 and W.206, enclosing L.179, L.180 and L.181; see Figs. 37-38), mainly furnaces (especially T.183), used for working bronze in the open air (Figs. 39-40).

To this period must be attributed the abundant slag, also found on the surface, which greatly complicated the geomagnetic prospections carried out in 2017 (Scholz - Scholz 2019: 246-249). In this phase, therefore, subsequent to the 'House of the Courts', the entire area is first abandoned and then reoccupied by bronze workshops partially reusing the old structures of Phase 5.

Locus	Artefacts
L. 186	1 piece of bronze slag 1 'triangular cake'

Tab. 3: archaeological associations in Phase 2.

The abandonment of Area 33 is difficult to explain, as is the brevity of this phase. It does however precede by a small margin the definitive rise of the Indus culture following the shift from Harappa 2 to 3A and the appearance of a new ceramic horizon in the Kopet Dagħ, reflected in the transition from Namazga IV to V. It is also contemporaneous with the end of Miri Qalat IIIB and Nausharo I.

3.3. Layer 3 - Shahr-i Sokhta IIB - Phase 5A-B (ca. 2850-2650 BC)

Layer 3 contained a new building completely different from anything found in



Fig. 41: the 'House of the Courts' by drone.



Fig. 42: north-east view of the 'House of the Courts'.



Fig. 43: north-west view of the 'House of the Courts'.



Fig. 44: south-west view of the 'House of the Courts'.



Fig. 45: south view of the 'House of the Courts'.



Fig. 46: south-east view of the 'House of the Courts'.

Layer 4, with a total change in the orientation of the walls and a new urban layout (Figs. 41-43). Indeed, while in the previous period (Layer 4) the area housed two buildings (the 'Western Building' and the 'Eastern Building') separated by a road running north-west/south-east, in Layer 3, the whole of Area 33 is occupied by a new building, called the 'House of the Courts' due to its specific floorplan type, which reflects an architectural tradition that is amply attested in Shahr-i Sokhta during Phases 6 and 5 of the site.

The building yields bricks measuring 11x22x44 cm, following a ratio of 1:2:4 common in later Indus settlements. The 'House of the Courts' measures 11x12.40 m, with a north-south orientation and a possible entrance on its northern side, where an initial courtyard granting access to the whole complex is located (Figs. 44-46). Indeed, the building consists of two juxtaposed courtyards (L.185+L.186 and L.217): the first (L.185+L.186) leads to the second (L.217), which gave access to L.142, L.122, L.127, L.144 and L.149. Only room L.219 required a longer route, with access from L.142.

This type is also seen in ‘Building 20’ and ‘Building 1’, and is partially replicated in the ‘House of the Pit’, the eastern part of the ‘House of the Stairs’, the ‘House of the Jars’, the ‘House of the Foundations’ and the house excavated in square XH. *Building 1*, excavated between 1999 and 2009, has yielded six distinct construction phases (A-F), of which the first five (A-E) are attributable to Shahr-i Sokhta II and III, coeval with the ‘House of the Courts’, while ‘Building 20’ has been attributed to the later phases of Period III and the first few years of Period IV of the site (Sajjadi - Moradi 2014: fig. 4; 2017: 143). In the same way, the ‘House of the Stairs’ shows four distinct architectural phases within a chronological framework limited to Period II of the site, with very sporadic evidence linked to Period III; the first two phases are seen in the central body, also structured around two courts aligned with each other, while the third phase is related to the additional eastern complex which, as in the ‘House of the Courts’, consists of two courts aligned on a north-south axis and a small entrance hall (Tosi 1968: 293-310). Although not completely excavated, the ‘House of the Jars’ also has a structure with double courtyards with rooms around them, very similar to what was excavated in Area 33. The ‘House of the Jars’, excavated in the ‘Central Quarters’, is dated to Period II, although the whole area continued to be occupied until Phase 3 (Salvatori - Vidale 1997: 28-38, fig. 47). The ‘House of the Pit’ in the ‘Eastern Residential Area’ has the same chronological horizon, while the ‘House of the Foundations’ seems to have lasted until Period III (Tosi 1983: 102-122, figs. 8-19).

Although the presence of a courtyard with rooms around it, including a stairway, is also seen in the Indus tradition, especially in Mohenjo-daro (see the Green, Yellow and Red types in A. Sarcina 1978; 1979), the presence of two aligned courtyards, as described above, appears to be a characteristic of Shahr-i Sokhta architecture. This standard architectural model included a spacious initial courtyard, whose function was to lead towards a second, inner courtyard, mainly used for the internal circulation of the building. Indeed, all the peripheral rooms were reachable from here, with the exception of L.219 (accessed only from L.142), which was presumably used for storage. A fixed feature of these architectural



Fig. 47: mudbricks covering L.138 and L.149.



Fig. 48: north view of L.122.



Fig. 49: south view of L.122, L.142 and L.219.

Chronology (BC)	SiS Phase	Area 33 phase	US	Locus	Artefacts (SiS.19.33.)
2850-2650	5A	3a	23	L.217	1, 3, 6, 7, 9 99, 100, 118, 120, 123, 126, 128, 129, 130, 132, 133, 134, 136, 145, 146, 147, 148, 155, 156, 157, 158, 159, 160, 161, 167, 253, 391
			26	L.142	
	5B	3b	31	L.156	154, 162, 163, 164, 212 216, 224, 226, 228, 231, 232, 233, 243, 244, 248, 251, 252, 257, 258, 261, 313 321, 340, 342, 343 322, 333, 335, 379 2, 4, 8, 16, 19, 20, 24, 25, 29, 34, 35, 42, 43, 44, 46, 49, 53, 54, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 90, 91, 106, 108, 115, 382, 383 17, 21, 26, 31, 36, 37, 39, 51 10, 12, 109, 208 182, 183, 184, 188, 189, 190, 191, 192, 193, 195, 196, 197, 198, 199, 201, 202, 262, 310, 312, 314, 315, 316, 317, 337, 344, 346, 352, 357 186, 213 187, 194, 200, 207
			32	L.16	
			35	L.127	
			46	L.142	
			54	P.161	
			60	L.138	
	64	L.156			
	2	L.122			
	5	L.125			
	7	L.127			
	22	L.138			
	27	L.217			
	34	L.122			
36	L.142				
38	L.142				
39	L.159				
47	L.125				
62	L.159				
					323

Tab. 4: stratigraphic associations in the 'House of the Courts'.

complexes, dated to late Period II and early Period III, was the presence of two courtyards aligned along an axis (either east-west or south-north). This feature had a number of variants. The first court can be preceded by an introductory room, as in the eastern part of the 'House of the Stairs', 'House of the Pit', 'House of the Foundations', or it can have a sort of small entrance, as in 'Building 1' and 'Building 20'. In the 'House of the Courts' in Area 33, there is a direct entrance to the first court and a unique and obligatory passage to the second inner court.

The 'House of the Courts' had two construction phases, of which the second only partially modified the overall plan of the building. Evidence of the two phases is documented by two floor levels, finely crafted with a light layer of plaster applied to a bed of small to medium-sized pebbles, and by a substantial change in the circulation of the entire eastern sector (Fig. 47).

Indeed, towards the end of the building's life, L.149 and L.138 were completely covered by an expanse of mudbricks, larger than those usually used for the walls, which changed the original layout of the complex (Fig. 48).

Specifically, the long room that arose, which also included W.209, was used as a stairwell to provide access to a second floor or to the terrace of the building, changing the circulation in the eastern sector but preserving the circulation and functions of the western rooms (L.122, L.142 and L.219; Fig. 49).

Rooms L.122 (Fig. 50) and L.142 (Fig. 51) yielded numerous seals and seal impressions, which have helped to determine the functions and importance of the western wing of the building (Ascalone in press a). Indeed, in addition to providing an indication of the functions of L.122 and L.142, the distributive analysis of seals and seal impressions helps to recognise the relationship between the type of seal and the room where it was found (Ascalone in press c). It seems rather significant that the finds of L.142 have a different figurative system from those of L.122 (Tab. 5).

This type of evidence makes it possible to hypothesise the presence of two administrative cycles regarding the storage activities related to the family economy.

Specifically, the seals and impressions from L.142 (Figs. 52-61 and Tab. 5) belong to the most widespread geometric type known in Shahr-i Sokhta and



Fig. 50: south-east view of L.122.



Fig. 51: north view of L.142.

CA NUMBER	US	OBJECT	MATERIAL	TYPE 1 (Shape)	TYPE 2 (Technology)	TYPE 3 (Design)	CONTEXT	PERIOD	LAYER	CONTEXT CHRONOLOGY	LOCUS	MEASURE (cm)	
1	SIS.19.33.119	SIS.19.33.31/15	Seal impression	Clay	Square	Cutting	Geometric	Eastern Building	II- 6	4	3000-2890 BC	L.149	3.8x2.8x0.8
2	SIS.19.33.316	SIS.19.33.34/21	Seal impression	Clay	Circles	Cutting	Geometric	House of the Courts	II- 5A	3	2890-2650 BC	L.122	2.4x1.8x0.8
3	SIS.19.33.25	SIS.19.33.2/6	Stamp seal fragment	Bone	Square	Cutting and drilling	Geometric	House of the Courts	II- 5A	3	2890-2650 BC	L.122	1.4x1.1x0.4
4	SIS.19.33.158	SIS.19.33.26/20	Seal impression	Clay	Square	Cutting	Geometric	House of the Courts	II- 5A	3	2890-2650 BC	L.142	3.6x2.4x1.6
5	SIS.19.33.156	SIS.19.33.26/24	Seal impression	Clay	Square	Cutting	Geometric	House of the Courts	II- 5A	3	2890-2650 BC	L.142	3.4x2.7x1.3
6	SIS.19.33.159	SIS.19.33.26/22	Seal impression	Clay	Square	Cutting	Geometric	House of the Courts	II- 5A	3	2890-2650 BC	L.142	5.8x6.2x2.8
7	SIS.19.33.160a	SIS.19.33.26/23a	Seal impression	Clay	Square	Cutting	Geometric	House of the Courts	II- 5A	3	2690-2650 BC	L.142	6.9x6.8x3.6
8	SIS.19.33.160b	SIS.19.33.26/23b	Seal impression	Clay	Square	Cutting	Geometric	House of the Courts	II- 5A	3	2890-2650 BC	L.142	6.9x6.8x3.6
9	SIS.19.33.50	SIS.19.33.1/5	Stamp seal fragment	Chloite	Square	Cutting and drilling	Geometric	OOH2-OOH1	/	/	/	Surface	2.9x1.8x0.4
10	SIS.19.33.101	SIS.19.33.1/29	Stamp seal fragment	Chloite	Rectangular	Cutting	Geometric	OOG4-OOI3	/	/	/	Surface	4.8x4.2x0.5

Tab. 5: seals and sealings from Area 33 at Shahr-i Sokhta.

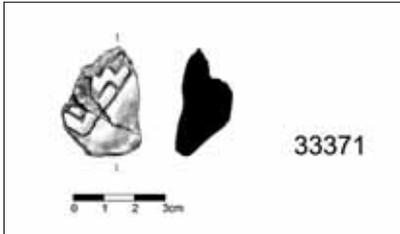


Fig. 53: SiS.19.33.158 (drawing by Nahid Zamani).



Fig. 52: SiS.19.33.158 (photo by Media Rahmani).



Fig. 54: SiS.19.33.156 (photo by Media Rahmani).

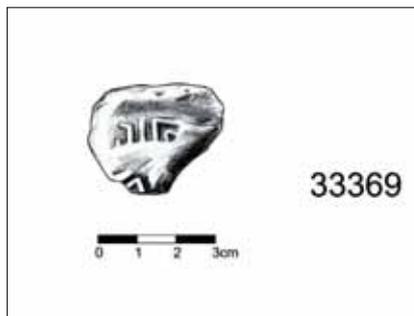


Fig. 55: SiS.19.33.156 (drawing by Nahid Zamani).

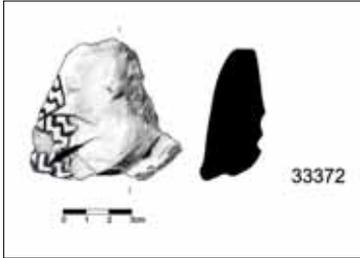


Fig. 57: SiS.19.33.159 (drawing by Nahid Zamani).



Fig. 56: SiS.19.33.159 (photo by Media Rahmani).

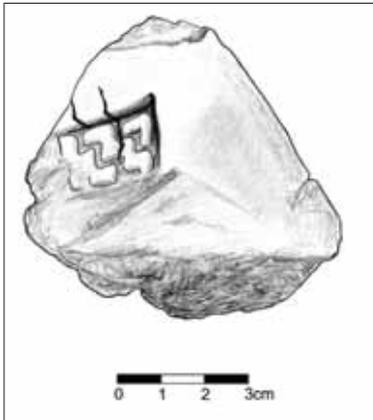


Fig. 59: SiS.19.33.160a (drawing by Nahid Zamani).



Fig. 58: SiS.19.33.160a (photo by Media Rahmani).



Fig. 60: SiS.19.33.160b (photo by Media Rahmani).

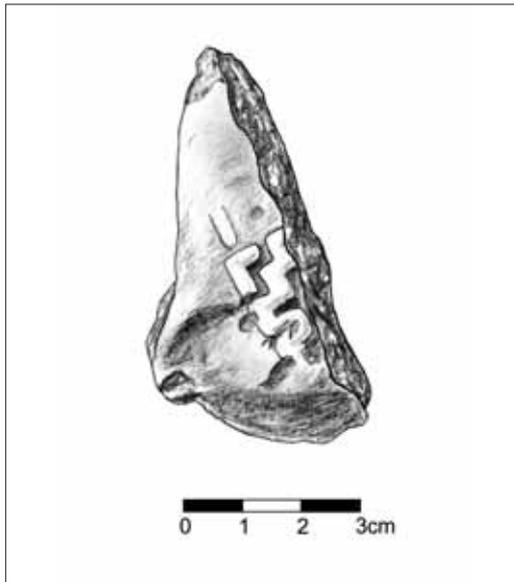


Fig. 61: SiS.19.33.160b (drawing by Nahid Zamani).

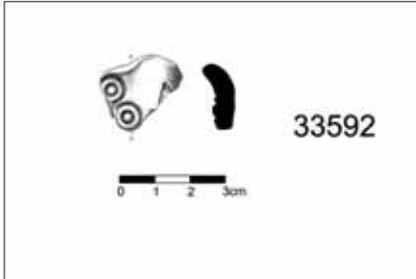


Fig. 63: SiS.19.33.316 (drawing by Nahid Zamani).



Fig. 62: SiS.19.33.316 (photo by Media Rahmani)

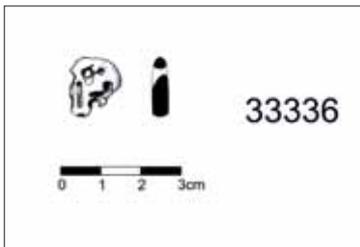


Fig. 65: SiS.19.33.25 (drawing by Nahid Zamani).



Fig. 64: SiS.19.33.25 (photo by Media Rahmani).

are considered to be of local origin, often in steatite/chlorite (on the presence of zigzag motifs at Shahr-i Sokhta, see Tosi 1968: fig. 264, 268; 1969, fig. 273; Heydari - Desset - Vidale 2018: fig. 13: 3, MAI 1436; Vidale - Lazzari 2019: SiS. 53A, 64A; Ameri 2020: MAI 0839, MAI 1597, MAI 1196, MAI 0758a and MAI 0758b; on the stepped motifs, see the specimens described in Tosi 1968: figs. 95a and 282; 1969: fig. 269; Ferioli - Fiandra - Tusa 1979: 25, fig. 9b.2 and Vidale - Lazzari 2019: SiS. 54A, 58A, 137A, 138A).

In contrast, the seals and impressions from L.122 (Figs. 62-65) belong to cultural spheres associated with Baluchistan (Damb Saadat in Franke - Cortesi 2015: fig. 10.37, Mehrgarh in Tromparent 2019: Ms 56-A, and Nausharo in Tromparent 2019: Ns 36-1), Khyber Pakhtunkhwa (Tarakai Qila and Rehman Dheri), Punjab (Harappa), Haryana (Kunal), Rajasthan (Tharakanewala Dera) and Gujarat (Bagasra and Nagwada) (see in general Uesegi 2018: figs. 17-19) (Tab. 6). In this case, the question arises as to whether these differences in the seals and seal impressions from the two architectural units can be explained by the differentiation of storage processes between locally sourced and off-site goods (Ascalone in press c).

The strong similarities between the iconographic motifs on the stamp seals and their impressions, mostly geometrical, confirm the standardisation of the main administrative aspects (Ascalone - Sajjadi in press). In the same way, the presence of specimens with close parallels with Baluchistan, together with polychrome pottery from Nal (Vecchio in this volume), confirms a cultural orientation of Sistan, in the first half of the third millennium BC, towards Baluchistan and Sohr-Damb/Nal in particular (but also towards Makran at Miri Qalat), whose stratigraphic and occupation sequences appear very similar to those of Shahr-i Sokhta (Franke-Vogt 2005; Görsdorf 2005).

The distributional analyses of the materials do not allow specific considerations other than to recognise L.122 as an area of some importance due to the high number of precious materials found (beads, alabasters, finely crafted flint blades, clay and bronze figurines, arrowheads, seals).

The 'House of the Courts' is thus firmly rooted in the architectural tradition of Shahr-i Sokhta, which in late Phase 6 and the whole of Phase 5 provides ample

Locus	Artefacts
L.138	1 core
L.142	1 stone axe 8 animal figurines 2 'triangular cakes' 1 cartwheel in clay 5 seal impressions 2 cretulae 10 sphendonoid counters 1 piece of bronze slag 3 figurines 1 grindstone 1 cretula with impression 1 counter with numerical signs 1 stone discard 1 spherical counter 1 polisher 1 bone spatula 1 weight 1 bone tool 1 alabaster vessel rim 1 pestle 1 token
L.156	3 sphendonoid counters 1 animal figurine 1 stone figurine 1 discoid spindle-whorl 2 arrowheads 1 smoother
L.217	1 sphendonoid counter 1 indeterminate bronze object 1 weight 1 flint discard 1 animal figurine
L.122	1 bead 5 spherical counters 3 alabaster vessel bodies 2 arrowheads 1 perforated alabaster disc 10 cretulae 6 sphendonoid counters 2 blades 5 cretulae with impressions 3 grindstones 3 tokens 2 pieces of bronze slag

	1 seal
	1 indeterminate bronze fragment
	3 figurines
	2 bone tools
	2 sealings
	1 rectangular clay bar
	1 bone spatula
	1 piece of glassy slag
	1 bone awl
	1 tripod
	1 anthropomorphic figurine
	1 bronze figurine
	1 animal figurine
	1 flint discard
L.125	1 alabaster vessel rim
	5 'triangular cakes'
	1 pebble
	1 rectangular clay bar
L.127	1 animal figurine
	1 polisher
	2 sphenonoid counters
L.142	1 alabaster vessel body
	1 flint
	1 arrowhead
	2 cretulae
	1 weight
	1 figurine
L.159	1 alabaster vessel rim

Tab. 7: archaeological associations in the 'House of the Courts'.

evidence of a homogeneous and coherent architectural type. In the first and second quarters of the third millennium BC (ca. 2900-2650 BC), Shahr-i Sokhta appears to have been a mature settlement whose standardised architectural forms are associated with highly homogeneous pottery production, the production of stamp seals with repetitive and well-coded geometric decorations, the use of weights (Ascalone 2019a; 2019b; 2020) within an as-yet non-solidified system, and standardised measurements of length.

The ‘House of the Courts’ therefore seems to represent a complex embedded within a centrally organised plan involving the entire settlement, which must have reached its zenith at the end of Period II around 2650 BC. This coincides with the transition from Harappa 2 to Harappa 3A in the Indus, when in Mesopotamia the first dynasties of Ur and Lagash begin to orient their markets towards the Makkan coast and the Iranian hinterland. In this historical context, the crisis of Area 33 in the transition from Period II to Period III (Layer 3 to 2) seems to presage a period of strong internationalisation in the second half of the third millennium BC, which however does not seem to have involved Shahr-i Sokhta. Indeed, the Sistan settlement does not provide any strong evidence of the numerous interactions unfolding across the entire plateau (primarily Jiroft) in the second half of the third millennium BC. On the contrary, it seems that Shahr-i Sokhta was excluded from the new Indo-Mesopotamian trade axis, while the beginning of the endemic Akkadian military incursions into all regions of the Iranian plateau (reaching at least as far as south-eastern Iran) definitively brought the settlement to its knees. Shahr-i Sokhta’s time as a trading power seems to be broadly limited to the first half of the third millennium BC.

3.4. Layer 4 - Shahr-i Sokhta IIA - Phase 6A-B (ca. 3000-2850 BC)

The excavated area returned two buildings, whose walls were only partially reused in the next phase. These buildings were separated by a road (L.148) (Fig. 66), consisting of a floor paved with medium-sized stones providing good drainage.

To the west of L.148, a large architectural complex (the ‘Western Building’) has been identified, built on a south-east/north-west axis parallel to the walls



Fig. 66: north view of the street L.149.



Fig. 67: north view of L.167.



Fig. 68: south view of L.169.

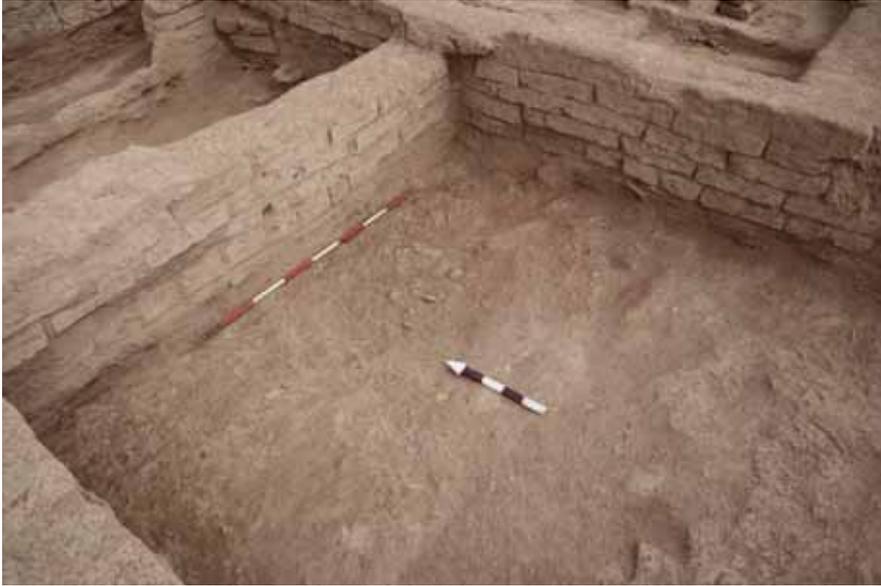


Fig. 69: south-west view of L.176.



Fig. 70: north-east view of L.176 with the door socket R.216.

of the second building to the east of L.148 (the 'Eastern Building', also called the 'Western Building'; Ascalone in press a). The eastern perimeter walls of the 'Western Building' (W.158, W.174 and W.163) along the aforementioned road L.148 make it possible to recognise at least three rooms arranged on a north-south axis: L.167 (Fig. 67), L.169 (Fig. 68) and L.176 (Fig. 69).

While little is known of L.167 due to the limited archaeological investigation, the size and fine workmanship of the walls of L.176 suggest that it is a large courtyard, whose western and southern limits remain unexcavated. It is probable that one of the entrances to the building was via an opening in W.158, near the door socket found *in situ* (R.216) (Fig. 70).

This was later closed, probably during the construction work of the next phase, which saw the creation of the so-called 'House of the Courts'. The entire complex seems to be outside the Shahr-i Sokhta architectural tradition (well attested in Layer 3), with an orientation slightly offset with respect to the other buildings excavated on the site. The presence of a large space with a non-central entrance in its perimeter wall is in fact an absolute novelty in the tradition of Bronze Age Sistan.

As previously mentioned, the presence of such a large courtyard and the cramped urban circulation represented by the street L.148 and the wall W.151 suggest a theoretical perception of architectural space that is completely different from what is seen with the 'House of Courts' of Layer 3. The architectural unit is inserted in a densely packed urban environment with little space between the outer walls of one building and the next: it does not face outwards as in Layer 3 where the space in front of the building is free, but inwards. The large room L.176 (9.35x2.80 m), although this is currently only a partial measurement, and the narrow external space around it express a perception of architectural unity that is very different from that of the later period. The building fits into a chaotic urban fabric that drove a search for spaces inside the residential complex, which in the case of the 'Western Building' take on monumental dimensions.

Chronology (BC)	SiS Phase	Area 33 Layer	US	Locus	Artefacts (SiS.19.33.)
3000-2850	6A	4a	43	L.167	217, 219, 221, 222, 223, 225, 245, 246, 256
			44	L.168	218
			48	L.169	234, 236, 237, 238, 239, 240, 241, 249, 250, 254, 255, 260, 263, 324
			49	L.169	235
			53	L.176	292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 308, 311, 326, 328, 330, 331, 347, 348, 354, 381
	6B	4b	51	L.169	266, 268, 270, 271, 272, 273, 275, 277, 278, 279, 280, 285, 288, 289, 306
			52	L.169	269, 274, 287, 291, 307, 309, 318, 353
			63	L.176	320, 327, 350, 358, 359, 371, 377, 378, 384, 385, 390

Tab. 8: stratigraphic associations in the ‘Western Building’.

The limited nature of the excavation precludes considerations of a typological nature. However, from a functional point of view, the distribution of the artefacts appears particularly significant: the presence of numerous accounting objects of an administrative nature (such as tokens, *cretulae*, spherical objects, numerical clay bars) suggest that L.167 and L.176 played a role in administrative activities regarding accounting and storage.

Seen from this perspective, the distributional and associative analysis of the material is particularly significant because it allows us to recognise in L.169 an area for the storage of precious materials such as alabaster vases, beads, bone tools, bronze figurines, alabaster cosmetic vials and clay figurines. In contrast, the large courtyard L.176 seems to be related to accounting activities and the recording of incoming and/or outgoing resources. The discovery of 101 quadrangular clay blocks, 13 of which bear numerical annotations, should be considered as having an accounting and administrative function that sheds new light on the dynamics of complex societies in Bronze Age Iran.

The so-called ‘Eastern Building’ is located east of the road L.148 and should be considered architecturally separate from the ‘Western Building’. Unlike the latter, it was possible to identify two hypothetical entrances, one on the north side and another, less plausible, on the east side. The complex consists of at least two

Locus	Artefacts
L.167	5 sphendonoid counters 1 cretula 1 polisher 1 animal figurine 1 anthropomorphic figurine
L.168	1 sphendonoid counter
L.169	1 alabaster vessel 3 alabaster vessel rims 2 animal figurines 1 bead 2 bone awls 1 bone pin 1 bronze tool 1 cosmetic flask 9 sphendonoid counters 5 cretulae 7 clay figurines 1 grindstone 1 perforated alabaster disc 1 polisher 1 stone figurine 1 stone vessel
L.176	1 alabaster vessel rim 1 animal figurine 1 anthropomorphic figurine 2 bone tools 101 rectangular bars, 13 of which with numerical incisions 1 sphendonoid counter 4 cretulae 6 anthropomorphic figurines 1 smoother 1 measuring stick 1 spherical counter 1 ovoid weight with flat ends 1 wooden handle

Tab. 9: archaeological associations in the 'Western Building'.



Fig. 71: north-west view of L.149.



Fig. 72: north view of L.149.



Fig. 73: north-east view of L.149.



Fig. 74: south-east view of L.149.



Fig. 75: south view of L.149.



Fig. 76: T.213 in L.149.

large rooms (L.149 and L.150) delineated by walls made of bricks with the same dimensions and ratios as those of the ‘Western Building’: two horizontal rows of bricks were conserved, in good condition partly thanks to a thick layer of grey plaster of very fine workmanship. Also in this building, two archaeological phases have been identified from two superimposed floors, the later stage involving a change in the inner circulation of the building. Indeed, the two rooms (L.149 and L.150) were initially connected (Layer 4b) through a doorway in W.152, but were then closed off from each other by the addition of W.173 (Figs. 71-76 for L.149 and Fig. 77 for L.150).

This structural change must have drastically changed the use of the rooms. The internal circulation, which in the earlier phase is believed to have been on a north-south axis (an opening was identified in W.152), was altered for reasons not yet understood (Fig. 78).

On the basis of our current knowledge, L.149 maintained its communication with the northern sectors of the building via two openings in W.154, one of which has a door socket (R.215) and shows clear signs of the use of locking systems with wooden beams embedded in the brick walls. L.149 yielded a considerable amount of material, including seal impressions, tools for food processing (a bone awl), clay figurines and above all a very significant amount of *cretulae* and spherical objects used for administrative accounting (Rivoltella in this volume). All the accounting objects were found near the jar placed next to W.152, not too far from the quadrangular oven (T.213), perfectly preserved and positioned near the centre of the room. The craftsmanship of the walls and the floors, the sophisticated locking device (in the eastern part of W.154, in the same doorway as R.215) and the presence of administrative objects (counters, *cretulae*, jars, alabaster vessels, seal impressions) all suggest that this compartment was used for accounting activities and storage. In this context, the closure of the doorway between L.149 and L.150 in a later phase could be due to a change in the way the economic resources of the building were managed and accounted for (Ascalone in press c). While in phase 4a of Area 33, L.149 seems to be more central to the



Fig. 77: north-west view of L.150.



Fig. 78: the passage to north in L.149.

Chronology (BC)	SiS Phase	Area 33 phase	US	Locus	Artefacts (SiS.19.33.)
3000-2850	6A	4a	28	L.149	94, 104
			29	L.149	92, 93, 103, 111
			31	L.149	95, 96, 97, 102, 105, 117, 119, 121, 122, 124, 125, 127, 135, 137, 138, 139, 140, 141, 142, 143, 144, 149, 150, 151, 152, 153, 165, 166, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 185, 203, 205, 211, 368, 372, 376 325, 332, 339, 341, 345, 349, 356
			61	L.149	338, 351, 355, 360, 361, 362, 363, 364, 365, 366, 367, 373, 374, 375, 387, 388, 389
			30	L.150	
			67	L.149	
	6B	4b			
	68		L.169		

Tab. 10: Stratigraphic associations in the 'Eastern Building'.

Locus	Artefacts
L.149	<ul style="list-style-type: none"> 1 alabaster fragment 1 alabaster vessel 1 alabaster vessel body 1 alabaster vessel rim 4 animal figurines <ul style="list-style-type: none"> 1 arrowhead 1 bone awl 1 bone tool 40 sphenonoid counters <ul style="list-style-type: none"> 9 cretulae 1 cretula with impression 3 anthropomorphic figurines <ul style="list-style-type: none"> 1 flint core 1 inlay fragment 1 smoother 1 perforated stone disc <ul style="list-style-type: none"> 1 pestle 1 seal impression 1 spherical clay object 2 spherical counters 2 stone vessel bodies
L.150	<ul style="list-style-type: none"> 1 spherical counter

Tab. 11: archaeological associations in the 'Eastern Building'.

life of the building, L.150 seems to lose its function. The closure of the doorway in W.152 seems to have led to an abandonment of L.150, as can be assumed from the excavated infill (completely different from that of L.149) and above all from the almost total absence of ceramics and objects (only one counter): the 'Eastern Building' appears to have undergone a significant downsizing in phase 4a, with the exclusion of an entire sector (L.150) from its internal circulation.

The presence of numerical accounting and administrative material from both buildings in Layer 4 enriches our perception of proto-urban societies in eastern Iran at the beginning of the third millennium BC. Alongside the *cretulae* and seal impressions, the tokens and clay blocks with numerical notations allow us to rewrite the history of accounting systems in Sistan at that time.

The material found and the reconstructed archaeological associations provide a rather innovative picture of urban formation processes in the settlements of eastern Iran. Specifically, evidence from the 'Eastern Residential Area' and the 'Central Quarters' shows that after SiS 7, Shahr-i Sokhta seems to follow growth processes that are completely different from those of the earlier period, which was characterised by a pottery horizon linked to Namazga III (Biscione 1984) and Proto-Elamite models of administrative control (Amiet - Tosi 1978). In contrast, the archaeological evidence of successive period, collected from the 'Western Building' and 'Eastern Building', points to development rooted in the local cultural complex, broadly indigenous albeit with strong links to Baluchistan. The new forms of administrative control using stamp seals with geometric decorations and the numerical clay 'proto-tablets', very approximate in shape and workmanship, are the clearest evidence of a shift that involved the entire social system of Shahr-i Sokhta. With respect to the settlement's first period (SiS 11-8), Period II seems to represent a clear historical break (confirmed by strata bearing evidence of destruction): this is the period of maximum growth of the site, which, in addition to its easternmost core, occupied the entire area around the lake. It is in this historical context that the 'Western Building' emerges in Area 33: the hundred or so numerical 'proto-tablets' discovered there document careful control of resources, including storage and accounting. Pending the westward

extension of the excavations, it remains hard to determine whether this extensive standardised administrative apparatus was a family or elite operation. The size of the building's courtyard (L.176), the craftsmanship seen in the building's construction (including the floors), the presence and the high quality of alabaster vessels (*Festuccia* in this volume) and above all the large number of *cretulae* and 'proto-tablets' found in the north-eastern corner of L.176, immediately next to the gate in W.158, all indicate the presence of an active elite or elites at Shahr-i Sokhta. This historical leap occurs at Shahr-i Sokhta at a time of strong regionalisation in the Indus Valley (as seen in Harappa 1 with the Ravi Culture), and coincides with an apparent break in the sequences in Turkmenistan (with no evidence of traumatic events) from the Chalcolithic cultures of Namazga III to Namazga IV.

4. Conclusions

The excavations of Area 33 have thus far made it possible to investigate periods II and III of the settlement, revealing a pattern of growth that fits well into the broader historical context: the traumatic transition from Period I to Period II, for example, is well documented in other regions. The historical transitions in Sistan in about 3000 BC, away from the pottery horizon of Namazga III and from the Proto-Elamite model of resource management, are reflected in Baluchistan in the transitions from Miri Qalat IIIA to IIIB (Besenval 1994), from Sohr Damb I to II (Görsdorf 2005) and from Nausharo IA to IB (Jarrige - Quivron - Didier 2011). Similarly, in Central Asia, a stratigraphic break has been detected in the same period in the Upper Level sequences of Geoksyur 1 (Kohl 1984), in the transition from Namazga III to IV (Kohl 1984) and in the transition from Hissar IIB to Hissar IIIA (Dyson - Lawn 1987), as well as in the foundation of Shortugai (Kohl 1984). On the Iranian plateau, the beginning of Shahr-i Sokhta Period II (SiS 6, ca. 3000 BC) also saw the start of Takab IV.2 at Shahdad (Hakemi 1997) and the Banesh period at Tall-i Malyan (Ehrich 1992; Miller - Sumner 2003; 2004). Above all, there was a break in the Varamin sequences, marking the transition from Period IV to Period V (Eskanderi in press). To summarise, the Late Chalcolithic cultures on the Iranian Plateau and in the Kopet Dagħ and

Baluchistan show substantial changes in their stratigraphic sequences and cultural horizons. Specifically, Period II seems to begin at Shahr-i Sokhta following a traumatic event extensively documented (SiS 7) in the stratigraphic sequences of the 'Eastern Residential Area' and the 'Central Quarters' (Salvatori - Vidale 1997).

The transition from Period II to Period III of the settlement around 2600 BC, documented in Area 33 in Layer 2 (SiS 4), also shows similarities with the fractures seen in the major settlements of Baluchistan, in the transition from Miri Qalat IIIB to IIIC, from Sohr Damb III to IV and from Nausharo I to II, as well as in Central Asia, from Namazga IV to V and from Shortugai I to II (the Hissar sequences corresponding to the transition from IIIA to IIIB are more problematic).

The third major historical shift at Shahr-i Sokhta is not fully documented in Area 33, which is believed to have been definitively abandoned during SiS 3, some time before the transition to Period IV (SiS 1). The definitive collapse and abandonment of the settlement as a whole have chronological and stratigraphic correspondences with neighbouring regions: Shortugai passes from Period II to III and Namazga passes from Period V to Period VI, while Hissar is abandoned for a couple of centuries, only to be reoccupied again with Hissar IIIC.

Similarly in south-eastern Iran, Konar Sandal South is abandoned in favour of Konar Sandal North and a new settlement appears with Mahtoutabad IV, while in Shahdad there is a transition from Takab III.1 to Takab III.2. In Elam, the Kaftari period begins, while the cultural horizons of Bampur V-VI completely replace those of Bampur I-IV.

The end of Shahr-i Sokhta must have been linked to concomitant factors involving the wider region: climate change, which brought about new environmental equilibria, the Akkadian expansionist policy with respect to the entire Iranian plateau and the emergence of a new maritime market, which now reached beyond Oman to the coasts of Greater Indus. From 2300/2200 BC onwards, these three macro-factors must have disturbed the political and economic equilibrium between the major settlements of the plateau, giving rise to new scenarios in which Shahr-i Sokhta and Sistan no longer played a key role (Ascalone in press b).

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Archaeological Survey on the East and Southeast Areas of Shahr-i Sokhta: Some Evidence for Making Chronology during the Third and Early Second Millennium BC

Hossein Moradi¹, Hossein Sarhaddi Dadian², Mojtaba Saadatian³, Seyed Mohammad Javad Marashi⁴ and Mohammad Keikha⁵

1. h_moradi57@yahoo.com

2. h_sarhadi56@hotmail.com

3. Mojtaba.saadatian@gmail.com

4. Mj_marashi@yahoo.com

5. mohammad.keikha1367@gmail.com

Abstract

The cultural basin around Shahr-i Sokhta stretches from the Ramshar area north of the site to the Tasuki region known as the Rud-i Biaban area in the south, forming a strip of land approximately 45 km long. The present article is the result of a non-probabilistic survey carried out in April 2019 which covers the east and southeast of Shahr-i Sokhta from Ramshar to Rud-i Biaban. During the surface survey, a total of 32 sites were visited and surface finds including pottery sherds and stone objects such as alabaster vessel fragments and micro blades were collected

and registered. The surveyed sites of the area have various chronologies, from 3000 BC to 2000 BC and later. To better understand the distribution of these sites, a general classification based on the comparative dating of the collected pottery was performed, assigning the sites to three main periods: a) the early third millennium BC; b) Periods III-II of Shahr-i Sokhta and c) Period IV of Shahr-i Sokhta and the Rud-i Biaban phase.

1. Introduction

The cultural basin around Shahr-i Sokhta stretches from the Ramshar area in the north to the lands around the Tasuki region known as Rud-i Biaban in the south, encompassing a strip of territory approximately 45 km long. This cultural area is important in two ways. First, this extensive area of settlement was occupied from the middle of the fourth millennium BC to the Islamic era. Although it underwent moments of crisis, it was still considered to be one of the more attractive areas until the Safavid (Sajjadi 2003: 20-57). The second reason for its importance is that today the transportation routes from large parts of Sistan and Afghanistan to the southeast and centre of Iran pass through this region. For this reason, we have witnessed increasing construction along this route that raises the need for rescue projects such as the 'Salvage Archaeological Project', which facilitates archaeological studies in the disputed landscapes. The present article is the result of a non-probabilistic survey carried out in connection with the Zabol-Zahedan water transfer project in April 2019 (Sarhaddi Dadian - Moradi 2021: 439-446), which covers the areas to the east and southeast of Shahr-i Sokhta from Ramshar to Rud-i Biaban (Fig. 1).

2. Archaeological background

In the 1960s, the Italian IsMEO institute began exploring the area (Tosi 1968) and conducted sporadic studies of the cultural landscape of Shahr-i Sokhta. This led to the identification and recording of data from a number of sites such as Tepe Dash (Biscione *et al.* 1975: 40-44) and Tepe Rud-i Biaban (Tosi 1984: 30).

From 1979 to 1997, no archaeological work was carried out in this area. New archaeological excavations by an Iranian archaeological expedition began in 1997 (Sajjadi 2003), and a series of surveys to record the location of archaeological sites in the area were conducted by the Sistan and Baluchistan Cultural Heritage Organization, recording more than 100 satellite sites around Shahr-i Sokhta. In 2009, the Sistan basin archaeological survey project was entrusted to Mousavi Haji and Mehrafarin from the Archaeological Department of Sistan and Baluchistan University. Surveying and mapping the area, this expedition identified more than 1,200 sites dated to a number of periods (Mehrafarin - Musavi Haji 2011).

In the last few decades, the universities of Sistan and Baluchistan and Zabol have begun a series of excavations in smaller sites around Shahr-i Sokhta: Tepe-Dash (Mortazavi 2010); Tepe Sadegh (Shirazi 2018: 298-306); Tepe Graziani; and Tepe Taleb-Khan 1 & 2 (Kavosh *et al.* 2019: 157).

3. Surveys around Shahr-i Sokhta

During the surface survey of the eastern side of Shahr-i Sokhta to the east of the Zabol-Zahedan road, a total of 32 sites were visited. As mentioned above, some of the sites in this area, such as Tape Taleb Khan 1 (No. 11), Tape Taleb Khan 2 (No. 12) and Tape Rud-i Biaban, had already been excavated. Some sites, such as nos. 1, 3 and 15, have been severely damaged by climatic agents, especially winds and seasonal floods, which have led to the mixing of shards and gravels and their concentration in a small area with no other surface evidence of a settlement.

The surveyed sites have various chronological dating from 3300 BC to 2000 BC or even later. To better understand the distribution of sites, a general classification, based on the comparative dating of collected pottery, was carried out. Based on the typological comparison of their pottery, the sites were classified into three general categories: a) Sites dated to late fourth the beginning of the third millennium; b) Sites related to Shahr-i Sokhta Periods II and III, and c) Sites with pottery related to IV and the Rud-i Biaban Phase (Tab. 1).

Site	Name	Period	Phase	Dates (BC)
1	-	II	5-6	3000-2600
2	-	II	5-6	3000-2600
3	-	II-III	?	-
4	-	I	9-8	3200-3000
5	-	I	9-8	3200-3000
6	-	I	9-10	3350-3100
7	-	I	9-8	3200-3000
8	-	?	?	-
9	-	II-III	4	2600-2550
10	Fibr-e-Nouri	II-III	2-3	2550-2400
11	Tepe Taleb Khan	IV	2-3 - Rud-i Biaban	2550-2400
12	Tepe Taleb Khan (2)	IV	2-3 - Rud-i Biaban	2550-2400
13	-	II-III	?	-
14	-	II-III	?	-
15	-	II-III	?	-
16	Tirak-e Barq	III	2-3	2550-2400
17	-	I	9	3300-3000
18	-	I	8-9	3200-3000
19	-	I-III	4&9	-
20	-	I	8-9	3200-3000
21	-	IV	2 - Rud-i Biaban	2450-2400
22	-	III	3	2550-2450
23	Rud-i Biaban	III	3	2550-2450
24	Rud (1)	IV	2-3 - Rud-i Biaban	2550-2400
25	Rud (2)	III	3-4	2600-2450
26	Taleb Khan (3)	IV	0 - Rud-i Biaban	2000
27	Taleb Khan (4)	IV	0 - Rud-i Biaban and maybe later	2000-1800
28	Taleb Khan (5)	III	3-4	2600-2450
29	Kate Tepe (1)	IV	1-2 - Rud-i Biaban	2450-2300
30	Kete Tepe (2)	III-IV	2-3 - Rud-i Biaban	2550-2400
31	Kate Tepe (3)	III-IV	2 - Rud-i Biaban	2450-2400
32	Kate Tepe (4)	IV	2 - Rud-i Biaban	2450-2400

Tab. 1: surveyed sites.

3.1. Sites dated to the second half of the fourth and early third millennium BC (ca. 3550-3000 BC)

Eight sites with cultural materials dated to the second half of the fourth millennium BC are located around Shahr-i Sokhta (Fig. 2). The presence of such sites in an area of 500 square metres at a distance of one kilometre from Shahr-i Sokhta is interesting because it had been assumed that the materials related to the formation of the settlement during the Proto-Elamite were located only in the 'Eastern Residential Area' of the site, the location of the earliest archaeological layers (Amiet - Tosi 1978: 9). However, recent surveys show the presence of pottery similar to Phases 9-10 in seven small sites located about 1-2 kilometres south of Shahr-i Sokhta. Similar evidence has been obtained from the Proto-Elamite layers in rooms 88 and 88a in the 'Eastern Residential Area' (Sajjadi *et al.* 2021: fig. 3). These satellite sites are not very extensive and are built on heights of modest altitude. Due to the high degree of natural erosion, large parts of them have been destroyed, and except for one area, the height of the remains does not exceed about half a metre above the ground. Unlike Period II and III sites, which are built on relatively high natural *kaluts* scattered over the plain, these sites are very close together, about 100 to 200 metres apart, and are located on the natural surface (severely eroded) of the plain. The only cultural material found in these sites is a light Buff Ware together with some Grey and Red Ware. However, painted and plain Buff Ware is more visible here than other areas. In terms of form, this pottery is classified into two categories: bowls and jars. Vessels are mostly deep or shallow conical open bowls. The motifs include light brown parallel bands below the rim or on the middle section of the body. The jars are globular, classed as pseudo-Jemdet Nasr, with two or four short handles (Fig. 3, no. 7, Fig. 4, nos. 1, 6 and 11). They are thus of the proto-literature, and were found in layers associated with Phases 9 and 10 of Shahr-i Sokhta (Moradi 2021: fig. 24), and in other coeval sites in southeast Iran such as Tepe Yahya (Potts 2001: fig. 1.40). The distribution of such pottery close to the main site of Shahr-i Sokhta indicates that probably the first phase of development in Sistan, and specifically the southern Hirmand Delta, began in the late of second half of fourth millennium BC, with Shahr-i Sokhta Phase 9 (Sajjadi - Moradi 2018: 717).



Fig. 1: cultural landscape of Shahr-i Sokhta (left, Kavosh *et. al* 2019: fig. 1).



Fig. 2: areas associated with later fourth and early third millennium materials.

Site No. 4

This site is located about 800 metres southeast of Shahr-i Sokhta, with a low eroded height (about half a metre above the surrounding land at the highest point), with a low concentration of cultural material including pottery fragments, stone vessels and other items on the surface. The painted Buff Ware of this site belongs to Period I, Phase 9, i.e. around 3000 BC (Fig. 3, nos. 1-6 and Fig. 4, S4.1-5).

Site No. 6

This area is located 600 metres northwest of Site No. 4. At the centre of this low mound is a rectangular kiln measuring half a metre on each side. Also found were Buff Ware vessels decorated with solid geometric designs together with jars with lug-shaped handles (Fig. 3.7-10), similar to the Yahya IVC1 (Mutin 2013) and Jemdet Nasr types (Matthews 1989: fig. 11.3).

Site No. 7

This area is located 300 metres north of area number 6 and reaches a height of about 2 metres above the surrounding land. A fragment of a jar with a lug-shaped handle classified as pseudo-Jemdet pottery was found in this area, mixed with the remains of stone and marble vessels (Fig. 4, S7.11-13).

Site No. 17

This site is one of the areas belonging to Phase 9, Shahr-i Sokhta I, located near Sites No. 4 and No. 5, to which, along with Site No. 6, it is similar in terms of the quality of the available cultural materials. The ancient remains, which are covered with black pebbles, are no more than half a metre below the surface of the plain (Fig. 2, S.17).

Site No. 18

This site is located one kilometre southeast of Shahr-i Sokhta, 100 metres east of area No. 5. It is a hill with a diameter of approximately 40 metres about one metre above the surrounding terrain. Cultural materials include pottery, stone utensils

and marble items. The pottery includes Buff, Grey and Red Ware, the first two of which have painted geometric black patterns (Fig. 4, S.18.14-17). A piece of a cylindrical bowl with an everted rim is one of the interesting finds from this area (Fig. 4, S.18.17). It is related to Phase 9 of Shahr-i Sokhta, found in workshop 35 (Moradi 2021: fig. 20.17).

Site No. 19

This area is located 1200 metres southeast of Shahr-i Sokhta, about 1.5 metres above the surrounding terrain, with abundant pottery consisting of plain Buff, Red and Grey Ware. Patterns on the Buff Ware include triangles below the rim on the inside, associated with early Period II. A sample of light Buff Ware painted with rhomboids from Phase 9 of Shahr-i Sokhta is among the pottery collected at the site.

Site No. 20

Almost 500 metres east of Site No. 19, Site No. 20, 2.5 metres above the surrounding terrain, is the highest hill in this series of sites (Fig. 2, S.20). Items of Reddish and Buff Ware are scattered on the surface. Simple striped patterns are painted on deep bowls, a special style used around 3000 BC (Fig. 3, nos. 11-15).

3.2. Sites dated to Periods II and III (ca. 3000-2400 BC)

There are 16 sites in this group. The materials from sites located at some distance from Shahr-i Sokhta mostly belong to the second half of Period III and early Period IV. Most of these sites are larger than those of Period I, which are located on top of natural *kaluts* (Fig. 5).

Site No. 2, located 500 metres east of Shahr-i Sokhta, differs from other coeval sites in terms of both the dimensions and quality of its cultural materials, including pottery, which shows high diversity in designs and patterns and is mostly related to Period II and the mid third millennium BC (Fig. 5, No. S.2). Other sites coinciding with Periods II and III are scattered along a hypothetical line running north-south for about 40 km from Shahr-i Sokhta to Rud-i Biaban. Other landmarks dated to this period include Tepe-Rud-i Biaban on the eastern

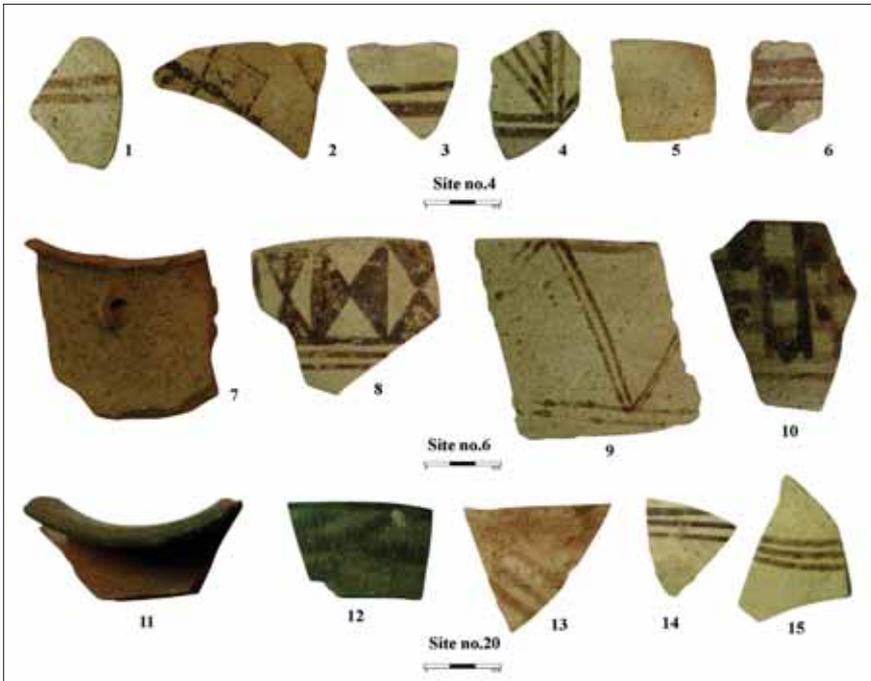


Fig. 3: pottery dated to the late fourth and early third millennium BC.

side of the southern end of this hypothetical line, which seems to belong entirely to the second half of Period III (Lazzari 2019: 11). Other large sites in this area are mostly located in Rud-i Biaban and generally belong to Period III and early Period IV (2600-2300 BC). The pottery of these areas includes various forms with linear motifs, hatched leaves or other hatched linear designs with thin lines that are characteristic of the motifs of Period III (Fig. 6 and 7). However, there are also areas such as Sites 24, 29 and 30 that have both materials belonging to Period III and materials from later phases.

Site No. 1

This eroded and very small area is located about 500 metres east of Shahr-i Sokhta but the presence of pottery residues suggests that one of the pottery workshop of the surrounding sites was probably located here (Fig. 7, no. 5).

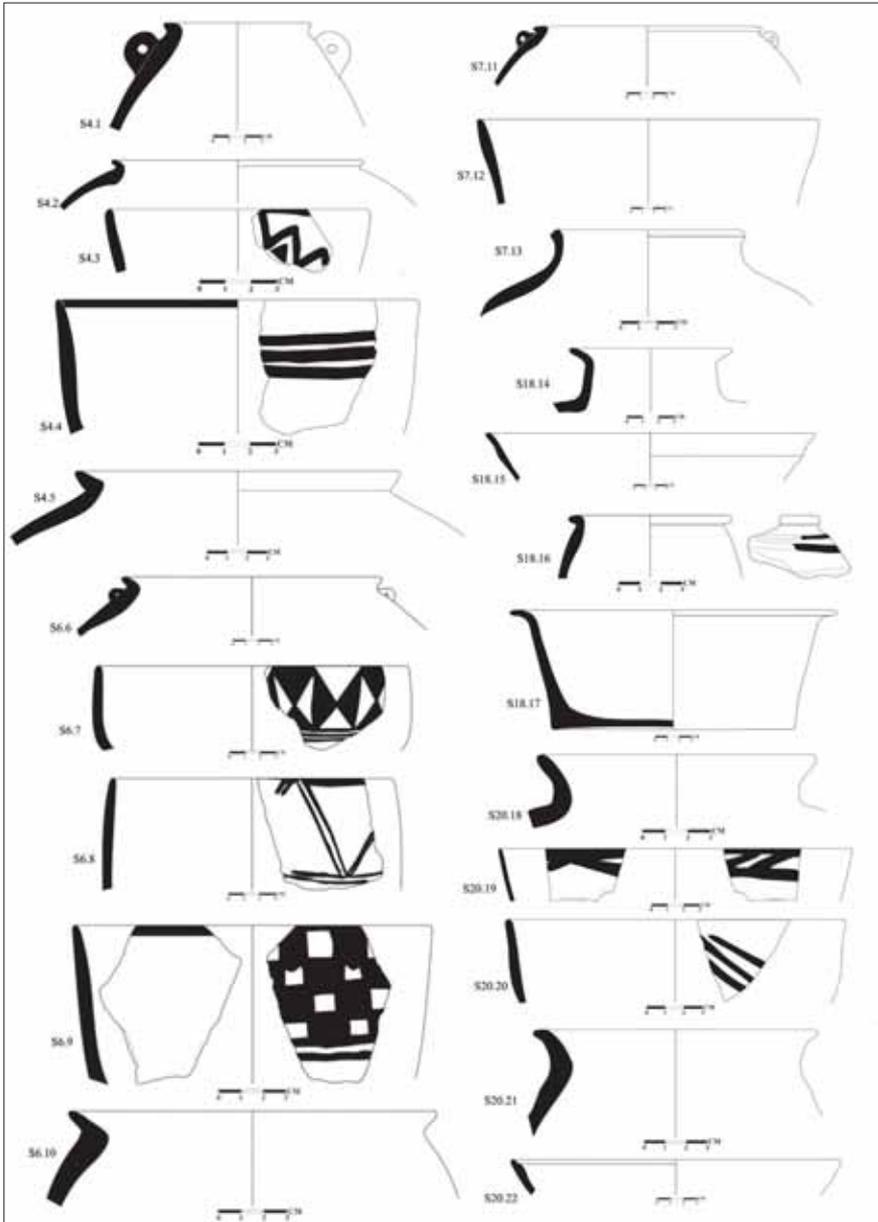


Fig. 4: designs seen on pottery from late fourth millennium BC and early third millennium BC.

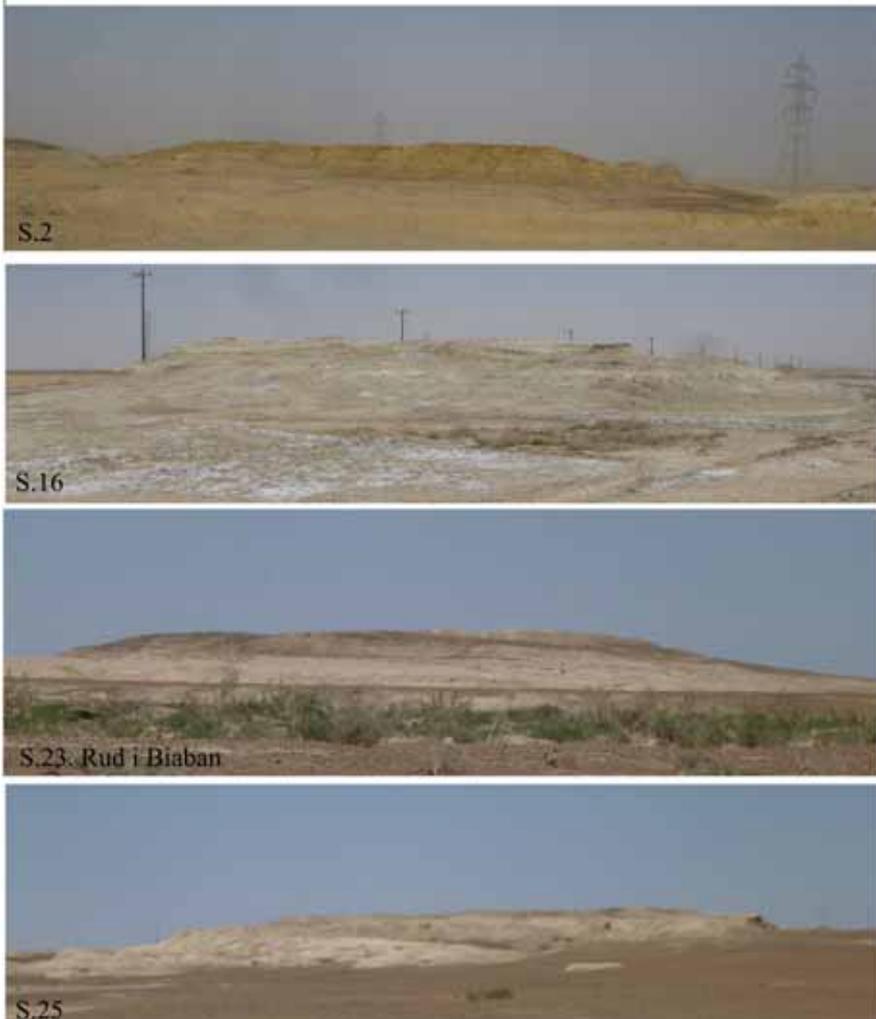


Fig. 5: areas dated to Periods II and III (3000-2400 BC).

Site No. 2

This site is located 500 metres east of Shahr-i Sokhta, and at 5 metres above the surrounding terrain it is one of the highest sites in the surveyed area. It is about 50 metres long and 30 metres wide. (Fig. 5, S.2). The density of pottery and other cultural materials on the surface is high. Most of the material belongs to period II, the first half of the third millennium BC (Fig. 6, nos. 1-4 and Fig. 7, nos. 1-4).

Site No. 3

This small site is located 300 metres south of site No. 2. The archaeological materials from the site include plain Buff and Grey Ware, fragments of marble vessels and stone objects. (Fig. 13, S.3).

Site No. 9

This very small and heavily eroded site is located east of a modern industrial kiln. The site is about 0.5 metres above the surrounding countryside, 30 metres long and 40 metres wide. A small number of pottery samples were collected; they include painted Grey Ware and plain and painted Buff Ware, as well as a brick-coloured fragment. The patterns on these fragments can probably be assigned to the middle of Period III, about 2500 BC (Fig. 6, nos. 6-7 and Fig. 7, nos. 19-21).

Site No. 10 (Tepe Fibr-e Nouri)

This site is located right next to the road. The installation of a fibre-optic transmission cable to the east of the site has damaged parts of the hill. The site is about 5 metres above the surrounding countryside and is 30 metres in diameter. The collected pottery consists of Buff, Reddish and plain Red Ware. The shape of the vessels indicates a dating to the second half of Period III and early Period IV (Phases 3 and 2 around 2450-2300 B.C).

Site No. 15

Site No. 15 is located 15 km south of Shahr-i Sokhta, 300 metres from Site No. 14. Fragments of plain Buff Ware and a few pieces of marble bowls were found on its surface (Fig. 6, no. 5).

Site No. 16

This site is located 10 km south of Shahr-i Sokhta. This is a small hill with a height of about 5 metres, 70 metres long, located on a natural *kalutak*. An electricity transmission pole has destroyed parts of the central section of the site. The pottery includes plain and painted Buff Ware with simple linear motifs, as well as Reddish and Grey Ware fragments. The shape of the vessels indicates the second half of Period III or the beginning of Period IV, i.e. 2450 to 2300 BC (Fig. 5, S.16).

Site No. 23

Site No. 23 (Tepe Rud i Biaban), with a trapezoidal shape, is a hill with a height of 8 metres, located 30 km southeast of Shahr-i Sokhta, close to the dried bed of a river with the same name (Fig. 5, S.23). This site can be considered the most distant of Shahr-i Sokhta's prehistoric satellites. It is an industrial area, with evidence of pottery kilns operating around the half of the third millennium BC. The surface of the mound is covered with ceramic residues and deformed pottery, scattered over a very large area with a high density. The ceramics include painted Buff Ware with fine and elaborate designs (Fig. 6, nos. S23.17-27). Motifs include hatched leaves or other motifs with delicate hatching, which are characteristic of the second half of Period III. This site is a centre for pottery production in the final phase of Shahr-i Sokhta's development, indicating the presence of industrial specialization on the Sistan plain (Tosi 1984: 29-30).

Site No. 25

Located 200 metres northwest of Tepe Rud-i Biaban, it is 6 metres high and about 100 metres in diameter. The pottery of this area, unlike that of Rud 1 (Site No. 24), is significantly in harmony with the pottery of Tepe Rud-i Biaban, which probably supplied this site with pottery products (Fig. 5, S.25).

Site No. 28

Site 28 is located 500 metres northwest of Site No 27. It is 4 metres high with

a diameter of 100 metres. The height of the mound is not uniform and it slopes gently to the south. The pottery found at the site reflects the tradition of Periods II and III of Shahr-i Sokhta, and it includes Buff, Red and Grey Ware (Fig. 6, nos. S28. 8-16). The quantity of marble vessels among the cultural materials of this area is significant (Fig. 13, no. S.28).

Site No. 31

Site No. 31 is a hill 4 metres high and 70 metres in diameter, located to the north of Site No. 30. The pottery of this site is classified into Buff and Reddish Ware. The painted Buff Ware is chronologically comparable to Phase 3, Period III. Unpainted pottery similar to that of sites 29 and 30 is comparable to that of Shahr-i Sokhta IV and the Rud-i Biaban phase (Fig. 6, nos. S.31. 28-30).

3.3. Sites coeval with the second half of Period IV and the Rud-i Biaban Phase (ca. 2400-2000 BC)

During recent surveys, 10 sites yielded a sort of pottery that was already known from earlier excavations. Although some samples of this pottery are comparable to that of Period IV, others do not show any connection to known Period IV pottery and are perhaps associated with the pottery found in the most recent layer of the Burnt Building (Biscione 1979: Figs. 4 and 8) and in the upper layer of workshops 20 and 26 (Sajjadi - Moradi 2016: fig. 20.1-2). It should be remembered that these sites are of large dimensions and are located on large Kalutaks (Fig. 8). Among this group, Tepe Taleb-Khan, Tepe Graziani and sites 29 and 30 all have a height of more than 15 metres and diameters of 100-150 metres, and are considered large among the archaeological sites of the Sistan plain (Fig. 9). They are located along a branch of the Rud-i Biaban river 15 to 30 km south of Shahr-i Sokhta and belong to the sites of the Rud-i Biaban basin.

The pottery of this group consists of a variety of fine and coarse Buff, Reddish and Grey Ware, with a large concentration of unpainted brick-coloured ceramics. Some painted and unpainted forms show connections with Phase 3, late Period III, and Phase 2, Period IV (Fig. 10). There are also unpainted items, including



Fig. 6: pottery from sites dated to Periods II-III and early Period IV.

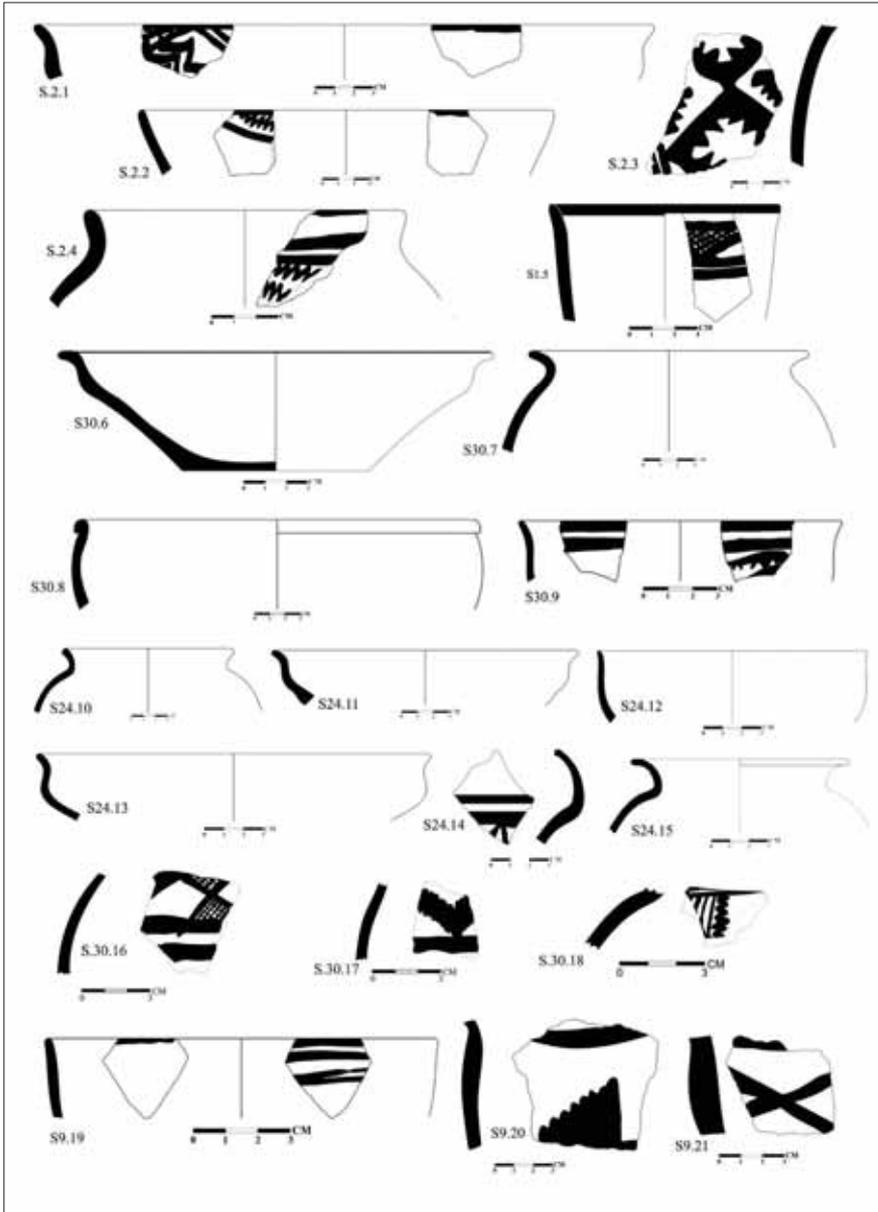


Fig. 7: patterns seen on pottery from sites coeval with Shahr-i Sokhta II-early IV.



Fig. 8: view of the sites related Rud-i Biaban phase.

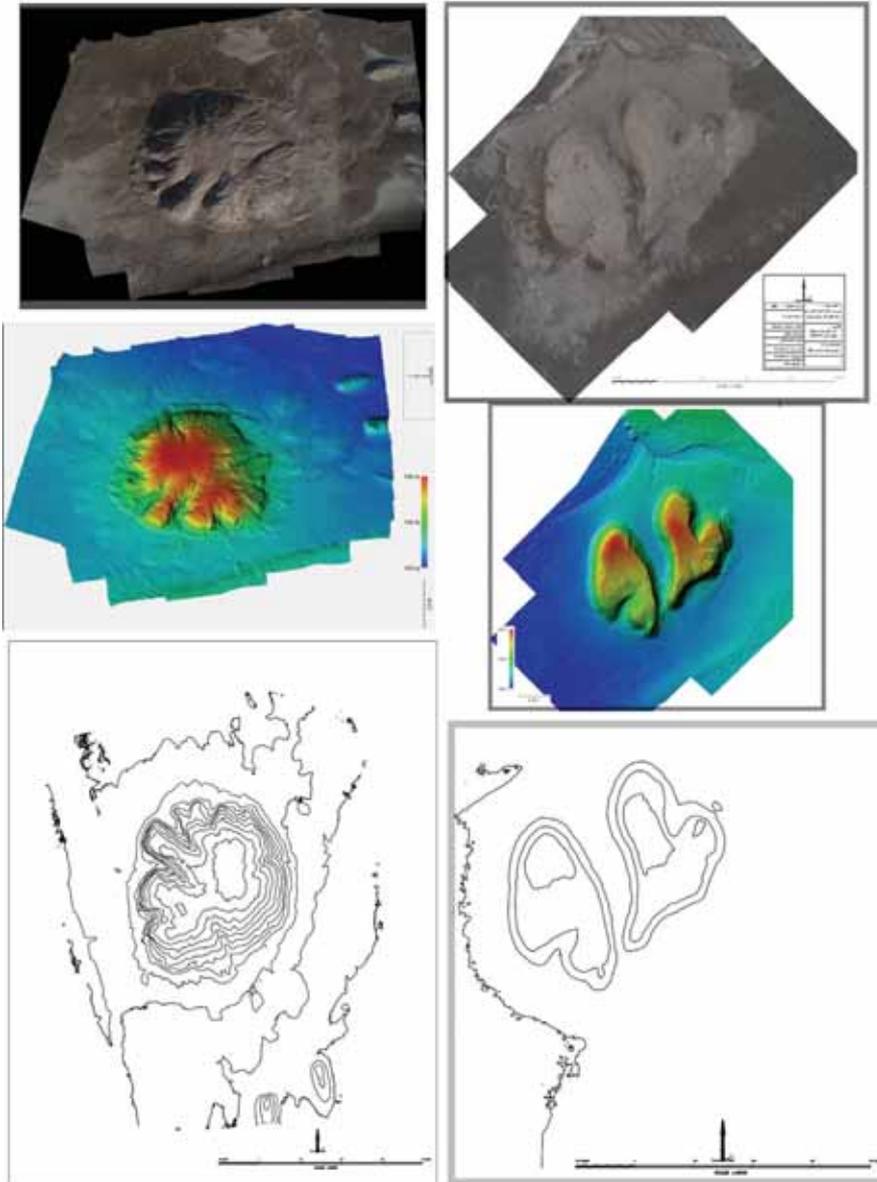


Fig. 9: aerial photo, orthophoto and topography of Site No. 29 on the left and Site No. 30 on the right (M. Saadatian).

jars with everted rims and shallow bowls similar to rare specimens from the most recent phase of the Burnt Building and the upper layers of workshops 20 and 26 (Moradi in this volume).

Some fragments have a thick ochre or dark brown slip on the outer body. In one sample a potter's mark is incised, and on another specimen a goat is painted in a light reddish brown colour (Fig. 10, S30.2). None of these types has been reported among the pottery of Shahr-i Sokhta were reported from BMAC sites in Khorasan

The unpainted and slipped painted Buff Ware of Phase 3, Period III, was found in Tepe Graziani, 10 km southeast of Shahr-i Sokhta, in a context dated to 2550-2450 BC (Helwing *et al.* 2019: 155), and in several other sites, such as No. 30. In some sites, including Nos. 24, 26 and 27, the pottery was more uniform. Based on the pottery classification, the following groups of sites were found in the area of Rud-i Biaban: 1) sites with Phase 3, Period III, pottery; 2) sites with Phase 3 pottery alongside unpainted Buff and brick-coloured Ware, comparable to ceramics from the last phase of the Burnt Building and areas 20 and 26; and 3) sites with more uniform pottery including unpainted Buff and brick-coloured Ware with everted rims, carinated bodies, a dark slip and in some cases grooved bodies. The latter type is not reported for Shahr-i Sokhta.

Based on the typology of pottery, it can be assumed that some pottery specimens, in particular unpainted Buff and slipped Ware, can be attributed to Phase 0 of Shahr-i Sokhta (Biscione 1979: 239). In the case of Fig. 10 S.29.12 and 6, S.30.2 and S.27.6-8, considering the patterns and grooves on the body, it can be assumed that they are subsequent to Period IV. Due to the abundance of sites with this type of pottery in the Rud-i Biaban region, the group 3 sites are considered to belong to the Rud-i Biaban phase.

As mentioned above, pottery fragments similar to these items have been found only in limited quantities in the upper layers of the Burnt Building and workshops 20 and 26, layers that are not related to the main body of the buildings and thus indicate a new phase of occupation on the ruins of the previous structures (Moradi in this volume). C14 dating of Building no. 26 indicates ca. 2400 BC, possibly

Phases 3 and 2 of Shahr-i Sokhta late Period III or early Period IV (Ascalone *et al.* in press). Pottery similar to that of the Rud-i Biaban area can probably be dated to a later period at Shahr-i Sokhta itself, indicating that the Burnt Building was occupied for a short time after the fire around 2000 BC (Biscione 1979: 239). It should be noted that the date provided for the final phase of occupation in the Burnt Building is 1800 BC (Salvatori - Tosi 2005: fig. 12), which casts doubt on the accuracy of the dates of this phase. Perhaps the answer to this question lies in the analysis of data from the Rud-i Biaban region. It seems that the settlement sequence in this area runs from the final years of Phase 3 (2550-2450 BC) until the beginning of the second millennium BC (ca. 1800 BC), and is seen in sites with Buff and brick-coloured pottery such as Nos. 26, 29 and 30. The accidental discovery by two young tourists of two stone pillars belonging to the BMAC (2300-1750 BC) (Biscione - Vahdati 2011: 238) in the Rud-i Biaban area may confirm our hypothesis. Such stone pillars, dated to the period 2200-1800 BC (Salvatori 2008: 89-90; Masson 1988: 96) can help to fill the chronological void from the end of 2300 BC to the beginning of the second millennium in the Sistan plain (Fig. 13 below). More over some types of pottery from site Nos. 29-32 are similar to those one from BMAC sites and until now, except along the Rud-i Biaban river in Afghani Sistan no evidence of BMAC material of southern Turkmenistan, north-eastern Iran, northern Afghanistan, parts of Tajikistan and Uzbekistan and the Sistan basin has been reported in Iranian Sistan (Tahmasebi Zave 2015: 1).

Thus, we appear to be dealing with three chronological phases in the Rud Biaban area. First, we have Tepe Rud-i Biaban and some other sites with painted pottery that reflects the evolution of the style associated with Phase 3, Period III, where pottery with simple flaring, everted rims and carinated bodies is absent. This reflects the Shahr-i Sokhta sequence (Phases 3 and 2) that was to mature at Tepe Rud-i Biaban and seems to be dated to 2400 BC. The second phase includes the upper layer of Graziani and sites No. 29 and No. 30, which have only a small quantity of painted pottery related to Phase 3, Period III and Period IV.2 and a higher quantity of unpainted Buff and Reddish Ware with flared rims and

carinated bodies that may be attributed to the transitional phase between Periods III and IV of Shahr-i Sokhta (probably Phase 1), dated to 2300 BC. The third phase includes sites such as No. 26 and No. 27, which have completely uniform pottery attributed to the Rud-i Biaban phase, which means that the sites with uniform unpainted Buff and Reddish Ware and in some cases grooved pottery (maybe Phase 0 of Shahr-i Sokhta) may be dated to around 2000 BC.

Pottery similar to the above-mentioned Rud-i Biaban-Phase specimens is not reported outside of Sistan, although some specimens are similar to material from Period I of BMAC dated to the period 2100-1900 BC (Hiebert 1994: 77). This similarity is of a general nature and differences in the details remain. For example, fragment no. 6 from Site No. 29 in figure 11 (S.29.6), and fragment no. 1 from Site No. 30 (S.30.1) are comparable to specimens from Period I of BMAC (Hiebert 1994: fig. 4.36.IV; Vahdati 2014: fig. 8).

In addition, sample S32.3 in Fig. 11 is comparable to specimens dated to Period I of BMAC in layers 0 to 2 of Altyn Tepe, due to the similar carination in the lower part of the body (Hiebert 1994: fig. 4.36.XXII). The grooved vessels from sites No. 27 and No. 30 in figure 10 S.27.6-8 and S.30.7 are similar to a rare specimen from G.N.1256 at Gonur Tepe, which is dated to the first quarter of the second millennium BC (Sarianidi 2007: 56 fig. 12).

Site No. 11: Tepe Taleb-Khan

This site is located 50 metres east of the Zahedan-Zabol road and 15 kilometres southeast of Shahr-i Sokhta. It was excavated by the department of archaeology of the University of Zabol. Based on a comparison of the pottery, it could be dated to the period from the third quarter of the third millennium to the beginning of the second millennium BC, i.e. the end of Period IV. The site has yielded some Rud-i Biaban phase type pottery (Fig. 10, S11.1-2).

Site No. 12: Tepe Taleb Khan 2

Tepe Taleb Khan 2 is located approximately 900 metres northeast of Tepe Taleb Khan 1 and is severely threatened by the railway project. The site is about 6 metres above the surrounding countryside and its diameter is about 60 metres.

Site No. 21

The site is located 15 km southeast of Shahr-i Sokhta and consists of two ridges with a significant quantity of pottery. It differs from other sites surrounding Shahr-i Sokhta in terms of the homogeneity of its cultural materials, since it contains both Buff Ware painted with motifs dated to the beginning of the third millennium BC and the common brick-coloured pottery of the second half of Period III and early Period IV (Fig. 10, S.21.1-2).

Site No. 24

Located 100 metres west of Tepe Rud-i Biaban, the site has an approximate height of 6 metres and a diameter of 60 metres, with the remnants of a modern brick building. The pottery is of the Shahr-i Sokhta IV type, together with a small quantity of painted Buff Ware. The pottery includes vessels with carinated bodies, bowls with everted rims and globular jars with flared rims and ochre slip, already seen in the upper levels of buildings 20 and 26, Tepe Taleb-Khan 1 and 2, and a number of other satellite sites (Fig. 11, S.24.1-3).

Site No. 26

This site is located 2 km east of Tepe Taleb-Khan. It is a large trapezoid hill 8 metres above the surrounding countryside with an approximate diameter of 150 metres. The pottery is in line with the tradition of Site No. 24 (Fig. 11, S.26.1-3).

Site No. 27

Site No. 27 is located near Site 26 and consists of two small adjacent hills with a height of 8 metres and a diameter of approximately 30 metres. The pottery of this small site is similar to that of Site No. 24. It includes grooved pottery from the Parthian period in Sistan (Fig. 10, S.27.1-8 and Fig. 11, S.27.2). These items are coarse ware and different from the grooved specimens of Kuh-i Khawje, despite the apparent similarity. The pottery assemblage includes only one Grey Ware fragment of the third millennium BC.

Site No. 29

Site No. 29, built on one of the largest *kaluts* on the edge of the plain, is one of the most extensive. 15 km southeast of Shahr-i Sokhta and 5 km east of Tepe Taleb Khan (Figs. 8 and 9), it is about 15 metres above the surrounding countryside and about 150 metres in diameter. The surface of the site, which is located next to the bed of the Rud-i Biaban river, is covered in Buff and Red Ware. The pottery is comparable to that of Site No. 24, but painted sherds related to Period III can be observed. There is also a small quantity of painted Red Ware with dark brown motifs, not common in the Shahr-i Sokhta tradition (Fig. 10, S.29.1-18, and Fig. 11, S.29.1-18). A piece of a bronze stamp seal and pieces of marble vessels are among the other finds (Fig. 13).

Site No. 30

Site No. 30 is located 30 km southeast of Shahr-i Sokhta in the Rud-i Biaban basin. The site is 8 metres above the surrounding terrain and trapezoid in shape, lying on a north-south axis, with two ridges on its north and south sides. Based on the materials scattered over its surface, it could be dated to Period III and early Period IV, as well as the Rud-i Biaban phase. The pottery consists of unpainted and painted Buff and brick-coloured Ware (Fig. 10, S.30.1-8, Fig. 11, S.30.1, 3, 4, 8).

Site No. 32

This small semi-circular site is about 4 metres above the surrounding countryside. The pottery follows the same tradition and composition as Site No. 31, although it is mostly attributed to Period IV of Shahr-i Sokhta and the Rud-i Biaban phase (Fig. 10 and 11, S.32.1-4).

4. Conclusion

The pottery and small finds discovered in an area stretching 40 km southeast from Shahr-i Sokhta belong to three phases in harmony with the Shahr-i Sokhta



Fig. 10: Rud-i Biaban phase pottery.

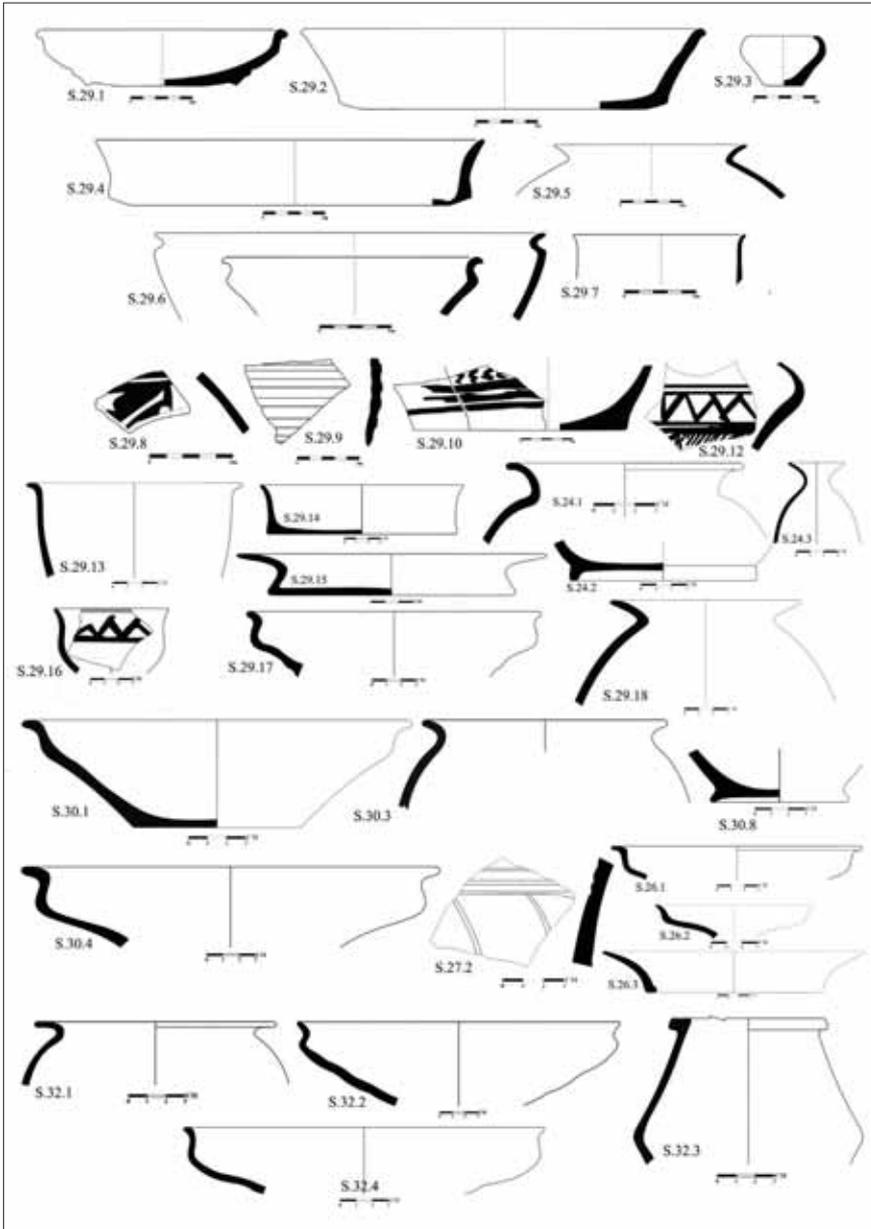


Fig. 11: Rud-i Biaban phase pottery.

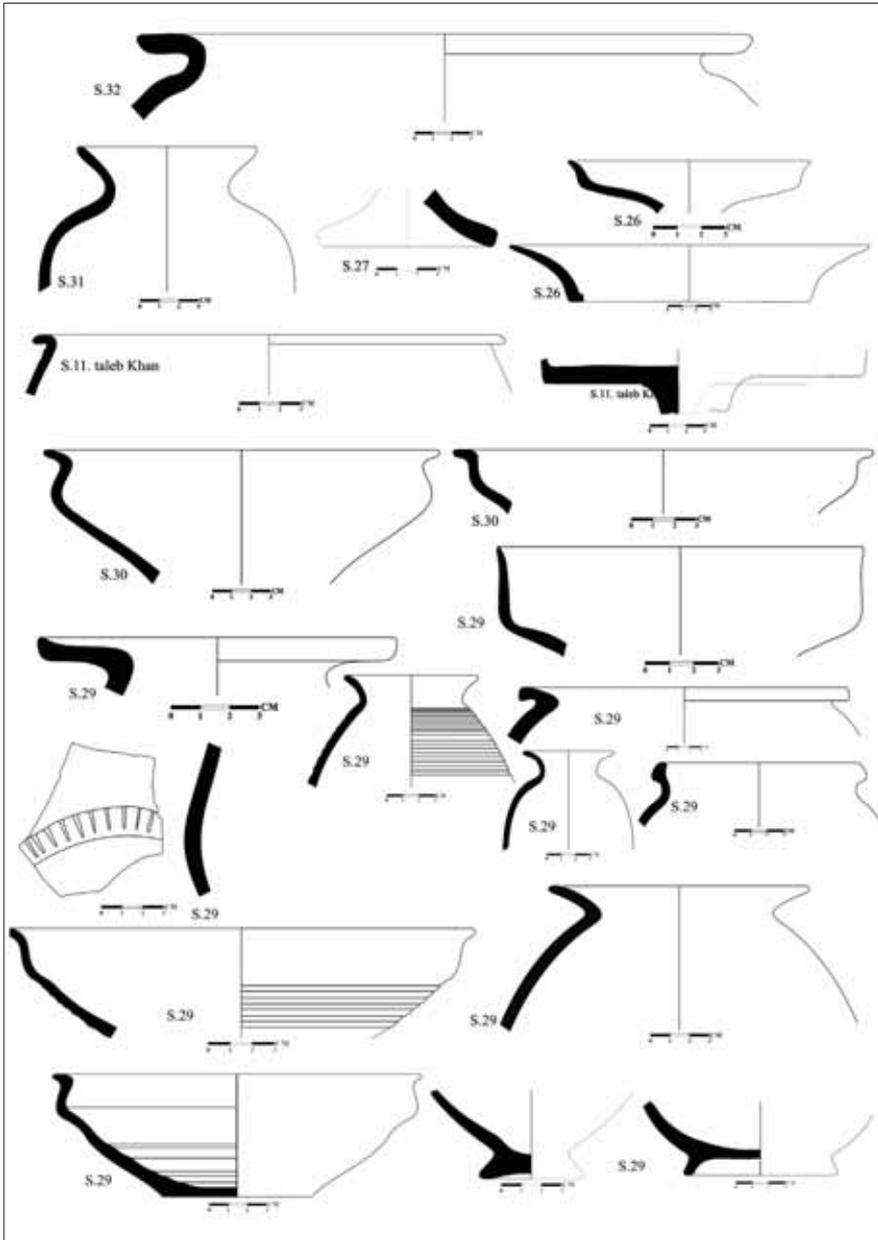


Fig. 12: Rud-i Biaban phase pottery.

sequence, each category representing a stage in the development of Sistan culture from the third to the early second millennia BC.

The first group of sites are very small settlements located two kilometres southeast of Shahr-i Sokhta. The cultural materials associated with this group are mostly related to the early third millennium BC and coincide with the first phase of development in this settlement. Remnants of materials related to Phase 9 (3300-3100 BC), have been found in the 'Eastern Residential Area' at the deepest levels and the formation of a large and populous settlement seems to have begun in this period. New discoveries show that groups of people who settled around the site in the late fourth and early third millennium BC had exactly the same cultural materials as their neighbours in the 'Eastern Residential Area' at Shahr-i Sokhta.

These findings show that the area of the city in the early third millennium BC was larger than previously thought and we are dealing with the first phase of urban development in the southern Hirmand Delta. The second group of sites, very small and scattered, is dated to the first half of third millennium BC, i.e. 3000-2600 BC. The excavation of Tepe-Dasht and Tepe-Sadegh, which are dated to this period, show that in general, the population in the mid third millennium BC was concentrated in Shahr-i Sokhta itself, and unlike the Rud-i Biaban phase, the periphery was of little importance, with a much smaller number of settlements than the subsequent period, scattered over the plain.

This comparison makes sense when considering the next category of sites, dated to the late third millennium and early second millennium BC. The largest site, number 2, is located very close to Shahr-i Sokhta, but the other sites are very small. The assumption that the population at this time was concentrated in Shahr-i Sokhta itself, the surrounding area being of little importance, is consistent with archaeological data obtained from excavations in the graveyard and residential areas. However, following this phase, in the last quarter of the third millennium BC, which marks the final stage of development of the southern Hirmand Delta the number of sites increased. The pottery from this stage found at the sites is mixed with materials from the Rud-i Biaban phase and Shahr-i Sokhta Phase 0 (around 2000 BC). It seems that the Rud-i Biaban phase is probably associated

with the contexts of this stage of development and represents the final stage of settlement in the southern Hirmand Delta. The presence of cultural materials from this stage, corresponding to the Rud-i Biaban phase, indicates the third category of sites, whose material remains are very limited in Shahr-i Sokhta itself, being found in the upper layers, exhibiting its final phase of occupation. It seems that from 2300 BC the growth of the settlements was outside the main site of Shahr-i Sokhta, along the tributaries of the Rud-i Biaban river. Simultaneously with the shrinking of occupation in Shahr-i Sokhta around 2000 BC, scattered but large settlements formed in the Rud-i Biaban basin, probably surviving, based on the presence of the above-mentioned stone pillars discovered there, until around 1800 BC. The settlements of this period were built on large kalutaks in order to be safe from floods and seasonal rains, but the inhabited areas were small and scattered across the plain.

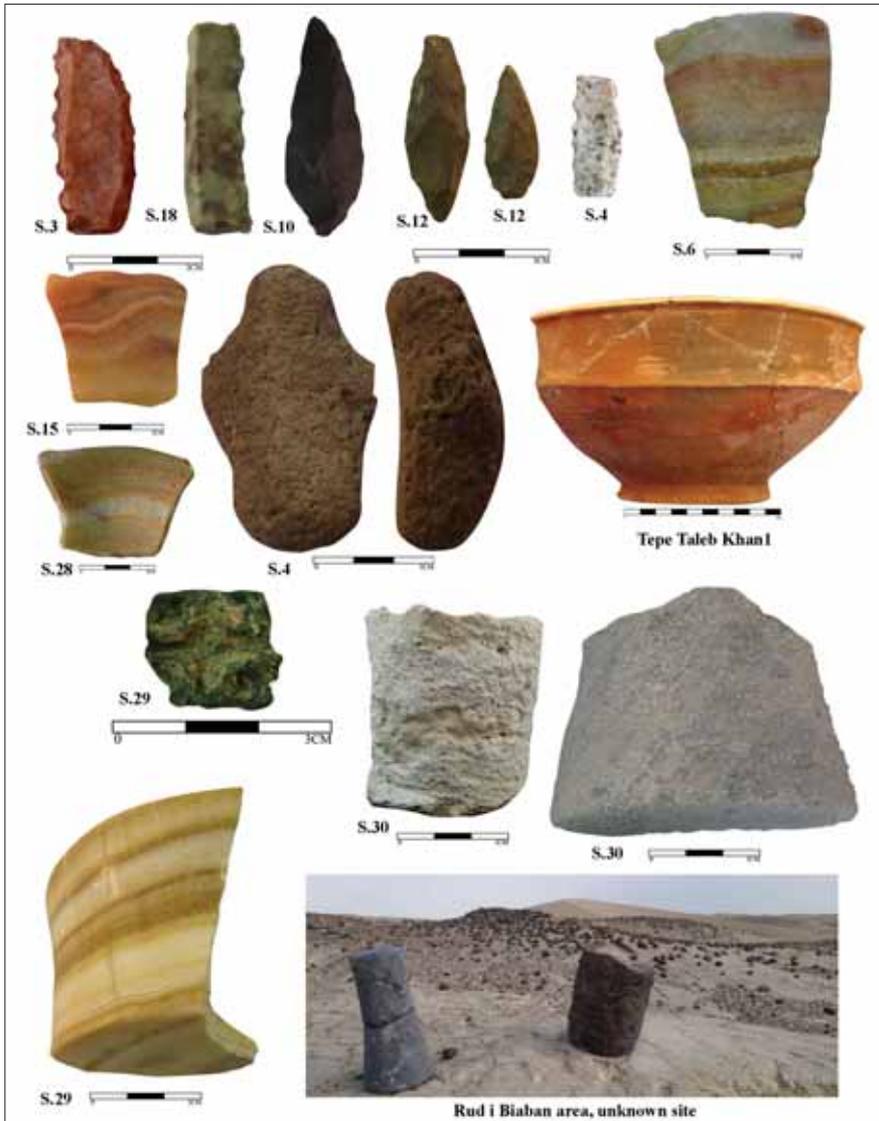


Fig. 13: small finds from the surveyed area.

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Part II
Archaeological Researches

The Emir Ware from Shahr-i Sokhta

Seyyed Mansur Seyyed Sajjadi
Iranian Center for Archaeological Research
m_sajjadi@hotmail.com

Abstract

One class of pottery vessels from Shahr-i Sokhta consists of a type of Grey Ware in the form of jars, bowls, pots and cups with a thin grey body. It was first seen in various ancient cemeteries in south-eastern Iran and Pakistani Baluchistan, including the tombs of Shahi Tombs. Later, other specimens of this grey pottery, known as Emir Ware, were also found in Afghanistan and Sistan. In Iran, during the excavations at Shahr-i Sokhta, especially in the graveyard, more samples of this pottery were found. This elegant and delicate grey pottery has various motifs enclosed in bands of curved lines. Its main design inside the bowls is very similar to a swastika.

1. Introduction

A class of pottery characteristic of Shahr-i Sokhta is Grey Ware, first identified and reported by A. Stein in the ancient site of Shahi-Tump and then in the cemeteries of south-eastern Iran and Pakistani Baluchistan (Stein 1931: 93). Years later, Walter Fairservis found other specimens of this grey pottery in Sistan, Afghanistan (Fig. 1). In order to distinguish it from another type of Grey Ware in the region, he

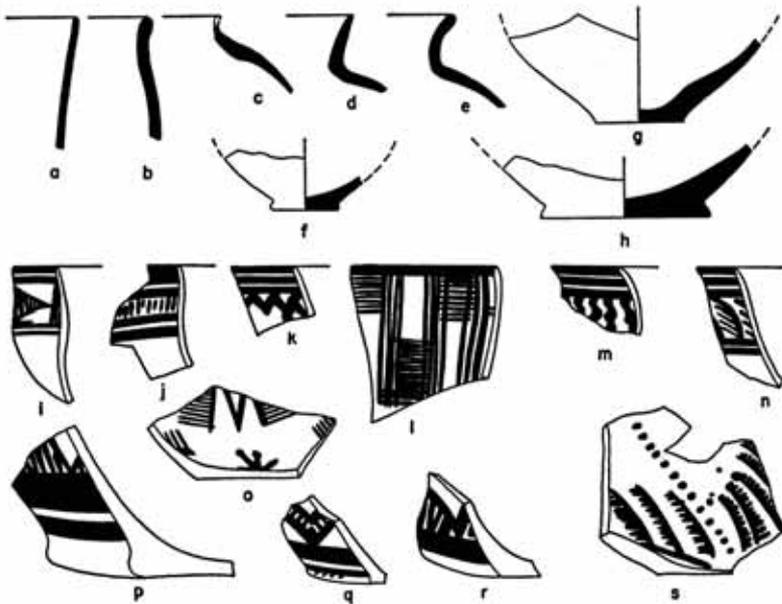


Fig. 1: Emir Ware pottery (Fairservis 1961: 86; Fig. 44).

named it 'Emir Ware' (Fairservis 1961). According to Fairservis, Emir Ware is an elegant and delicate grey pottery with a variety of designs bounded by a number of curved lines seen in relatively deep bowls. It is characterised by geometric and natural designs, in some cases combined with each other (Fairservis 1961: 86), and it is distinct from Faiz Mohammad Grey Ware.

The production techniques, geographical distribution and chronology of this type of pottery have been carefully studied and explained by Wright (1984; 1985; 1989; 2013) and Mutin (2013). Plenty of this pottery type was found at Shahr-i Sokhta during the 1997-2018 excavations, when more than 900 graves were excavated (Sajjadi 2003; 2005; 2006; 2007; 2008; 2009; 2014; 2020) (Fig. 2).

2. The Emir Gray at Shahr-i Sokhta

The pottery assemblage of Shahr-i Sokhta is mainly divided into three groups: Buff Ware, Grey Ware and Polychrome Ware. Despite the proximity of the area

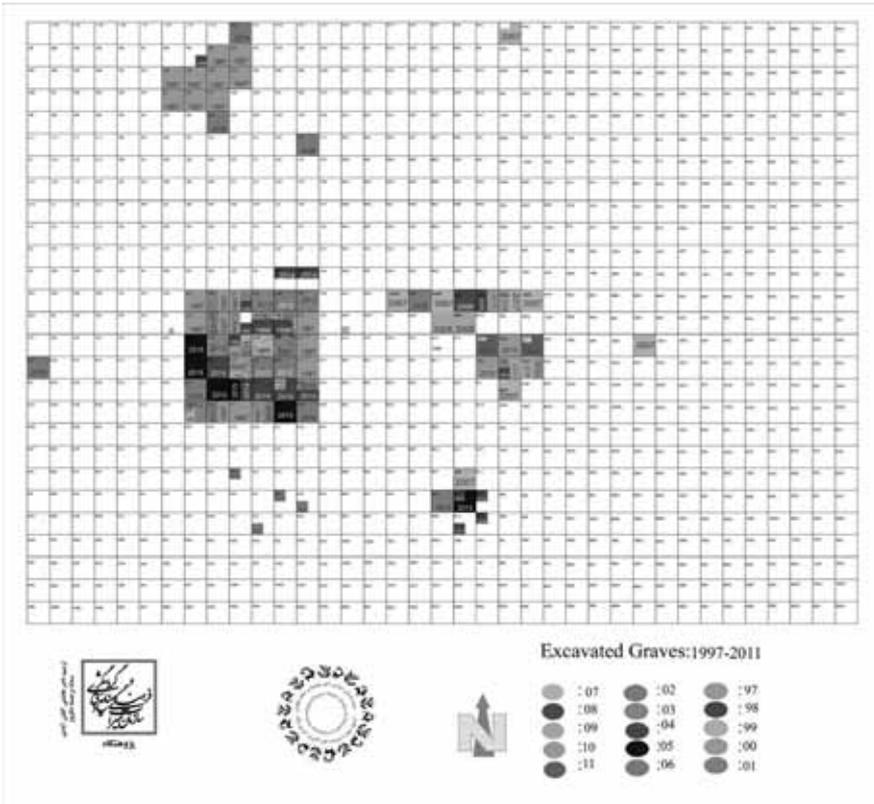


Fig. 2: excavated graves in Shahr-i Sokhta, 1997-2014.

to Baluchistan, very little Red Ware, almost all of which appears to be imported, can be observed in this assemblage.

Due to the huge volume of pottery (Fig. 3) found during the excavations we do not have exact statistics for the pottery fragments found during excavations, but based on the other evidence and scattered statistics related to excavation data, about 90% of the pottery is Buff Ware, 1% is Polychrome Ware, Red Ware and miscellaneous types, and the rest (about 5% of the pottery assemblage of the site) is plain and painted Grey Ware (Lamberg-Karlovsky - Tosi 1973).

The quantity of Grey Ware at Shahr-i Sokhta is thus much smaller than that of Buff Ware, and although the quantity of this type found in the graveyard is



Fig. 3: concentration of pottery fragments and other wastage on the surface in Shahr-i Sokhta.

significant, it accounts for only about 5% of the painted pottery in residential areas.

Most of the Grey Ware was found in the central part of the graveyard, while in the northern part it is very scarce, the most common types here being painted Buff Ware bowls (Fig. 5) , large painted jars (Fig. 4) and cylindrical flower vases (Fig. 6) .

In terms of their structural features, the Grey and Red Ware vessels of Shahr-i Sokhta are characterised by compactness, hardness and the presence of sand temper. These vessels were produced almost uniformly and without fundamental changes throughout the occupation of the settlement, from Period I to the beginning of Period IV, although in the last few decades of Period III and the beginning of Period IV, the production of both types was gradually halted. Emir Ware patterns are different from other Grey Ware motifs. They include various delicate and beautiful designs, as well as a combination of different types of



Fig. 4: Shahr-i Sokhta Buff Ware Jars, brownish painted decoration on the shoulder.



Fig. 5: Shahr-i Sokhta Buff Ware bowls, black painted internal decoration.



Fig. 6: Shahr-i Sokhta Buff Ware cylindrical flower vases, brownish painted decoration with hanging and regularly spaced sheaves of twin vertical dentate lines.

geometric and natural lines. Straight lines, zigzags, horizontal bands of triangular designs and ladder-shaped decoration with plant motifs are common on the inside of the bowls. The designs are painted on the inner and outer surfaces of the bowls, using soft and delicate brushes, in black, red and brown. The background colour and surface of the vessels varies from very light grey to dark cream to black, but the predominant background colour is standard grey. The decorations are black, grey and sometimes pale red. The patterns are often carefully drawn and are of relatively fine craftsmanship.

The main motifs on the central field of the internal surface are four ‘fan blades’ or two intersecting *S*-shaped lines bounded by other motifs. Generally, the upper third of the outer surface of the bowls is painted with geometric patterns. In some cases, the same internal pattern has been drawn by means of a decal with minor changes on the outer surfaces of the bowls.

Grey Ware vessels are mostly found in graves in the central part of the cemetery. In some cases, all the grave goods were Grey Ware (Fig. 9), while in the northern part of the graveyard they are very rare.



Fig. 7: Shahr-i Sokhta Grey Ware bowls: 1-2. Black on dark grey, 3-4. Light red on light grey.

Two distinct types of Emir Ware pottery have been found at Shahr-i Sokhta: deep dishes and bowls whose main decoration is a kind of swastika pattern on the internal surface, and another type without this pattern and decorated with other types of motif, although none as frequent as the swastika patterns. This second group of patterns are less internally consistent.

Bowls with non-swastika motifs can be generally divided into three separate groups: a. deep bowls with decorative motifs on the outer surface; b. Small bowls with decorative motifs on the outer surface and c. deep bowls with decorative motives on the interior surface.

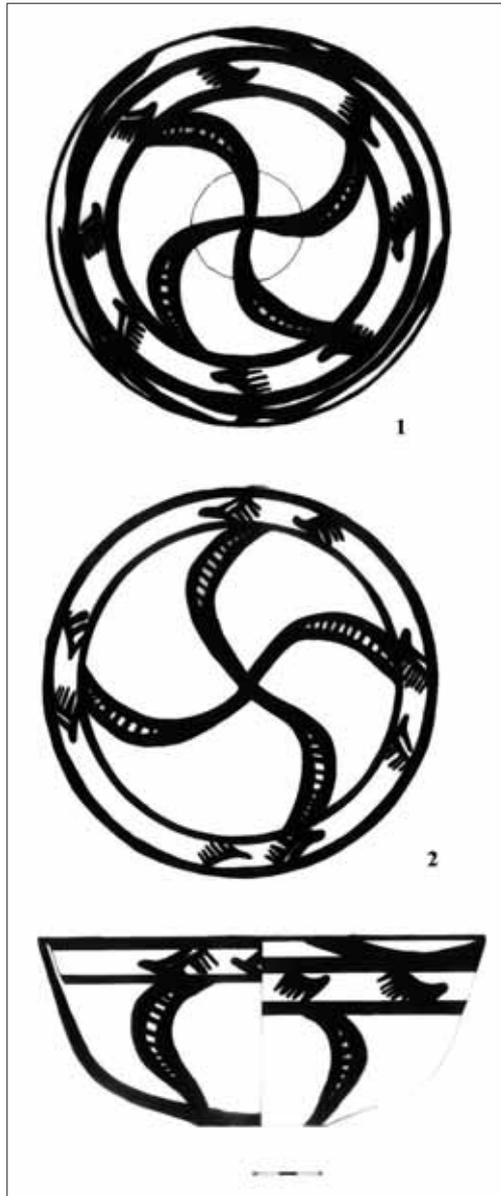


Fig. 8: Shahr-i Sokhta Emir Grey Ware: 1. External patterns; 2. Internal patterns (G.N.5301/6).



Fig. 9: Shahr-i Sokhta grave goods (G.N.1516): two alabaster bowls, six Grey Ware vessels.



Fig. 10: Grey Ware vessels: 1-3. Painted red decorations on grey pots; 4. Painted black decoration on very light colour teapot.

a. Conical bowls with slightly raised foot, wide mouth, flared rim. Designs drawn on the upper part of the external body and more rarely on the internal surface (Figs. 11-12).

b. Small bowls with slightly flared rim, rounded base and decorative motifs on the upper part of the outer surface (Fig. 13).

c. In terms of form, shape and distribution of patterns, the third group of bowls are quite similar to those decorated with swastikas. The interior and exterior of these bowls are decorated with various designs. The main difference between this group of bowls and those decorated with swastikas is their internal and external decoration, and one of the features they share is the use of patterns to create a kind of division of the bottom of the bowls. The decorative motifs of this group are divided into 5 main groups and 26 subgroups (Figs. 14-16).

This composite structure of internal patterns is not limited to Grey Ware bowls, but is also seen in some Buff and Red Ware vessels. In the case of Red Ware bowls, in one example, the internal and external decorative motifs are the exact reverse of each other (based on a decal) covering the entire interior and exterior surfaces of the bowl (Fig. 17).

Grey Ware bowls decorated with Spoked/Swastika patterns are bowls whose internal parts are decorated with two intersecting S-shapes. Patterns are drawn in various shapes on the internal surface of the bowls, dividing it into four parts, and in some cases into three or five parts. The central and main motifs were usually restricted and confined by other sub-motifs on the inner edges of the vessels.

These bowls are usually medium-sized and their average height varies between 6-9 cm, while the mouth and base measure 12-16 cm and 4-8 cm in diameter respectively. The temper of the vessels is very soft and well mixed with the clay, and their bodies are completely smooth and polished. The decorative motifs are delicately drawn inside and on the upper parts of the exterior of the vessels. In some cases, the internal pattern is repeated on the exterior surface of the vessels.

The patterns on the upper part of the outer surface of the bowls consist of geometric shapes composed of curved and straight lines or a combination of the two. Thirteen main and sub-groups have been identified (Fig. 18).

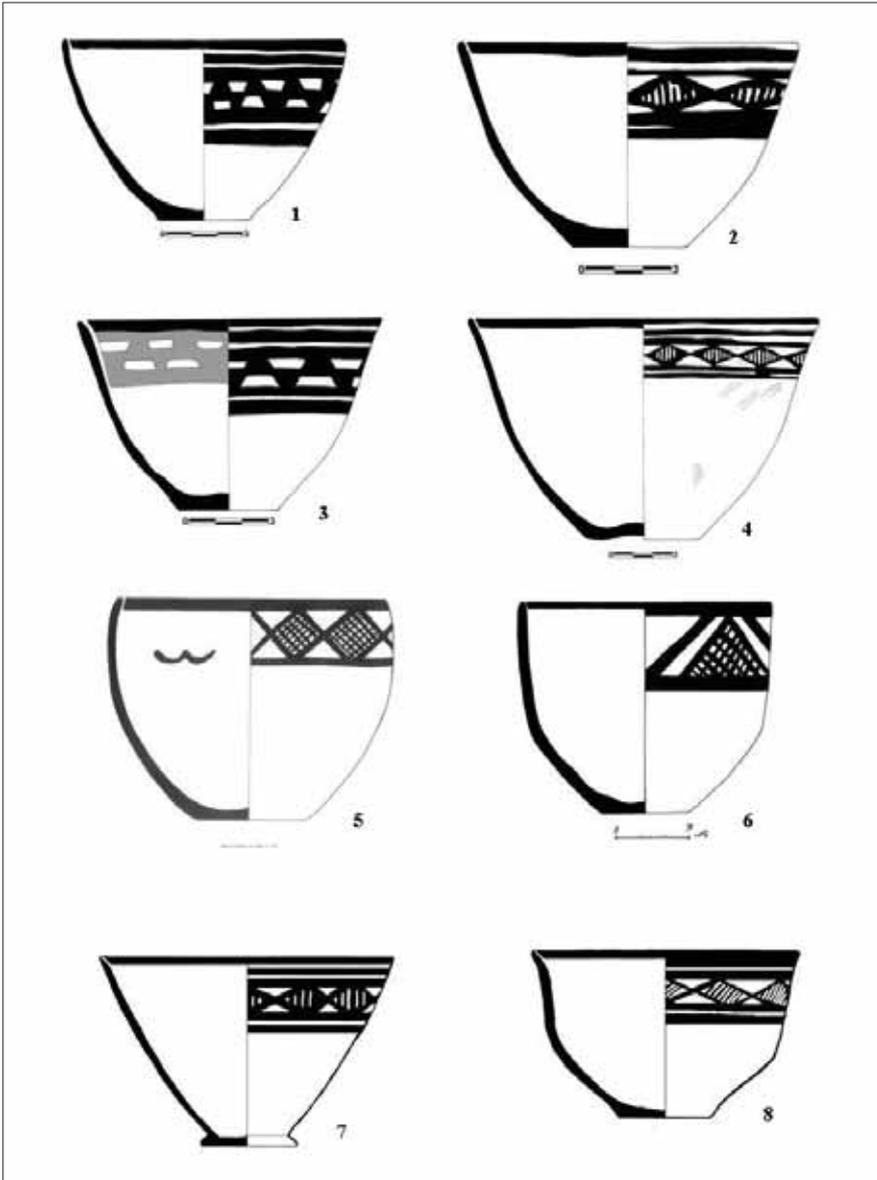


Fig. 11: Shahr-i Sokhta Grey Ware deep bowls with external decorations: 1. G.N.8725/98; 2. G.N.8725/97; 3. G.N.8725/94; 4. G.N.8725/96; 5. G.N.5203/0; 6. G.N.5502; 7. G.N.1605/10; 8. G.N.1400/59.

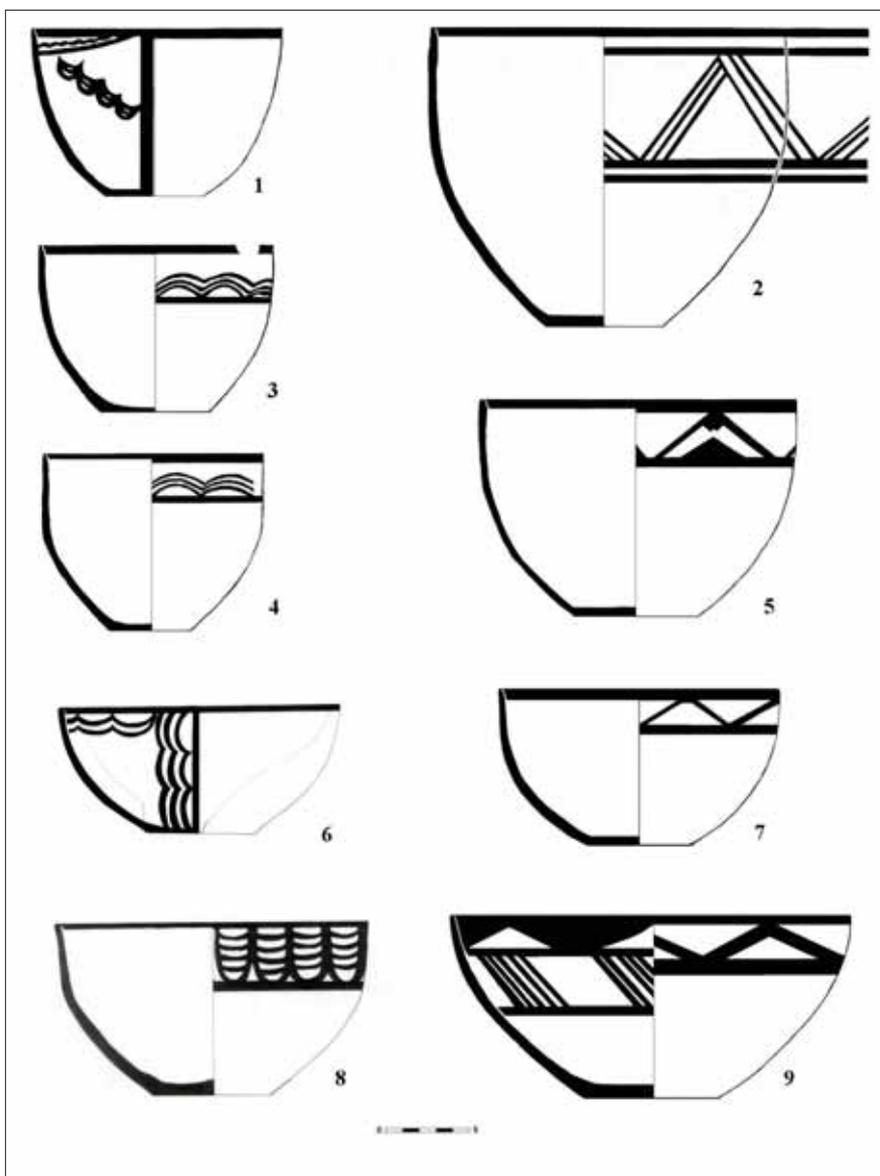


Fig. 12: Shahr-i Sokhta Grey Ware deep bowls with external decorations: 1. G.N.1708/2; 2. G.N.2810/5; 3. G.N.1708/8; 4. G.N.1708/9; 5. G.N.2701/5; 6. G.N.4212/5; 7. G.N.1708/5; 8. G.N.4410/3; 9. G.N.2810/1.

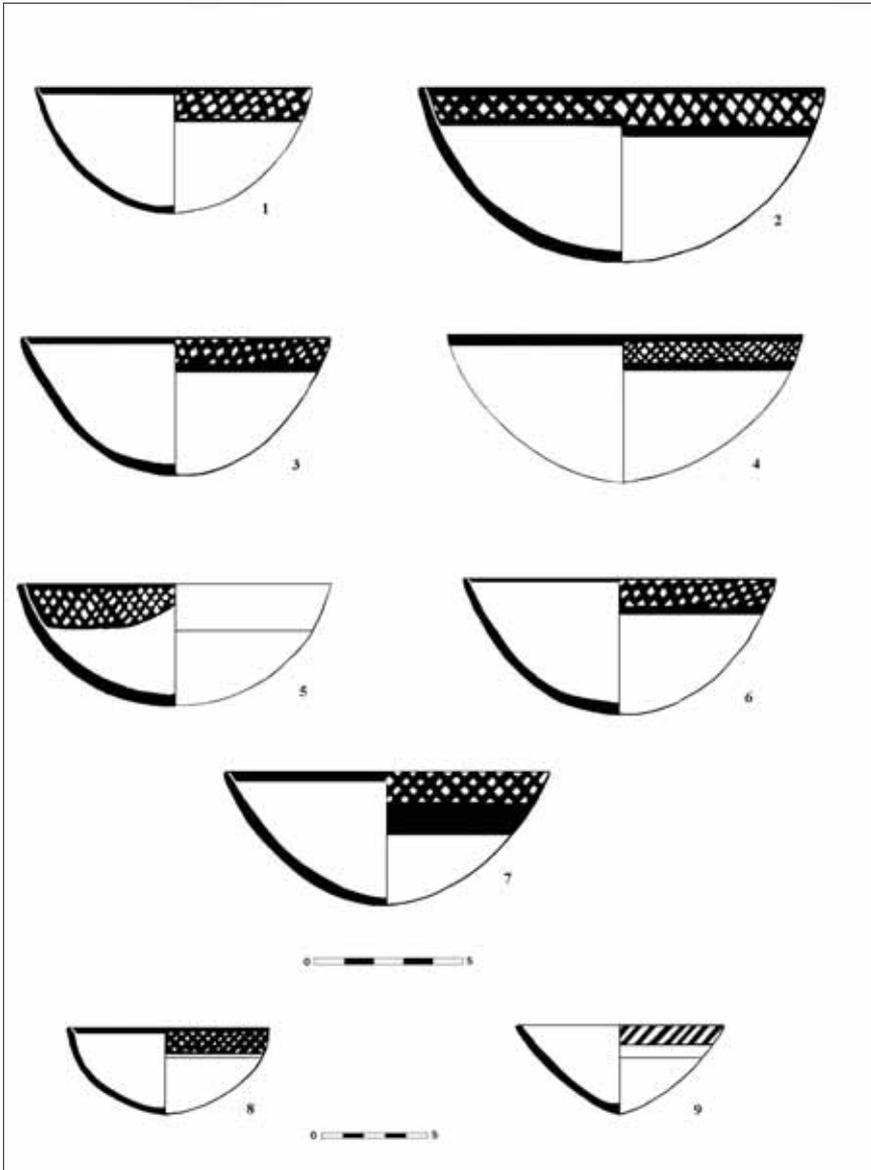


Fig. 13: Grey Ware small bowls with external decorations: 1. G.N.1717/1; 2. G.N.1608/3; 3. G.N.1716/8; 4. G.N.2703/7; 5. G.N.1519/5; 6. G.N.1718/7; 7. G.N.1413/5; 8. G.N.1300/13; 9. G.N.1700/3.

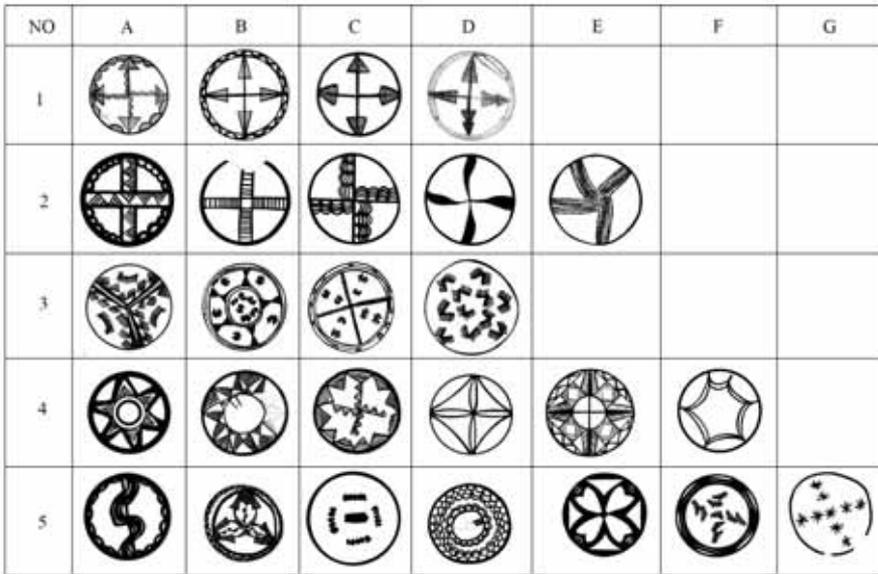


Fig. 14: non-swastika patterns.

As mentioned, the central designs inside the bowls are bounded and decorated with stripes with various designs. These interior designs are more numerous and their shapes are more diverse than the stripes on the outer surface of the bowls. A total of 19 main groups and 46 subgroups of decorative motifs have been identified. All the designs on the inner edges of these bowls are geometric combinations except for the very abstract design of a 'Baluchi goat' (Figs. 19-20).

Concerning the intersecting S-shaped 'spoke' patterns, it was pointed out that the main motifs on Emir Ware bowls are intersecting S-shapes or 'fan blades' that divide the interior part of the vessels into three or four and in a few cases five parts. These motifs are divided into 12 main groups and a number of subgroups, including designs with division into three parts (Fig. 21) and four parts, without additional exterior or interior decorations (Fig. 22). There are also motifs that are similar to the aforementioned but drawn freely, with no restrictive circles around them (Fig. 23).

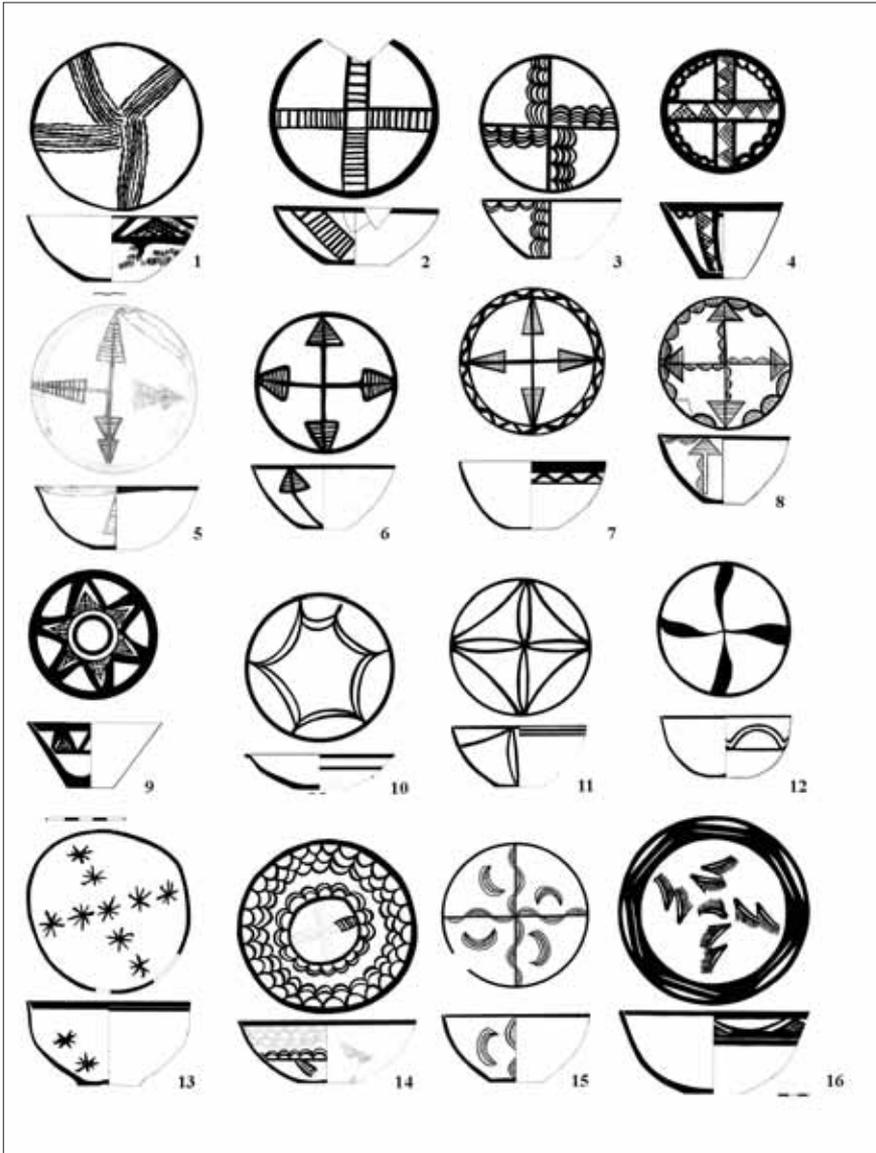


Fig. 15: Grey Ware bowls with internal non-swastika patterns: 1. G.N.8621/3; 2. G.N.4212/17; 3. G.N.4212/15; 4. G.N.1701/2; 5. G.N.5207/4; 6. G.N.3909/9; 7. G.N.2701/2; 8. G.N.1708/1; 9. G.N.1706/12; 10. G.N.7935/3; 11. G.N.4215/1; 12. G.N.1717/5; 13. G.N.8519/1; 14. G.N.3903/10; 15. G.N.1706/6; 16. G.N.5603/2.



Fig. 16: Grey Ware bowls with internal non-swastika patterns: 1. G.N.1706/2; 2. G.N.5603/2; 3. G.N.3503/1; 4. G.N.4103/5; 5. G.N.1713/7.

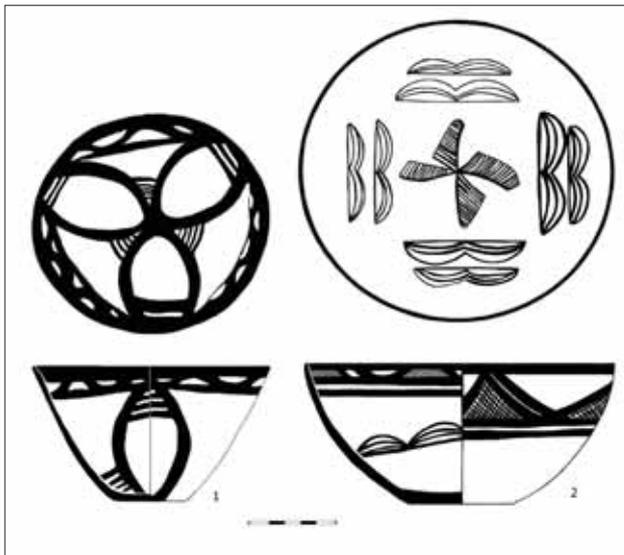


Fig. 17: Painted Red Ware bowls: 1. G.N.2511/3; 2. G.N.2501/1.

NO	A	B	c
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			

Fig. 18: external motifs on the upper part of Grey Ware bowls with internal swastika patterns.

No	A	B	C
10			
11			
12			
13			
14			
15			
16			
17			

Fig. 19: decorations on the internal edges of Grey Ware bowls with swastika patterns.

NO	A	B	c
14			
15			
16			
17			
18			
19			

Fig. 20: decorations on the internal edges of Grey Ware bowls with swastika patterns.

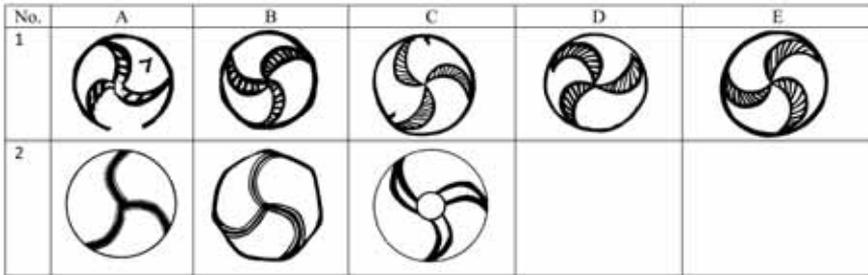


Fig. 21: interior of bowls divided into three parts by crescent-shaped spokes bounded by a circle.

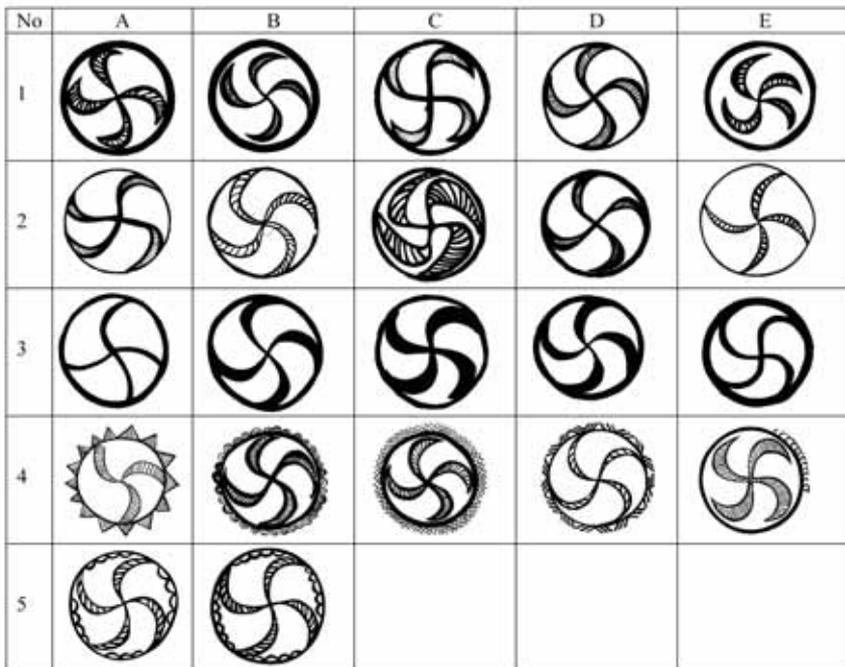


Fig. 22: interior of bowls divided into four parts by intersecting S-shaped spokes bounded by a circle.

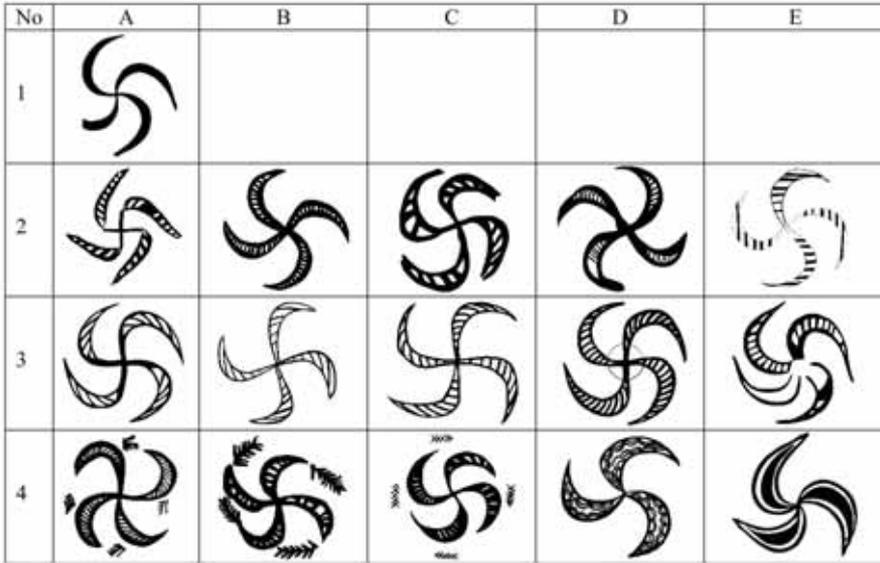


Fig. 23: interior of bowls divided into four parts by intersecting S-shaped spokes not bounded by a circle.

The Emir Ware pottery of Shahr-i Sokhta is similar to what Wright first classified as Emir Ware (Wright 1989: 146). The paste of these vessels is light brownish grey and both the inner and outer surfaces are decorated with patterns. They mostly consist of deep bowls.

This pottery was produced for a sustained period during Phases 9-7, which account for 90% of the production of Grey Ware at Shahr-i Sokhta (Sajjadi 2003; Piperno - Salvatori 2007). Emir Ware seems to have been in use from the last quarter of the fourth millennium to the first half of the third millennium BC. The second type of Emir Ware in Shahr-i Sokhta consists of dark grey vessels with a very thin body. The paste of this pottery is from brown to grey in colour, and both the outer and inner body surfaces are painted. It consists of deep and rather small bowls with a thin body. This type of pottery has mostly been found in association with Phases 7-4, although specimens have also been seen for Phases 9-8 and 3. A. Stein believed that because these vessels were found in graves and were made with great care and technique, they had special uses in funeral rituals (Stein 1929; 1931).

Other specimens of Emir Ware, along with Faiz Mohammad Grey Ware, which is mostly seen in graveyards in Baluchistan and south-eastern Iranian sites, confirm Stein's theory.

Following Wright and based on our own analysis, the Faiz Mohammad pottery of Shahr-i Sokhta is from the central regions of Pakistani Baluchistan and from the lands located between Baluchistan and the Iranian plateau.

At Shahr-i Sokhta, shallow bowls in the style of Mehrgareh V-VII and Damb Sadat II-III are found in contexts dated to Periods III and IV (Sajjadi 2003), while the Emir Ware of Shahr-i Sokhta I-III is coeval with Bampur I-IV and Yahya IVC-B.

The presence of Grey Ware vessels in large quantities in the tombs may suggest that these bowls were made solely for use in funeral rites and burials, but the evidence is contradictory. All the Emir Grey Ware vessels found in the graves bear signs of extended use in daily life, but some of the Buff Ware vessels of this graveyard, especially those recovered from catacombs, are brand new. Not only had the latter not been used during the lives of the buried individuals, but it seems that these unpainted Buff Ware bowls and jars were made exclusively for use in funeral rites. In addition, the arrangement of these new vessels in the tombs is very uniform, suggesting the presence of a group of priests or people specialized in arranging the objects in the tombs (Sajjadi 2007). The best examples of such previously unused utensils can be seen in burials G.N.4301, G.N.1400, G.N.1404 and G.N.1405 (Figs. 24-25).

The presence of one or more objects in tombs is a tradition of the site which was practised in all periods. Thus, the presence of Grey Ware vessels cannot be considered a special phenomenon seen only in certain graves but rather a normal and common funerary practice. Another reason regardless of their association with vows and so on might be the deceased's presumed desire to take these vessels and other objects with her/him to another world.

However, the deceased may wished to have these vessels in their tombs purely because of the elegance of their shape and structure and their fine patterns, especially the Emir Grey Ware bowls decorated with three- and four-spoke motifs, so distinct from other bowls.



Fig. 24: new and unused Buff Ware bowls.

We have already seen that the central part of almost all the grey bowls is divided into three or four parts using various designs. It is hard to imagine that the patterns were drawn aimlessly and without thought. These motifs are usually a reflection of the surrounding environment or events that took place in the region in which the pottery was found.

In addition to geometric decorative patterns, there are also patterns that deal with nature in some way. These include patterns that show the flow and movement of water, patterns that depict mountains and patterns that depict the animals or vegetation of an area. By examining and analysing these meanings, one can understand to some extent the natural and even sometimes intellectual conditions of a society.

In Emir Ware, the decorative curved lines are drawn in such a way that they depict the movement of the intersecting S-shapes from right to left and sometimes from left to right. Even in spoked patterns with almost right-angled rather than curved blades, the same rotational motion can be seen. This kind of movement can be interpreted as a rotation without beginning or end, i.e. an eternal movement.

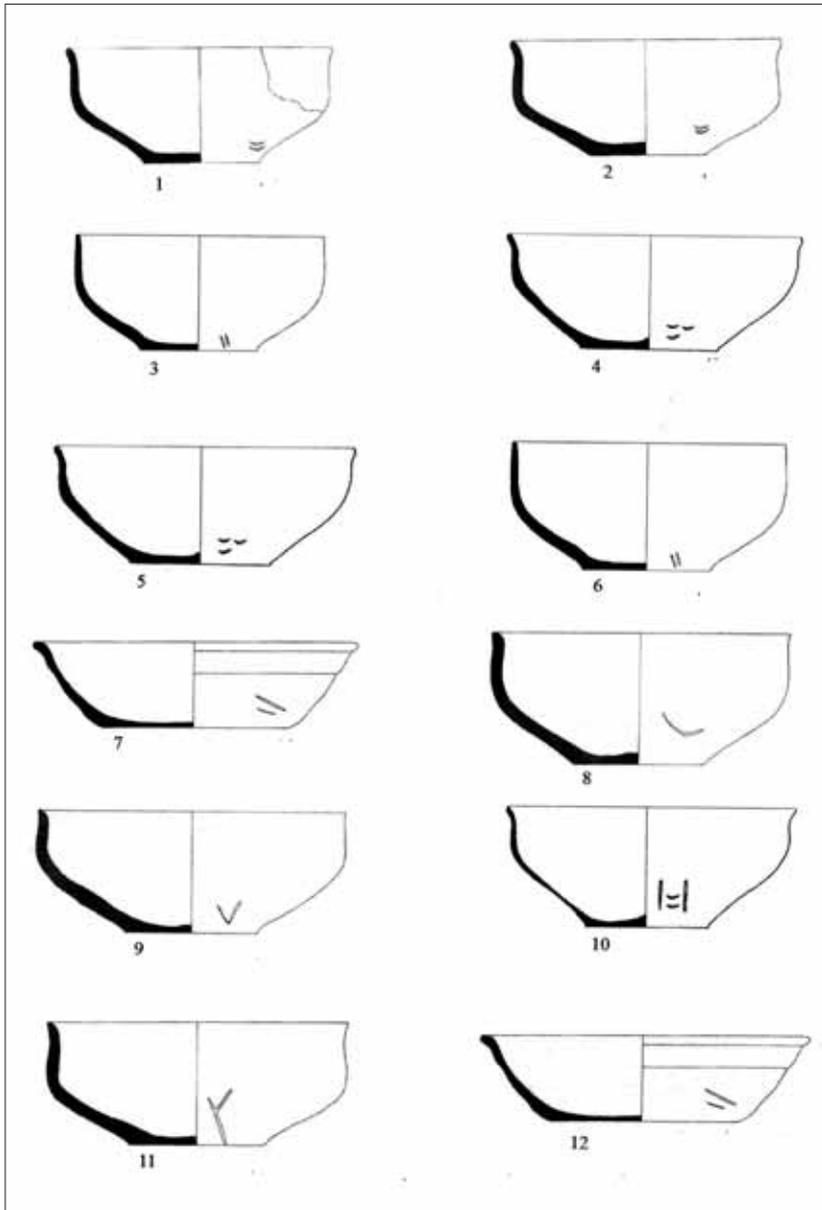


Fig. 25: new and unused Buff Ware bowls with potters' marks (G.N.1400).

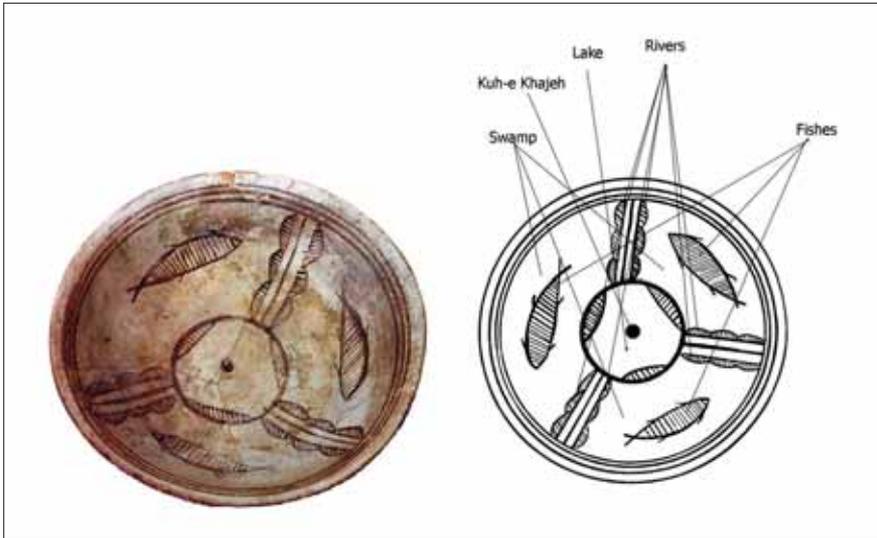


Fig. 26: reflection of the natural environment and 'map' of southern Sistan on a Buff Ware Deep Dish (Sajjadi 2017).

In accordance with this interpretation, the three-bladed or three-spoked motifs can be seen as three stages of human life, i.e. birth, life and then death, and each of the three fields separated by the blades is a symbol of one of these stages of life.

Perhaps this is why these painted vessels were placed in the graves with their owners after the material end of their lives, serving to inspire them after the first two stages of life as they enter the third stage. This cycle continues forever: they will be born again and life will continue.

Cross patterns are sometimes interpreted as depicting the sun's rays. It should be noted here that the sun, fire and light had a special value in the society of Shahr-i Sokhta (Sajjadi - Shahin 2018). In the cemetery of Shahr-i Sokhta, the orientation of the graves and the deposition of the individuals in the graves are not regular, but rather depend on the position of the sun in the sky.

In addition, each of the four parts created by the crossed blades may be a symbol of the four elements of nature, namely sun, water, wind and earth. It

should be noted that this interpretation is only an initial suggestion to justify the existence of these motifs.

As mentioned earlier, the data from the tombs are indicative of the use of these vessels in funeral ceremonies (Piperno - Tosi 1975; Piperno 1979; Piperno - Salvatori 1983; Sajjadi 2007-2009) (a revised chronology of Shahr-i Sokhta based on new data obtained during the second cycle of excavations is under preparation Ascalone *et al.* in press).

However, there are also data, in the form of fragments and (more rarely) intact vessels in the residential areas of Shahr-i Sokhta, Tepe Yahya and Bampur, showing their use in daily life (Fig. 27). Thus, it can be concluded that in the late fourth to mid-third millennium, a special type of Grey Ware pottery was produced at Shahr-i Sokhta which, in addition to its daily use, played a special role in funerary rites and this product was also common in Pakistani Baluchistan in the same period, where it had the same use.

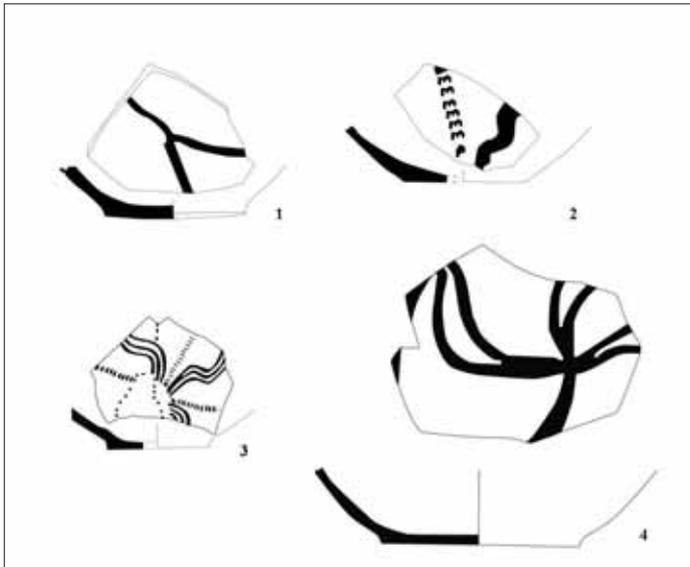


Fig. 27: Grey ware pottery: Bampur I-IV, Nos. 1-3 (de Cardi 1970 figs. 25.251;18.38;30.20; Yahya IVC2. No. 4 (Potts 2001; Fig.1.6 K).

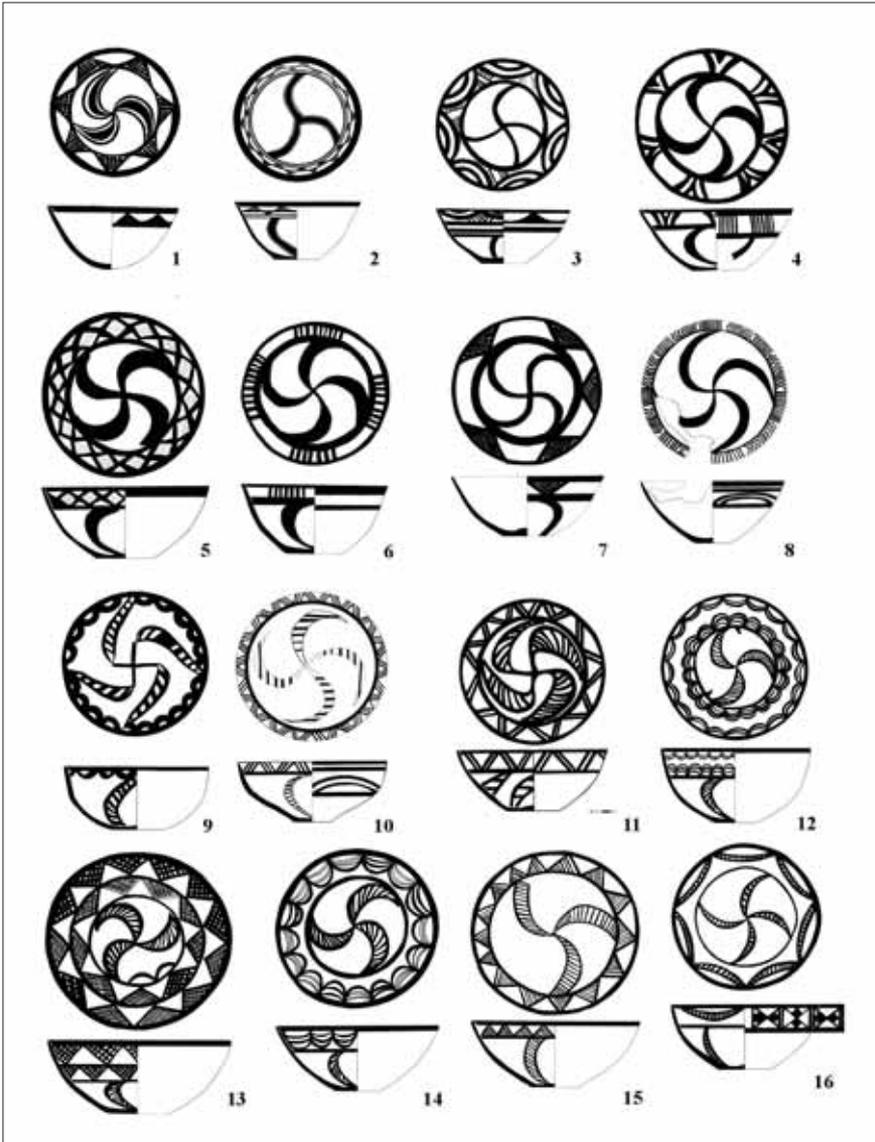


Fig. 28: Shahr-i Sokhta Grey Ware bowls with swastika patterns: 1. G.N.5201/12; 2. G.N.1706/7; 3. G.N.3105/6; 4. G.N.3204/2; 5. G.N.3400/6; 6. G.N.3502/4; 7. G.N.5003/4; 8. G.N.5106/1; 9. G.N.1515/5; 10. G.N.1516/2; 11. G.N.2810/6; 12. G.N.3903/3; 13. G.N.3905/10; 14. G.N.3907/7; 15. G.N.4212/9; 16. G.N.5106/2.

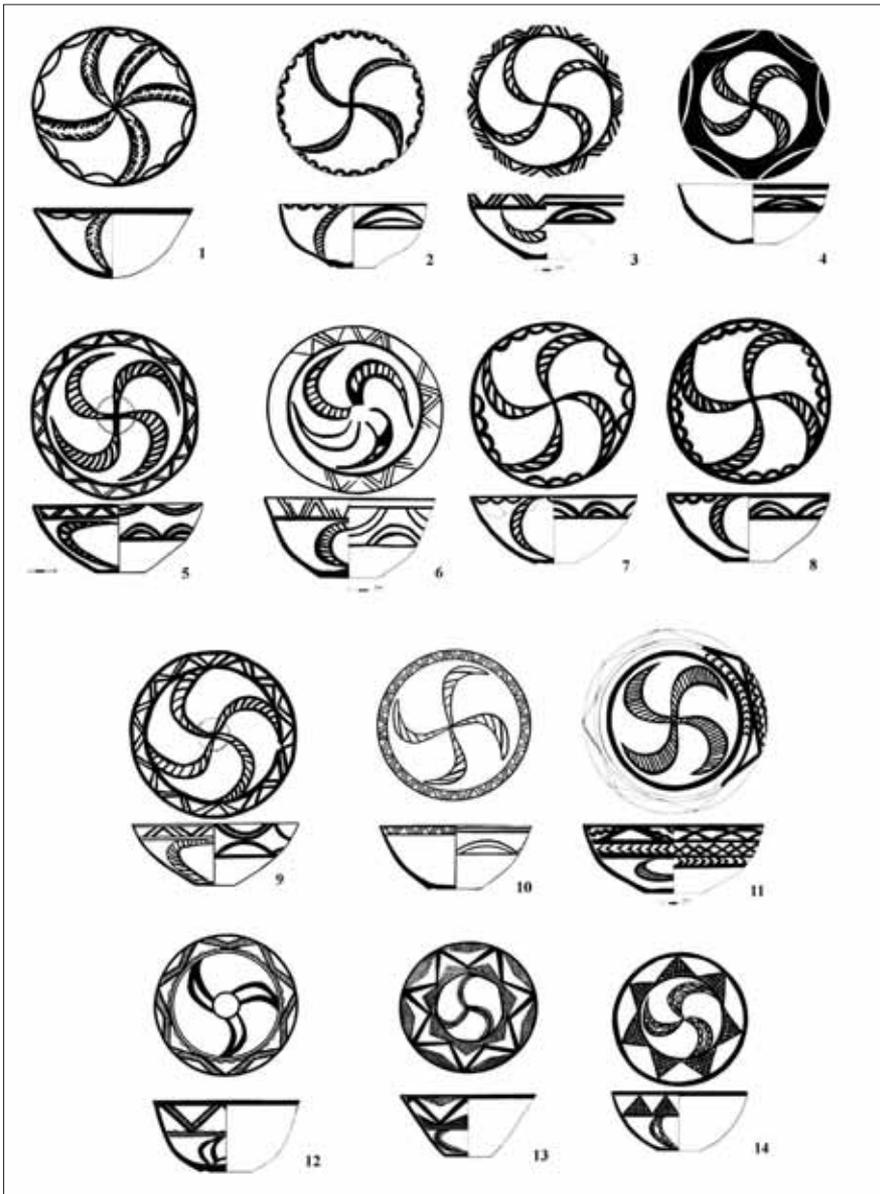


Fig. 29: Shahr-i Sokhta Grey Ware bowls with internal swastika.

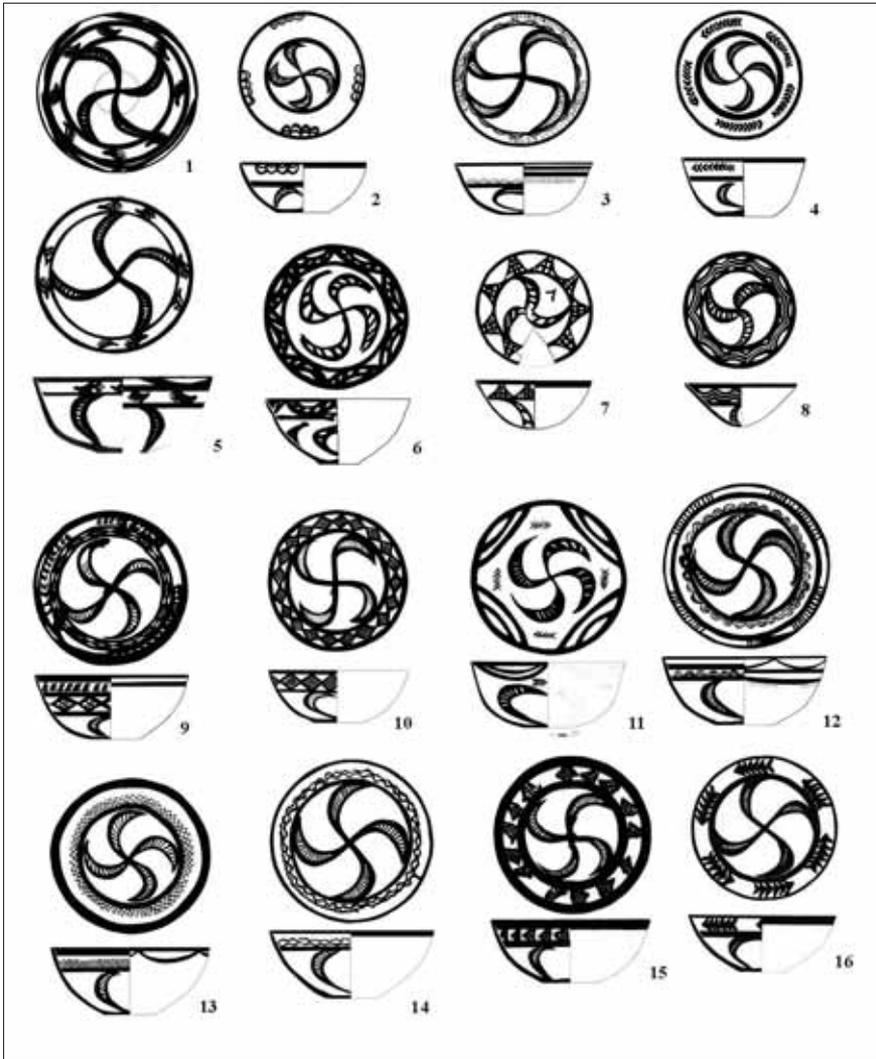


Fig. 30: Shahr-i Sokhta Grey Ware bowls with internal swastika patterns: 1. G.N.5301/6; 2. G.N.1413/3; 3. G.N.1703/4; 4. G.N.1716/1; 5. G.N.5301/6; 6. G.N.1613/6; 7. G.N.1713/3; 8. G.N.1708/12; 9. G.N.3000/8; 10. G.N.3102/4; 11. G.N.3105/5; 12. G.N.3208/2; 13. G.N.3503/3; 14. G.N.3912/6; 15. G.N.4303/3; 16. G.N.4314/7.

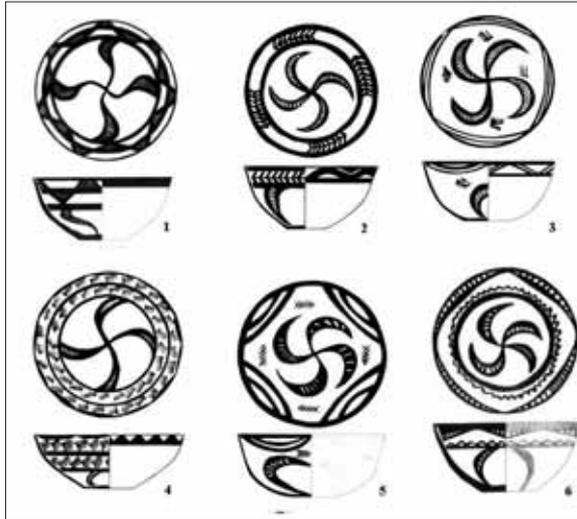


Fig. 31: Shahr-i Sokhta Grey Ware bowls with internal swastika patterns: 1. G.N.5202/3; 2. G.N.1613/2; 3. G.N.1702/1; 4. G.N.1703/2; 5. G.N.3105/5; 6. G.N.5106/10.



Fig. 32: Shahr-i Sokhta Grey Ware bowls with non-swastika patterns: 1. G.N.8910/4; 2. G.N.8817/8; 3. G.N.8320/12; 4. G.N.8225/94.



Fig. 33: Shahr-i Sokhta Grey Ware bowls with non-swastika patterns: 1. G.N.8725/51; 2. G.N.8725/97; 3. G.N.8725/98; 4. G.N.5113/4; 5. G.N.1706/9; 6. G.N.8702/3; 7. G.N.8819/6; 8. G.N.8819/00; 9. G.N.8322/55; 10. G.N.4314/31; 11. G.N.4215/6.



Fig. 34: Shahr-i Sokhta Grey Ware bowls with internal non-swastika patterns: 1. G.N.6401/2; 2. G.N.1701/2; 3. G.N.5302/5; 4. G.N.1706/5; 5. G.N.3106/3; 6. G.N.4410/11; 7. G.N.4410/14.



Fig. 35: Shahr-i Sokhta Grey Ware bowls with internal non-swastika patterns: 1. G.N.4314/5; 2. G.N.4311/4; 3. G.N.2800/3; 4. G.N.2906/4; 5. G.N.1414/6; 6. G.N.1504/4.



Fig. 36: Shahr-i Sokhta Grey Ware bowls with internal non-swastika patterns: 1. G.N.4212/4; 2. G.N.5603/2; 3. G.N.4408/3; 4. G.N.7934/7.



Fig. 37: Shahr-i Sokhta Grey Ware bowls with internal non-swastika patterns: 1. SB-AB 1017; 2. G.N.4314/2; 3. G.N.4314/3; 4. G.N.4408/3; 5. G.N.4408/5; 6. G.N.8519/1; 7. G.N.1604/5; 8. G.N.3503/1.



Fig. 38: Shahr-i Sokhta Grey Ware bowls with internal non-swastika patterns: 1. G.N.9021/10; 2. G.N.8725/87; 3. G.N.8725/93; 4. G.N.8725/95.



Fig. 39: Shahr-i Sokhta Grey Ware bowls with internal non-swastika patterns: 1. G.N.1713/7; 2. G.N.2702/2; 3. G.N.5207/4; 4. G.N.9302/00.



Fig. 40: Shahr-i Sokhta Grey Ware bowls with internal swastika patterns: 1. G.N.1601/6; 2. G.N.3204/2; 3. G.N.3502/4; 4. G.N.1600/00; 5. G.N.5113/2; 6. G.N.6401/3; 7. G.N.3000/8 8. G.N.3000/2; 9. G.N.4303/3; 10. G.N.4314/7; 11. G.N.5106/1; 12. G.N.8301/6.



Fig. 41: Shahr-i Sokhta Grey Ware bowls with internal swastika patterns: 1. G.N.6200/5; 2. G.N.1613/4; 3. G.N.1706/7; 4. G.N.2800/4; 5. G.N.3204/3; 6. G.N.5106/10.

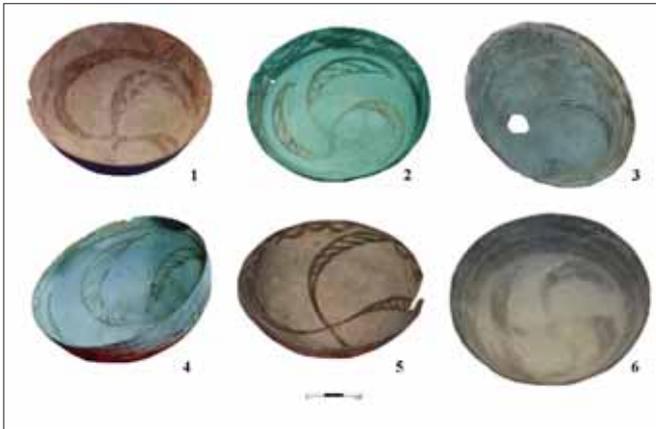


Fig. 42: Shahr-i Sokhta Grey Ware bowls with internal swastika patterns: 1. G.N.1703/1; 2. G.N.1703/4; 3. G.N.9348/4; 4. G.N.3102/4; 5. G.N.7809/3; 6. G.N.5106/10.



Fig. 43: Shahr-i Sokhta Grey Ware bowls with internal swastika patterns: 1. G.N.7809/4; 2. G.N.1718/2; 3. G.N.3100/5; 4. G.N.1703/2; 5. G.N.1718/2.



Fig. 44: Shahr-i Sokhta Grey Ware bowls with internal swastika patterns: 1. G.N.1718/15; 2. G.N.1718/14; 3. G.N.1601/9; 4. G.N.9298/5; 5. G.N.4411/4; 6. G.N.1717/5; 7. G.N.3000/8; 8. G.N.1613/2.

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The Pottery Assemblage from Area 33 (2019 Excavations)

Pierfrancesco Vecchio

**Multidisciplinary International Archaeological Project at Shahr-i
Sokhta**

pierfrancesco.vecchio@gmail.com

Abstract

The pottery in Area 33 presents forms and types mostly coherent with the patrimony of shapes already identified during the previous research at Shahr-i Sokhta. But the new outline of the chronology due to the updated information from C14 opens a new direction of study and a general reassessment will be needed in the next publications. As far as it regards the shapes, the truncated-conical bowls are ubiquitous, in space and time, but there is also a wide variety of other smaller cups or morphologically different open vessels which expand our knowledge about possible distinctive uses in the domestic daily life. For the closed forms, the beakers, as usual, account for the highest percentage during the different phases while the decorations show few peculiarities compared to the already known designs. The storage vessels and the bigger containers display a high degree of variability as regards the profiles and the general structure of the shapes and considering for the future research a proper interpretational review

to understand the function and the use of this class of forms. Connections with Kech-Makran, Bampur, the Nal horizon as the presence of classes of fine ware highlight the wide range of contacts between Shahr-i Sokhta and the surrounding cultures.

1. Introduction

In this paper dedicated to the study of pottery found in Area 33 we present an outline of the shapes and types associated with the archaeological contexts identified during the most recent research at the site, in continuity with previous work on its pottery (Ascalone 2019a; 2019b).

A total of 1733 sherds from the 2019 excavations were processed and catalogued, of which 835 were used for diagnostics. A total of 143 sherds are examined in this paper.

Of the vessels belonging to the successive phases of this area, the open forms are presented first, and the closed forms second. In addition, in the final chapter, we present a general scheme of the most representative types recovered from the excavation in an effort to establish a ‘universe’ of shapes used during the daily life of this domestic unit.

The so-called ‘truncated-cone bowls’ account for the highest percentage of the fragments catalogued for Layers 3A, 3B and 4A (respectively 33, 42 and 33%), as already noted by S. Salvatori and M. Vidale (1997: 67, 69), followed in all three cases by the beakers, which are the most numerous in Phase 4B (accounting for 33% of the fragments).

Of the open forms in 3A, basins and cups account for 6% and 14% respectively; in Layer 4A the basins still make up 5%, with a higher number of total fragments, while the cups fall to 4%.

Frequent among the closed forms are the so-called necked jars, which account for about 10% of potsherds in 3A and 3B, almost doubling to 18% in phase 4A before falling back to 10-11% during the last excavated phase. Lesser percentages are accounted for by the neckless jars, i.e. 4.6% in 3A, 8% in 3B, 4.6% in 4A and

8.5% in 4B, a fairly constant rate reflecting the activities held inside the domestic unit.

In our excavation, Black-on-Red Ware and Black-on-Grey Ware account for a small part of the assemblage, equivalent to only 1% of the diagnostic potsherds. Polychrome jars occur in all four phases, increasing progressively from 1% in 3A to 7% in 4B, these specific vessels being more frequent in the earlier levels.

2. Layer 3A - L.122, L.142, L.138, L.217 - open forms

As previously specified, Layer 3A is characterised by the constant and ubiquitous presence of truncated-conical bowls, which account for the highest number - 128 - of fragments. These are mostly straight-bodied, especially in the upper part of the vessel, with a plain rim, while in some cases the body is slightly concave. In the majority of the sherds the rim is simply rounded, but another type has a pointed and everted rim, with a concave moulding just below it on the exterior surface.

In L.142 the decorations on the inner surface of the truncated conical bowls display mostly friezes with festoons inserted in triangles drawn with double lines hanging from the rim (Fig. 1: 1, 3, 4, 5) - already known from the 'Central Quarters' as a single motif or a frieze (Salvatori - Vidale 1997: 114, fig. 140, 5, Phase 5A; Salvatori - Vidale: 112, fig. 137, 2, Phase 5A). In one case, the frieze consists of a double zigzag below the rim with festoons inside the resulting triangles, underscored by a continuous double line, below which there are two diagonal curving lines with the upper one fringed (Fig. 1: 2).

A loosely structured frieze consisting of a zigzag line alternating with short wavy lines (Fig. 1: 6) seems to be similar to the motif identified by C.C. Lamberg-Karlovsky and M. Tosi (1973: fig. 22), Period II and to the decoration on a dish from Layer 4B in L.176. In the same locus, the truncated conical bowls have a diagonal chain of lozenges with tooth-edged lines or a single such line hanging from the vertex (Fig. 1: 7, 8) (Salvatori - Vidale 1997: 113, fig. 138, 1, Phase 5A).

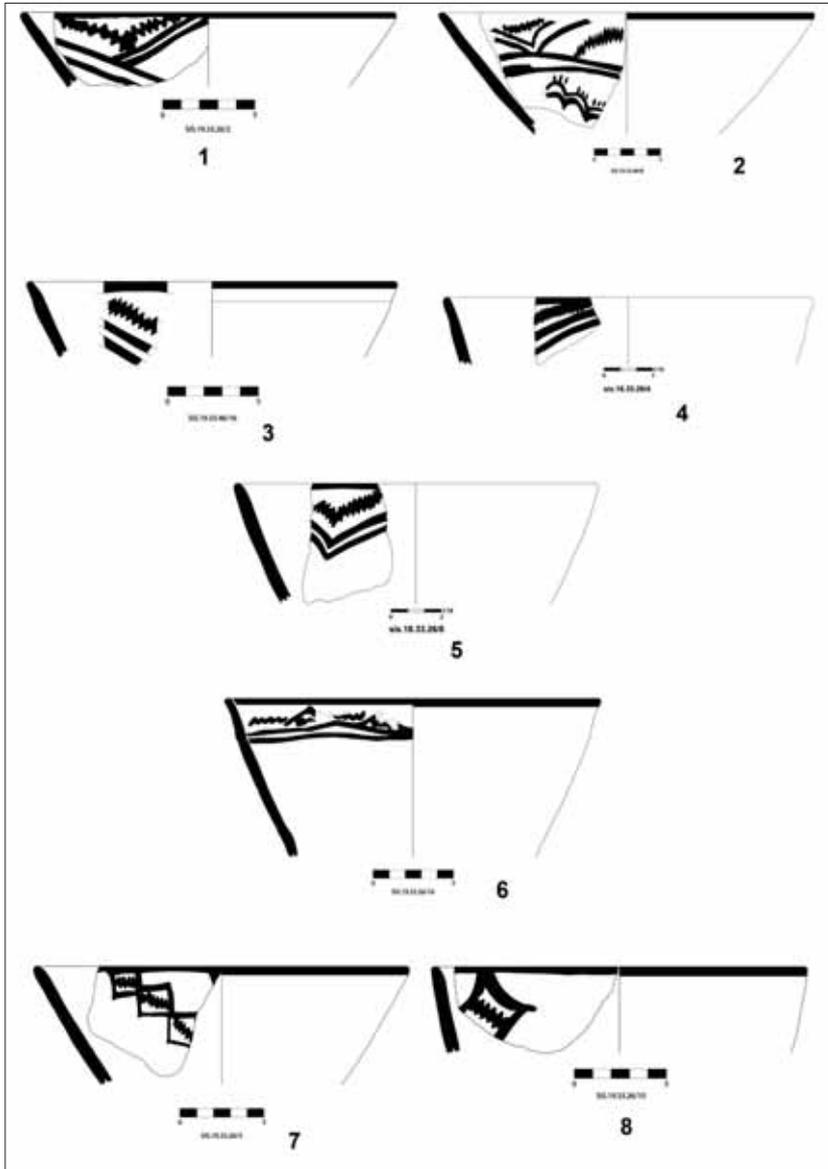


Fig. 1: the pottery assemblage of Phase 3A, open forms: 1. SiS.19.33.26/2; 2. SiS.19.33.46/8; 3. SiS.19.33.46/16; 4. SiS.19.33.26/4; 5. SiS.19.33.26/8; 6. SiS.19.33.26/16; 7. SiS.19.33.26/3; 8. SiS.19.33.26/10.

Two vessels have a group of three hanging stepped lines (Fig. 2: 10, 11), in one case alternating with a double V-shaped symbol fringed on the upper side (Fig. 2: 10) (Tosi 1969: fig. 28, 5, h, Period II-III). Diagonal cross-hatched lozenges and triangles seem to be a common feature of this layer (Fig. 2: 12, 13, 14). The variety of decoration is completed by a triple zigzag below the rim underscored by a double line (Fig. 2: 15, 16) (Salvatori - Vidale 1997: 111, fig. 135, 2, Phase 5A, Piperno - Salvatori 2007: 190, G. 140, no. 7534). For the motif in Fig. 2: 9 there are no parallels.

Two distinct types of large container or basin were found: the so-called S-shaped contour type with an everted rounded rim, and the type with an almost straight profile and a rim that is square in cross section with a protruding outer lip. The former is painted, while the latter sometimes has only a black band on the outer surface of the lip. With their mix of linear and semi-curvilinear decorated friezes inside the rims, the three specimens retrieved from L.122 and L.142 (Fig. 3: 17-19) seem to belong to an older phase, probably the residue of Phase 6 garbage or infill, with parallels in the necropolis and the settlement (Piperno - Salvatori 2007: 238, G. 704, no. 7543, fig. 536 and 102, fig. 116, 3, Phase 6).

One bowl has a double curving line below the rim enclosing a festoon (Fig. 3: 20) (on the profile, see Salvatori - Vidale 1997: 130, fig. 170, 4, Phase 5B) while two others have diagonal stepped lines (Fig. 3: 21, 22) with several parallels from Phase 5A in the 'Central Quarters' (some of the examples are examined in Salvatori - Vidale 1997: 111, fig. 134, 5 and 113, fig. 138, 4).

A large basin with a tooth-edged Maltese cross (Fig. 3: 23) has a lip with a profile that seems to belong to Phase 6 (Salvatori - Vidale 1997: 95, fig. 103, 4), and the Maltese cross (the central part of the motif on our piece is empty) also appears in Tepe Graziani at the beginning of the same period (Kavosh *et al.* 2019: 105, fig. 104, 22).

As already stated, the undecorated shapes include large basins with everted rims (Fig. 3: 24-26) (Salvatori - Vidale 1997: 94, fig. 101, 1, 3, Phase 6), small cups with a curvilinear profile and an everted lip (Fig. 4: 27-28) and a miniature vessel with a highly irregular profile (Fig. 4: 29).

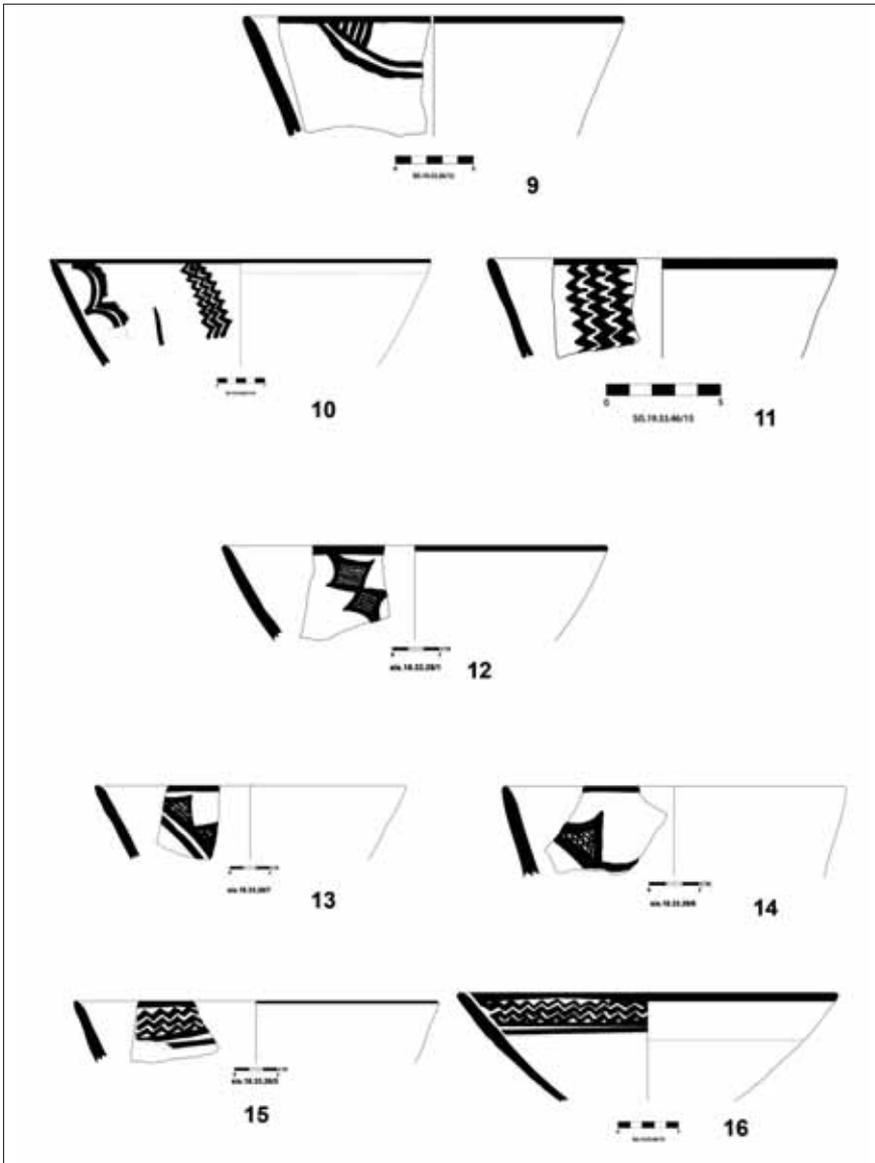


Fig. 2: the pottery assemblage of Phase 3A, open forms: 9. SiS.19.33.26/12; 10. SiS.19.33.60/3.5.8; 11. SiS.19.33.46/15; 12. SiS.19.33.26/1; 13. SiS.19.33.26/7; 14. SiS.19.33.26/6; 15. SiS.19.33.26/5; 16. SiS.19.33.46/10.

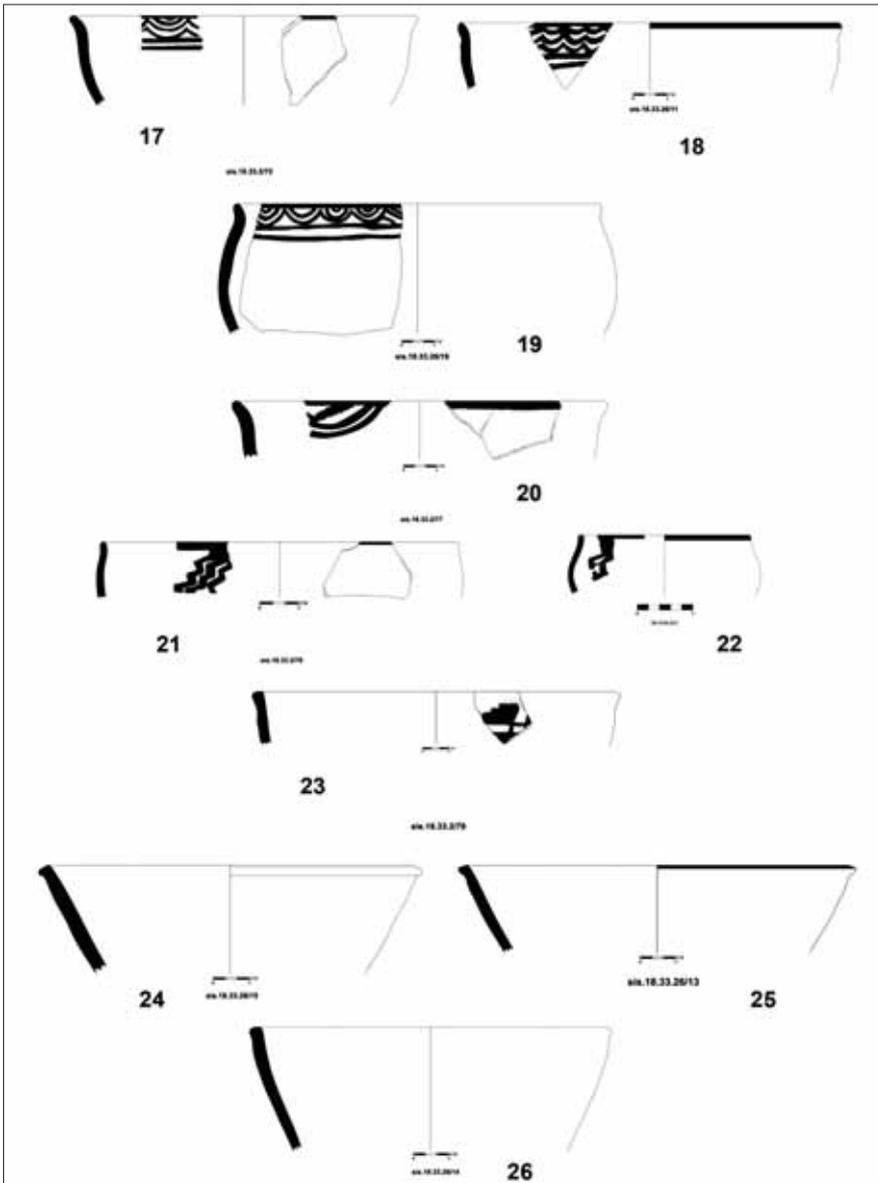


Fig. 3: the pottery assemblage of Phase 3A, open forms: 17. SiS.19.33.2/72; 18. SiS.19.33.2/11; 19. SiS.19.33.2/19; 20. SiS.19.33.2/77; 21. SiS.19.33.2/78; 22. SiS.19.33.2/1; 23. SiS.19.33.2/79; 24. SiS.19.33.2/15; 25. SiS.19.33.2/13; 26. SiS.19.33.2/14.

The Red Ware is represented by two cups (Fig. 4: 30-31), the first with a plain rim and distinct wavy lines - a fairly rare pattern - and the second with an S-shaped everted rim painted with bundles of zigzag lines inside and wavy lines outside: this kind of decoration can be partially compared with a cup, not decorated on the outside, from the 'Central Quarters' (Salvatori - Vidale 1997: 142, fig. 187, 4). Another possibly comparable fragment comes from Sohr Damb, in the form of a bowl with similar decoration and surface treatment (Franke 2015: Pl. 06-d, Tr. II, Period II).

The Black-on-Grey Ware includes three vessels belonging to different types (Wright 1984: 131-133, fig. 3.25-26): Fig. 4: 32 is a cup with slightly concave walls and simple lines, irregularly painted below the outer rim (Salvatori - Vidale 1997: 145, fig. 191, 1, 2). Fig. 4: 33 has a conical profile (with straight-sided walls) and a vertically hatched frieze of lozenges below the outer lip - a decoration which is quite frequent in Piperno - Salvatori 2007: 163, G. 118, no. 6633. However, inside it there is a distinctive motif consisting of hatched triangles that might symbolise leaves, so far not seen in Shahr-i Sokhta or other sites (see Jarrige 1974: 498, fig. 1, phase IV). The cup with straight walls shown in Fig. 4: 34 has a chaotic cross-hatched frieze between simple bands on the upper portion of the outside of the body that has no parallels.

3. Layer 3A - L.122, L.142, L.138, L.217 - closed forms

In this phase, the beakers (Buson - Vidale 1983; Vidale 1984) and their larger version, the pear-shaped jars, represent the most common of the closed forms (112 fragments). The profiles of the vessels are varied, probably due to the duration of the depositional process.

On the upper portion of the neck, some beakers have zigzags or wavy decoration in between bands (Fig. 5: 1, 2, 3) (Piperno - Salvatori 2007: 190, G. 140, no. 7535; Piperno - Salvatori 2007: G. 59 inf., nos. 6929-6930, dated to Phase 5, according to Piperno - Salvatori 1983: plate IV, b) or metopes (Fig. 5: 4) (Salvatori - Vidale 1997: 120, fig. 153, 2, Phase 5A).

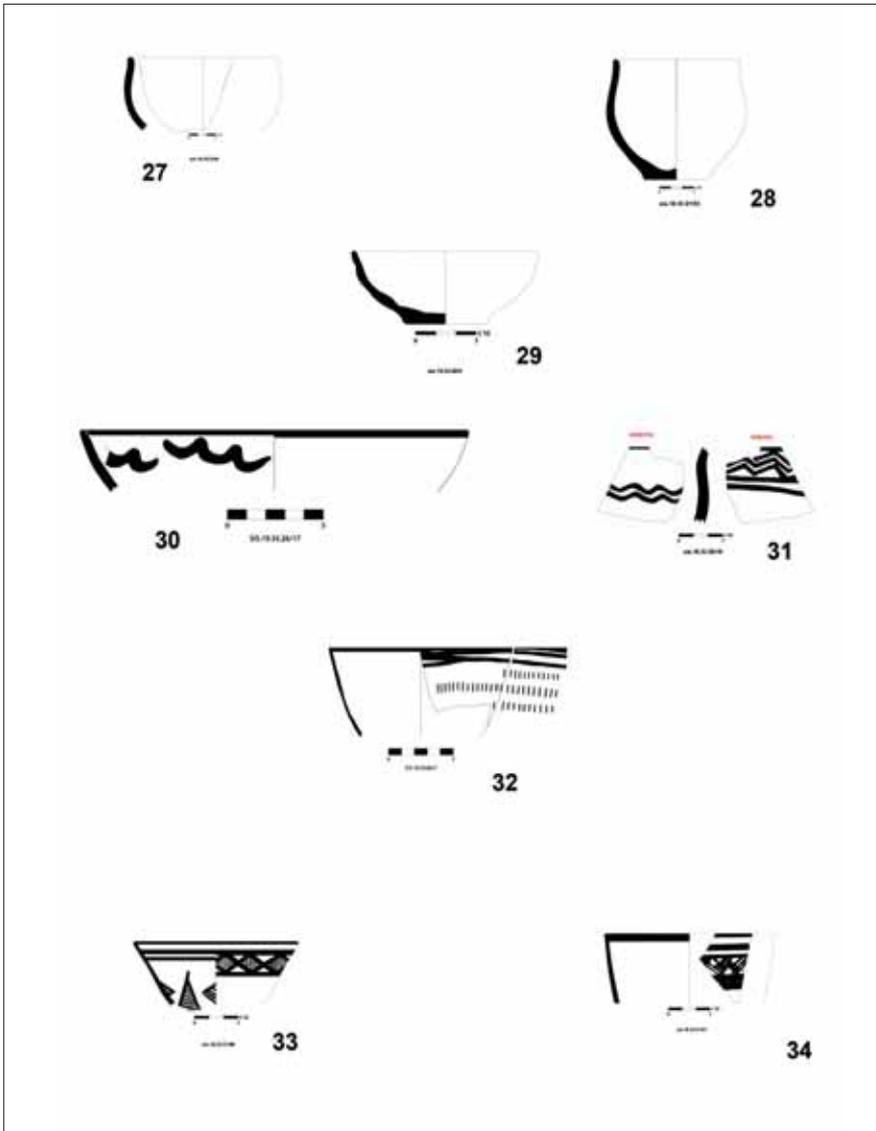


Fig. 4: the pottery assemblage of Phase 3A, open forms: 27. SiS.19.33.2/44; 28. SiS.19.33.2/153; 29. SiS.19.33.60/4; 30. SiS.19.33.26/17; 31. SiS.19.33.26/18; 32. SiS.19.33.60/7; 33. SiS.19.33.2/150; 34. SiS.19.33.2/151.

Other beakers have decoration on the body, as shown in Fig. 5: 6 (Biscione 1974, G. 10, Phase 6, Piperno - Salvatori 2007: 40-41, G. 10/19, not inventoried) and Fig. 5: 9 (Salvatori - Vidale 1997: 137, fig. 182, 5, Phase 5B); a toothed zigzag band inside a frieze is also seen (Fig. 5: 5.1.3.4) (Piperno - Salvatori 1983: pl. V, Phase 5; Salvatori - Vidale 1997: 156, fig. 221, Phase 5B).

Cylindrical beakers also continue to be present in this phase. The fragment from L.142 shown in Fig. 5.8 has decoration that enables it to be recognised as the one in Salvatori - Vidale (1997: 138, fig. 183, 14, Phase 5B).

Two examples stand out. One is an elongated beaker (Fig. 5: 5.2) with decoration on the body and the neck consisting of a combination of two friezes filled with chains of alternating solid triangles with bases on the same line (first described by Biscione 1973: 114, fig. 8.10 e, and later by Piperno - Salvatori 2007: 54, G. 16, nos. 6211-6212, fig. 80). The other is a neck fragment of a beaker with a frieze of birds with straight legs (Fig. 5: 7), a motif seen in only one other case, a jar from the necropolis (Piperno - Salvatori 2007: 99, G. 44, fig. 197, no. 6283, dated to Period II according to Mugavero - Vidale 2003: 90).

There are two pear-shaped jars (Fig. 5: 10-11) with decoration on the upper section of the body and the neck, one with stepped lines and probably a spiral motif (Salvatori - Vidale 1997: 132, fig. 173, 1, Phase 5B), while the decoration of the other has no convincing parallel in the 'Central Quarters' (Salvatori - Vidale 1997: 137, fig. 182, 7, Phase 5B and 139, fig. 184, 9, Phase 5B).

There are three miniature vessels in Buff Ware (Fig. 5: 12), Red Ware (Fig. 5: 13) and Black-on-Grey Ware (Fig. 5: 14) with identical profiles and shapes. Decoration seems to be limited to the shoulders, with friezes composed of oblique toothed-edge lines between two bands or a chain of vertically hatched lunettes (common in Bampur during Period IV, Phase 1; de Cardi 1970: 289-291, fig. 25) or bundles of zigzag lines (Piperno - Salvatori 2007: 25, G. 2, nos. 6087-6088, the specimen in the necropolis belongs to Buff Ware, dated, according to Piperno - Tosi 1975, to Phase 5).

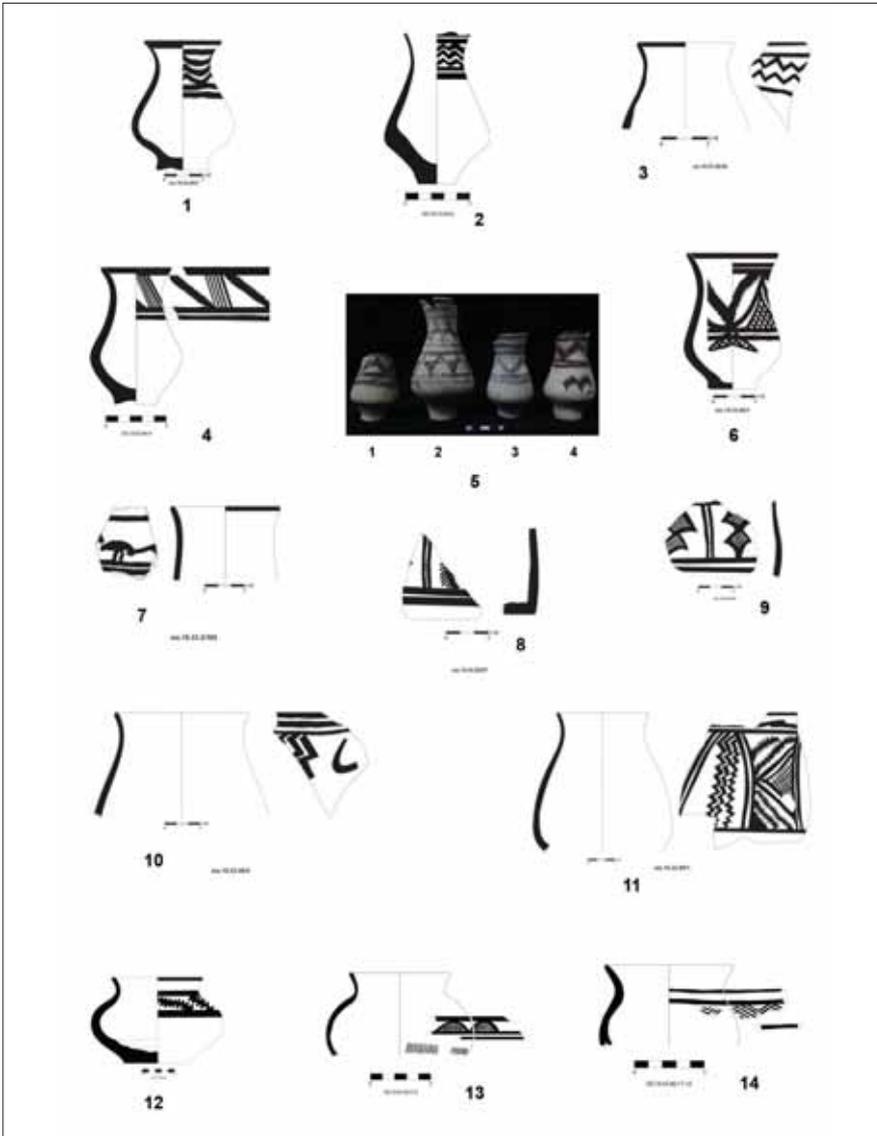


Fig. 5: the pottery assemblage of Phase 3A, closed forms. 1. SiS.19.33.46/2; 2. SiS.19.33.60/6; 3. SiS.19.33.26/26; 4. SiS.19.33.46/3; 5.1. SiS.19.33.2; 5.2. SiS.19.33.2; 5.3. SiS.19.33.2; 5.4. SiS.19.33.2; 6. SiS.19.33.46/1; 7. SiS.19.33.2/103; 8. SiS.19.33.26/27; 9. SiS.19.33.26/25; 10. SiS.19.33.26/4; 11. SiS.19.33.60/1; 12. SiS.19.33.46/9; 13. SiS.19.33.46/5.6; 14. SiS.19.33.46/11.12.

Storage vessels include a 'hole-mouth' jar (Fig. 6: 15) painted with an 'S' filled with horizontal tooth-edged lines - maybe part of a frieze - as in the type mentioned in Salvatori - Vidale 1997: 103, fig. 119, 3 (a later production) and two other jars with a well-defined neck and a slightly everted rim either plain or painted with bands under the lip (Fig. 6: 17-18) (Salvatori - Vidale 1997: 42, NJ6).

There is also a well-known type (Fig. 6: 16) with a short neck and an everted convex lip (Salvatori - Vidale 1997: fig. 146, 4, 5, Phase 5A).

Two fragments of biconical jars (Fig. 6: 19-20) have the distinctive 'sigma' frieze on the shoulder. In one case this is a continuous sequence within double bands above hatched triangles: a possible parallel is found in de Cardi 1970: 286, fig. 22, no. 129, Bampur III (the piece from Bampur is fragmentary; the apexes could belong to triangles, but they do not seem to be hatched). The other is inserted in a metope/triglyph scheme, with parallels in Piperno - Salvatori 2007: 101, G. 46, fig. 203.

Zoomorphic motifs appear on two sherds. One (Fig. 6: 21) is a fragmentary frieze with ibexes with long curving horns and arched bodies, a distinctive theme already described by Biscione - Bulgarelli 1983: 235, no. 0145, that may be linked to Bampur (de Cardi 1970: 283, fig. 20, 92, Bampur II). The other (Fig. 6: 23) is believed to have had a metope frieze consisting of vertical strokes flanked by hatched lunettes, as well as what may be a springing goat: the combination of vertical strokes and lunettes is also seen on a jar from the necropolis (Piperno - Salvatori 2007: G. 14, no. 6201, dated to Phase 5 according to Piperno - Tosi 1975: 192).

There are long-necked jugs with slightly squat globular bodies and painted walls (Fig. 6: 22, 24) (Salvatori - Vidale 1997: fig. 155, 6, Phase 5A the former), while Fig. 6: 26, probably from a secondary deposit, has decoration similar to the Damb Sadaat II-III style (Lamberg-Karlovsky - Tosi 1973: fig. 13, from southern Turkmenistan, fig. 15, 4, 11, from Geoksjur and Quetta; Biscione 1973: fig. 8. 7, 4 and more recently Sajjadi *et al.* 2008: 317, fig. 8.b, G. MJN 6705/5).

L.217 in this phase yielded a fragmented and incomplete polychrome jar (Fig. 6: 25) with a complex metope design including lozenges with the ‘sun motif’ (Mugavero - Vidale 2003: 82, fig. 13, 6a).

4. Layer 3B - L.122, L.142, L.138, L.217 - open forms

Truncated conical bowls with almost unchanged rim profiles account for the majority of the pottery sherds (48 fragments). Double chains of festoons (Fig. 7: 1) (Salvatori - Vidale 1997: 96, fig. 104, 5 and 99, fig. 110, 5, both Phase 6) prevail among the motifs, sometimes with zigzags, wavy lines (garlands?) and what may be sigmas (Fig. 7: 3, 4) or bundles of zigzags (Fig. 7: 2).

A small basin (Fig. 7: 5) has an inner frieze with cross-hatched triangles, while the rim’s square cross section resembles the bowl in Salvatori - Vidale (1997: 114, fig. 141, 4, Phase 5A). A Black-on-Grey cup (Fig. 7: 6) has inner decoration that resembles the specimen in Salvatori - Vidale 1997: 144, fig. 190, 2.

5. Layer 3B - L.122, L.142, L.138, L.217 - closed forms

In L. 138, a set of closed vessels seem to be part of a foundation deposit composed of three beakers and a miniature lentoid jar (Fig. 7: 7-8). One of the beakers (Fig. 7: 8) has decoration which recalls a design identified in the ‘Central Quarters’ (Salvatori - Vidale 1997: 120, fig. 153, 2, Phase 5A and 137, fig. 182, 8, Phase 5B). The painted wall of a long-necked jug (Fig. 7: 9) bears decoration dated to Period II, according to C.C. Lamberg-Karlovsky and M. Tosi (1973: fig. 25).

6. Layer 4A - L.149, L.168, L.176, L.182 - open forms

The layers under scrutiny in this phase concern the infill dumped in the various rooms before the new floors of Layer 3B were laid.

Most of the vessels are truncated-cone bowls, especially the older type characterised by tapering rims and chains of double wavy lines (Fig. 8: 2-6), others having a rounded lip and friezes of triangles, cross or diagonally hatched (Fig. 8: 8-11). Many parallels, all belonging to Phase 6, can be found in the

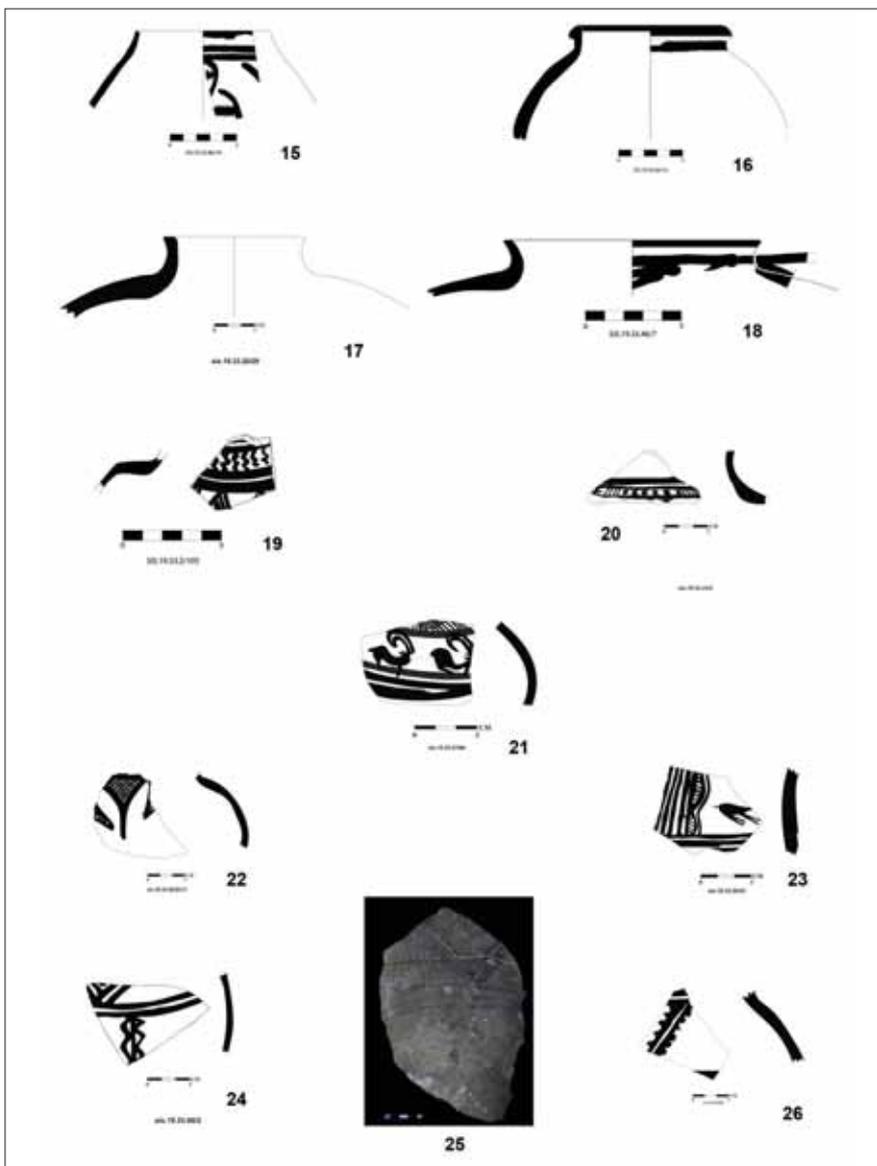


Fig. 6: the pottery assemblage of Phase 3A, closed forms: 15. SiS.19.33.46/14; 16. SiS.19.33.46/13; 17. SiS.19.33.26/29.30.31; 18. SiS.19.33.46/7; 19. SiS.19.33.2/105; 20. SiS.19.33.23/2; 21. SiS.19.33.2/104; 22. SiS.19.33.26/20.21; 23. SiS.19.33.26/22; 24. SiS.19.33.60/2; 25. SiS.19.33.23; 26. SiS.19.33.26/23.

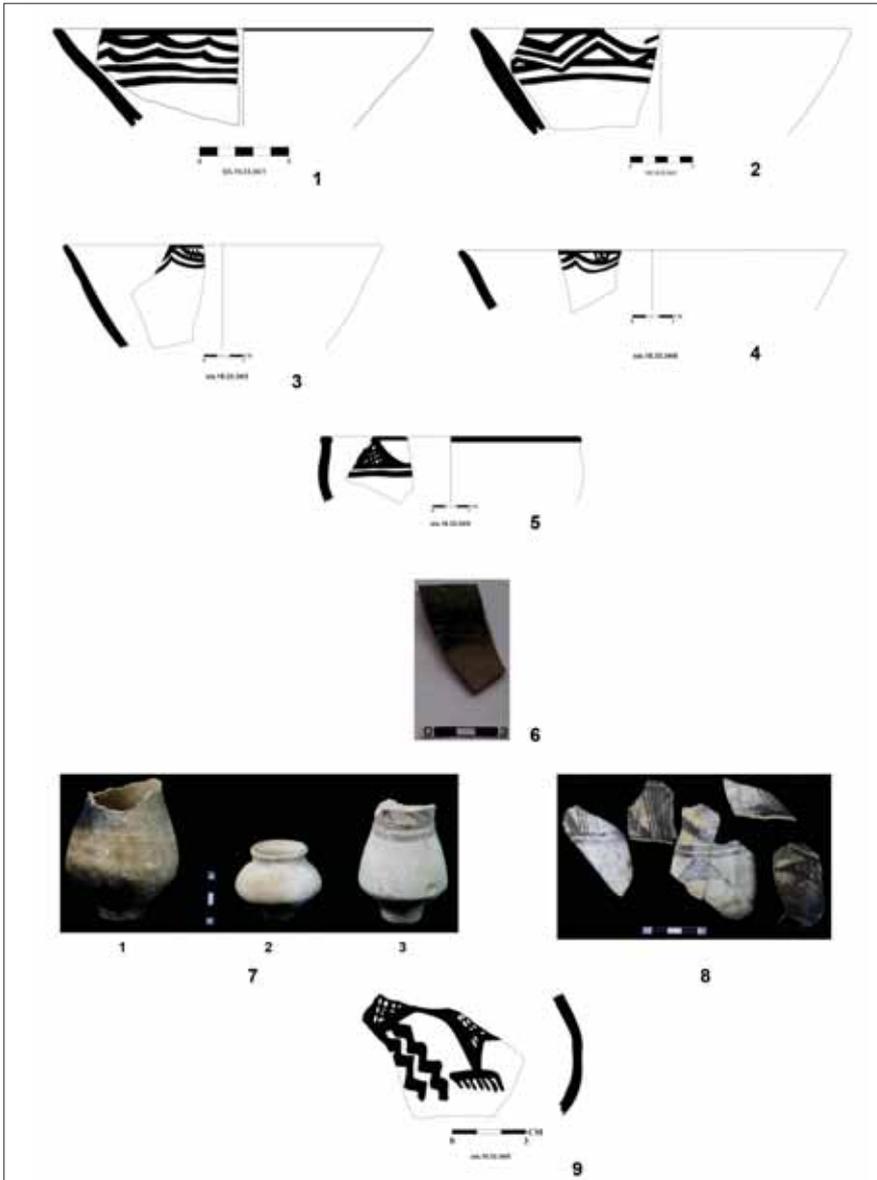


Fig. 7: the pottery assemblage of Phase 3B, open and closed forms: 1. SiS.19.33.34/1; 2. SiS.19.33.34/2; 3. SiS.19.33.34/3; 4. SiS.19.33.34/6; 5. SiS.19.33.34/4; 6. SiS.19.33.34; 7.1. SiS.19.33.22; 7.2. SiS.19.33.22; 7.3. SiS.19.33.22; 8. SiS.19.33.22; 9. SiS.19.33.34/5.

‘Central Quarters’ (on the double lines, see Salvatori - Vidale 1997: 96, fig. 104, 1, 5; 99, fig. 110, 3; 101, fig. 115, 1-2; 102, fig. 117, 2; on triangles, see Salvatori - Vidale 1997: 97, fig. 107, 3; 98, fig. 109, 2; 100, fig. 113, 3).

A smaller bowl with inner decoration consisting of a simple chain of hanging triangles, clumsily painted with a large brush and dark reddish pigment (Fig. 8: 1), could be from the earliest Phases recovered in the ‘Central Quarters’ (a similar technique appears in Tosi 1969: 324, fig. 34, e, k, as the author writes: ‘the paint has usually a red-brown colour’). An additional fragment might belong to the settlement’s foundation, given its distinctive motif (Fig. 8: 7) similar to one found by Salvatori - Vidale 1997: 83, fig. 79, 2, Phase 8-7.

Another group of conical bowls have decoration dated to Phases 5A/B: hanging triangles (Fig. 9: 12-13), cross-hatched lozenges or stepped lines (Fig. 9: 14-16) (Salvatori - Vidale 1997: 114, fig. 140, 4, and 129, fig. 167, 4) and festoons or triangles containing garlands or zigzag lines (Fig. 9: 17-18) (Salvatori - Vidale 1997: 129, fig. 167, 4; Biscione *et al.* 1974: 37; Salvatori - Vidale 1997: 115, fig. 142, 3).

An unusual shape is exemplified by the specimen seen in Fig. 9: 19, which is a large dish decorated inside with a double spiral filled with diagonal tooth-edged lines. Another painted sherd (Fig. 9: 20) with a highly stylised silhouette of an ibex may belong to the same category: currently this design has no parallel in Shahr-i Sokhta, the only close example being found in Tosi 1969: 312, fig. 33, d (this fragment belongs to the Black-on-Grey group).

There are curvilinear vessels with everted rims in an array of different dimensions, from basins to large bowls and cups. A large basin (Fig. 10: 21) decorated with chains of festoons should be included in Phase 6, like the bowls cited above. They can be plain (Fig. 10: 25-26) or decorated on the inside with diagonally arranged cross-hatched triangles and stepped lines (Fig. 10: 22-23), or on the external surface with complex friezes, probably with spirals and garlands (Fig. 10: 24).

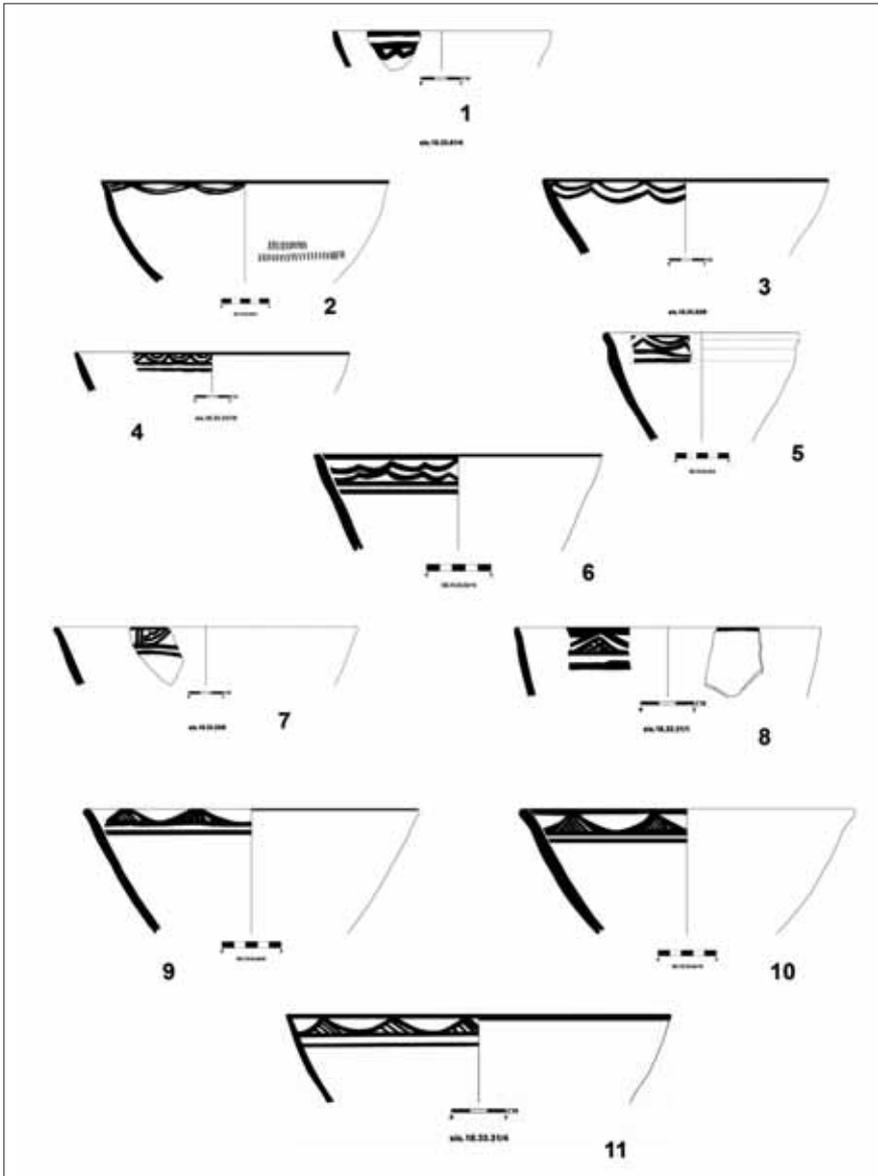


Fig. 8: the pottery assemblage of Phase 4A, open forms: 1. SiS.19.33.61/4; 2. SiS.19.33.29/3; 3. SiS.19.33.53/8; 4. SiS.19.33.31/19; 5. SiS.19.33.29/4; 6. SiS.19.33.53/14; 7. SiS.19.33.53/9; 8. SiS.19.33.31/1; 9. SiS.19.33.44/9; 10. SiS.19.33.44/10; 11. SiS.19.33.31/4.

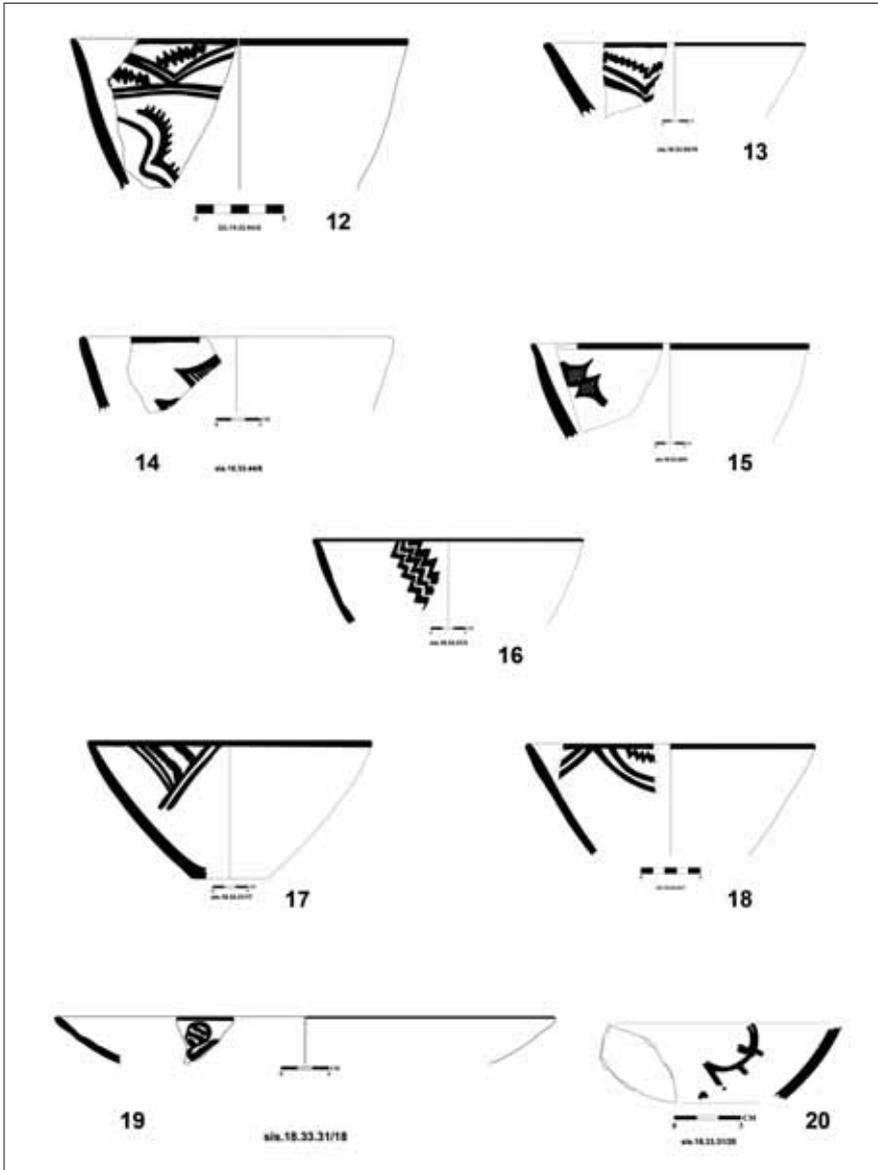


Fig. 9: the pottery assemblage of Phase 4A, open forms: 12. SiS.19.33.44/6; 13. SiS.19.33.53/10; 14. SiS.19.33.44/8; 15. SiS.19.33.29/5; 16. SiS.19.33.31/3; 17. SiS.19.33.31/17; 18. SiS.19.33.44/7; 19. SiS.19.33.31/18; 20. SiS.19.33.31/20.

There are deep basins with bevelled rims and motifs not attested elsewhere (Fig. 10: 27-28) (Salvatori - Vidale 1997: 112, fig. 139, 1, Phase 5A). A miniature cup (Fig. 10: 29) with schematic linear decoration hanging from the inner lip completes the pottery sequence (Salvatori - Vidale 1997: 130, fig. 169, 2, Phase 5B).

7. Layer 4A - L.149, L.168, L.176, L.182 - closed forms

Beakers account for the second highest percentage of fragments (115), and their decorations vary widely, being painted on the upper part of the neck (Fig. 11: 1-3), the body (Fig. 11: 5-7) or all over the surface (Fig. 11: 4). Regarding their chronology, the literature refers to two phases (Cortesi *et al.* 2008: fig. 4, Phase 5A *contra* Biscione 1974: 37, fig. 8, G. 10, Phase 6). However, in a table published by Tosi for items from the 'House of the Pit', the author shows beakers from an infill dated to Period II and three of them (Tosi 1983: 111, fig. 13, CC 1-10, CC 3 - third from left - CCXXIX S) display close similarities with Fig. 11: 2, 4, 6.

Metopes with S-shaped motifs and cross-hatched lozenges or stylised birds complete the catalogue. Note the presence of a cylindrical beaker with metopes with a stag and a vertical fringed V-shape (the so-called bird motif), an association which has not been recorded so far (Fig. 11: 8) (although there are multiple examples of the stag, see Salvatori - Vidale 1997: 138, fig. 183, 4-9, Phase 5B; for the bird, see Piperno - Salvatori 2007: 49, G. 14, fig. 67, no. 6462 and 52, G. 15, fig. 76, no. 6209).

Pear-shaped jars and lentoid, squat jars complete this group of small containers (Fig. 11: 9-12). Painted on the body of vase no. 11 is a very distinctive design with a stag, a spiral with tooth-edged lines inside the loops and a bundle of three stepped lines. There is no clear parallel for this zoomorphic element but the closest is attested in the necropolis (Piperno - Salvatori 2007: 358, motif no. 0136).

The painted medium-sized jars include a biconical carinated vessel with a double frieze with intersecting zigzag lines (Fig. 12: 13) (Salvatori - Vidale 1997: 122, fig. 156, Phase 5). A Black-on-Buffer fragment probably has a chain of triangles drawn with double lines on the shoulder (the clay appears to be adequately fired, fine and unusually red, 5YR 5/8) (Fig. 12: 14).

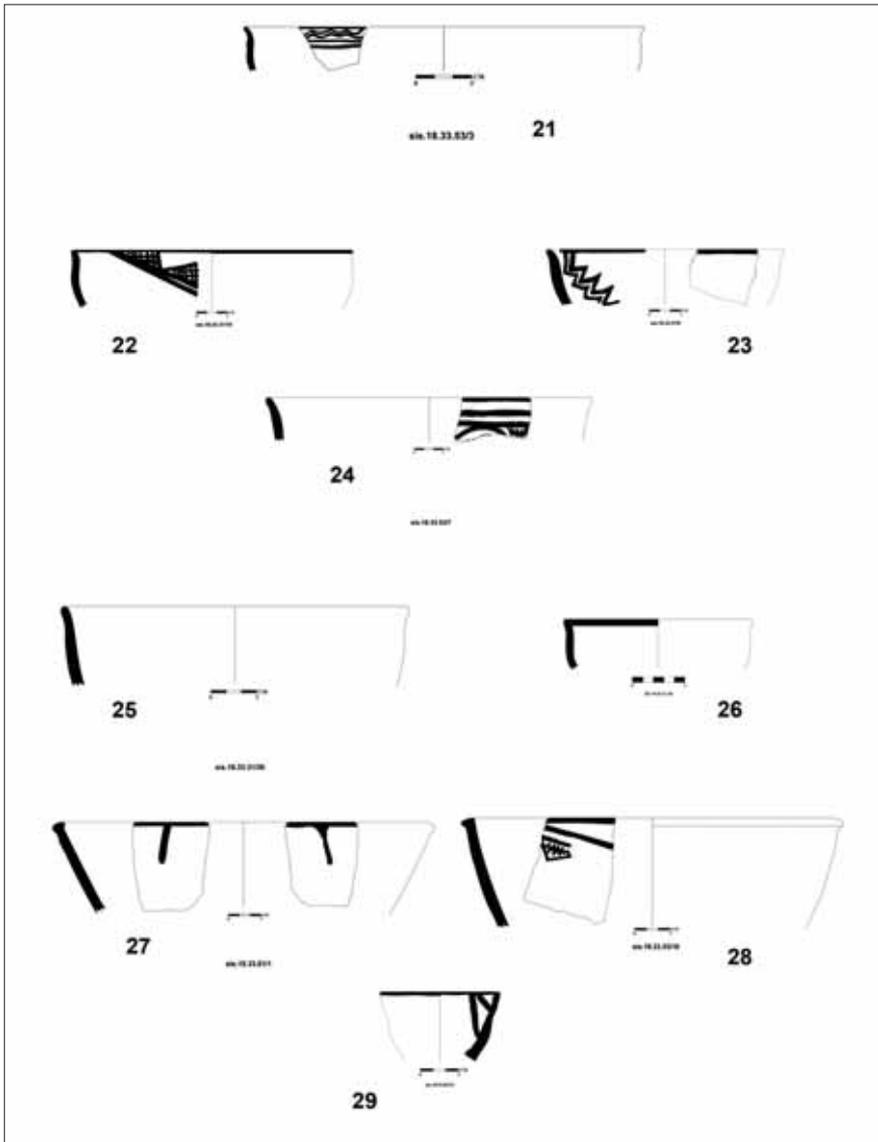


Fig. 10: the pottery assemblage of Phase 4A, open forms: 21. SiS.19.33.53/3; 22. SiS.19.33.31/10; 23. SiS.19.33.31/9; 24. SiS.19.33.53/7; 25. SiS.19.33.31/30; 26. SiS.19.33.31/29; 27. SiS.19.33.61/1; 28. SiS.19.33.53/10; 29. SiS.19.33.53/13.

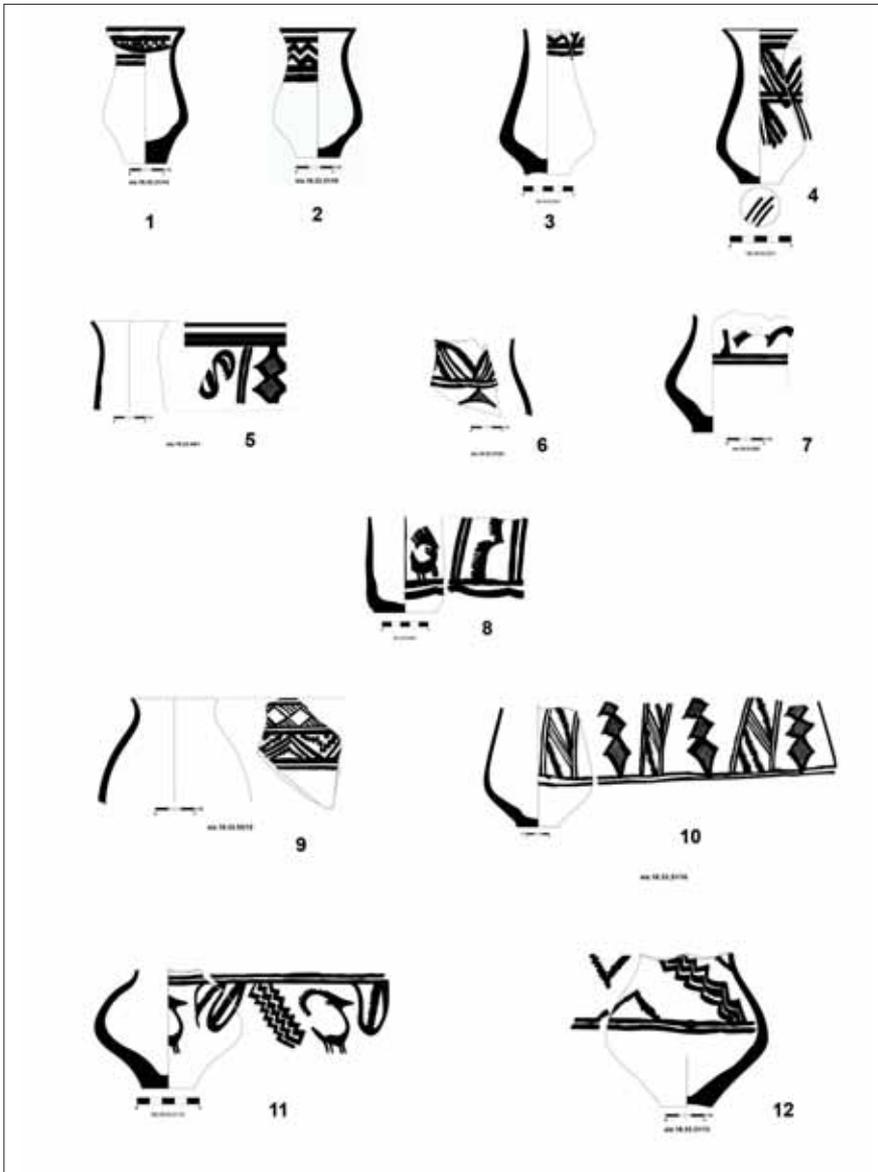


Fig. 11: the pottery assemblage of Phase 4A, closed forms: 1. SiS.19.33.31/14; 2. SiS.19.33.31/15; 3. SiS.19.33.53/2; 4. SiS.19.33.53/1; 5. SiS.19.33.44/1; 6. SiS.19.33.31/23; 7. SiS.19.33.29/2; 8. SiS.19.33.44/4; 9. SiS.19.33.53/12; 10. SiS.19.33.31/16; 11. SiS.19.33.31/12; 12. SiS.19.33.31/13.

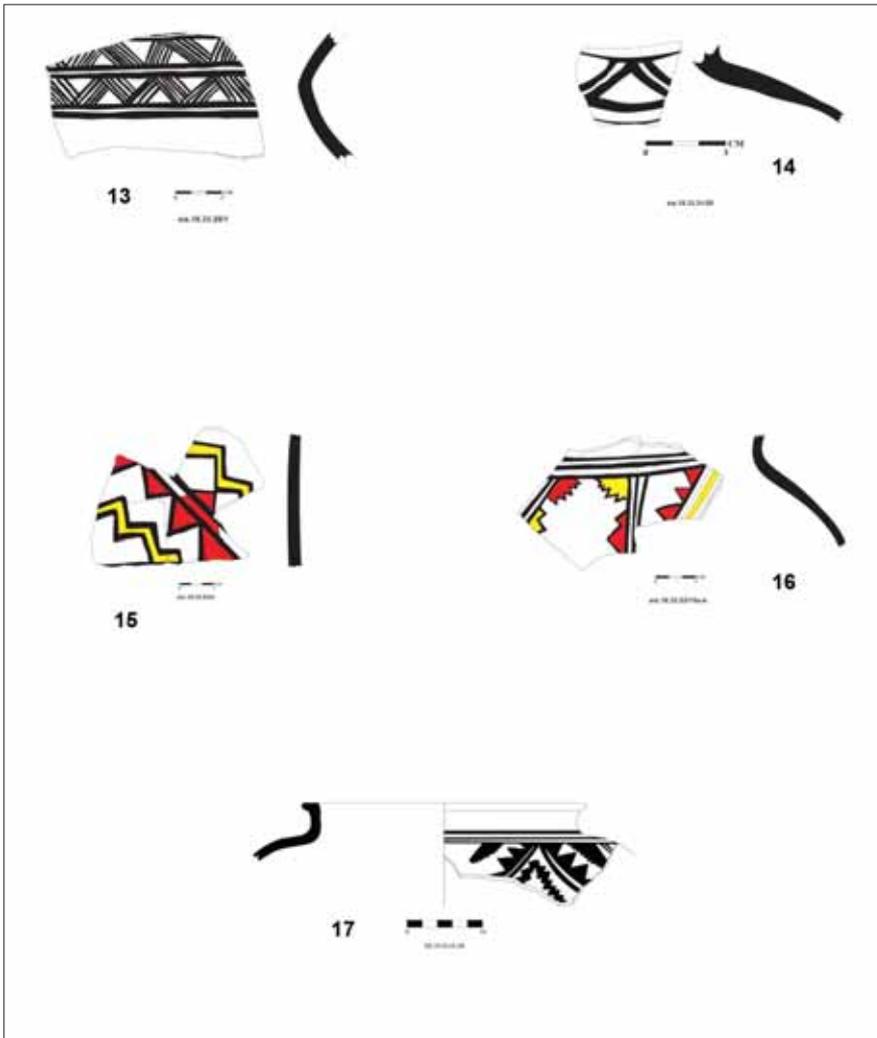


Fig. 12: the pottery assemblage of Phase 4A, closed forms: 13. SiS.19.33.29/1; 14. SiS.19.33.31/25; 15. SiS.19.33.53/4; 16. SiS.19.33.53/15; 17. SiS.19.33.31/14.

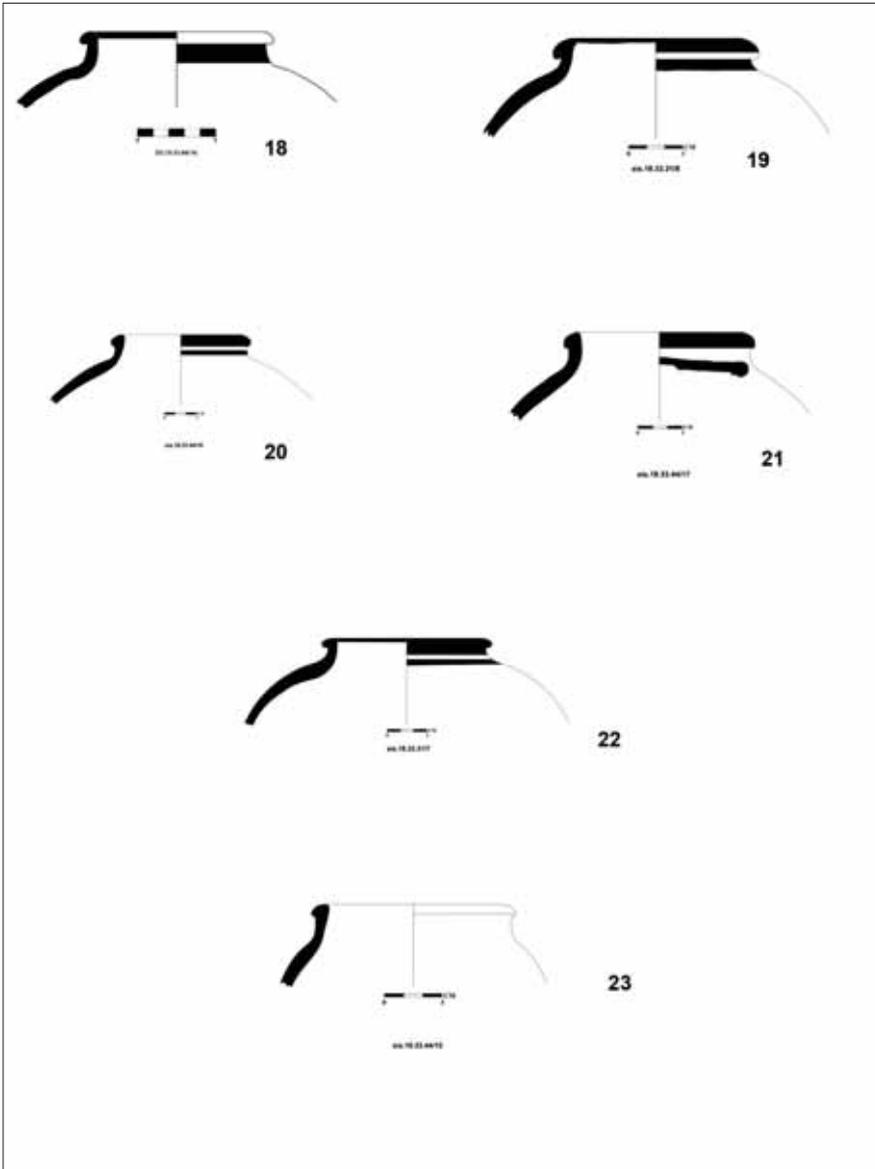


Fig. 13: the pottery assemblage of Phase 4A, closed forms: 18. SiS.19.33.44/16; 19. SiS.19.33.31/18; 20. SiS.19.33.44/18; 21. SiS.19.33.44/17; 22. SiS.19.33.31/7; 23. SiS.19.33.44/15.

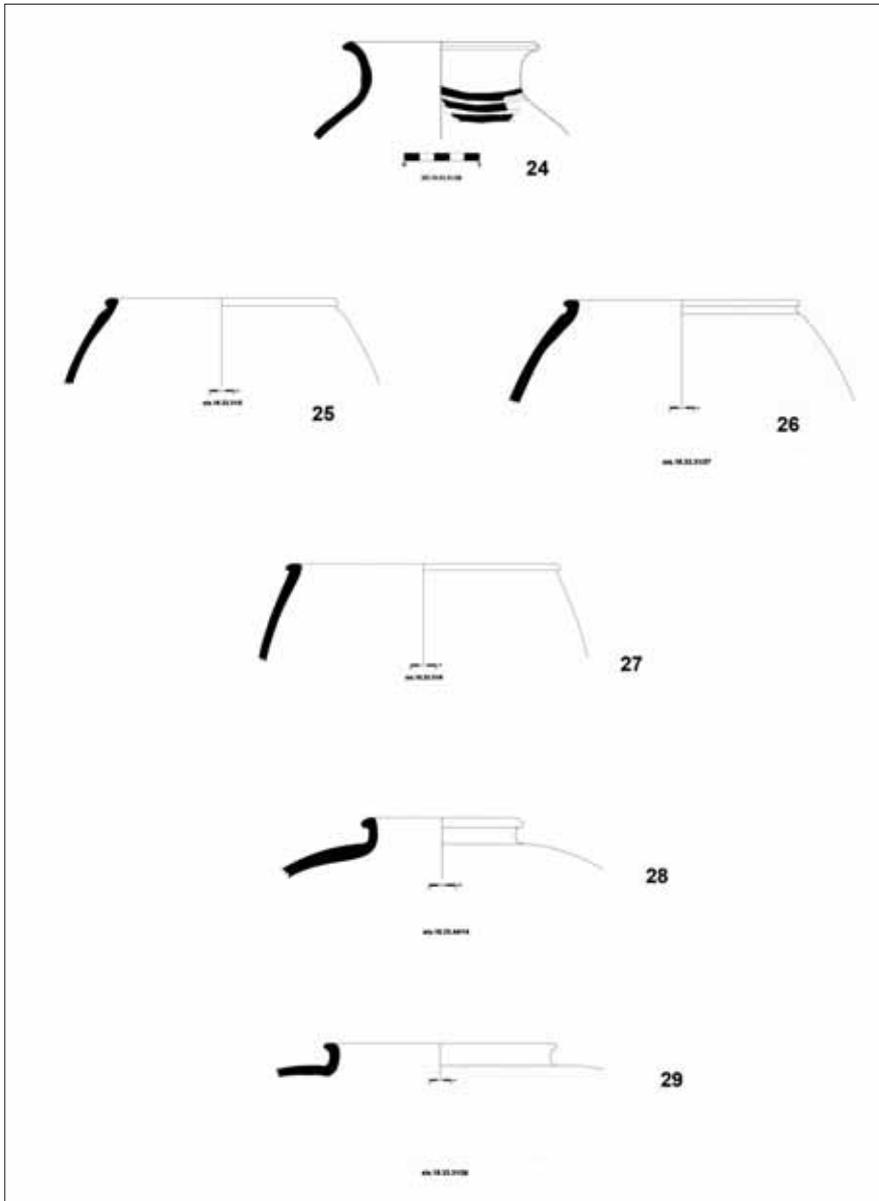


Fig. 14: the pottery assemblage of Phase 4A, closed forms: 24. SiS.19.33.31/28; 25. SiS.19.33.31/5; 26. SiS.19.33.31/27; 27. SiS.19.33.31/6; 28. SiS.19.33.31/14; 29. SiS.19.33.31/26.

A large bichrome jar seems to belong to the type with a collar neck and a flat everted lip (Fig. 12: 17), not recorded in the 'Central Quarters' (Salvatori - Vidale 1997: 127, fig. 163, for the design, Phase 5A). The polychrome jars - black, red and yellow - display schemes (Fig. 12: 15-16) which could be connected to the type from Mugavero - Vidale 2003: fig. 14, 10b.

Necked jars with a bevelled convex lip, frequent in the 'Central Quarters' (Salvatori - Vidale 1997: 117, fig. 146, 3 and fig. 147, Phase 5A), are also abundant in this phase in Area 33 (Fig. 13: 18-22), mostly displaying a painted black band on the neck and the lip. Another jar (Fig. 13: 23), undecorated, has a higher neck and a less prominent convex shoulder, which may be compared with a specimen in Salvatori - Vidale 1997: 119, fig. 151, 8, Phase 5A.

An unusual high concave flared neck is present in an item from L. 149, painted with three broad curvilinear lines on the shoulder (Fig. 14: 24): the shape may be compared with an item in Tosi 1969: 312, fig. 31, e.

There are large plain open-mouthed jars with a bevelled rim, sometimes separated from the body by a deep moulding (Fig. 14: 25-26), a feature not registered until now at Shahr-i Sokhta. Another storage jar (Fig. 14: 27) looks like the one from the 'House of the Jars' (Salvatori - Vidale 1997: 123, fig. 157, Phase 5A).

Two larger undecorated containers have a short neck and do not seem to have parallels elsewhere (Fig. 14: 28-29).

8. Layer 4B - L.149, L.150, L.176, L.182 - open forms

The truncated conical bowls - accounting for the second highest percentage of the pottery assemblage (33%) - seem to belong to the chronological threshold between Phases 5A and 6, as in Fig. 15: 2 (Salvatori - Vidale 1997: 110, fig. 132, 3, Phase 5A) and Fig. 15: 1 (Piperno - Salvatori 2007: 124, G. 71, no. 6958, fig. 255 and 111, G. 57, fig. 226). A large plate (Fig. 15: 3), which is a rare shape in this context among the open forms, and its decoration have a parallel in Lamberg-Karlovsky - Tosi 1973: fig. 22, Period II.

A miniature conical bowl (Fig. 15: 6) has a triangle hanging from the inner rim with one side extended. It is loosely painted, with two irregular diagonal lines inside. This kind of small vessel sometimes appears in the necropolis (Piperno - Salvatori 2007: 134-135, G. 77, no. 7011 and 236, G. 703, no. 7958). Another bowl with a convex profile (Fig. 15: 5) bears a distinctive design, although the piece is fragmentary. It appears to be a small portion of a curving element drawn with thick parallel lines, horizontally hatched inside. This kind of pattern has no match in Shahr-i Sokhta (Biscione - Bulgarelli 1983) but it shows some affinity with the 'branch' motif found on shallow bowls in Pakistani Kech-Makran (Mutin *et al.* 2017: 144, fig. 2, nos. 7-10). Our piece differs in terms of the layout however, as if it was an old-fashioned copy of a once renowned and appreciated style.

As for larger containers, there are four wide basins (Fig. 15: 4, 7, 8, 9) with an average diameter of more than 30 cm, including three plain and one with a chain of diagonal cross-hatched triangles (Fig. 15: 4). The latter has a distinctive design not occurring in any other contemporary context in Shahr-i Sokhta (Salvatori - Vidale 1997: 112, fig. 136, 6, Phase 5A; (the specimen has diagonally hatched triangles without the double line at the base).

Two fragments displaying everted, almost flat rims may belong to deep basins (or alternatively large storage jars, Fig. 15: 10-11), with parallels in Tappeh Graziani (Kavosh *et al.* 2019: 105, fig. 104, 9, 10, Phase 6), although their alleged association with examples from the 'Central Quarters' does not seem to be completely borne out (Salvatori - Vidale 1997: 105, fig. 123, 1, 2).

A small thick vessel (Fig. 15: 12) could be the clay variant of a mortar due to the large, flat, everted lip, easy to grasp when grinding something inside it, and the stable, flat base. A similar lip is seen in Salvatori - Vidale 1997: 141, fig. 186, 3, Phase 5B.

9. Layer 4B - L.149, L.150, L.176, L.182 - closed forms

A wide selection of decorations is seen on the beakers of this phase, which represent the most frequent of the pottery categories. The bodies are elongated and their bottoms display varying heights, more or less squat above the bases.

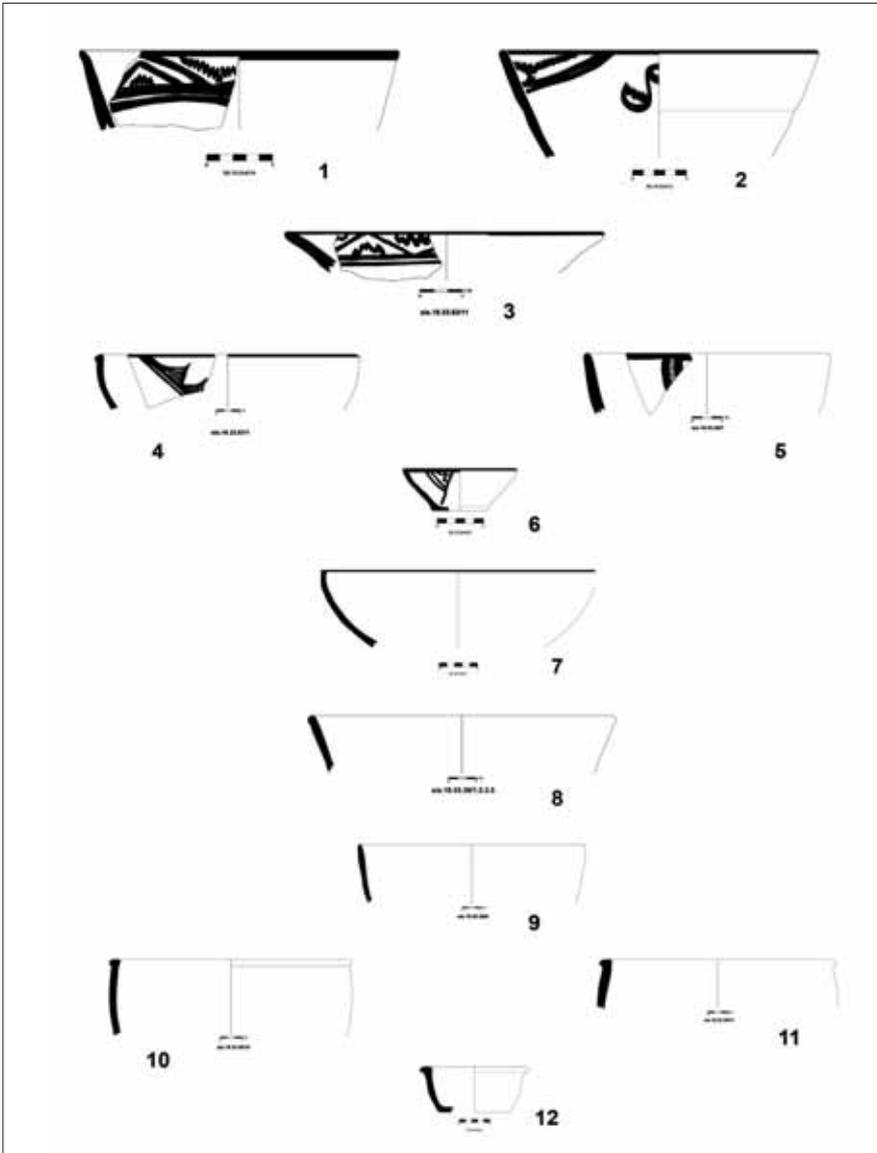


Fig. 15: the pottery assemblage of Phase 4B, open forms: 1. SiS.19.33.67/4; 2. SiS.19.33.67/2; 3. SiS.19.33.63/11; 4. SiS.19.33.67/1; 5. SiS.19.33.30/7; 6. SiS.19.33.63/2; 7. SiS.19.33.63/1; 8. SiS.19.33.30/1.2.3.5; 9. SiS.19.33.30/8; 10. SiS.19.33.30/10; 11. SiS.19.33.30/11; 12. SiS.19.33.63/9.

The designs can be divided into two groups: those in Fig. 16: 1, 4-7 have motifs on the upper section, such as fringed festoons, simple or wavy horizontal lines, double stepped lines and zigzags (see the festoons in Piperno - Salvatori 2007: 52, G. 15, no. 6209 and 63, G. 22B, no. 6471; wavy lines in Salvatori - Vidale 1997: 109, fig. 130, 3, Phase 6; stepped lines in Vidale 1984: 93, fig. 11.13, Piperno - Salvatori 2007: 177, G. 131, no. 7137; zigzags in Salvatori - Vidale 1997: 136, fig. 181, 3, 6, Phase 5B).

The vessels in Fig. 16: 2-3 have decorations on the whole surface or half of it. One (Fig. 16: 2) has metopes consisting of columns of four vertical lozenges alternating with diagonal garlands bounded by double vertical lines, as in the pear-shaped jars (Salvatori - Vidale 1997: 132, fig. 174, 2 and 139, fig. 184, 2, Phase 5B); the other (Fig. 16: 3) has a unique motif composed of two (or three) stepped lines and what is probably a snake.

A trefoil jug with part of the strainer - in the same paste as the jug - seems to be the only example of this shape found in Shahr-i Sokhta so far (Fig. 16: 8-9), and we can assume it was a special vessel made for pouring and purifying liquids.

Possibly connected with liquids and their use is a body fragment of a biconical vessel that may belong to the squat/biconical high-necked jug decorated with a chain of triangles hanging from the shoulder (Fig. 16: 10). Something similar but inverted can be seen in Salvatori - Vidale 1997: 139, fig. 184, 9, Phase 5B.

The storage jars (Fig. 16: 11-12) are of the hole-mouth type (Salvatori - Vidale 1997: 115, fig. 143, 3, 5, Phase 5A), while the vessel in Fig. 16: 13 belongs to the series of necked jars with a flat everted rim.

The decoration of Fig. 17: 14 has completely faded away but the rim finds a perfect match with a polychrome vessel from the 'Central Quarters' (Salvatori - Vidale 1997: 127, fig. 164, 1, Phase 5A).

Other polychrome wall fragments (Fig. 17: 15-16) have chains of solid red triangles outlined in black flanked by double stepped lines or metopes with stepped triangles in the corners filled in with red and white. The body sherd in Fig. 17: 17 has a very distinctive pattern, with double symmetrical stepped

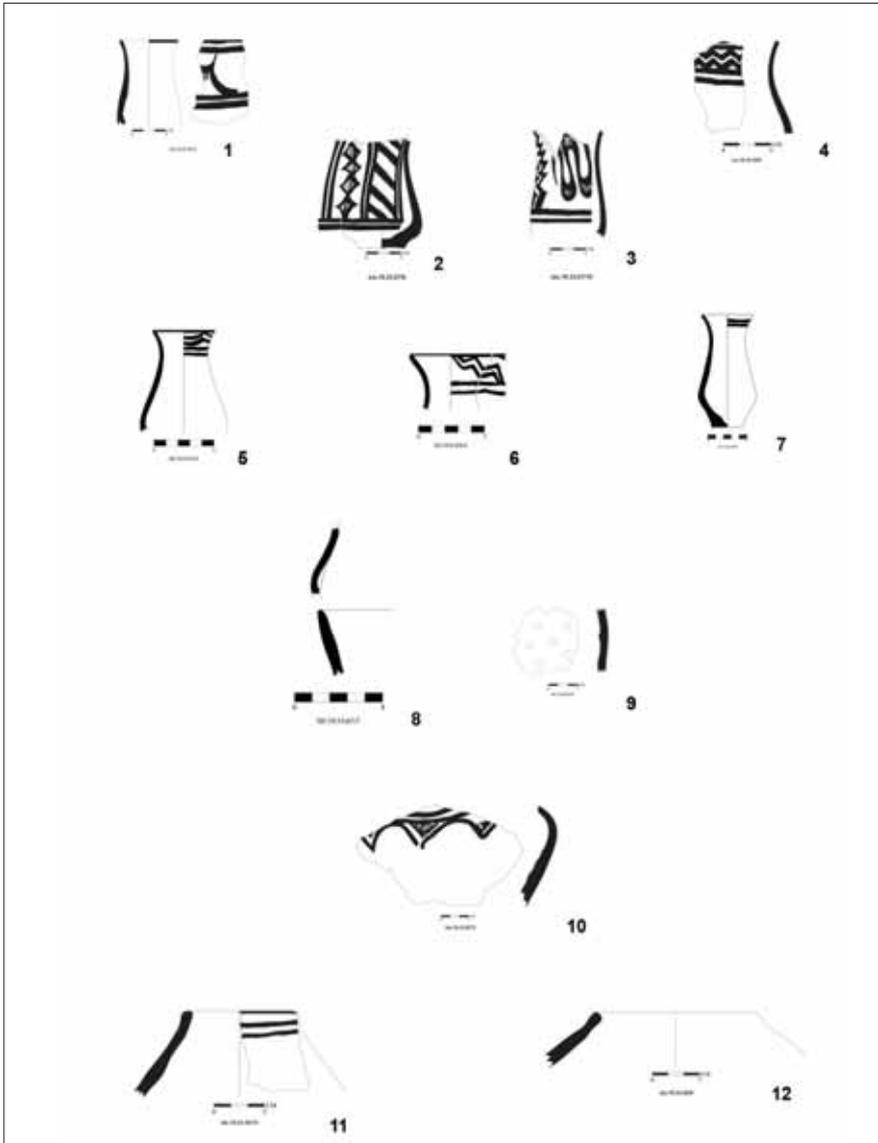


Fig. 16: the pottery assemblage of Phase 4B, closed forms: 1. SiS.19.33.30/12; 2. SiS.19.33.67/6; 3. SiS.19.33.67/10; 4. SiS.19.33.30/6; 5. SiS.19.33.63/3; 6. SiS.19.33.63/4; 7. SiS.19.33.63/8; 8. SiS.19.33.67/7; 9. SiS.19.33.67/5; 10. SiS.19.33.67/3; 11. SiS.19.33.30/15; 12. SiS.19.33.30/9.

lines on both sides of three vertical lines flanked by a diagonal chain of solid red triangles outlined in black. This pattern resembles a design framework that is seen in Central Baluchistan known as the Nal Horizon (see Salvatori-Tosi 2005: 282, fig. 2.2, and Cortesi *et al.* 2008: 11-13, fig. 3-5; Cortesi 2015: 193, Nos. 335, 217, No. 442 and according to the author, both pieces are chronologically contemporary with Period II of Sohr Damb/Nal, 3100-2800/2700 BC). In our specimen the chain of triangles is added, apparently reflecting the larger surface available on a jar than the small Nal cups.

10. Conclusions

During the 50 years since the start of scientific research in Shahr-i Sokhta, many studies have focused on pottery production, mainly the innumerable sequences and series of decorations painted on the surfaces of the vessels (Biscione 1973; 1974; Biscione - Bulgarelli 1983; Pracchia 1984; Salvatori - Vidale 1997: 44-49). Nevertheless, we still lack a general overview and analysis of the entire body of classes, shapes and types developed by artisans over the hundreds of years of the city's history. We still have an inadequate vision of the cooking ware class and nearly nothing has been published regarding food preparation and other typical domestic activities, which must have required mortars, basins, vats, trays, etc. Furthermore, in the existing bibliography, broad categories such as jars or bowls do not help to understand the complex variety of ceramic items used in the everyday life of a settlement in the third millennium BC. Another astounding example of the absence of a detailed study concerns the clay supports for lamps, such as lanterns or simple saucers. Even if the potters never produced such modest vessels essential for everyday life, it would still be important to study why the inhabitants of Shahr-i Sokhta were using other supports, or indeed which lighting technology they were accustomed to.

Ideally, the research on material culture and pottery production in Shahr-i Sokhta should proceed in various directions: an analysis of the ceramic paste and fabric could lead to a significant reassessment of obsolete theories, as some researchers have already demonstrated for production centres in Sistan

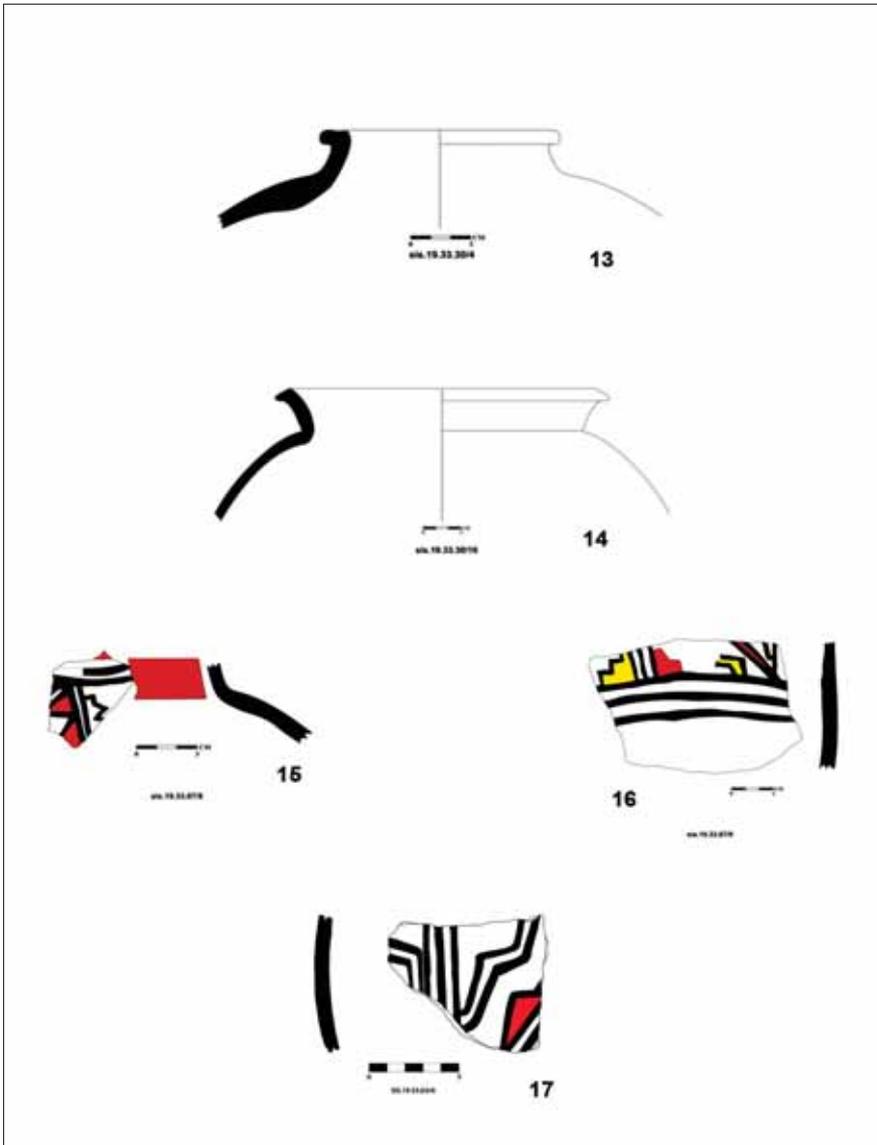


Fig. 17: the pottery assemblage of Phase 4B, closed forms: 13. SiS.19.33.30/4; 14. SiS.19.33.30/16; 15. SiS.19.33.67/8; 16. SiS.19.33.67/9; 17. SiS.19.33.63/6.

(Mutin - Minc 2019), while a general diachronic typology of vessel shapes and variants should be drawn up in order to establish a nomenclature valid for future excavations and useful for the chronologies of nearby cultures.

Lastly, a specific problem arises in connection with the nature of the deposits and the methodology of excavations in Shahr-i Sokhta. Concerning comparisons and the connections with one key area of the settlement, the Central Quarters, the reliability of the pottery's chronological sequence seems to have been affected by the method adopted for the archaeological research, which, according to the excavators, entailed 'artificial cuts'. This attitude is represented perfectly by the section in Salvatori - Vidale 1997: 24, fig. 37 in which Phase 5A comprises the floor level, the layers upon which it was founded and the rubble of the walls in connection with the same floor, meaning that three highly distinct activities - anthropic and natural - were mixed and confused when the pottery was examined and catalogued. Furthermore, the loose, silty texture of the majority of layers in this kind of geo-archaeological context makes it harder to understand correctly the ancient pits dug into the various deposits, as already pointed out for another iconic site, i.e. Tepe Yahya (Mutin 2013: 45; a satellite site of Shahr-i Sokhta, Tepe Graziani, suffers from the same problems, with more recent sherds in earlier contexts, Kavosh *et al.* 2019: 106). The consequence is that what is retrieved from the infill gets confused with what is found in the primary context. This makes it difficult to understand and compare the distinctive areas of the settlement, the development and duration of types, the preferences of customers and producers, the crystallisation of shapes and the emergence of new ones. The uncertainty is exacerbated by the lack - apart from a few scattered references in articles (Biscione *et al.* 1974; Piperno - Tosi 1975; Piperno - Salvatori 1983 and 1987; Piperno 1986; Bonora *et al.* 2000) - of a general chronological framework regarding the Shahr-i Sokhta necropolis (Piperno - Salvatori 2007), which in contrast may represent one of the most reliable pottery complexes of the region and its surrounding cultures.

Our task then is to contribute - with this work and with future researches - to a pragmatic effort to outline the overall structure underlying the preferences and practices of pottery consumers associated with specific domestic units in roughly the first half of the third millennium BC (Ascalone in this volume).

As an example, towards a general classification, figures 18 and 19 show an attempt to establish the development of the most frequent shape in the excavated areas of Shahr-i Sokhta, i.e. the straight-sided truncated-cone bowls, which are found in the majority of contexts in the site.

In the two different phases of Area 33 explored in 2019, although we lack a statistically substantial quantity of sherds, the general trend of the vessels is for thick walls and two main profiles, one straight-sided and the other slightly convex.

In Layer 3A (Fig. 18), many of them display a simple rounded rim while by the end of the phase there is a faint concavity just below the lip, which can be thinner at the edge. Moving into the deeper levels, in Layer 4A (Fig. 19) the tendency towards slightly convex walls associated with thinner everted rims continues, until some bowls show a concave moulding just below the lip.

Another element that should be highlighted is the morphological variety seen in the oldest Layer - 4A - and a more standardised profile in the most recent one, as if pottery production underwent a sort of centralisation, becoming more cohesive.

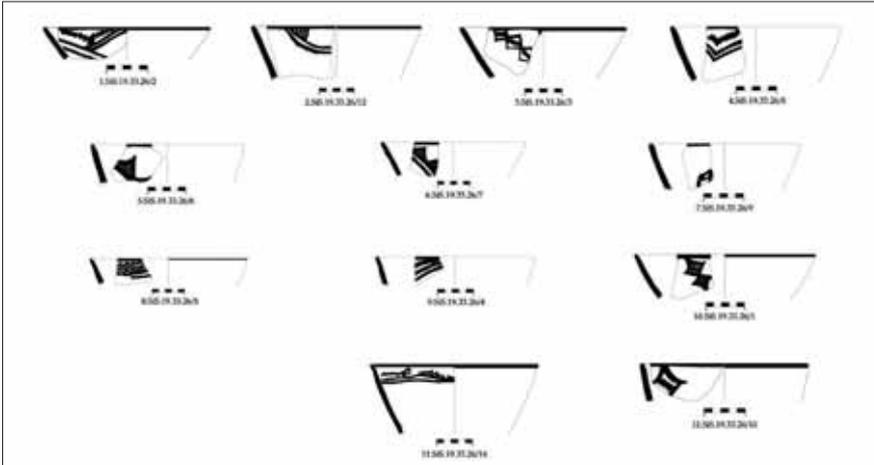


Fig. 18: the types of truncated-cone bowls in Phase 3A: 1. SiS.19.33.26/2; 2. SiS.19.33.26/12; 3. SiS.19.33.26/3; 4. SiS.19.33.26/10; 5. SiS.19.33.26/8; 6. SiS.19.33.26/9; 7. SiS.19.33.26/1; 8. SiS.19.33.26/6; 9. SiS.19.33.26/7; 10. SiS.19.33.26/5; 11. SiS.19.33.26/4. 12. SiS.19.33.26/16.

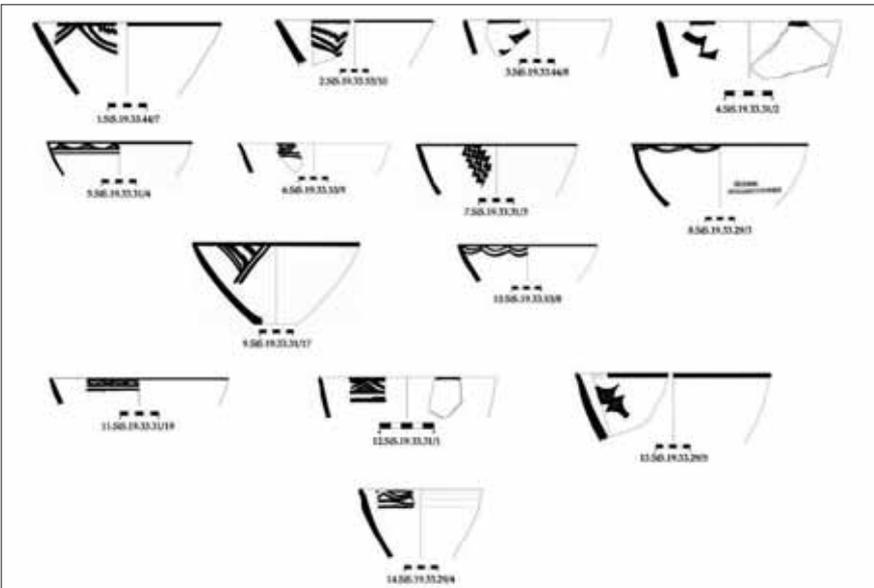


Fig. 19: the types of truncated-cone bowls in Phase 4A: 1. SiS.19.33.44/7; 2. SiS.19.33.53/10; 3. SiS.19.33.44/8; 4. SiS.19.33.31/2; 5. SiS.19.33.31/4; 6. SiS.19.33.53/9; 7. SiS.19.33.31/3; 8. SiS.19.33.29/3; 9. SiS.19.33.31/17; 10. SiS.19.33.53/8; 11. SiS.19.33.31/19; 12. SiS.19.33.31/1; 13. SiS.19.33.29/5; 14. SiS.19.33.29/4.

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The Artefacts from Area 33 at Shahr-i Sokhta: 2018 and 2019 Excavations

Rosa Rivoltella
University of Alma Mater Studiorum Bologna
rosa.rivoltella@gmail.com

Abstract

The aim of this paper is a preliminary presentation of the artefacts collected during the 2018 and 2019 excavation campaigns at Shahr-i Sokhta. The campaigns followed the MAIPS project's initial campaign in 2017, which was the result of an agreement between the University of the Salento in Italy and the Iranian Center of Archaeological Research. Between 2017 and 2019 excavations were conducted in Area 33 in Shahr-i Sokhta, bringing to light a stratified archaeological context dated to period III and period II (ca. 3000 to 2450 BC). The artefacts from the 2018 and 2019 excavation campaigns reflect the cultural and material characteristics established by previous excavations, and they shed new light on the archaeological context of the area.

1. Introduction

This paper presents the artefacts from the 2018 and 2019 excavation campaigns. It follows the presentation of the artefacts from the 2017 campaign (see Ascalone

- Sajjadi 2019). The stratigraphic sequence for Area 33 resulting from the 2017-2019 excavations can be divided into four macro-phases:

Layer 1. 'Building 33'. Shahr-i Sokhta III - Phase 4-3: ca. 2600-2450 BC.

Layer 2. Squatter occupation. Shahr-i Sokhta III - Phase 5b/4: ca. 2620-2600 BC.

Layer 3a-b. 'House of the Courts'. Shahr-i Sokhta II - Phase 5a: ca. 2850-2620 BC.

Layer 4a-b. 'Western Building' and 'Eastern Building'. Shahr-i Sokhta II - Phase 6: ca. 3000-2850 BC.

While the artefacts from 2018 belong to the same chronological range as the items from the 2017 campaign (Area 33, Layer 1. 'Building 33'. Shahr-i Sokhta III - Phase 4-3: 2600-2450 BC), for the objects from the 2019 campaign we have a more ancient chronology, due to the fact that the excavation that year was conducted in deeper strata than 2017 and 2018. Comparisons are made with finds from previous excavations in Shahr-i Sokhta, conducted in the settlement and the graveyard by Italian and Iranian teams. The material assemblage from the 2018 and 2019 campaigns broadly fits the chronological and morphological features found by previous excavations. Specifically, the excavated area is contemporary with 'Building 1' and 'Building 20', investigated by Iranian teams in the 'Monumental Area' and the northern part of the mound respectively (Sajjadi - Moradi 2014; 2017), and with the 'Central Quarters' (Salvatori - Vidale 1997) and the 'Eastern Residential Area' (Tosi 1968; 1969; 1983) excavated by Italian teams in the 1970s. It is important to stress that all of the categories of artefact presented here require more specific and careful study; this is especially true for finds such as the 'rectangular clay bars'. In addition, the types of stone have been identified only visually, and specific laboratory analyses are necessary. This paper contains only a general and preliminary presentation of the finds, which await more detailed analysis.

2. The artefacts of Area 33 at Shahr-i Sokhta: 2018 excavations

During the 2018 excavation campaign, 126 artefacts were brought to light. Numerous artefacts recovered this year are from the superficial layers, and they were collected during superficial surveys and cleaning operations in the

excavation area and its immediate surroundings before the excavation itself. In 2018 the excavation was extended eastwards and westwards with respect to the 2017 excavation area. For this reason, the artefacts cover a chronological range similar to those collected during the 2017 excavation campaign (Area 33, Layer 1. 'Building 33'. Shahr-i Sokhta III - Phase 4-3: 2600-2450 BC), with the exception of SiS.19.33.90, an undetermined spherical bronze object from L.15, a locus belonging to a previous period (Layer 2. Squatter occupation. Shahr-i Sokhta III - Phase 5b/4: ca. 2620-2600 BC).

The number of specimens made of clay was quite low compared with the amount of clay objects collected in previous excavations. SiS.18.33.4 is the only clay figurine found during the 2018 excavation campaign, and it came from the superficial layers, at some distance from the excavation area itself. In any case it is consistent with the production of clay figurines established by previous excavations, and has parallels with the frequently attested boar type (Sajjadi - Moradi 2014: fig. 7 k; Salvatori - Vidale 1997: fig. 238 n. 5, 10, 14, fig. 239 n. 5; Tosi 1968: fig. 69; 1969: 141-144; Tosi 1983: fig. 64).

SiS.18.33.33 is a fragmentary ceramic spindle-whorl from L.81. It has clear parallels with items from previous excavations (Ascalone 2019: figs. 11, 25; Tosi 1969 fig. 41 h, I). This kind of tool was often made of stone or discarded ceramic vessels (Tosi 1969: 371).

SiS.18.33.78, 95 and 96 (respectively from the surface, L. 43 and L.92) are small perforated terracotta disks. They have been interpreted as beads, based on comparisons with previous excavations (Sajjadi 2003: fig. 39; Salvatori - Vidale 1997: fig. 240 19-34; a similar object from the 2019 excavation campaign is SiS.19.33.264).

Concerning artefacts made of stone, here we merely present the total number of alabaster vessel fragments (41). Most of them are from superficial strata. They consist of fragments of vessel rims, bases or bodies. For a complete analysis of this type of find, please see the paper by Silvia Festuccia in this volume, and, for the 2017 finds, the paper by the same author in Ascalone - Sajjadi 2019.

Stone carving is attested by numerous pieces of processing residue, semi-worked fragments and pebbles of semi-precious stones, most of which (SiS.18.33.26, 28, 42, 45, 52, 65, 67, 68, 73, 82, 115, 116, 125) come from superficial layers. This confirms once again that Shahr-i Sokhta was an important centre of stone craft production (Salvatori - Vidale 1997: 77; Tosi 1968: 57 – 59; 1969: 367-369).

SiS.18.33.23, a perforated alabaster disc from L.177, belongs to a fiercely debated class of materials. Indeed, as stressed by other authors (Vidale *et al.* 2016: 9-12), these artefacts have been previously interpreted as stone-working tools, spindle whorls or parts of lamps. Further analysis has demonstrated that they are the 'lids' of cosmetic vials or cosmetic applicators (Vidale *et al.* 2016).

This kind of artefact is familiar from past excavations (Tosi 1969 fig. 41 r, s, t and Salvatori - Vidale 1997: fig. 249 n. 1-6).

In Shahr-i Sokhta, stone vessels are not only made from alabaster, although it is the most commonly used material for this type of artefact. There is a conspicuous quantity of vessels made of other types of stone. 15 fragments of vessels made of various types of stone were collected from the surface and one from L.34. This kind of production requires more detailed analysis, and here we offer a only general view that might represent a starting point for a more complete study in the future.

Besides the three ceramic beads described above, two stone beads were found: SiS.18.33.30 and SiS.18.33.79, from superficial layers. Both of them are in carnelian, but they are of different types. While the first has a truncated-cone shape, the second is spherical. There are numerous parallels with the finds of previous excavation campaigns (Tosi 1968: 59-60; 1969: 373-374 and fig. 260). However, as already pointed out for the 2017 excavation campaign (Ascalone 2019b: 77), previously well attested types such as lozenge-shaped and lenticular beads (Sajjadi 2003: 79-80; Tosi 1969: 373-375) were not found.

Another class of material linked to stone processing includes the numerous basalt grindstones: SiS.18.33.13, 14, 56, 71, 81, 85, 91 and 99. Half of these come from superficial layers, but SiS.18.33.13 and 14 come from L. 34, and SiS.18.33.81 and 91 are from L. 85. Some, such as SiS.18.33.56, 91, and 99,

are very smooth on one side. For this reason, this kind of stone tool has been interpreted as being used in the final stage of the manufacture of stone vessels, specifically to polish the surface (Tosi 1968: figs. 89-91; 1969: 370).

Grindstones are not the only type of stone implement. There are also smoothers, such as SiS.18.33.6, 15, 17, 92 and 93 (Ascalone 2019: figs. 10, 21, 47), and pestles, such as SiS.18.33.55 and SiS.18.33.101, both unfortunately fragmentary (Ascalone 2019: figs. 56, 57, 62; Salvatori - Vidale 1997: fig. 249 14-15).

There are two micro-lithic tools, both from the surface: SiS.18.33.114, an arrowhead and SiS.18.33.7, a flint blade, which have parallels with finds from previous excavations (Ascalone 2019: figs. 37, 45; Tosi 1968: fig. 21, 7-23).

Two stone objects belong to the category of tokens: SiS.18.33.18 is a spherical stone from the surface, and SiS.18.33.21 is a flat stone token from L.34. Both have parallels in the finds from the 2017 excavations (Ascalone 2019b: figs. 48, 60 and figs. 39, 49) as well as in items from the 2019 campaign (see below).

Local bronze processing is attested by fragments of metal (SiS.18.33.10, 11, 19, 20, 31, 84, 90) and slag (SiS.18.33.5, 8, 9, 24, 25, 36, 58, 70, 72, 112). The majority come from the surface layer, and the poor state of conservation prevents any hypothesis about their original shape or function. As already pointed out (Tosi 1968: 64; 1969: 378-379), complete bronze artefacts are very rare due to the nature of the material, which can be melted and assume new shapes once the original artefact is no longer used.

No wooden or bone items were found in this excavation campaign, unlike previous excavations, where these kinds of finds are quite common due to the local climate of the site, which allows the conservation of perishable materials.

3. The artefacts of Area 33 at Shahr-i Sokhta: 2019 excavations

In this excavation season the archaeological investigations focused on deeper layers belonging to Periods II and III (Phase 6-5b/4):

Layer 2. Squatter occupation. Shahr-i Sokhta III - Phase 5b/4: ca. 2620-2600 BC.

Layer 3a-b. 'House of the Courts'. Shahr-i Sokhta II - Phase 5a: ca. 2850-2620 BC.

Layer 4a-b. 'Western Building' and 'Eastern Building'. Shahr-i Sokhta II - Phase 6: ca. 3000-2850 BC.

A total of 391 artefacts were collected.

Regarding clay production, numerous clay figurines (57) were collected this year from various layers. Although most of them are in a bad state of conservation and so fragmentary that their original shape cannot be surmised, some of them at least are better preserved, and we can recognise both animal and human figures. From a general point of view, as previous studies have pointed out, animal figurines are more common than human ones. The most common animal form is the ox or bull. The human figurines are in a poor state of preservation and whether they are female or male is not clear. It should be stressed that in past studies female figures were more numerous than male ones (Tosi 1969: 358-361).

There are three human figurines in total: SiS.19.33.41, SiS.19.33.54 and SiS.19.33.377, respectively from L.30, L.122 ('House of the Courts') and L.176 ('Western Building'). They all belong to types that are frequently attested in Shahr-i Sokhta, and from the morphological and technical point of view they reflect the general characteristics of clay figurine production seen in this site: they are inaccurate, crude and have little in the way of anatomical or decorative detail. The slightly more accurate and decorated specimens found in previous excavations (albeit in small quantities) were not found (Tosi 1969: figs. 158-159).

On the basis of the types identified in past excavations, SiS.19.33.41 seems to belong to the type of figurine with a cylindrical body (Sajjadi - Moradi 2014: fig. 7 h-i; Tosi 1969: figs. 152-157; 1983: figs. 13 a, 14 c, 59), while SiS.19.33.54 and SiS.19.33.377 are figurines with flat, triangular bodies (Tosi 1968: figs. 72, 74, 75; 1969: figs. 158-161; 1983: fig. 14 a, b).

Both types of figurine are frequently attested in Periods II and III. The former is also attested, albeit rarely, in Period I, and shows so many morphological variations that typological seriation is impossible. The latter type is attested only for Period II and is absent in Period I (Tosi 1983: 147-153).

More frequent are the animal figurines. SiS.19.33.47, 124, 128, 162, 245, 309 and 311 (from various loci) belong to types attested in past excavations.

SiS.19.33.47, 128, 245 and 309 are of the humped bull or ox type, and SiS.19.33.124, 162 and 311 belong to the bull type (Sajjadi *et al.* 2008: fig. 23; Sajjadi 2014: fig. 7; Salvatori - Vidale 1997: fig. 238 n. 8, 13, fig. 239 n. 3, 4; Tosi 1968: figs. 64-67; 1969: figs. 133-140). In specimen SiS.19.33.309, a key detail is the tail in relief, the only case in our corpus of anatomical detail created with plastic additions, painting or fingernail impressions, techniques which are all attested in specimens from past excavations (Tosi 1968: figs. 76-77; 1969: figs. 129-132; 1983: 48, 50-51).

In specimen SiS.19.33.145 we can recognise another type that is attested but less common, even in previous excavations. It appears to be a bird figurine (Tosi 1983: fig. 63).

Lastly, SiS.19.33.126 is a cart wheel, probably part of a child's toy, as already hypothesized by S. Salvatori and M. Vidale for a similar specimen found in the excavation of the 'Central Quarters' (Salvatori - Vidale 1997; fig. 240 n. 35).

Specimens SiS.19.33.9, 51, 81, 94, 117, 118, 123, 127, 130, 133, 134, 248 and 279 seem to be animal figurines, but their state of preservation is too poor to allow clear identification.

From a general point of view, clay figurine manufacture, as already mentioned (Tosi 1968: 54-55), is characterised by simple techniques: anatomical features are basic and coarse and there are few unnecessary details in both the anthropomorphic and animal types. Even when they are attested, anatomical details are simple and rendered with fingernail impressions, appliques or paint. All these techniques are attested in past excavations but are almost totally absent in our corpus (Sajjadi - Moradi 2014: fig. 7 k; Salvatori - Vidale 1997: fig. 237: 1, 15, 21; fig. 238 2-4; fig. 239: 1-22; Tosi 1968: figs. 76-77; Tosi 1969: figs. 129-132; 158-172).

SiS.19.33.212 and SiS.19.33.240 are fragments of stone figurines, but their state of conservation prevents any hypothesis concerning their original shape. One of the figurines is made of a grey metamorphic stone with white veins, a material commonly used for vessels and weights. A figurine made of the same type of stone was recovered from *Building 1* (Sajjadi 2014a: fig. 7), and another stone figurine was found in the 'Central Residential Area' (Sajjadi 2015a: Fig. 11 no. 1, anthropomorphic).

Two 'feet' or tripods in unfired clay, SiS.19.33.18 and SiS.19.33.44 from L.122 ('House of the Courts'), have parallels with items found by M. Tosi in the 'Eastern Residential Area' (Tosi 1969: figs. 205, 206).

Numerous clay objects collected during this excavation campaign can be linked to the administrative and accounting sphere.

46 cretulae and 8 seal impressions were found. Most of the cretulae come from L.122 (15), L.142 (5), L.159 (7) ('House of the Courts') and L.149 (7) ('Eastern Building'). Of the seal impressions, SiS.19.33.129, 156, 158, 159 and 160 are from L.142 ('House of the Courts'), SiS.19.33.316 and 344 are from L.122 ('House of the Courts') and SiS.19.33.119 is from L.149 ('Eastern Building') (for a systematic analysis of the seal impressions, see Ascalone in press).

From the iconographic and morphological point of view, all the items are consistent with the cultural features of Shahr-i Sokhta. All the seal impressions, with the exception of SiS.19.33.316, are rectangular or quadrangular with geometric motifs. All the seal impressions from L.142 seem to be from the same seal and they show zigzag decorative motifs. SiS.19.33.119, from L.149, also belongs to this category (Tosi 1968: figs. 264, 268, 273).

SiS.19.33.316 shows concentric circles, a type more widespread in Baluchistan, the Indus valley and Gujarat, but also attested in Shahr-i Sokhta (Ascalone in press; Cortesi - Tosi 2008: 20-21, fig. 14: 1-2).

For certain types of clay and stone artefact, it has been suggested that they functioned as tokens or counters, and for this reason they are discussed together.

84 spondonoid counters, also called 'sling stones' in Kavosh *et al.* 2019: 159 or 'missiles' in Tosi 1969: 361, were found in various rooms, but most of them come from the 'Eastern Building' (L.149) and the 'House of the Courts' (L.149, L.122 and L.217). These small bi-conical objects made of unfired clay are very common in Shahr-i Sokhta and in other Bronze Age sites in Sistan. They have been found both in the settlement (Sajjadi - Moradi 2017: fig. 21, no. 7; Tosi 1969: fig. 180) and the graveyard (Piperno - Salvatori 2007: fig. 483, figs. 607, 610).

It has been suggested that they were projectiles or tokens (Tosi 1969: 361-362). Their real function is still unknown (Kavosh *et al.* 2019: 159), but for us, the most likely interpretation is that they were used for counting.

Other clay objects have been interpreted as counters or tokens: SiS.19.33.157, from L.142 ('House of the Courts'), is a lenticular disc with numerical signs. One side is characterised by the presence of 13 holes made with a thin stick. A clear parallel is a very similar clay artefact found by Tosi (Tosi 1969: fig. 189). SiS.19.33.368 from L.149 (the 'Eastern Building') is a spherical clay object and belongs to a very common type of artefact found at the site (Sajjadi - Moradi 2014: fig. 7 g). SiS.19.33.253 from L.142 ('House of the Courts'), a terracotta token, belongs to an interesting class of artefact. As already pointed out (Kavosh *et al.* 2019: 159; Tosi 1969: 369), once stone and terracotta vessels lost their function, they were recycled to produce tokens, spindle whorls and seals. Indeed, in this item, signs of processing are still visible on the rim.

SiS.19.33.322 is a discoid ceramic spindle-whorl from L.156. It has parallels in Ascalone 2019b: figs. 11, 25 and Tosi 1969: fig. 41 h, I. This kind of object has the same origin as the ceramic token: they come from ceramic vessels that were broken up and reused, as mentioned above.

The same counting function is attributed to other stone items. SiS.19.33.2, 8, 32, 35, 49, 108, 182, 183, 185, 203, 205, 226, 315 and 359 are spherical or discoid counters, SiS.19.33.26 is possibly a pebble and SiS.19.33.206 is cylindrical. Most of them come from L.122 ('House of the Courts'), but some are from L.149 (the 'Eastern Building') (Ascalone 2019b: figs. 39, 48, 49, 60).

101 rectangular clay bars were found together in L.176 ('Western Building'). These artefacts have a roughly rectangular shape and are quadrangular in cross section. None of these items were found intact (SiS.19.33.292a, b), but 13 of them have holes and lines engraved on one side: SiS.19.33.293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303 and 304. They range from 2.7 cm to 4.6 cm in length, from 1.3 cm to 2.6 cm in height and from 1.00 to 1.9 cm in thickness. Due to the ongoing debate regarding their function, which can only be resolved by new studies (Bonora *et al.* 2014), here we consider only the possibility that some of them were used for counting.

This hypothesis is based on comparisons with artefacts linked to administrative activities recovered from sites in the Indus valley, as well as Proto-Elamite and proto-cuneiform settlements. It is clear that our bars have two different types of symbol, i.e. holes and vertical lines, similar to those found on ‘miniature tablets’ from Indus (Rao 2018). It seems reasonable to see these holes and lines as signs with counting functions, as with SiS.19.33.157 (see above).

Two other objects, SiS.19.33.37 and SiS.19.33.337, have been attributed to the same class of artefact, but they come from different architectural and chronological contexts: from L.125 and L.122 (‘House of the Courts’).

Other clay objects found at Shahr-i Sokhta belong to a category whose function is still unclear: 10 ‘triangular cakes’ (SiS.19.33.14, 17, 21, 31, 36, 39, 56, 120, 313, 380) were recovered from various layers, including 5 from L.125 (east of the ‘House of the Courts’) and two from L.142 (‘House of the Courts’). Only one specimen, SiS.19.33.120, from L.142, is intact, while all the others are in a fragmentary condition. Parallels for this kind of object can be found in previous excavations in Cortesi - Tosi 2008: fig. 12, Jarrige - Didier - Quivron 2011: fig. 11 and Tosi 1968: fig. 80.

Some of these objects, such as SiS.19.33.21 and SiS.19.33.313, clearly show crossed lines incised on one side, as in Sajjadi - Moradi 2014: fig. 7 d and in Salvatori - Vidale 1997: fig. 239 n. 8.

The real function of these artefacts is still unclear, although some kind of cooking-related use has been supposed (Cortesi *et al.* 2008: 17-18; Jarrige - Didier - Quivron 2011: 19-20).

In addition to clay production, the stone artefacts also fit the material tradition revealed by past excavations, as seen with the alabaster items recovered in both 2018 and 2019 (see S. Festuccia in this volume). As well as the numerous alabaster vessel fragments (rims, bases and body vessels), four complete (or almost complete) specimens, SiS.19.33.204, 305, 307 and 375, were found.

Alabaster was used not only for vessels, but for various types of object, including SiS.19.33.236, a truncated-cone cosmetic vial from L.169 (‘Western

Building’). This kind of find is very common in funerary contexts, but not exclusive to them (Piperno - Salvatori 2007: figs. 380, 418, 461, 579; Sajjadi 2003: fig. 40).

SiS.19.33.28, 122, 131, 184 and 318 are all perforated stone/alabaster discs, and they represent lids for cosmetic use. They were found in various layers belonging to various periods.

Parallels can be found in past excavations, but, as stressed before, they were interpreted as drilling tools, spindle whorls or parts of lamps (Piperno - Salvatori 2007: figs. 98, 136, 321, 330, 375, 389, 428, 442, 478, 484, 494, 593, 745, 762, 790, 804; Sajjadi - Moradi 2017: fig. 17: 2; Salvatori - Vidale 1997: fig. 249, n. 1-6; Tosi 1969: fig. 41 f-t).

SiS.19.33.28 belongs to the same category of artefact, but has a square shape (Tosi 1969: fig. 41 j; Vidale *et al.* 2016: 11).

A total of five beads were collected in the 2019 excavation campaign: SiS.19.33.106, SiS.19.33.107, SiS.19.33.238, SiS.19.33.264 and SiS.19.33.319.

The types of stone these beads are made of, as well as their shapes, are extremely familiar in Shahr-i Sokhta (Tosi 1968: 59-60; 1969: 373-374, figs. 259-260).

SiS.19.33.106 from L.122 (‘House of the Courts’) is a lapis-lazuli cylindrical bead (Ascalone 2019: figs. 27, 30, 55; Sajjadi - Moradi 2017: fig. 17:2; Tosi 1969: fig. 249); SiS.19.33.319 is a truncated-cone jasper bead (Sajjadi 2004: figs. 33b, 34c); SiS.19.33.238 from L.169 (‘Western Building’) is a discoid bead in turquoise; SiS.19.33.107 is a truncated-cone bead (possibly made of limestone) from L.115 (Sajjadi 2004: fig. 35); SiS.19.33.264, from a superficial context, is a ceramic discoid bead, similar to those found during the 2018 excavation campaign (Sajjadi 2003: fig. 39; Salvatori - Vidale 1997: fig. 240 19-34).

Three stamp seals were recovered: SiS.19.33.25, SiS.19.33.50 and SiS.19.33.101 (for a detailed discussion of this class of artefact see Ascalone in press). These items reflect the characteristics highlighted by past excavations: all the seals have a rectangular or square shape; the decorative motifs are aniconic

geometrical patterns, engraved in stone with stone drills, with holes close to each other (Tosi 1968: 61; 1969: 375).

SiS.19.33.25, a broken shell stamp seal from L.122 ('House of the Courts'), and SiS.19.33.50, a broken chlorite stamp seal from a superficial context, both exhibit the so-called 'stepped motif'. They both have a line of holes drilled in them (Kavosh *et al.* 2019: fig. 141 no. 8; Piperno - Salvatori 2007: fig. 292, fig. 389; Sajjadi - Moradi 2014: fig. 7 a; Salvatori - Vidale 1997: fig. 251: 2.44; Tosi 1968: fig. 95a; 1969: figs. 269, 271; 1983: fig. 73, h).

SiS.19.33.101, from a superficial context, is a broken chlorite rectangular stamp seal with drilled geometric motifs composed of crosses. Parallels can be found in both the settlement and the graveyard, as well as in sites nearby (Sajjadi 2006: fig. 30; Salvatori - Vidale 1997: fig. 256: 3; 1983: pl. 72: fig. 73/1).

In addition to the more widespread alabaster, there are also vessels made of other kinds of stone, including: SiS.19.33.93, SiS.19.33.266, SiS.19.33.329 and SiS.19.33.364. All of these, with the sole exception of SiS.19.33.266, are just fragments.

SiS.19.33.266, from L.169 ('Western Building'), made of metamorphic grey stone with white lines, seems to belong to the hemispherical bowl type, parallels of which can be found in Salvatori - Vidale 1997: figs. 246-248 and in Tosi 1969: fig. 40 e-f, fig. 227 (although this is an alabaster vessel). It also bears similarities with stone bowls found in Tepe Yahya (Lamberg-Karlovsky - Tosi: 1973: fig. 95).

SiS.19.33.93, from L.149 ('Eastern Building'), shows clear signs of processing on the surface.

Regarding the production of stone tools, types already described by other authors can be recognised (Tosi 1968: 62-63).

A total of 9 arrowheads were collected, belonging to three different types.

SiS.19.33.187 from L.142 ('House of the Courts'), 230 and 333 from L.156 and 373 from L.149 ('Eastern Building') are arrowheads of the leaf-shaped type (Ascalone 2019b: fig. 31; Sajjadi - Moradi 2017: fig. 17 no. 1; Tosi 1968: figs. 24-25).

SiS.19.33.379, from L.156, belongs to a less common type, that of the arrowheads with stems (Tosi 1968: fig. 23).

SiS.19.33.16 and 20, both from L.122 ('House of the Courts'), and 242 and 227, both from superficial contexts, all belong to a type of arrowhead with a triangular structure (Ascalone 2019b: fig. 1 no. 4, 34; Tosi 1968: fig. 27).

Four stone blades were recovered, all fragmentary. SiS.19.33.27 and SiS.19.33.267, both from superficial contexts, are the best preserved; SiS.19.33.46 and SiS.19.33.190, both from L.122 ('House of the Courts'), are flint blades. They all belong to a type identified by past studies (Ascalone 2019b: figs. 37, 45; Salvatori - Vidale 1997: fig. 250, 10-12; Tosi 1968: figs. 21-22).

SiS.19.33.33 and 104, blade cores (Tosi 1968: fig. 26) from L.130, SiS.19.33.321, a nucleus from L.130 and the residual fragments SiS.19.33.4 from L.122, SiS.19.33.7 and 40 from L.130, SiS.19.33.82 from L.122 and SiS.19.33.224 from L.142 are all indicators of the presence of local stone processing.

Further evidence comes in the form of the basalt grindstones that were also used for making stone vessels: SiS.19.33.11, 13 and 15 from L.130, SiS.19.33.87 and 88 from L.122 ('House of the Courts'), SiS.19.33.114 and 148 from L.142 ('House of the Courts'), SiS.19.33.199 from L.122 ('House of the Courts') and SiS.19.33.324 from L.169 ('Western Building') (Tosi 1968 figs. 89-91; 1969: 370; Kavosh *et al.* 2019: figs. 8-9).

Other stone tools include three smoothers: SiS.19.33.105 (L.149), 335 (L.156) and 371 (L. 176) (Ascalone 2019b: figs. 10, 21, 47); 2 pestles: SiS.19.33. 121 (L. 149) and 244 (L.142) (Salvatori - Vidale 1997: fig. 250 8); 5 polishers: SiS.19.33.10 (L.127), 116, 225 (L.167), 228 (L.142) and 306 (L.169) (Salvatori - Vidale 1997: fig. 249, 14-15; Tosi 1969: fig. 253); a stone axe: SiS.19.33.100 (L.142).

Five potential weights were recovered during the 2019 excavation campaign. This class of artefact requires more detailed study and analysis (Ascalone 2019a; 2019b). From a general point of view, both the materials and morphologies reflect the characteristics revealed by previous studies. Parallels can be found

with finds from the Iranian excavations, in both the necropolis and domestic areas (Ascalone 2019a: 36-38), and with items collected during the 2017 excavations (Ascalone 2019b).

SiS.19.33.6, SiS.19.33.207 and SiS.19.33.232 are from L. 217 and L.142 ('House of the Courts').

SiS.19.33.6 is a spherical stone weight, similar to what is seen in Ascalone 2019a: fig. 11; SiS.19.33.207 is an ovoid weight, possibly made of limestone, similar to what is seen in Ascalone 2019a: fig. 2; 2019b: fig. 33; SiS.19.33.385 is an ovoid weight with flat ends from L.176 ('Western Building'). SiS.19.33.58, a spondonoid weight in chert from L.131, belongs to the same type as Ascalone 2019a: figs. 5, 10 and Ascalone 2019b: fig. 3.

Regarding bronze production, numerous pieces of slag (SiS.19.33.24, 34, 45, 55, 57, 336) and metal fragments (SiS.19.33.3, 22, 29, 38, 48, 52, 181, 214, 215, 269) were collected from various layers. Only 2 objects are in a good state of conservation: SiS.19.33.386, a fishing hook from the surface, and SiS.19.33.79, a bronze figurine from L.122 ('House of the Courts'), probably representing a zebu, of which clay figurines are very common, as mentioned above. The fishing hook belongs to a frequently attested class of artefact (Tosi 1968: fig. 117), but the bronze figurine is practically unique, with the only parallels being two bronze theriomorphic figurines from Grave 16 (Piperno - Salvatori 2007: 53) and the bronze female figurine recovered from surface (Tosi 1983: 303-317).

Due to the characteristics of the environment of Shahr-i Sokhta, which allows the conservation of perishable materials (Tosi 1969: 363), wooden and bone artefacts were also collected. SiS.19.33.378, a wooden find from L.176 ('Western Building'), seems to be a handle (Salvatori - Vidale 1997: figs. 243, 244; Tosi 1969: fig. 42-a), but its poor state of conservation prevents more precise considerations, as for 8 bone artefacts.

Other bone finds include five awls: SiS.19.33.237 from L.169 ('Western Building') and 370 from L.130 are the best preserved. They are made of a sheep's tibia and metacarpus; SiS.19.33.235 is a bone pin from L.169 ('Western Building'), while SiS.19.33.231 from L.142 ('House of the Courts') and 383

from L.122 ('House of the Courts') are spatulas. All these objects find parallels in finds from past excavations in both domestic and funerary contexts (Potenza 2019: figs. 6-7, 10-11; Piperno - Salvatori 2007: figs. 341, 461, 486, 560; Sajjadi 2015: fig. 11, no. 4; Sajjadi - Moradi 2014: fig. 7 p; Salvatori - Vidale 1997: fig. 242; Tosi 1968: fig. 118, 119; 1969: figs. 299-303).

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SiS.18.33.1; 30-11-2018; Body vessel; Alabaster; Fragmentary; 9 cm; 5.5 cm; 1.8 cm; 33; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.2; 30-11-2018; Vessel rim; Alabaster; Fragmentary; 3.3 cm; 2.3 cm; 8.0 cm; 33; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.3; 01-12-2018; Vessel rim; Alabaster; Fragmentary; 3.6 cm; 4.3 cm; 0.8 cm; 33; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.4 (Fig. 1); 30-11-201; Animal figurine; Clay; Fragmentary; 5.8 cm; 2.5 cm; 1.2 cm; Survey; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.5; 30-11-2018; Slag; Bronze; Fragmentary; 3.7 cm; 2.7 cm; 2.9 cm; 33; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.6 (Fig. 2); 02-12-2018; Lisciator; Stone; Broken; 4.6 cm; 2.9 cm; 1.1 cm; OOI1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.7 (Fig. 3); 02-12-2018; Blade; Flint; Broken; 3.1 cm; 0.7 cm; 0.2 cm; 33; OOI1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.8 (Fig. 4); 03-12-2018; Slag; Bronze; Fragmentary; 0.9 cm; 0.8 cm; 0.5 cm; 33; OOH3; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.9 (Fig. 5); 03-12-2018; Slag with charcoal; Bronze; Fragmentary; 0.7 cm; 0.8 cm; 0.7 cm; OOH3; P.65; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.10 (Fig. 6); 03-12-2018; Undefined fragment; Bronze; Fragmentary; 1.3 cm; 1.1 cm; 0.8 cm; 33; OOI1; L.34; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.11; 04-12-2018; Undefined fragment; Bronze; Fragmentary; 5.7 cm; 6.7 cm; 1.1 cm; 33; OOI1; L.34; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.12 (Fig. 7); 04-12-2018; Vessel rim; Stone (gray alabaster?); Fragmentary; 33; OOI1; L.34; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.13 (Fig. 8); 04-12-2018; Grindstone; Basalt; Broken; 3.5 cm; 3.1 cm; 5.2 cm; 33; OOI1; L.34; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.14; 04-12-2018; Grindstone; Basalt; Broken; 4.6 cm; 4.3 cm; 2.5 cm; 33; OOI1; L.34; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.15 (Fig. 9); 04-12-2018; Lisciator; Stone; Broken; 8.4 cm; 4.4 cm; 4.5 cm; 33; OOI1; L.34; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.16; 04-12-2018; Body vessel; Alabaster; Fragmentary; 5.5 cm; 2.1 cm; 0.8 cm; 33; OOH3; L.5 (P.65); 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.17 (Fig. 10); 04-12-2018; Lisciator; Stone; Broken; 6.3 cm; 7 cm; 1.4 cm; 33; OOH3; L.5; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.18 (Fig. 11); 01-12-2018; Token; Stone; Good; 1.2 cm; 1.2 cm; 1.0 cm; 33; OOI4; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.19; 05-12-2018; Undefined fragment; Bronze; Fragmentary; 33; OOH3; P.65+P.71; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.20 (Fig. 12); 05-12-2018; Undefined fragment; Bronze; Fragmentary; 33; OOH3; P.65+P.71; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.21 (Fig. 13); 05-12-2018; Token; Stone; Good; 1.2 cm; 3.1 cm; 0.2 cm; 33; OOH3; L.34; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.22 (Fig. 14); 05-12-2018; Residual stone; Quartzite; Fragmentary; 1.0 cm; 0.9 cm; 0.2 cm; 33; OOH3; L.34; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.23 (Fig. 15); 06-12-2018; Perforated disc; Alabaster; Broken; 3.9 cm; 1.5 cm; 1.3 cm; 33; OOH3; L.77; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.24; 06-12-2018; Slag; Bronze; Fragmentary; 3.3 cm; 2.3 cm; 1.7 cm; 33; OON2; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.25; 06-12-2018; Slag; Bronze; Fragmentary; 2.9 cm; 1.2 cm; 1.2 cm; 33; OON2; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.26 (Fig. 16); 06-12-2018; Semi-worked fragment; Calcite; Fragmentary; 2.2 cm; 1.2 cm; 1.3 cm; 33; OON2; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.27 (Fig. 17); 06-12-2018; Stone tool; Stone; Fragmentary; 3.1 cm; 4.0 cm; 3.0 cm; 33; OOM4; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.28 (Fig. 18); 06-12-2018; Pebble; Calcite; Good; 4.8 cm; 2.2 cm; 1.3 cm; 33; OOM4; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.29 (Fig. 19); 06-12-2018; Residual stone; Malachite; Fragmentary; 1.3 cm; 0.9 cm; 0.4 cm; 33; OOM4; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.30 (Fig. 20); 06-12-2018; Bead; Carnelian; Broken; 0.5 cm; 0.4 cm; 0.4 cm; 33; OOM4; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.31 (Fig. 21); 06-12-2018; Undefined fragment; Bronze; Fragmentary; 2.0 cm; 1.0 cm; 0.3 cm; 33; OOM4; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.32; 08-12-2018; Body vessel; Alabaster; Fragmentary; 7.3 cm; 5.5 cm; 1.2 cm; 33; OOM4; L.33; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.33 (Fig. 22); 08-12-2018; Spindle-whorl; Terracotta; Broken; 3.5 cm; 1.8 cm; 0.5 cm; 33; OON2; L.81; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.34; 08-12-2018; Body vessel; Alabaster; Fragmentary; 5.5 cm; 3.3 cm; 1.1 cm; 33; OOM4; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.35; 08-12-2018; Residual stone; Stone; Fragmentary; 1.5 cm; 1.6 cm; 0.8 cm; 33; OOM4; L.33; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.36; 08-12-2018; Slag; Bronze; Fragmentary; 5 cm; 3.5 cm; 3.0 cm; 33; OOM4; III.4-3; 2600-2450 BC.

SiS.18.33.37; 08-12-2018; Slags; Bronze; Fragmentary; 33; OON2; P.84; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.38; 10-12-2018; Body vessel; Alabaster; Fragmentary; 2.1 cm; 3.1 cm; 0.8 cm; 33; OOS1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.39; 09-12-2018; Vessel rim; Alabaster; Fragmentary; 3.8 cm; 4.6 cm; 0.7 cm; 33; OOM2; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.40; 09-12-2018; Vessel rim; Alabaster; Fragmentary; 1.8 cm; 1.3 cm; 0.4 cm; 33; OOM2; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.41 (Fig. 23); 09-12-201; Vessel rim; Stone; Fragmentary; 5.8 cm; 4.5 cm; 2.3 cm; 33; OOM2; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.42; 09-12-2018; Processing residue; Alabaster; Fragmentary; 2.0 cm; 0.5 cm; 0.4 cm; 33; OOM2; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.43; 09-12-2018; Body vessel; Alabaster; Fragmentary; 2.2 cm; 1.2 cm; 0.8 cm; 33; OOM2; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.44; 09-12-2018; Vessel rim; Alabaster; Fragmentary; 3.1 cm; 1.4 cm; 0.8 cm; 33; OOM2; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.45; 09-12-2018; Alabaster fragment; Alabaster; Fragmentary; 2.2 cm; 1.1 cm; 0.4 cm; 33; OOM2; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.46 (Fig. 24); 09-12-2018; Residual stone; Stone; Fragmentary; 2.2 cm; 1.4 cm; 1.1 cm; 33; OOM2; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.47; 09-12-2018; Body vessel; Alabaster; Fragmentary; 0.7 cm; 2.4 cm; 0.6 cm; 33; OOM2; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.48; 09-12-2018; Vessel rim; Alabaster; Fragmentary; 1.2 cm; 3.2 cm; 0.9 cm; 33; OOL4; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.49; 09-12-2018; Stone tool; Flint; Good; 3.0 cm; 2.1 cm; 0.7 cm; 33; OOL4; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.50; 09-12-2018; Vessel rim; Alabaster; Fragmentary; 1.4 cm; 2.9 cm; 0.9 cm; 33; OOL4; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.51 (Fig. 25); 09-12-2018; Stone tool; Flint; Good; 2.3 cm; 3.2 cm; 0.4 cm; 33; OOL4; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.52; 09-12-2018; Alabaster fragment; Alabaster; Fragmentary; 2.2 cm; 2.2 cm; 1.4 cm; 33; OOL4; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.53; 09-12-2018; Vessel rim; Alabaster; Fragmentary; 3.8 cm; 3.2 cm; 0.4 cm; 33; Surface; III.4-3; 2600-2450 BC.

SiS.18.33.54 (Fig. 26); 09-12-2018; Body vessel; Stone; Fragmentary; 4.4 cm; 5.5 cm; 0.9 cm; 33; Surface; III.4-3; 2600-2450 BC.

SiS.18.33.55 (Fig. 27); 09-12-2018; Pestle; Stone; Fragmentary; 4.8 cm; 3.3 cm; 2.5 cm; 33; Surface.

SiS.18.33.56 (Fig. 28); 09-12-2018; Grindstone; Basalt; Broken; 3.8 cm; 2.2 cm; 1.9 cm; 33; Surface.

SiS.18.33.57 (Fig. 29); 09-12-2018; Vessel rim; Stone; Fragmentary; 3.1 cm; 2.8 cm; 0.9 cm; 33; Surface.

SiS.18.33.58; 09-12-2018; Slag; Bronze; Fragmentary; 3.2 cm; 1.7 cm; 1.2 cm; 33; Surface.

SiS.18.33.59; 09-12-2018; Vessel rim; Alabaster; Fragmentary; 3 cm; 3.2 cm; 0.7 cm; 33; Surface.

SiS.18.33.60; 09-12-2018; Vessel rim; Alabaster; Fragmentary; 2.2 cm; 3.2 cm; 0.7 cm; 33; Surface.

SiS.18.33.61; 09-12-2018; Body vessel; Alabaster; Fragmentary; 3.2 cm; 3.2 cm; 0.7 cm; 33; Surface.

SiS.18.33.62; 09-12-2018; Body vessel; Alabaster; Fragmentary; 5.6 cm; 3.4 cm; 0.9 cm; 33; Surface.

SiS.18.33.63; 09-12-2018; Body vessel; Alabaster; Fragmentary; 6.3 cm; 1.4 cm; 1.9 cm; 33; Surface.

SiS.18.33.64; 09-12-2018; Body vessel; Alabaster; Fragmentary; 3.3 cm; 3.4 cm; 0.7 cm; 33; Surface.

SiS.18.33.65; 10-12-2018; Body vessel; Alabaster; Fragmentary; 1.2 cm; 2.1 cm; 0.7 cm; 33; OOS1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.66; 10-12-2018; Body vessel; Alabaster; Fragmentary; 2.3 cm; 3.4 cm; 0.8 cm; 33; OOS1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.67; 10-12-2018; Body vessel; Alabaster; Fragmentary; 1.7 cm; 1.6 cm; 0.5 cm; 33; OOS1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.68; 10-12-2018; Body vessel; Alabaster; Fragmentary; 3.4 cm; 1.9 cm; 0.9 cm; 33; OOS1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.69; 10-12-2018; Body vessel; Alabaster; Fragmentary; 4.5 cm; 2.2 cm; 1.1 cm; 33; OOS1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.70; 10-12-2018; Slag; Bronze; Fragmentary; 4.5 cm; 2. Cm; 1.1 cm; 33; OOS1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.71 (Fig. 30); 10-12-2018; Grindstone; Stone; Broken; 2.4 cm; 1.9 cm; 1.2 cm; 33; OOS1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.72 (Fig. 31); 10-12-2018; Slag; Bronze; Fragmentary; 4.2 cm; 3.3 cm; 2.2 cm; 33; OOS1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.73; 10-12-2018; Vessel body; Alabaster; Fragmentary; 2.3 cm; 1.2 cm; 0.8 cm; 33; OOS1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.74 (Fig. 32); 10-12-2018; Tool; Stone; Good; 5.4 cm; 6.1 cm; 0.7 cm; 33; OOS1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.75 (Fig. 33); 10-12-2018; Vessel base; Stone; Fragmentary; 2.9 cm; 2.1 cm; 1.1 cm; 33; OOS1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.76 (Fig. 34); 10-12-2018; Vessel base; Stone; Fragmentary; 7.3 cm; 4.3 cm; 1.3 cm; 33; OOS1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.77; 10-12-2018; Vessel rim; Alabaster; Fragmentary; 2.4 cm; 2.3 cm; 0.6 cm; 33; OOS1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.78 (Fig. 35); 10-12-2018; Bead; Ceramic; Good; 1.6 cm; 1.6 cm; 0.5 cm; 33; OOR3; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.79 (Fig. 36); 10-12-2018; Bead; Carnelian; Good; 0.7 cm; 0.6 cm; 0.5 cm; 33; OOR3; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.80 (Fig. 37); 10-12-2018; Vessel base; Stone; Fragmentary; 3.4 cm; 5.6 cm; 0.8 cm; 33; OOR3; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.81 (Fig. 38); 10-12-2018; Grindstone; Basalt; Broken; 6.3 cm; 3.2 cm; 2.3 cm; 33; OOM2; L.85; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.82; 11-12-2018; Vessel body; Alabaster; Fragmentary; 1.0 cm; 1.9 cm; 0.5 cm; 33; OOR1; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.83 (Fig. 39); 11-12-2018; Residual stone; Stone; Fragmentary; 1.4 cm; 2.0 cm; 0.7 cm; 33; OOL4; L.86; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.84; 11-12-2018; Vessel; Bronze; Good; 33; OOL4; L.86; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.85; 09-12-2018; Grindstone; Basalt; Broken; 5.1 cm; 4.1 cm; 2.9 cm; 33; OON2; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.86 (Fig. 40); 03-12-2018; Vessel base; Stone; Fragmentary; 4.3 cm; 2.3 cm; 0.8 cm; 33; OOH3; Surface; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.87; 12-12-2018; Body vessel; Alabaster; Fragmentary; 3.6 cm; 2.8 cm; 0.7 cm; 33; OOR3; L.85; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.88; 12-12-2018; Vessel rim; Alabaster; Fragmentary; 4.7 cm; 4.2 cm; 0.8 cm; 33; OOR1; L.85; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.89; 12-12-2018; Body vessel; Alabaster; Fragmentary; 4.0 cm; 2.3 cm; 0.9 cm; 33; OOR1; L.85; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.90 (Fig. 41); 12-12-2018; Spherical object; Bronze; Good; 1.7 cm; 1.7 cm; 1.7 cm; 33; OOM2; L.15.

SiS.18.33.91 (Fig. 42); 13-12-2018; Grindstone; Basalt; Broken; 7.3 cm; 4.6 cm; 2.8 cm; 33; OOM4; L.85; 1-Building 33; III.4-3; 2600-2450 BC.

SiS.18.33.92 (Fig. 43); 13-12-2018; Lisciator; Stone; Broken; 8.4 cm; 2.6 cm; 1.4 cm; 33; OOR3; L.85; 1-Building 33; III.4-3; 2600-2450 BC.

SiS.18.33.93 (Fig. 44); 13-12-2018; Lisciator; Stone; Broken; 7.8 cm; 2.6 cm; 2.0 cm; 33; OOR3; L.85; 1-Building 33; III.4-3; 2600-2450 BC.

SiS.18.33.94; 13-12-2018; Blade; Stone; Fragmentary; 3.8 cm; 4.7 cm; 0.7 cm; 33; OOR3; L.85; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.95 (Fig. 45); 15-12-2018; Bead; Ceramic; Good; 1.3 cm; 1.3 cm; 0.5 cm; 33; OON2; L.43; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.96 (Fig. 46); 15-12-2018; Bead; Ceramic; Good; 1.2 cm; 1.2 cm; 0.3 cm; 33; OOS1; L.92; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.97; 15-12-2018; Vessel base; Alabaster; Fragmentary; 4.6 cm; 2.7 cm; 0.9 cm; 33; OOS1; L.92; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.98 (Fig. 47); 15-12-2018; Vessel rim; Stone; Fragmentary; 5 cm; 4.1 cm; 2.0 cm; 33; Surface.

SiS.18.33.99 (Fig. 48); 15-12-2018; Grindstone; Basalt; Broken; 6.4 cm; 3.5 cm; 2.0 cm; 33; Surface.

SiS.18.33.100 (Fig. 49); 15-12-2018; Vessel base; Stone; Fragmentary; 7.5 cm; 4.3 cm; 1.2 cm; 33; Surface.

SiS.18.33.101 (Fig. 50); 15-12-2018; Pestle; Stone; Fragmentary; 6.9 cm; 4.0 cm; 4.0 cm; 33; Surface.

SiS.18.33.102 (Fig. 51); 15-12-2018; Vessel body; Stone; Fragmentary; 5.5cm; 4.8 cm; 1.5 cm; 33; Surface.

SiS.18.33.103 (Fig. 52); 15-12-2018; Vessel body; Stone; Fragmentary; 3.6 cm; 4.1 cm; 1.2 cm; 33; Surface.

SiS.18.33.104 (Fig. 53); 15-12-2018; Vessel rim; Stone; Fragmentary; 4.5 cm; 4.9 cm; 0.5 cm; 33; Surface.

SiS.18.33.105; 15-12-2018; Stone block; Steatite; Good; 13.2 cm; 7.9 cm; 5.0 cm; 33; Surface.

SiS.18.33.106; 15-12-2018; Vessel rim; Alabaster; Fragmentary; 6.7 cm; 3.8 cm; 0.8 cm; 33; Surface.

SiS.18.33.107; 15-12-2018; Vessel body; Alabaster; Fragmentary; 4.7 cm; 6.8 cm; 1.0 cm; 33; Surface.

SiS.18.33.108; 15-12-201; Vessel rim; Alabaster; Fragmentary; 3.8 cm; 6.9 cm; 0.7 cm; 33; Surface.

SiS.18.33.109; 15-12-2018; Vessel rim; Alabaster; Fragmentary; 3.0 cm; 3.2 cm; 0.7 cm; 33; Surface.

SiS.18.33.110; 15-12-2018; Vessel rim; Alabaster; Fragmentary; 6.0 cm; 4.5 cm; 0.7 cm; 33; Surface.

SiS.18.33.111; 15-12-2018; Vessel rim; Alabaster; Fragmentary; 3.1 cm; 3.5 cm; 0.7 cm; 33; Surface.

SiS.18.33.112; 15-12-2018; Slag; Bronze; Fragmentary; 7.8 cm; 5.6 cm; 3.6 cm; 33; Surface.

SiS.18.33.113; 16-12-2018; Vessel rim; Alabaster; Fragmentary; 4.2 cm; 2.9 cm; 0.7 cm; 33; OOR1; L.107; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.18.33.114; 16-12-2018; Arrowhead; Stone; Good; 4.0 cm; 1.8 cm; 0.4 cm; 33; Surface.

SiS.18.33.115; 16-12-2018; Semi-worked fragment; Alabaster; Fragmentary; 3.0 cm; 2.2 cm; 0.7 cm; 33; Surface.

SiS.18.33.116; 16-12-2018; Semi-worked fragment; Alabaster; Fragmentary; 3.1 cm; 2.5 cm; 1.2 cm; 33; Surface.

SiS.18.33.117; 16-12-2018; Vessel rim; Alabaster; Fragmentary; 4.5 cm; 4.0 cm; 1.0 cm; 33; Surface.

SiS.18.33.118; 16-12-2018; Vessel rim; Alabaster; Fragmentary; 3.8 cm; 5.2 cm; 0.9 cm; 33; Surface.

SiS.18.33.119; 16-12-2018; Vessel body; Alabaster; Fragmentary; 3.9 cm; 2.0 cm; 0.8 cm; 33; Surface.

SiS.18.33.120 (Fig. 54); 16-12-2018; Vessel base; Stone; Fragmentary; 6.4 cm; 3.0 cm; 0.8 cm; 33; Surface.

SiS.18.33.121 (Fig. 55); 16-12-2018; Vessel rim; Stone; Fragmentary; 9.7 cm; 4.8 cm; 1.0 cm; 33; Surface.

SiS.18.33.122; 18-12-2018; Vessel base; Stone; Fragmentary; 4.3 cm; 2.4 cm; 0.6 cm; 33; Surface.

SiS.18.33.123 (Fig. 56); 18-12-2018; Vessel base; Alabaster; Fragmentary; 4.3 cm; 2.5 cm; 0.6 cm; 33; Surface.

SiS.18.33.124; 18-12-2018; Vessel rim; Alabaster; Fragmentary; 4.4 cm; 4.1 cm; 0.8 cm; 33; Surface.

SiS.18.33.125; 18-12-2018; Vessel body; Alabaster; Fragmentary; 5.5 cm; 4.1 cm; 1.2 cm; 33; Surface.

SiS.18.33.126; 18-12-2018; Vessel base; Alabaster; Fragmentary; 6.7 cm; 4.5 cm; 2.2 cm; 33; Surface.

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SiS.19.33.1; 17.11.2019; Sphendonoid counter; Clay; Slightly eroded; 4 cm; 2.9 cm; 2.5 cm; 33; OOM1; L.217; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.2 (Fig. 1); 17.11.2019; Token; Stone; Good; 1.7 cm; 0.8 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.3 (Fig. 2); 17.11.2019; Undefined object; Bronze; Fragmentary; 2.3 cm; 1.7 cm; 0.5 cm; 33; OOM1; L.217; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.4; 17.11.2019; Slag; Bronze; Fragmentary; 0.8 cm; 0.3 cm; 0.2 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.5; 17.11.2019; Sphendonoid counter; Clay; Slightly eroded; 4.5 cm; 3.2 cm; 2.4 cm; 33; OOM1; L.130.

SiS.19.33.6 (Fig. 3); 17.11.2019; Potential Weight; Stone; Good; 2.4 cm; 2.1 cm; 33; OOM1; L.217; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.7 (Fig. 4); 17.11.2019; Residual Flint; Flint; Fragmentary; 3.7 cm; 2.5 cm; 1.3 cm; 33; OOM1; L.217; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.8 (Fig. 5); 17.11.2019; Token; Stone; Good; 1 cm; 0.8 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.9; 17.11.2019; Animal figurine; Clay; Fragmentary; 5.1 cm; 3.7 cm; 2.1 cm; 33; OOM1; L.217; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.10 (Fig. 6); 17.11.2019; Polisher; Stone; Good; 1.5 cm; 1.7 cm; 33; OOM1; L.127.

SiS.19.33.11 (Fig. 7); 17.11.2019; Grindstone; Basalt; Fragmentary; 5.9 cm; 3.5 cm; 2 cm; 33; OOM1; L.130.

SiS.19.33.12; 17.11.2019; Sphendonoid counter; Clay; Good; 4.8 cm; 2.8 cm; 2.3 cm; 33; OOM1; L.127.

SiS.19.33.13 (Fig. 8); 17.11.2019; Grindstone; Basalt; Fragmentary; 4.2 cm; 2.8 cm; 2.2 cm; 33; OOM1; L.130.

SiS.19.33.14 (Fig. 9); 17.11.2019; 'Triangular cake'; Clay; Fragmentary; 4.4 cm; 4.1 cm; 2 cm; 33; OOM1; L.130.

SiS.19.33.15 (Fig. 10); 17.11.2019; Grindstone; Basalt; Fragmentary; 6x2 cm; 2.8 cm; 1.9 cm; 33; OOM1; L.130.

SiS.19.33.16 (Fig. 11); 17.11.2019; Arrowhead; Flint; Good; 2.9 cm; 2.2 cm; 0.5 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.17 (Fig. 12); 12.11.2019; 'Triangular cake'; Clay; Fragmentary; 4 cm; 3.5 cm; 3.2 cm; 33; OOH2; L.125.

SiS.19.33.18 (Fig. 13); 15.11.2019; Tripod; Clay; Broken; 6 cm; 3.2 cm; 3 cm; 33; OOM2.

SiS.19.33.19; 12.11.2019; Sphendonoid counter; Clay; Slightly eroded; 4.2 cm; 2.4 cm; 2.2 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.20 (Fig. 14); 12.11.2019; Arrowhead; Flint; Good; 2.7 cm; 1.8 cm; 0.5 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.21 (Fig. 15); 11.11.2019; 'Triangular cake'; Clay; Fragmentary; 6.6 cm; 5.7 cm; 2.8 cm; 33; OOH2; L.125.

SiS.19.33.22 (Fig. 16); 09.11.2019; Undefined fragment; Bronze; Fragmentary; 1.5 cm; 0.7 cm; 1.3 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.23; 15.11.2019; Sphendonoid counter; Clay; Slightly eroded; 3.2 cm; 2.5 cm; 1.0 cm; 33; OOH2; W.8; 1 (Building 33); III.4-3; 2600-2450 BC.

SiS.19.33.24 (Fig. 17); 12.11.2019; Slag; Bronze; Fragmentary; 2.9 cm; 2.3 cm; 1.1 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.25 (Fig. 18); 11.11.2019; Seal; Shell; Fragmentary; 1.4 cm; 1.1 cm; 0.4 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.26 (Fig. 19); 11.11.2019; Pebble; Stone; Broken; 3 cm; 2.4 cm; 2.1 cm; 33; OOH2; L.125.

SiS.19.33.27 (Fig. 20); 15.11.2019; Blade; Stone; Broken; 3.3 cm; 1.4 cm; 0.2 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.28 (Fig. 21); 13.11.2019; Perforated disc (squared); Stone; Broken; 1.3 cm; 1 cm; 0.5 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.29 (Fig. 22); 10.11.2019; Undefined fragment; Bronze; Fragmentary; 3.9 cm; 2.3 cm; 2.4 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.30; 11.11.2019; Figurine; Clay; Fragmentary; 4.3 cm; 1.9 cm; 1.6 cm; 33; OOL3; L.123.

SiS.19.33.31 (Fig. 23); 11.11.2019; 'Triangular cake'; Clay; Fragmentary; 6.2 cm; 5 cm; 3.4 cm; 33; OOH2; L.125.

SiS.19.33.32; 09.11.2019; Counter; ?; ?; 1.4 cm; ?; ?; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.33 (Fig. 24); 13.11.2019; Core blade; Flint; Fragmentary; 3 cm; 2 cm; 1 cm; 33; OOM1; L.130.

SiS.19.33.34 (Fig. 25); 13.11.2019; Slag; Bronze; Fragmentary; 3.4 cm; 2.9 cm; 1.3 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.35 (Fig. 26); 11.11.2019; Token; Stone; Good; 1 cm; 0.5 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.36 (Fig. 27); 11.11.2019; 'Triangular cake'; Clay; Fragmentary; 5.1 cm; 4.5 cm; 2.9 cm; 33; OOH2; L.125.

SiS.19.33.37 (Fig. 28); 12.11.2019; Rectangular bar (?); Terracotta; Fragmentary; 11.5 cm; 7.5 cm; 4 cm; 33; OOH; L.125.

SiS.19.33.38 (Fig. 29); 14.11.2019; Undefined object; Bronze; Fragmentary; 3.4 cm; 2.7 cm; 1.5 cm; 33; OOM2; Surface.

SiS.19.33.39 (Fig. 30); 11.11.2019; 'Triangular cake'; Clay; Fragmentary; 5 cm; 3.8 cm; 3.2 cm; 33; OOH2; L.125.

SiS.19.33.40 (Fig. 31); 13.11.2019; Residual stone; Flint; Fragmentary; 3.2 cm; 1.9 cm; 0.5 cm; 33; OOM1; L.130.

SiS.19.33.41 (Fig. 32); 13.11.2019; Anthropomorphic Figurine; Clay; Fragmentary; 3.8 cm; 3 cm; 1.9 cm; 33; OOM1; L.130.

SiS.19.33.42; 12.11.2019; Sphendonoid counter; Clay; Good; 4.5 cm; 2.6 cm; 1.9 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.43 (Fig. 33); 13.11.2019; Bone awl; Bone; Fragmentary; 8.5 cm; 1.7 cm; 0.6 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.44 (Fig. 34); 15.11.2019; Tripod; Clay; Broken; 9.4 cm; 10. cm; 5 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.45; 12.11.2019; Slag; Bronze; 4.5 cm; 1.9 cm; 1.5 cm; 33; OOL3; L.123.

SiS.19.33.46 (Fig. 35); 14.11.2019; Blade; Flint; Fragmentary; 1.8 cm; 0.9 cm; 1 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.47 (Fig. 36); 11.11.2019; Animal figurine (ox?); Clay; Fragmentary; 4.8 cm; 2.6 cm; 1.9 cm; 33; OOL3; L.123.

SiS.19.33.48 (Fig. 37); 09.11.2019; Undefined fragment; Bronze; Fragmentary; 1.8 cm; 1.6 cm; 1 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.49 (Fig. 38); 13.11.2019; Spherical counter; Stone; Good; 2 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.50 (Fig. 39); 10.11.2019; Seal; Chlorite; Broken; 2.9 cm; 1.8 cm; 0.4 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.51; 12.11.2019; Animal figurine; Clay; Fragmentary; 6.3 cm; 3.3 cm; 2.3 cm; 33; OOH2; L.125.

SiS.19.33.52 (Fig. 40); 11.11.2019; Undefined fragment; Bronze; Fragmentary; 1.8 cm; 1.1 cm; 0.9 cm; 33; OOG4; L.124.

SiS.19.33.53; 12.11.2019; Sphendonoid counter; Clay; Good; 4 cm; 2.8 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.54 (Fig. 41); 13.11.2019; Anthropomorphic Figurine; Clay; Fragmentary; 4.2 cm; 2.1 cm; 1.5 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.55 (Fig. 42); 09.11.2019; Slag; Bronze; Fragmentary; 0.9 cm; 0.8 cm; 1 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.56 (Fig. 43); 11.11.2019; 'Triangular cake'; Clay; Fragmentary; 6.9 cm; 4.9 cm; 3.9 cm; 33; OOL3; L.123.

SiS.19.33.57; 15.11.2019; Slag; Bronze; Fragmentary; 5.1 cm; 4.7 cm; 2.5 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.58 (Fig. 44); 13.11.2019; Weight; Stone; Good; 2.9 cm; 2.1 cm; 1.5 cm; 33; OOL3; L.131.

SiS.19.33.59; 11.11.2019; Vessel rim; Alabaster; Fragmentary; 6.5 cm; 4.5 cm; 0.8 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.60; 10.11.2019; Vessel rim; Alabaster; Fragmentary; 5.3 cm; 4.8 cm; 1 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.61; 10.11.2019; Vessel rim; Alabaster; Fragmentary; 4.6 cm; 3.1 cm; 0.5 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.62; 10.11.2019; Vessel rim; Alabaster; Fragmentary; 5.0 cm; 3.4 cm; 0.7 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.63; 10.11.2019; Vessel body; Alabaster; Fragmentary; 5.9 cm; 5.2 cm; 1.9 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.64; 10.11.2019; Vessel body; Alabaster; Fragmentary; 3.9 cm; 3.8 cm; 1.5 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.65; 10.11.2019; Vessel rim; Alabaster; Fragmentary; 4.2 cm; 3.8 cm; 0.7 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.66; 10.11.2019; Vessel base; Alabaster; Fragmentary; 4.5 cm; 2.1 cm; 0.6 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.67; 10.11.2019; Vessel body; Alabaster; Fragmentary; 5.7 cm; 5.2 cm; 1 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.68; 10.11.2019; Vessel rim; Alabaster; Fragmentary; 2.5 cm; 2 cm; 0.7 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.69; 10.11.2019; Vessel base; Alabaster; Fragmentary; 4.0 cm; 1.7 cm; 0.9 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.70; 10.11.2019; Vessel rim; Alabaster; Fragmentary; 3.2 cm; 4.7 cm; 6 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.71; 10.11.2019; Vessel rim; Alabaster; Fragmentary; 3.0 cm; 3.1 cm; 0.7 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.72; 10.11.2019; Vessel Base; Alabaster; Fragmentary; 1.5 cm; 2.5 cm; 0.3 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.73; 10.11.2019; Vessel rim; Alabaster; Fragmentary; 2.3 cm; 2.8 cm; 1 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.74; 11.11.2019; Vessel rim; Alabaster; Fragmentary; 4.1 c; 2.2 cm; 0.7 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.75; 10.11.2019; Vessel body; Alabaster; Fragmentary; 4.6 cm; 3.3 cm; 0.6 cm; 33; OOH2-OOM1-OOG4-OOL3.

SiS.19.33.76; 10.11.2019; Vessel Base; Alabaster; Fragmentary; 2.5 cm; 3.2 cm; 0.7 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.77; 10.11.2019; Vessel rim; Alabaster; Fragmentary; 9.1 cm; 4.4 cm; 0.7 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.78; 16.11.2019; tappo o fusaiola?; Alabaster; Fragmentary; Diameter 3.7 cm; diameter hole 0.9 cm; 0.9 cm; 33; OOH2; L.137.

SiS.19.33.79 (Fig. 45); 10.11.2019; Animal figurine; Bronze; Eroded; 6.6 cm; 2.2 cm; 1.9 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.80; 16.11.2019; Sphendonoid counter; Clay; Good; 4 cm; 2.2 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.81; 16.11.2019; Animal figurine; Clay; Fragmentary; 4.2 cm; 4.7 cm; 2.3 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.82 (Fig. 46); 16.11.2019; Residual flint; Flint; Fragmentary; 2.7 cm; 2.4 cm; 0.5 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.83; 16.11.2019; Figurine; Clay; Fragmentary; 3.0 cm; 2.8 cm; 2.3 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.84; 11.11.2019; Vessel body; Alabaster; Fragmentary; 4.2 cm; 2 cm; 1.1 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.85; Vessel body; Alabaster; Fragmentary; 4.9 cm; 1.5 cm; 0.7 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.86; Sphendonoid counter; Clay; Good; 3.5 cm; 2.3 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.87 (Fig. 47); Grindstone; Basalt; Broken; 6.9 cm; 6.4 cm; 3.1 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.88 (Fig. 48); Grindstone; Basalt; Broken; 4.6 cm; 3.5 cm; 2.1 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.89; 11.11.2019; Vessel rim; Alabaster; Fragmentary; 1.8 cm; 2.1 cm; 0.3 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.90; 20.11.2019; Vessel rim; Alabaster; Fragmentary; 2.4 cm; 2.9 cm; 0.6 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.91; Vessel rim; Alabaster; Fragmentary; 11.2 cm; 8.7 cm; 1 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.92 (Fig. 49); 20.11.2019; Sphendonoid counter; Clay; Good; 5.3 cm; 3 cm; 3 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.93 (Fig. 50); 20.11.2019; Body vessel; Stone; Fragmentary; 4.9 cm; 3.1 cm; 1 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.94; Animal figurine; Clay; Fragmentary; 4.1 cm; 2.3 cm; 1.2 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.95; 20.11.2019; Sphendonoid counter; Clay; Good; 5.4 cm; 3.1 cm; 3.1 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.96; 20.11.2019; Sphendonoid counter; Clay; Slightly eroded; 4.1 cm; 2.8 cm; 2.8 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.97; 20.11.2019; Sphendonoid counter; Clay; Eroded; 3.6 cm; 2.4 cm; 2.4 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.98; 20.11.2019; Figurine; Clay; Fragmentary; 4.5 cm; 3.3 cm; 3 cm; 33; OOL3; L.131.

SiS.19.33.99; 20.11.2019; Figurine; Clay; Fragmentary; 4.7 cm; 2.7 cm; 0.6 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.100 (Fig. 51); 20.11.2019; Stone ax; Stone; Slightly eroded; 9.9 cm; 6 cm; 1.7 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.101 (Fig. 52); 20.11.2019; Seal; Chlorite; Broken; 4.8 cm; 4.2 cm; 0.5 cm; 33; OOH2-OOM1-OOG4-OOL3; Surface.

SiS.19.33.102; 20.11.2019; Bone tool; Bone; Fragmentary; 6.7 cm; 1.5 cm; 0.5 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.103; Figurine; Clay; Fragmentary; 1.9 cm; 1 cm; 0.5 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.104 (Fig. 53); 20.11.2019; Flint nucleus; Flint; Fragmentary; 3.8 cm; 2.9 cm; 0.6 cm; 33.

OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.105 (Fig. 54); 20.11.2019; Lisciator; Stone; Broken; 10.5 cm; 4.7 cm; 1.3 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.106 (Fig. 55); 11.11.2019; Bead; Lapistazuli; Good; 0.4 cm; 0.3 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.107 (Fig. 56); 30.11.2019; Bead; Stone; Erased; 0.9 cm; 0.3 cm; 33; OOH2; L.115.

SiS.19.33.108 (Fig. 57); 16.11.2019; Spherical counter; Stone; Good; 1.2 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.109; 16.11.2019; Sphendonoid counter; Clay; Slightly eroded; 4.2 cm; 2.8 cm; 2.8 cm; 33; OOM1; L.127.

SiS.19.33.110; 16.11.2019; Sphendonoid counter; Clay; Eroded; 2.8 cm; 2.3 cm; 2 cm; 33; OOM1.

SiS.19.33.111; 20.11.2019; Sphendonoid counter; Clay; Good; 5.2 cm; 3 cm; 3 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.112; 16.11.2019; Figurine; Clay; Fragmentary; 3.2 cm; 3.1 cm; 2.5 cm; 33; OOH2; L.137.

SiS.19.33.113; 16.11.2019; Slag; Bronze; Fragmentary; 5x cm; 4.5 cm; 2.2 cm; 33; OOM1.

SiS.19.33.114 (Fig. 58); 16.11.2019; Grindstone; Basalt; Fragmentary; 5.3 cm; 4.1 cm; 3 cm; 33; OOM1.

SiS.19.33.115; 11.11.2019; Alabaster vessel body; Alabaster; Fragmentary; 4.2 cm; 7 cm; 1 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.116 (Fig. 59); 16.11.2019; Polisher; Stone; Good; 11.5 cm; 8.2 cm; 6.5 cm; 33; OOH2; L.137.

SiS.19.33.117; 21.11.2019; Animal Figurine; Clay; Fragmentary; 2.5 cm; 2.1 cm; 0.7 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.118; 21.11.2019; Animal figurine; Clay; Fragmentary; 5.9 cm; 2.5 cm; 2.7 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.119 (Fig. 60); 21.11.2019; Sealing; Clay; Fragmentary; 3.8 cm; 2.8 cm; 0.8 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.120 (Fig. 61); 21.11.2019; 'Triangular cake'; Clay; Good; 5x cm; 5.2 cm; 2.1 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.121 (Fig. 62); 21.11.2019; Pestle; Stone; Broken; 4.6 cm; 3.2 cm; 2 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.122 (Fig. 63); 21.11.2019; Perforated disc; Stone; Good; hole diam. 0.7 cm; 4.2 cm; 0.9 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.123; 21.11.2019; Animal figurine; Clay; Fragmentary; 6.1 cm; 2.3 cm; 2 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.124 (Fig. 64); 21.11.2019; Animal figurine; Clay; Broken; 4.4 cm; 2.2 cm; 2 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.125 (Fig. 65); 21.11.2019; Cretula with impression; Clay; Fragmentary; 6.7 cm; 4.3 cm; 3.4 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.126 (Fig. 66); 21.11.2019; Cart wheel; Clay; Broken; 9.4 cm; 7 cm; 1.8 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.127; 21.11.2019; Animal figurine; Clay; Fragmentary; 7.8 cm; 3 cm; 3 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.128 (Fig. 67); 21.11.2019; Animal figurine; Clay; Fragmentary; 3.7 cm; 1.7 cm; 1.4 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.129 (Fig. 68); 21.11.2019; Sealing; Clay; Fragmentary; 2.7 cm; 2 cm; 2 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.130; 21.11.2019; Animal figurine; Clay; Fragmentary; 4.6 cm; 2.3 cm; 2.5 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.131 (Fig. 69); 21.11.2019; Perforated disc; Alabaster; Broken; 2.1 cm; 1.2 cm; 1.1 cm; 33; Surface.

SiS.19.33.132 (Fig. 70); 21.11.2019; Cretula; Clay; Fragmentary; 3.1 cm; 2.3 cm; 1 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.133; 21.11.2019; Animal Figurine; Clay; Fragmentary; 3.7 cm; 1.8 cm; 2 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.134; 21.11.2019; Animal figurine; Clay; Broken; 4.8 cm; 2 cm; 2.1 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.135; 21.11.2019; Figurine; Clay; Fragmentary; 4.5 cm; 1.9 cm; 1.7 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.136; 21.11.2019; Sphendonoid counter; Clay; Good; 3 cm; 1.4 cm; 1.4 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SiS.19.33.137; 21.11.2019; Sphendonoid counter; Clay; Good; 5 cm; 3.2 cm; 3.2 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.138 (Fig. 71); 21.11.2019; Sphendonoid counter; Clay; Good; 5.3 cm; 3.1 cm; 3.1 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.139; 21.11.2019; Sphendonoid counter; Clay; Slightly eroded; 4.3 cm; 1.9 cm; 1.6 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.140; 21.11.2019; Sphendonoid counter; Clay; Good; 4.7 cm; 2.7 cm; 2.7 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.141; 21.11.2019; Sphendonoid counter; Clay; Good; 5.1 cm; 2.9 cm; 2.9 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.142; 21.11.2019; Sphendonoid counter; Clay; Good; 5 cm; 3.1 cm; 3.1 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.143; 21.11.2019; Sphendonoid counter; Clay; Good; 5.2 cm; 3 cm; 3 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SiS.19.33.144; 21.11.2019; Sphendonoid counter; Clay; Good; 4 cm; 2.2 cm; 1.5 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.145 (Fig. 72); 21.11.2019; Animal figurine (volatile); Clay; Broken; 2.3 cm; 1.8 cm; 1.5 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.146; 23.11.2019; Slag; Bronze; Fragmentary; 6.1 cm; 4.4 cm; 3.6 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.147; 23.11.2019; Figurine; Clay; Fragmentary; 6 cm; 3.6 cm; 2.5 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.148 (Fig. 73); 23.11.2019; Grindstone; Basalt; Fragmentary; 6.3 cm; 5 cm; 3.6 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.149; 23.11.2019; Sphendonoid counter; Clay; Good; 5.5 cm; 3.4 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.150; 23.11.2019; Sphendonoid counter; Clay; Good; 5.3 cm; 3.4 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.151; 23.11.2019; Sphendonoid counter; Clay; Good; 5.6 cm; 3.1 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.152; 23.11.2019; Sphendonoid counter; Clay; Good; 4.6 cm; 3.2 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.153; 23.11.2019; Sphendonoid counter; Clay; Good; 4.7 cm; 2.9 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.154; 23.11.2019; Sphendonoid counter; Clay; Eroded; 4.7 cm; 3.2 cm; 33; OOL; L.156.

SIS.19.33.155 (Fig. 74); 23.11.2019; Sealing; Clay; Fragmentary; 8.6 cm; 9 cm; 6.4 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.156 (Fig. 75); 23.11.2019; Sealing; Clay; Fragmentary; 3.4 cm; 2.7 cm; 1.3 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.157 (Fig. 76); 23.11.2019; Bar; Clay; Good; 3 cm; 2.6 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.158 (Fig. 77); 23.11.2019; Sealing; Clay; Fragmentary; 3.6 cm; 2.4 cm; 1.6 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.159 (Fig. 78); 23.11.2019; Sealing; Clay; Fragmentary; 5.8 cm; 6.2 cm; 2.8 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.160 (Fig. 79); 23.11.2019; Sealing; Clay; Fragmentary; 6.9 cm; 6.8 cm; 3.6 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.161; 23.11.2019; Figurine; Clay; Fragmentary; 3.8 cm; 2.5 cm; 2.1 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.162 (Fig. 80); 23.11.2019; Animal figurine; Clay; Fragmentary; 7.4 cm; 5.2 cm; 6.2 cm; 33; OOL3; L.156.

SIS.19.33.163; 23.11.2019; Sphendonoid counter; Clay; Eroded; 4.2 cm; 3.1 cm; 33; OOL3; L.156.

SIS.19.33.164; 23.11.2019; Sphendonoid counter; Clay; Good; 4.6 cm; 3.4 cm; 33; OOL3; L.156.

SIS.19.33.165; 23.11.2019; Sphendonoid counter; Clay; Good; 5 cm; 3.1 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.166; 23.11.2019; Sphendonoid counter; Clay; Good; 3.6 cm; 2.3 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.167; 23.11.2019; Sphendonoid counter; Clay; Good; 3.7 cm; 2 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.168; 23.11.2019; Sphendonoid counter; Clay; Good; 5.2 cm; 3 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.169; 23.11.2019; Sphendonoid counter; Clay; Good; 4.9 cm; 3.1 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.170 (Fig. 81); 23.11.2019; Cretula; Clay; Good; 4.2 cm; 4.7 cm; 2.4 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.171; 23.11.2019; Sphendonoid counter; Clay; Good; 4.4 cm; 2.8 cm; 33; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.172; 23.11.2019; Sphendonoid counter; Clay; Good; 4.7 cm; 2.9 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.173; 23.11.2019; Sphendonoid counter; Clay; Good; 4.9 cm; 3.2 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.174; 23.11.2019; Sphendonoid counter; Clay; Good; 4.8 cm; 3.2 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.175; 23.11.2019; Sphendonoid counter; Clay; Good; 5.2 cm; 3.4 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.176 (Fig. 82); 23.11.2019; Sphendonoid counter; Clay; Good; 5.5 cm; 3.2 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.177; 23.11.2019; Sphendonoid counter; Clay; Good; 4.6 cm; 2.9 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.178; 23.11.2019; Sphendonoid counter; Clay; Good; 5.7 cm; 3.2 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.179; 23.11.2019; Sphendonoid counter; Clay; Good; 4.4 cm; 2.7 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.180; 23.11.2019; Sphendonoid counter; Clay; Good; 5.2 cm; 3 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.181 (Fig. 83); 23.11.2019; Tool; Bronze; Eroded; 4.4 cm; 3.1 cm; 1.9 cm; 33; OOH-OOM1-OOG4-OOL3; Surface.

SIS.19.33.182 (Fig. 84); 24.11.2019; Spherical counter; Stone; Good; 0.5 cm; 0.4 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.183 (Fig. 85); 24.11.2019; Spherical counter; Stone; Good; 1.7 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.184 (Fig. 86); 24.11.2019; Perforated disc; Alabaster; Broken; 3.4 cm; 1.7 cm; 1.5 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.185 (Fig. 87); 24.11.2019; Spherical counter; Stone; Good; 1.4 cm; 33; OOM1; L.150; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.186; 25.11.2019; Flint o alabaster? 3.3 cm; 1.6 cm; 0.6 cm; 33; OOH4; L.142; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.187 (Fig. 88); 25.11.2019; Arrowhead; Stone; Good; 4 cm; 1.4 cm; 0.4 cm; 33; OOH4; L.142; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.188; 25.11.2019; Cretula; Clay; Fragmentary; 2.8 cm; 1.9 cm; 1.4 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.189; 25.11.2019; Cretula; Clay; Fragmentary; 7.3 cm; 4.6 cm; 3.2 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.190 (Fig. 89); 25.11.2019; Blade; Flint; Broken; 2.2 cm; 1.8 cm; 1.4 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.191 (Fig. 90); 25.11.2019; Sealing; Clay; Good; 6.2 cm; 4.2 cm; 3.1 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.192 (Fig. 91); 25.11.2019; Sealing; Clay; Good; 7.7 cm; 5.6 cm; 2.9 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.193; 25.11.2019; Cretula; Clay; Fragmentary; 4.5 cm; 3.5 cm; 2.2 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.194; 25.11.2019; Cretula; Clay; Fragmentary; 3.1 cm; 2.4 cm; 1.8 cm; 33; OOH4; L.142; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.195 (Fig. 92); 25.11.2019; Sealing; Clay; Good; 3.6 cm; 3 cm; 2.7 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.196 (Fig. 93); 25.11.2019; Sealing; Clay; Good; 6.2 cm; 3.6 cm; 2.6 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.197 (Fig. 94); 25.11.2019; Sealing; Clay; Good; 6.6 cm; 5.1 cm; 3.4 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.198; 25.11.2019; Cretula; Clay; Fragmentary; 4.3 cm; 3.7 cm; 3.7 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.199; 25.11.2019; Grindstone; Basalt; Good; 5.6 cm; 4.2 cm; 2.3 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.200; 25.11.2019; Cretula; Clay; Fragmentary; 5.1 cm; 3 cm; 1.6 cm; 33; OOH4; L.142; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.201; 25.11.2019; Cretula; Clay; Fragmentary; 5.5 cm; 3 cm; 1.6 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.202; 25.11.2019; Cretula; Clay; Fragmentary; 6.2 cm; 5.3 cm; 2.9 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.203 (Fig. 95); 23.11.2019; Spherical counter; Stone; Good; 1.6 cm; 1.4 cm; 1 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.204; 26.11.2019; Vessel; Alabaster; Broken; 4 cm; 2.3 cm; 1.8 cm; 33; OOM3.

SIS.19.33.205 (Fig. 96); 23.11.2019; Spherical counter; Stone; Good; 1.8 cm; 1.4 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.206 (Fig. 97); 26.11.2019; Token; Stone; Good; 1.2 cm; 1.1 cm; 33; OOM2-OOL4.

SIS.19.33.207 (Fig. 98); 25.11.2019; Potential weight; Stone; Good; 33; OOH4; L.142; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.208; 05.12.2019; Vessel body; Alabaster; Fragmentary; 3.5 cm; 5.7 cm; 0.6 cm; 33; OOM1; L.127.

SIS.19.33.209; 26.11.2019; Sphendonoid counter; Clay; Good; 5.4 cm; 2.9 cm; 33; OOH4; L.137.

SIS.19.33.210; 26.11.2019; Sphendonoid counter; Clay; Slightly eroded; 4.8 cm; 2.8 cm; 33; OOH4; L.137.

SIS.19.33.211 (Fig. 99); 23.11.2019; Bone tool; Bone; Good; 11.5 cm; 1.3; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.212; 23.11.2019; Stone figurine; Stone; Broken; 3.8 cm; 5 cm; 33; OOL3; L.156.

SIS.19.33.213; 25.11.2019; Figurine; Clay; Broken; 5.1 cm; 3.5 cm; 2.5 cm; 33; OOH4; L.142; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.214 (Fig. 100); 26.11.2019; Undefined object; Bronze; Erased; 0.7 cm; 33; OOM2-OOL4.

SIS.19.33.215 (Fig. 101); 26.11.2019; Undefined object; Bronze; Erased; 2.8 cm; 0.9 cm; 33; OOM2.

SIS.19.33.216; 27.11.2019; Sphendonoid counter; Clay; Good; 4.2 cm; 3 cm; 33; OOH4; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.217; 27.11.2019; Sphendonoid counter; Clay; Good; 3.7 cm; 2.5 cm; 33; OOH4; L.167; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.218; 27.11.2019; Sphendonoid counter; Clay; Good; 4.2 cm; 3 cm; 33; OOM3; L.168; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.219; 27.11.2019; Sphendonoid counter; Clay; Good; 3.3 cm; 2.1 cm; 33; OOH4; L.167; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.220; 27.11.2019; Sphendonoid counter; Clay; Good; 4.3 cm; 2.7 cm; 33; OOM3; 2 (Squatter Phase); III.5b; 2620-2600 BC.

SIS.19.33.221; 27.11.2019; Sphendonoid counter; Clay; Good; 4.1 cm; 2.4 cm; 33; OOH4; L.167; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.222; 27.11.2019; Sphendonoid counter; Clay; Good; 4.6 cm; 3.1 cm; 33; OOH4; L.167; 4a (Western; Building); II.6; 3000-2850 BC.

SIS.19.33.223; 27.11.2019; Cretula; Clay; Fragmentary; 4.3 cm; 3.4 cm; 3.2 cm; 33; OOH4; L.167; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.224 (Fig. 102); 27.11.2019; Residual stone; Quartz; Good; 2.2 cm; 1.4 cm; 1.5 cm; 33; OOH4; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.225; 27.11.2019; Polisher; Stone; Broken; 6.2 cm; 4.4 cm; 3.4 cm; 33; OOH4; L.167; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.226 (Fig. 103); 27.11.2019; Spherical counter; Stone; Good; 1.7 cm; 1.5 cm; 33; OOH4; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.227; 27.11.2019; Arrowhead; Stone; Broken; 3.5 cm; 1.1 cm; 0.7 cm; 33; Surface.

SIS.19.33.228 (Fig. 104); 27.11.2019; Polisher; Stone; Good; 14.6 cm; 3.7 cm; 1.7 cm; 33; OOH4; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.229; 27.11.2019; Vessel rim; Alabaster; Fragmentary; 4.1 cm; 2.6 cm; 1.4 cm; 33; OOM2-OOL4.

SIS.19.33.230 (Fig. 105); 27.11.2019; Arrowhead; Stone; Broken; 3.3 cm; 1.6 cm; 0.5 cm; 33; OOM3; L.159; 2 (Squatter Phase); III.5b; 2620-2600 BC.

SIS.19.33.231 (Fig. 106); 27.11.2019; Bone spatula; Bone; Good; 13.9 cm; 1 cm; 0.1 cm; 33; OOH4; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.232; 27.11.2019; Potential weight; Stone; Broken; 14 cm; 33; OOH4; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.233 (Fig. 107); 28.11.2019; Bone tool; Bone; Broken; 4.4 cm; 1.2 cm; 33; OOH4; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.234; 28.11.2019; Vessel rim; Alabaster; Fragmentary; 2 cm; 2.3 cm; 0.5 cm; 33; OOH4; L.169; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.235 (Fig. 108); 28.11.2019; Bone pin; Bone; Good; 11.1 cm; 0.5 cm; 33; OOH4; L.169; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.236 (Fig. 109); 02.12.2019; Cosmetic vial; Alabaster; Perfect; 12 cm; 4.2 cm; 1.3 cm; 33; OOH4; L.169; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.237 (Fig. 110); 28.11.2019; Bone awl; Bone; Good; 13.7 cm; 1.5 cm; 0.5 cm; 33; OOH4; L.169; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.238 (Fig. 111); 28.11.2019; Bead; Turquoise; Good; 0.4 cm; 0.3 cm; 33; OOH4; L.169; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.239; 28.11.2019; Vessel rim; Alabaster; Fragmentary; 14 cm; 7.6 cm; 1 cm; 33; OOH4; L.169; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.240 (Fig. 112); 28.11.2019; Stone figurine; Stone; Fragmentary; 8.2 cm; 3.2 cm; 5.9 cm; 33; L.169; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.241; 28.11.2019; Vessel rim; Alabaster; Fragmentary; 6.2 cm; 6.3 cm; 1 cm; 33; OOH4; L.169; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.242 (Fig. 113); 28.11.2019; Arrowhead; Quartz; Good; 2.6 cm; 1.6 cm; 0.6 cm; 33; Surface.

SIS.19.33.243; 28.11.2019; Vessel rims; Alabaster; Fragmentary; 9.1 cm; 10.9 cm; 1 cm; 33; OOH4; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.244; 28.11.2019; Pestle; Stone; Broken; 7.7 cm; 6.4 cm; 33; OOH4; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.245 (Fig. 114); 28.11.2019; Animal figurine; Clay; Eroded; 4.7 cm; 2.7 cm; 1.9 cm; 33; OOH4; L.167; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.246; 28.11.2019; Figurine; Clay; Fragmentary; 2.6 cm; 1.8 cm; 1.4 cm; 33; OOH4; L.167; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.247 (Fig. 115); 28.11.2019; Animal figurine; Clay; Broken; 9.2 cm; 5.8 cm; 3.7 cm; 33; Surface.

SIS.19.33.248; 28.11.2019; Animal Figurine; Clay; Broken; 4.9 cm; 3.8 cm; 2.2 cm; 33; OOH4; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.249; 28.11.2019; Figurine; Clay; Broken; 5.6 cm; 3.2 cm; 2.5 cm; 33; OOH4; L.169; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.250; 28.11.2019; Sphendonoid counter; Clay; Broken; 6.2 cm; 4 cm; 2.5 cm; 33; OOH4; L.169; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.251; 28.11.2019; Figurine; Clay; Broken; 4.8 cm; 3.6 cm; 2.8 cm; 33; OOH4; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.252; 28.11.2019; Sphendonoid counter; Clay; Fragmentary; 2.2 cm; 33; OOH4; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.253 (Fig. 116); 28.11.2019; Token; Terracotta; Broken; 3.6 cm; 1 cm; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.254; 28.11.2019; Sphendonoid counter; Clay; Fragmentary; 4 cm; 2.6 cm; 33; OOH4; L.169; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.255; 28.11.2019; Sphendonoid counter; Clay; Fragmentary; 4 cm; 2.6 cm; 33; OOH4; L.169; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.256; 28.11.2019; Sphendonoid counter; Clay; Good; 3.9 cm; 2.4 cm; 33; L.167; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.257; 28.11.2019; Sphendonoid counter; Clay; Good; 3.8 cm; 2.5 cm; 33; OOH4; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.258; 28.11.2019; Sphendonoid counter; Clay; Good; 5 cm; 3.9 cm; 33; OOH4; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.259; 28.11.2019; Sphendonoid counter; Clay; Slightly eroded; 3.5 cm; 2.7 cm; 33; OOM3; L.159; 2 (Squatter Phase); III.5b; 2620-2600 BC.

SIS.19.33.260; 28.11.2019; Sphendonoid counter; Clay; Slightly eroded; 5 cm; 2.7 cm; 33; OOH4; L.169; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.261; 28.11.2019; Sphendonoid counter; Clay; Slightly eroded; 2.2 cm; 33; OOH4; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.262; 25.11.2019; Cretula; Clay; Fragmentary; 4.7 cm; 3.4 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.263; 28.11.2019; Cretula; Clay; Fragmentary; 4.2 cm; 2.9 cm; 1.9 cm; 33; OOH4; L.169; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.264 (Fig. 117); 28.11.2019; Bead; Ceramic; Good; 1.9 cm; 33; Surface.

SIS.19.33.265; 28.11.2019; Cretula; Clay; Fragmentary; 5.7 cm; 4.9 cm; 3.5 cm; 33; OOM3; L.159; 2 (Squatter Phase); III.5b; 2620-2600 BC.

SIS.19.33.266 (Fig. 118); 30.11.2019; Vessel; Stone (gray alabaster?); Broken; 14.6 cm; 8 cm; 1.3 cm; 33; OOH4; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.267 (Fig. 119); 30.11.2019; Blade; Flint; Broken; 2.7 cm; 0.7 cm; 0.2 cm; 33; Surface.

SIS.19.33.268 (Fig. 120); 30.11.2019; Awl; Bone; Broken; 6 cm; 1.1 cm; 0.4 cm; 33; OOH4; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.269 (Fig. 121); 30.11.2019; Tool; Bronze; Erased; 3.1 cm; 1 cm; 0.5 cm; 33; OOI2-OON1; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.270; 30.11.2019; Figurine; Clay; Fragmentary; 2.6 cm; 3.4 cm; 33; OOH4; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.271; 30.11.2019; Figurine; Clay; Broken; 3.7 cm; 3.1 cm; 1.9 cm; 33; OOH4; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.272; 30.11.2019; Sphendonoid counter; Clay; Good; 4.4 cm; 2.8 cm; 33; OOH4; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.273; 30.11.2019; Sphendonoid counter; Clay; Good; 3.2 cm; 2.1 cm; 33; OOH4; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.274; 30.11.2019; Sphendonoid counter; Clay; Good; 3 cm; 2.7 cm; 33; OOI2-OON1; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.275; 30.11.2019; Figurine; Clay; Broken; 4.1 cm; 2.3 cm; 2 cm; 33; OOH4; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.276; 30.11.2019; Figurine; Clay; Broken; 4.7 cm; 4.3 cm; 33; Surface.

SIS.19.33.277; 30.11.2019; Figurine; Clay; Broken; 4.3 cm; 2.7 cm; 1.6 cm; 33; OOH4; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.278; 30.11.2019; Sphendonoid counter; Clay; Good; 3.9 cm; 2.6 cm; 33; OOH4; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.279; 30.11.2019; Animal Figurine; Clay; Broken; 3.8 cm; 2.6 cm; 1.6 cm; 33; OOH4; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.280; 30.11.2019; Figurine; Clay; Fragmentary; 3.9 cm; 2.3 cm; 1.8 cm; 33; OOH4; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.281; 30.11.2019; Cretula; Clay; Fragmentary; 5.1 cm; 3.8 cm; 2.6 cm; 33; OOM3; 2 (Squatter Phase); III.5b; 2620-2600 BC.

SIS.19.33.282; 30.11.2019; Cretula; Clay; Fragmentary; 10 cm; 8 cm; 3.7 cm; 33; OOM3; 2 (Squatter Phase); III.5b; 2620-2600 BC.

SIS.19.33.283; 30.11.2019; Cretula; Clay; Fragmentary; 5.3 cm; 4 cm; 2.5 cm; 33; OOM3; 2 (Squatter Phase); III.5b; 2620-2600 BC.

SIS.19.33.284; 30.11.2019; Cretula; Clay; Fragmentary; 4.2 cm; 3.6 cm; 2.7 cm; 33; OOM3; 2 (Squatter Phase); III.5b; 2620-2600 BC.

SIS.19.33.285; 30.11.2019; Cretula; Clay; Fragmentary; 4 cm; 3.3 cm; 2.7 cm; 33; OOH4; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.286; 30.11.2019; Cretula; Clay; Fragmentary; 4.3 cm; 3.3 cm; 2.6 cm; 33; OOM3; 2 (Squatter Phase); III.5b; 2620-2600 BC.

SIS.19.33.287; 30.11.2019; Cretula; Clay; Fragmentary; 4.8 cm; 5 cm; 3.9 cm; 33; OOH2; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.288; 30.11.2019; Cretula; Clay; Fragmentary; 3.4 cm; 2.8 cm; 1.4 cm; 33; OOH4; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.289; 30.11.2019; Cretula; Clay; Fragmentary; 4.4 cm; 1.9 cm; 1.8 cm; 33; OOH4; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.290; 30.11.2019; Cretula; Clay; Fragmentary; 8.2 cm; 5 cm; 4.8 cm; 33; OOM3; 2 (Squatter Phase); III.5b; 2620-2600 BC.

SIS.19.33.291; 30.11.2019; Sphendonoid counter; Clay; Good; 4.8 cm; 3.1 cm; 33; OOH2; L.176; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.292/1-87 (Fig. 122a,b); 01.12.2019; Rectangular bars (88); Clay; Fragmentary; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.293 (Fig. 123); 01.12.2019; Rectangular bar; Clay; Fragmentary; 4 cm; 1.6 cm; 1 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.294 (Fig. 124); 01.12.2019; Rectangular bar; Clay; Fragmentary; 3 cm; 2 cm; 1.1 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.295 (Fig. 125); 01.12.2019; Rectangular bar; Clay; Fragmentary; 2.9 cm; 2 cm; 1.1 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.296 (Fig. 126); 01.12.2019; Rectangular bar; Clay; Fragmentary; 4.6 cm; 1.5 cm; 1.2 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.297 (Fig. 127); 01.12.2019; Rectangular bar; Clay; Fragmentary; 3 cm; 1.8 cm; 1.1 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.298 (Fig. 128); 01.12.2019; Rectangular bar; Clay; Fragmentary; 4.4 cm; 1.8 cm; 1.5 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.299 (Fig. 129); 01.12.2019; Rectangular bar; Clay; Fragmentary; 3.3 cm; 2.6 cm; 1.3 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.300 (Fig. 130); 01.12.2019; Rectangular bar; Clay; Fragmentary; 3.4 cm; 1.5 cm; 1.2 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.301 (Fig. 131); 30.11.2019; Rectangular bar; Clay; Fragmentary; 2.7 cm; 1.9 cm; 1.4 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.302 (Fig. 132); 01.12.2019; Rectangular bar; Clay; Fragmentary; 3.7 cm; 1.3 cm; 1.1 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.303 (Fig. 133); 01.12.2019; Rectangular bar; Clay; Fragmentary; 3.4 cm; 1.9 cm; 1.9 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.304 (Fig. 134); 01.12.2019; Rectangular bar; Clay; Fragmentary; 4.3 cm; 1.9 cm; 1.2 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.305; 28.11.2019; Vessel; Alabaster; Good; 12.5 cm; 7.5 cm; 33; Survey; Surface.

SIS.19.33.306 (Fig. 135); 30.11.2019; Polisher; Stone; Broken; 5 cm; 3.4 cm; 1.5 cm; 33; OOH4; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.307; 30.11.2019; Vessel; Alabaster; Good; 5.1 cm; 2.8 cm; 1 cm; 33; OOH2; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.308; 30.11.2019; Figurine; Clay; Fragmentary; 2.7 cm; 2.4 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.309 (Fig. 136); 30.11.2019; Animal figurine; Clay; Broken; 4.8 cm; 4 cm; 1.2 cm; 33; OOH2; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.310; 01.12.2019; Figurine; Clay; Fragmentary; 3.2 cm; 3.3 cm; 1.8 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.311 (Fig. 137); 01.12.2019; Animal figurine; Clay; Broken; 4 cm; 3.9 cm; 3.2 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.312; 01.12.2019; Figurine; Clay; Fragmentary; 4.4 cm; 3.2 cm; 2.7 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.313 (Fig. 138); 27.11.2019; 'Triangular cake'; Clay; Fragmentary; 6.3 cm; 6.6 cm; 3 cm; 33; OOH4; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.314 (Fig. 139); 01.12.2019; Tool; Bone; Good; 1.4 cm; 0.8 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.315 (Fig. 140); 01.12.2019; Spherical counter; Stone; Good; 1.7 cm; 0.8 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.316 (Fig. 141); 01.12.2019; Sealing; Clay; Broken; 2.4 cm; 1.8 cm; 0.8 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.317; 01.12.2019; Sphendonoid counter; Clay; Good; 3.3 cm; 2.4 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.318 (Fig. 142); 01.12.2019; Perforated disc; Alabaster; Broken; 6 cm; 2 cm; 33; OOI2-OON1; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.319 (Fig. 143); 01.12.2019; Bead; Jasper; Good; 2.7 cm; 0.8 cm; 33.

SIS.19.33.320; 03.12.2019; Tool; Bone; Broken; 3.7 cm; 1.2 cm; 33; OOH2-OOH4; L.176; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.321 (Fig. 144); 03.12.2019; Nucleus; Stone; Broken; 5.3 cm; 3.2 cm; 33; OOM2-OOL4; L.138; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.322 (Fig. 145); 04.12.2019; Discoid spindle-whorl; Terracotta; Broken; 2.5 cm; 2.6 cm; 0.5 cm; 33; OOG4-OOL3; L.156.

SIS.19.33.323; 03.12.2019; Vessel rim; Alabaster; Fragmentary; 2.9 cm; 3.4 cm; 0.8 cm; 33; OOM3-OOM4; L.159; House of the Courts; II.5a; 2850-2620 BC.

SIS.19.33.324 (Fig. 146); 02.12.2019; Grindstone; Basalt; Broken; 5 cm; 4.4 cm; 4.2 cm; 33; OOH4; L.169; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.325; 03.12.2019; Vessel body; Alabaster; Broken; 2.4 cm; 2.8 cm; 0.5 cm; 33; OOM2; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.326; 02.12.2019; Figurine; Clay; Fragmentary; 3.5 cm; 2.6 cm; 1.8 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.327; 03.12.2019; Figurine; Clay; Fragmentary; 4.2 cm; 1.9 cm; 2.2 cm; 33; OOH2-OOH4; L.176; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.328; 02.12.2019; Figurine; Clay; Fragmentary; 3.5 cm; 4.2 cm; 1.8 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.329 (Fig. 147); 23.11.2019; Vessel body; Stone; Fragmentary; 8.1 cm; 4.7 cm; 1.7 cm; 33.

SIS.19.33.330; 02.12.2019; Figurine; Clay; Fragmentary; 4.5 cm; 3.4 cm; 2.4 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.331; 02.12.2019; Vessel rim; Alabaster; Fragmentary; 2.9 cm; 2.8 cm; 0.8 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.332; 03.12.2019; Figurine; Clay; Fragmentary; 5.5 cm; 2.4 cm; 2.9 cm; 33; OOM2; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.333 (Fig. 148); 04.12.2019; Arrowhead; Stone; Good; 3.2 cm; 1.4 cm; 0.5 cm; 33; OOG4-OOL3; L.156.

SIS.19.33.334; 04.12.2019; Figurine; Clay; Fragmentary; 4.2 cm; 2.1 cm; 3.5 cm; 33; OOM2; L.177.

SIS.19.33.335 (Fig. 149); 04.12.2019; Lisciator; Stone; Good; 15 cm; 3.8 cm; 2 cm; 33; OOG4-OOL3; L.156.

SIS.19.33.336 (Fig. 150); 01.12.2019; Slag; Bronze; Broken; 4.1 cm; 2.7 cm; 2 cm; 33; OOM4; L.186; 2 (Squatter Phase); III.5b; 2620-2600 BC.

SIS.19.33.337 (Fig. 151); 04.12.2019; Rectangular bar (?); Clay; Broken; 4.4 cm; 1.6 cm; 1.2 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.338; 03.12.2019; Sphendonoid counter; Clay; Good; 4.8 cm; 2.7 cm; 33; OOM1; L.149; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.339; 13.11.2019; Sphendonoid counter; Clay; Slightly Eroded; 4.7 cm; 3.2 cm; 33; OOM2; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.340; 03.12.2019; Sphendonoid counter; Clay; Good; 5.6 cm; 3.3 cm; 33; OOM2-OOL4; L.138; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.341; 03.12.2019; Sphendonoid counter; Clay; Good; 4.1 cm; 3 cm; 33; OOM2; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.342; 03.12.2019; Sphendonoid counter; Clay; Good; 4.3 cm; 2.7 cm; 33; OOM2-OOL4; L.138; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.343; 03.12.2019; Sphendonoid counter; Clay; Good; 3.4 cm; 2 cm; 33; OOM2-OOL4; L.138; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.344; 01.12.2019; Sealing; Clay; Fragmentary; 4.5 cm; 3.8 cm; 1.9 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.345; 03.12.2019; Cretula; Clay; Fragmentary; 8.7 cm; 4.8 cm; 5.6 cm; 33; OOM2; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.346; 25.11.2019; Cretula; Clay; Fragmentary; 6.2 cm; 3.6 cm; 4.9 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.347; 01.12.2019; Cretula; Clay; Fragmentary; 4.9 cm; 3.9 cm; 2.2 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.348; 01.12.2019; Cretula; Clay; Fragmentary; 4.5 cm; 3.4 cm; 2.4 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.349; 03.12.2019; Cretula; Clay; Fragmentary; 8.2 cm; 7.1 cm; 6 cm; 33; OOM2; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.350; 02.12.2019; Cretula; Clay; Fragmentary; 4.9 cm; 4.7 cm; 2.5 cm; 33; OOH2-OOH4; L.176; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.351; 04.12.2019; Cretula; Clay; Fragmentary; 6.9 cm; 4.6 cm; 4.4 cm; 33; OOM1; L.149; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.352; 01.12.2019; Cretula; Clay; Fragmentary; 3.6 cm; 2.2 cm; 1.7 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.353; 01.12.2019; Figurine; Clay; Fragmentary; 5.5 cm; 2.9 cm; 2.5 cm; 33; OOH2; L.169; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.354; 30.11.2019; Cretula; Clay; Fragmentary; 4.6 cm; 2.6 cm; 1.7 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.355; 04.12.2019; Cretula; Clay; Fragmentary; 6.4 cm; 7.1 cm; 5.6 cm; 33; OOM1; L.149; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.356; 03.12.2019; Cretula; Clay; Fragmentary; 6.1 cm; 6.3 cm; 2.9 cm; 33; OOM2; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.357; 01.12.2019; Cretula; Clay; Fragmentary; 4 cm; 3 cm; 1.1 cm; 33; OOH2; L.122; 3b (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.358; 03.12.2019; Sphendonoid counter; Clay; Good; 7.5 cm; 2.9 cm; 2.2 cm; 33; OOH2; L.176; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.359 (Fig. 152); 05.12.2019; Spherical counter; Stone; Good; 2.1 cm; 1.2 cm; 33; OOH2; L.176; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.360 (Fig. 153); 05.12.2019; Bone awl; Bone; Broken; 4.2 cm; 0.7 cm; 0.4 cm; 33; OOM1; L.149; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.361; 05.12.2019; Sphendonoid counter; Clay; Good; 5 cm; 2.8 cm; 33; OOM1; L.149; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.362; 05.12.2019; Sphendonoid counter; Clay; Good; 5.6 cm; 3.3 cm; 33; OOM1; L.149; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.363; 05.12.2019; Sphendonoid counter; Clay; Good; 4.7 cm; 3 cm; 33; OOM1; L.149; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.364 (Fig. 154); 05.12.2019; Vessel body; Stone; Fragmentary; 3.2 cm; 2.2 cm; 33; OOM1; L.149; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.365; Figurine; Clay; Fragmentary; 3.2 cm; 1.7 cm; 33; OOH2; L.176; 4 (Western Building); II.6; 3000-2850 BC.

SIS.19.33.366; 05.12.2019; Sphendonoid counter; Clay; Good; 5.6 cm; 3.3 cm; 33; OOM1; L.149; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.367; 05.12.2019; Sphendonoid counter; Clay; Good; 5.4 cm; 3.1 cm; 33; OOM1; L.149; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.368 (Fig. 155); Spherical object; Clay; Good; 6 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.369; 03.12.2019; Bone Tool; Bone; Broken; 7.2 cm; 2.9 cm; 33; OOL3; L.123.

SIS.19.33.370 (Fig. 156); 28.11.2019; Bone awl; Bone; Good; 11 cm; 1.6 cm; 33; OOM1; L.130.

SIS.19.33.371 (Fig. 157); 05.12.2019; Lisciator; Stone; Broken; 7.7 cm; 3.7 cm; 2.6 cm; 33; OOH2; L.176; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.372; Alabaster fragment; Alabaster; Fragmentary; 5 cm; 2.3 cm; 0.8 cm; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.373 (Fig. 158); 05.12.2019; Arrowhead; Flint; Good; 5.6 cm; 1.6 cm; 0.6 cm; 33; OOM1; L.149; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.374 (Fig. 159); 05.12.2019; Inlay fragment; Stone; Fragmentary; 1.3 cm; 0.7 cm; 0.8 cm; 33; OOM1; L.149; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.375; 05.12.2019; Alabaster vessel; Alabaster; Broken; 6.5 cm; 3.4 cm; 0.9 cm; 33; OOM1; L.149; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.376; Vessel rim; Alabaster; Fragmentary; 3.5 cm; 2.7 cm; 0.7 cm; 33; OOM1; L.149; 4a (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.377 (Fig. 160); 05.12.2019; Anthropomorphic Figurine; Clay; Broken; 5.1 cm; 4.2 cm; 2.5 cm; 33; OOH2; L.176; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.378 (Fig. 161); 05.12.2019; Wooden handle; Wood; Broken; 3.5 cm; 2.1 cm; 33; OOH2; L.176; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.379 (Fig. 162); 04.12.2019; Arrowhead; Stone; Good; 2.1 cm; 1.1 cm; 0.4 cm; 33; OOG4-OOL3; L.156.

SIS.19.33.380 (Fig. 163); 04.12.2019; 'Triangular cake'; Clay; Fragmentary; 9 cm; 5.7 cm; 5.4 cm; 33; OOM4; L.186; 2 (Squatter Phase); III.5b; 2620-2600 BC.

SIS.19.33.381; Figurine; Clay; Fragmentary; 7.9 cm; 2.8 cm; 5.3 cm; 33; OOH2; L.176; 4a (Western Building); II.6; 3000-2850 BC.

SIS.19.33.382; Bone tool; Bone; Broken; 5.2 cm; 1.4 cm; 33; OOH2; L.122; 3a (House of the Courts); II.5a; 2850-2620 BC.

SIS.19.33.384 (Fig. 165); 05.12.2019; Bone tool; Bone; Broken; 4.7 cm; 2 cm; 33; OOH2; L.176; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.385 (Fig. 166); Ovoid weight with flat ends; Stone; Broken; 3.9 cm; 2.4 cm; 33; OOH2-OOH4; L.176; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.386 (Fig. 167); Fishing hook; Bronze; Slightly eroded; 3.6 cm; 0.7 cm; 33; Surface.

SIS.19.33.387; 05.12.2019; Cretula; Clay; Fragmentary; 4.8 cm; 4.7 cm; 4.9 cm; 33; OOM1; L.149; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.388; 05.12.2019; Cretula; Clay; Fragmentary; 5.4 cm; 4 cm; 5.7 cm; 33; OOM1; L.149; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.389; 05.12.2019; Cretula; Clay; Fragmentary; 11.7 cm; 10.2 cm; 3.3 cm; 33; OOM1; L.149; 4b (Eastern Building); II.6; 3000-2850 BC.

SIS.19.33.390; 05.12.2019; Scale; 33; OOH2; L.176; 4b (Western Building); II.6; 3000-2850 BC.

SIS.19.33.391; 23.11.2019; Cretulae; Clay; Fragmentary; 33; OOH2; L.142; 3a (House of the Courts); II.5a; 2850-2620 BC.

Photo: Media Rahmani



Fig.1: SiS.18.33.4, animal figurine.



Fig. 3: SiS.18.33.7, blade.



Fig.2: SiS.18.33.6, lisciator.



Fig. 4: SiS.18.33.8, slag.



Fig. 5: SiS.18.33.9, slag with charcoal.



Fig. 6: SiS.18.33.10, indetermined fragment.



Fig. 8: SiS.18.33.13, grindstone

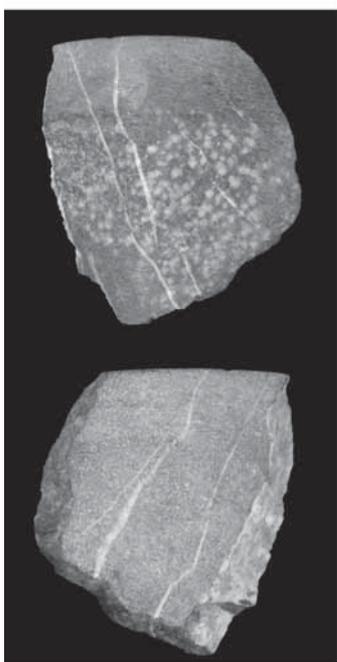


Fig. 7: SiS.18.33.12, vessel rim.



Fig. 9: SiS.18.33.15, lisciator.



Fig. 10: SiS.18.33.17, lisciator.



Fig. 11: SiS.18.33.18, token.



Fig. 14: SiS.18.33.22, residual stone.

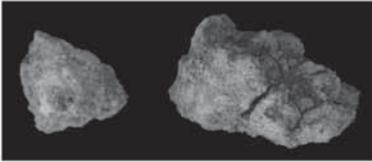


Fig. 12: SiS.18.33.20, indetermined fragment.

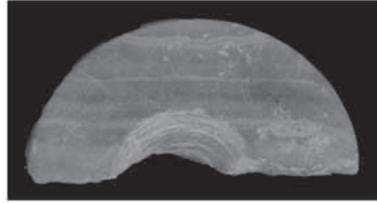


Fig. 15: SiS.18.33.23, perforated disc.

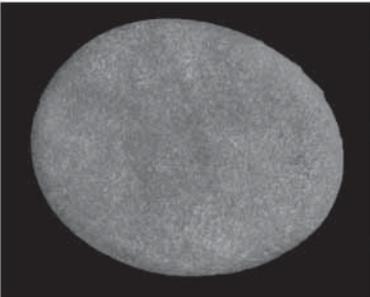


Fig. 13: SiS.18.33.21, token.



Fig. 16: SiS.18.33.26, semi-worked fragment.



Fig. 17: SiS.18.33.27, stone tool.

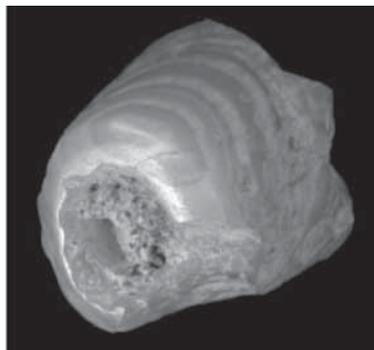


Fig. 20: SiS.18.33.30, bead.



Fig. 18: SiS.18.33.28, pebble.

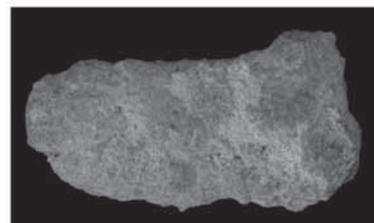


Fig. 21: SiS.18.33.31, indetermined.



Fig.19: SiS.18.33.29, residual stone.

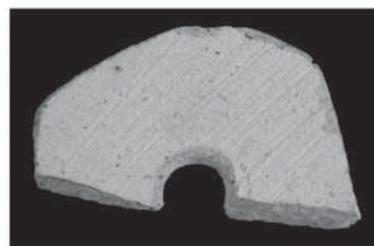


Fig. 22: SiS.18.33.32, spindle whorl.

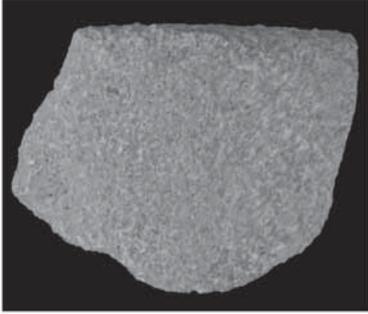


Fig. 23: SiS.18.33.41: vessel rim.



Fig. 26: SiS.18.33.54, body vessel.



Fig. 24: SiS.18.33.46, residual stone.

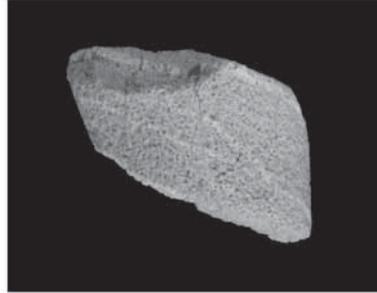


Fig. 27: SiS.18.33.55: pestle.



Fig. 25: SiS.18.33.51: stone tool.



Fig. 28: SiS.18.33.56, grindstone.



Fig. 29: SiS.18.33.57, vessel rim.



Fig. 32: SiS.18.33.74, stone tool.



Fig. 30: SiS.18.33.71, grindstone.



Fig. 33: SiS.18.33.75, vessel base.



Fig. 31: SiS.18.33.72, slag.



Fig. 34: SiS.18.33.76, vessel base.



Fig. 35: SiS.18.33.78, bead.



Fig. 38: SiS.18.33.81, grindstone.



Fig. 36: SiS.18.33.79, bead.



Fig. 39: SiS.18.33.83, residual stone.



Fig. 37: SiS.18.33.80, vessel base.



Fig. 40: SiS.18.33.86, vessel base.

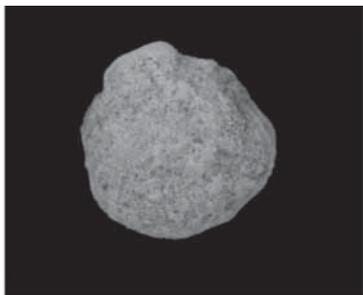


Fig. 41: SIS.18.33.90: spherical object.



Fig. 44: SIS.18.33.93, lisciator.

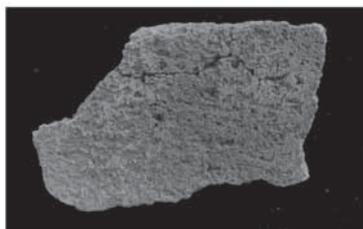


Fig. 42: SIS.18.33.91, grindstone.



Fig. 45: SIS.18.33.95, bead.



Fig. 43: SIS.18.33.92, lisciator.



Fig. 46: SIS.18.33.96 bead.

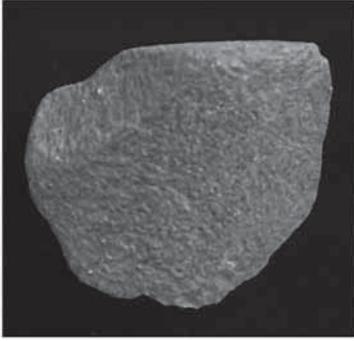


Fig. 47: SIS.18.33.98, vessel rim.



Fig. 50: SIS.18.33.101, pestle.



Fig. 48: SIS.18.33.99, grindstone.

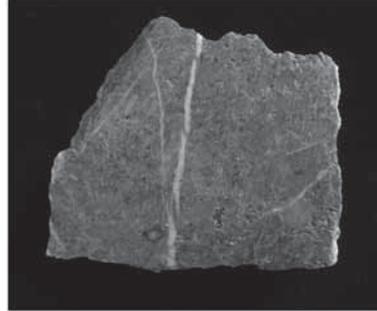


Fig. 51: SIS.18.33.102, body vessel.

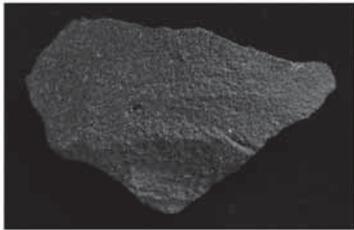


Fig. 49: SIS.18.33.100, vessel base.

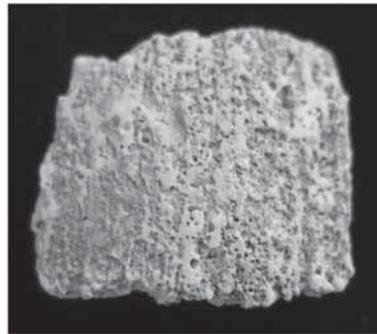


Fig. 52: SIS.18.33.103, body vessel.



Fig. 53: SIS.18.33.104, vessel rim.

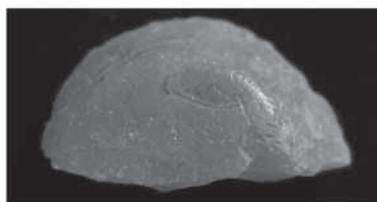


Fig. 56: SIS.18.33.122, vessel base.



Fig. 54: SIS.18.33.120, vessel base.

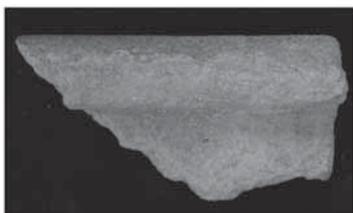


Fig. 55: SIS.18.33.121: vessel rim.

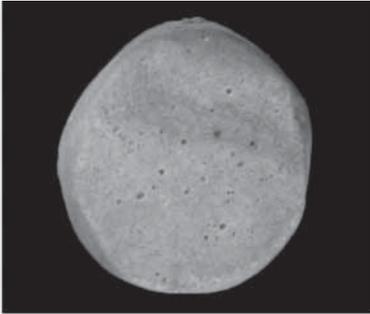


Fig. 1: SiS.19.33.2, token.



Fig. 4: SiS.19.33.7, residual flint.



Fig. 2: SiS.19.33.3, Indetermined object.



Fig. 5: SiS.19.33.8, token.

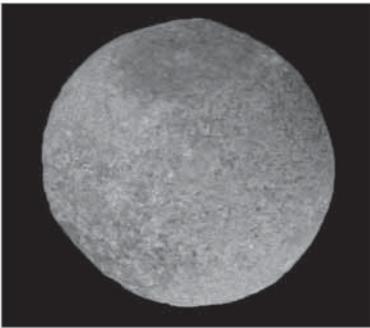


Fig. 3: SiS.19.33.6, weight.

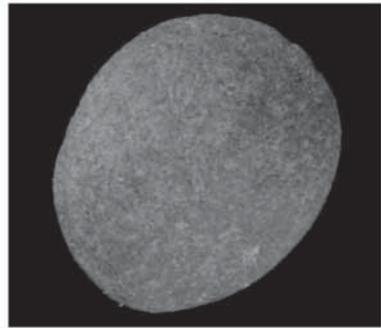


Fig. 6: SiS.19.33.10, polisher.

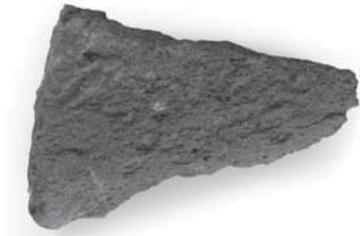


Fig. 7: SiS.19.33.11, grindstone.



Fig. 10: SiS.19.33.15, grindstone.



Fig. 8: SiS.19.33.13, grindstone.

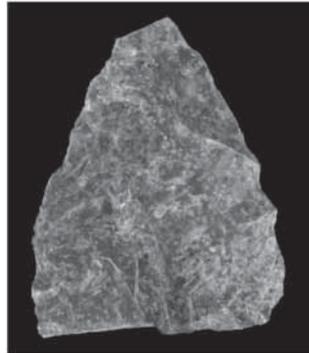


Fig. 11: SiS.19.33.16, arrowhead.



Fig. 9: SiS.19.33.14, 'triangular cake'.



Fig. 12: SiS.19.33.17, 'triangular cake'.



Fig. 13: SiS.19.33.18, tripod.



Fig. 16: SiS.19.33.22, indetermined fragment.



Fig. 14: SiS.19.33.20, arrowhead.



Fig. 17: SiS.19.33.24, slag.

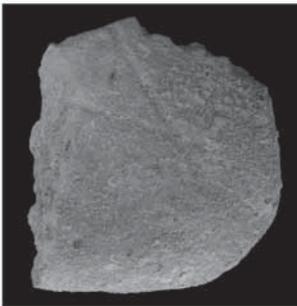


Fig. 15: SiS.19.33.21, 'triangular cake'.



Fig. 18: SiS.19.33.25, seal.



Fig. 19: SIS.19.33.26, pebble.



Fig. 22: SIS.19.33.29, indetermined fragment.

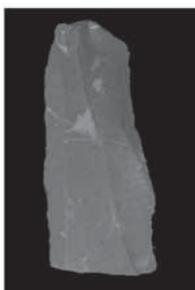


Fig. 20: SIS.19.33.27, blade.



Fig. 23: SIS.19.33.31, 'triangular cake'.

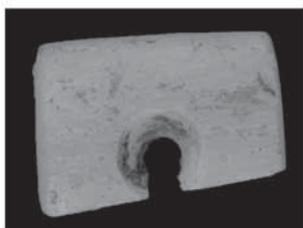


Fig. 21: SIS.19.33.28, perforated disc (squared).



Fig. 24: SIS.19.33.33, core blade.



Fig. 25: SiS.19.33.34, slag.



Fig. 28: SiS.19.33.37, clay rectangular bar (?).



Fig. 26: SiS.19.33.35, token.



Fig. 29: SiS.19.33.38, indetermined object.

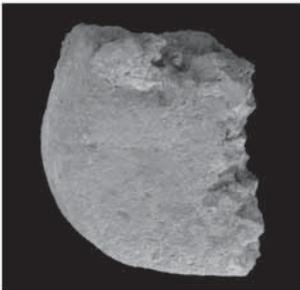


Fig. 27: SiS.19.33.36, 'triangular cake'.



Fig. 30: SiS.19.33.39, 'triangular cake'.



Fig. 31: SiS.19.33.40, residual stone.

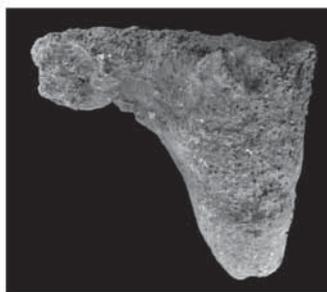


Fig. 34: SiS.19.33.44, tripod.



Fig. 32: SiS.19.33.41, anthropomorphic figurine.

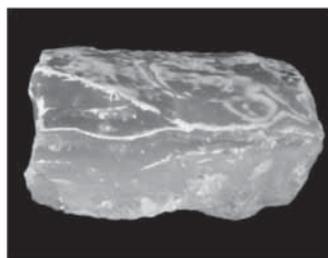


Fig. 35: SiS.19.33.46, blade.



Fig. 33: SiS.19.33.43, bone awl.



Fig. 36: SiS.19.33.47, animal figurine (ox).

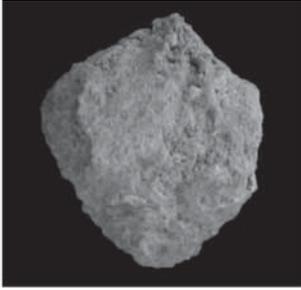


Fig. 37: SIS.19.33.48, indetermined fragment.



Fig. 40: SiS.19.33.52, indetermined fragment.



Fig. 38: SiS.19.33.49, spherical counter.



Fig. 41: SiS.19.33.54, anthropomorphic figurine.

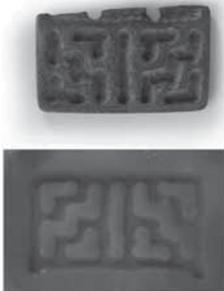


Fig. 39: SiS.19.33.50, seal.

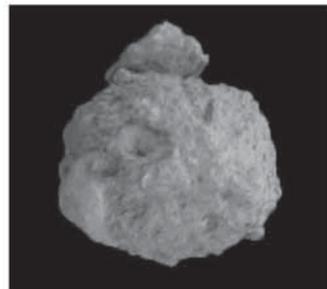


Fig. 42: SiS.19.33.55, slag.

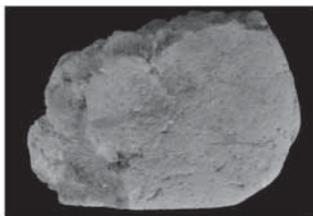


Fig. 43: SiS.19.33.56, 'triangular cake'.



Fig. 46: SiS.19.33.82, residual flint.



Fig. 44, SiS.19.33.58, weight.



Fig. 47: SiS.19.33.87, grindstone.

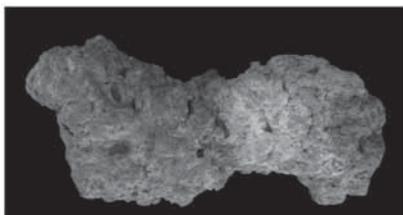


Fig. 45: SiS.19.33.79, animal figurine.



Fig. 48: SiS.19.33.88, grindstone.



Fig. 49: SiS.19.33.92, sphendonoid counter.



Fig. 52, SiS.19.33.101, seal.



Fig. 50: SiS.19.33.93, body vessel.



Fig. 53: SiS.19.33.104, flint nucleus.



Fig. 51: SiS.19.33.100, stone ax.



Fig. 54: SiS.19.33.105, lisciator.



Fig. 55: SiS.19.33.106, lapislazuli bead.



Fig. 58: SiS.19.33.114, grindstone.

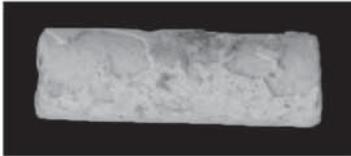


Fig. 56: SiS.19.33.107, bead.

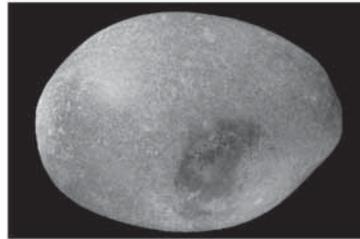


Fig. 59: SiS.19.33.116, polisher.

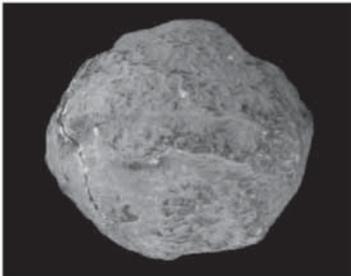


Fig. 57: SiS.19.33.108, spherical counter.

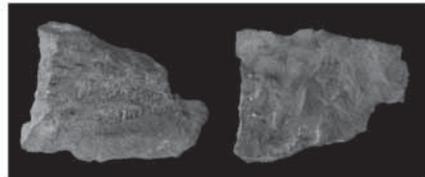


Fig. 60, SiS.19.33.119, sealing.



Fig. 61: SiS.19.33.120, 'triangular cake'.

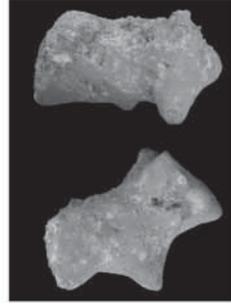


Fig. 64: SiS.19.33.124, animal figurine.

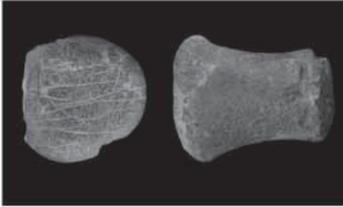


Fig. 62: SiS.19.33.121, pestle.

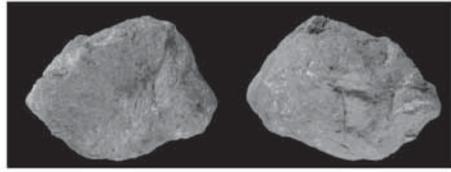


Fig. 65: SiS.19.33.125, cretula with impression.

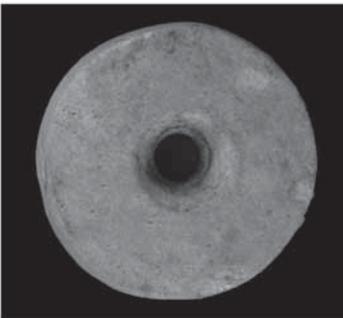


Fig. 63: SiS.19.33.122, perforated disc.



Fig. 66: SiS.19.33.126, cart wheel.



Fig. 67: SiS.19.33.128: animal figurine.



Fig. 70: SiS.19.33.132, cretula.



Fig. 68: SiS.19.33.129, sealing.



Fig. 71: SiS.19.33.138, spondonoid counter.

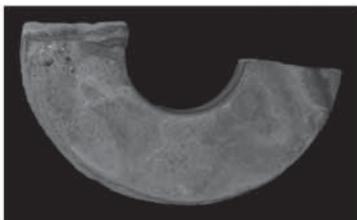


Fig. 69: SiS.19.33.131, perforated disc.

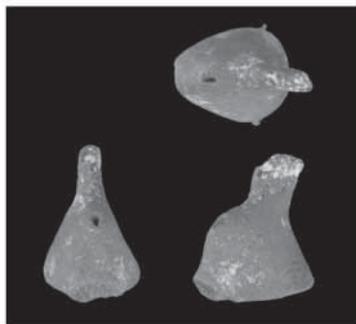


Fig. 72: SiS.19.33.145: animal figurine.



Fig. 73: SIS.19.33.148, grindstone.



Fig. 76: SIS.19.33.157, counter with numerical signs.



Fig. 74: SIS.19.33.155, cretula with impression.



Fig. 77: SIS.19.33.158, sealing.



Fig. 75: SIS.19.33.156, sealing.

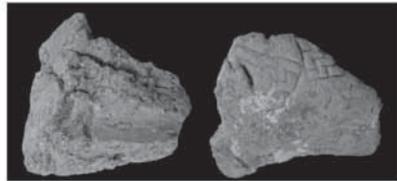


Fig. 78: SIS.19.33.159, sealing.



Fig. 79: SiS.19.33.160, sealing.

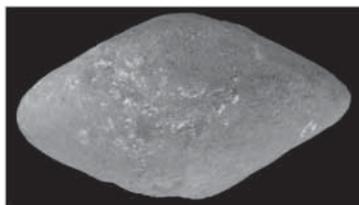


Fig. 82: SiS.19.33.176, sphenonoid counter.

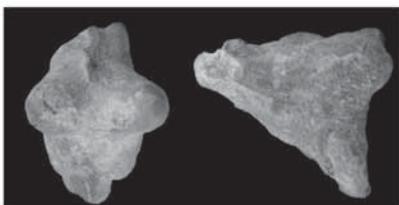


Fig. 80: SiS.19.33.162, animal figurine.



Fig. 83: SiS.19.33.181, bronze tool.



Fig. 81: SiS.19.33.170: cretula.



Fig. 84: SiS.19.33.182, spherical counter.



Fig. 85: SiS.19.33.183, spherical counter.



Fig. 88: SiS.19.33.187, arrowhead.

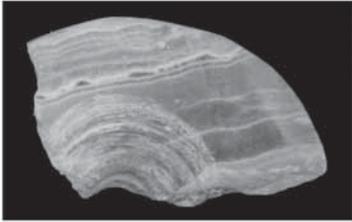


Fig. 86: SiS.19.33.184, perforated disc.



Fig. 89: SiS.19.33.190, blade.

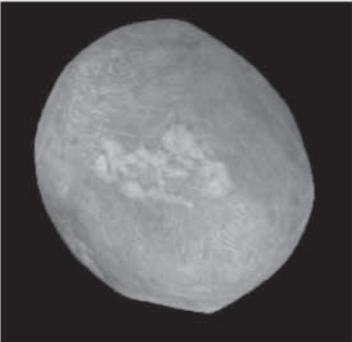


Fig. 87: SiS.19.33.185, spherical counter.



Fig. 90: SiS.19.33.191, cretula with impression.



Fig. 91: SiS.19.33.192, cretula with impression.



Fig. 94: SiS.19.33.197, cretula with impression.



Fig. 92: SiS.19.33.195, cretula with impression.



Fig. 95: SiS.19.33.203, spherical counter.

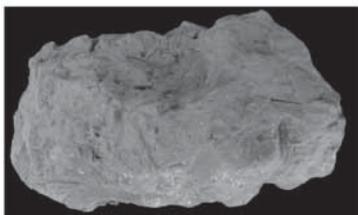


Fig. 93: SiS.19.33.196, cretula with impression.



Fig. 96: SiS.19.33.205, spherical counter.



Fig. 97: SiS.19.33.206, token.



Fig. 101: SiS.19.33.215, indetermined object.



Fig. 98: SiS.19.33.207, weight.

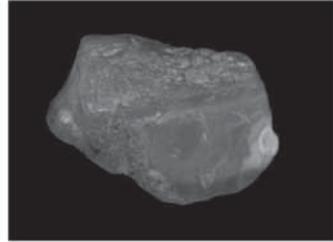


Fig. 102: SiS.19.33.224, residual stone.



Fig. 99: SiS.19.33.211: bone tool.



Fig. 100: SiS.19.33.214: indetermined object.



Fig. 103: SiS.19.33.226, spherical counter.



Fig. 104: SiS.19.33.228, polisher.



Fig.105:SiS.19.33.230, arrowhead.



Fig.107: SiS.19.33.233:bone tool



Fig. 106: SiS.19.33.231, bone spatula.



Fig. 108: SiS.19.33.235, bone pin.

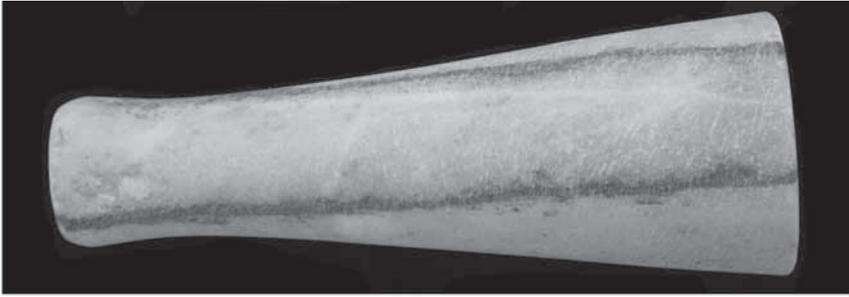


Fig. 109: SiS.19.33.236: cosmetic vial.



Fig. 110: SiS.19.33.237, bone awl.



Fig. 111: SiS.19.33.238, bead.



Fig. 113: SiS.19.33.242: arrowhead.



Fig. 112: SiS.19.33.240, stone figurine.



Fig. 114: SiS.19.33.245, animal figurine.



Fig. 115: SIS.19.33.247, animal figurine.

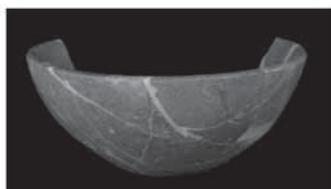


Fig. 118: Sis.19.33.266, vessel.



Fig. 116: SIS.19.33.253, token.



Fig. 119: Sis.19.33.267, blade.



Fig. 117: SiS.19.33.264, bead.



Fig. 120: SiS.19.33.268, bone awl.



Fig. 121: SiS.19.33.269, bronze tool.



Fig. 123: SiS.19.33.293, clay rectangular bar.

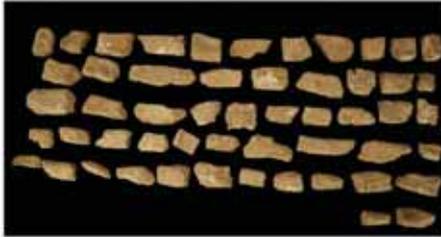


Fig. 122a: SiS.19.33.292a, clay rectangular bars.



Fig. 124: SiS.19.33.294, clay rectangular bar.

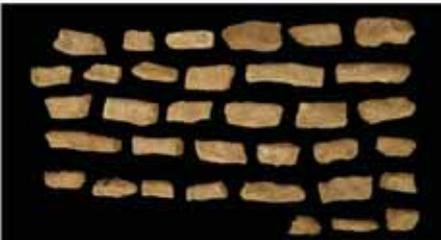


Fig. 122b: SiS.19.33.292b, clay rectangular bars.



Fig. 125: SiS.19.33.295, clay rectangular bar.



Fig. 126: SiS.19.33.296, clay rectangular bar.

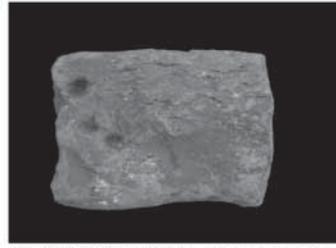


Fig. 129: SiS.19.33.299, clay rectangular bar.

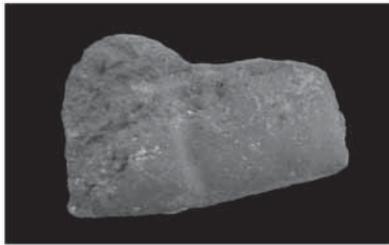


Fig. 127: SiS.19.33.297, clay rectangular bar.

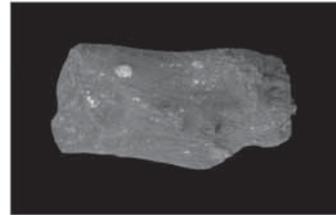


Fig. 130: SiS.19.33.300, clay rectangular bar.



Fig. 128: SiS.19.33.298, clay rectangular bar.



Fig. 131: SiS.19.33.301, clay rectangular bar.



Fig. 132: SiS.19.33.302, clay rectangular bar.



Fig. 135: SiS.19.33.306: polisher.

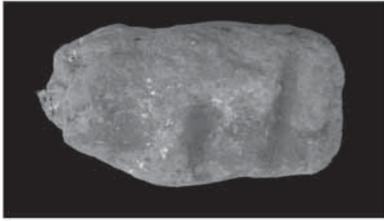


Fig. 133: SiS.19.33.303, clay rectangular bar.



Fig. 136: SiS.19.33.309, animal figurine.



Fig. 134: SiS.19.33.304, clay rectangular bar.



Fig. 137: SiS.19.33.311: animal figurine.



Fig. 138: SiS.19.33.313, 'triangular cake'.



Fig. 141: SiS.19.33.316, sealing.



Fig. 139: SiS.19.33.314, bone tool.

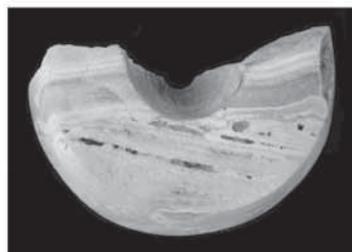


Fig. 142: SiS.19.33.318, perforated disc.



Fig. 140: SiS.19.33.315, spherical counter.



Fig. 143: SiS.19.33.319, bead.



Fig. 144: SiS.19.33.321, nucleus.



Fig. 147: SiS.19.33.329, Body (?) vessel.

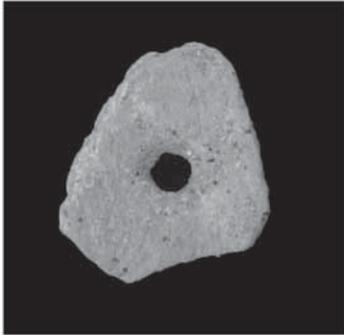


Fig. 145: SiS.19.33.322, discoid (?) spindle-whorl.

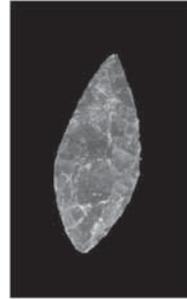


Fig. 148: SiS.19.33.333, arrowhead.



Fig. 146: SiS.19.33.324, grindstone.



Fig. 149: SiS.19.33.335, lisciator.



Fig. 150: SIS.19.33.336, slag.



Fig. 153: SiS.19.33.360, bone awl.



Fig. 151: SiS.19.33.337, clay rectangular bar (?).



Fig. 154: SiS.19.33.364, body vessel.



Fig. 152: SiS.19.33.359, spherical counter.



Fig. 155: SiS.19.33.368, spherical counter.

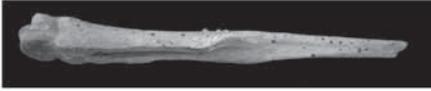


Fig. 156: SiS.19.33.370, bone awl.



Fig.159:SiS.19.33.374,inlayfragment.



Fig. 157: SiS.19.33.371, lisciator.



Fig. 160: SiS.19.33.377, anthropomorphic figurine.

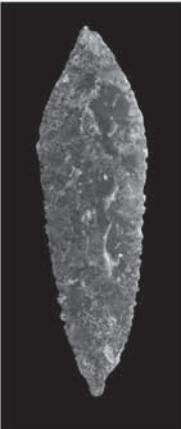


Fig. 158: SiS.19.33.373, arrowhead.



Fig.161: SiS.19.33.378, wooden handle.

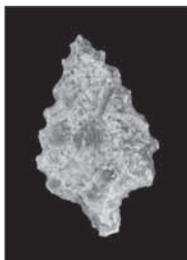


Fig. 162: SiS.19.33.379, arrowhead.



Fig. 165: SiS.19.33.384, bone tool.

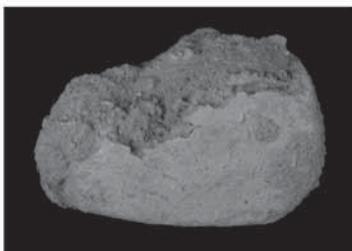


Fig. 163: SiS.19.33.380, 'triangular cake'.



Fig. 166: SiS.19.33.385, ovoid weight with flat ends.



Fig. 164: SiS.19.33.383, bone spatula.



Fig. 167: SiS.19.33.386, fishing hook.

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Understanding the Dead. Preliminary Results of Data Analysis and 3D-Visualization at the Shahr-i Sokhta Graveyard

Ratko Krvavac

**LMU Ludwigs-Maximilians University
Institute of Near Eastern Archaeology**

ratko.krvavac@gmail.com

Abstract

The Graveyard of Shahr-i Sokhta in Sistān, Iran, is one of the largest in the ancient Near East, with up to 40,000 undisturbed, mostly individual burials. An average of seven finds per burial (up to 50 in some cases), mainly ceramics, have been recovered. Since 1972, over 1,000 graves have been excavated and descriptions have been published in many cases. The central feature of this research is the use of multivariate/statistical analysis to identify the Graveyard's groupings and interpret the results. Various types of ceramics with a range of decorative motifs, such as Pear-Shaped Beakers and Truncated-Conical Bowls, as well as imported Emir Grey and Namazga Ware, are of primary interest regarding the period 3200-1800 BC. The finds themselves and their relative position, the skeletal position, and the distance between the burials are understood as vectors of information

in a multi-dimensional space. These calculated groupings can be interpreted chronologically, chronologically and sociologically. The approach to burials reflects a living society and the circulation of individuals in an interregional sphere. To deal with such immense data sets from a number of campaigns, proper digitisation and mapping of the excavated quadrants are essential. Programs such as CAD, GIS or CAPCA offer the possibility of visualising the results with an additional focus on 3D SfM Modelling.

1. Geography, geology, research history and project framework

The Graveyard of Shahr-i Sokhta,¹ the ‘Burnt City’, is immense. According to conservative estimates, it houses at least 20,000 and possibly more than 40,000 burials,² surpassing by far sites such as Gonur Tepe or Shahdad³ in the Indo-Iranian Borderlands. It has an area of approximately 30 ha⁴ and is situated to the southwest of the main settlement area (Fig. 1), from which it is separated by a small dry lake, evidenced by sedimentary deposits. Shahr-i Sokhta is located in Sīstān, which got its name from the Scythians, in the easternmost part of Iran in one of the deepest points of the western Helmand Basin. Here lies the inland delta of the Helmand River, rising in the Hindu Kush, which once formed a large lake (Lake Hāmūn), with today’s sparse remains to the north. In Old Persian, the area was probably called *z-r-k* (i.e. Zranka), while in Ancient Greek it was Drangiana, meaning ‘sea land’.⁵

Aeolian processes can be identified, alternating with sometimes very humid situations in the Neogene and Quaternary.⁶ The surface has thus been affected by both wind erosion⁷ and water erosion,⁸ seen in the desert area on the edges of the

1. Shahr-i Sokhta is occasionally shortened to SIS in the text.

2. Piperno - Salvatori (2007: 9) estimate 20,000 burials, Sajjadi (2003: 21) 25,000-40,000, and Bonora *et al.* (2000: 495) the most pessimistic with 18,000.

3. Gonur Tepe is believed to have over 3,000 burials (Sarianidi 2007), while Shahdad has 382 excavated graves and possibly several thousand (Hakemi 1997 and Götzelt 2002: 455).

4. On the extent of the Graveyard, see Sajjadi 2003: 23, fig. 2; Piperno - Salvatori 2007: 9.

5. Schmitt 1996: 534-537.

6. Jux - Kempf 1983: 45ff.

7. Sistan is estimated to have 120 days per year of wind from the north.

8. Erosion channels due to the infrequent but intense rains.

remaining buttes.⁹ These are remnants of the erosion caused by the Hirmand's tributaries to the former lake shore, on which the site of Shahr-i Sokhta lies. Today they reach heights of over 30 m above the surrounding terrain.

Geologically, the undisturbed layers within the Graveyard vary.¹⁰ Fine to medium-fine gravel and crushed stone are mainly recognisable on the surface and on the upper edge of the excavated profiles to a depth of 0.40 m (Fig. 2), which in some cases has protected the hill from the above-mentioned erosion. This natural stratum is often followed by a sometimes hard and salty clay layer with a thickness of up to 0.60 m, which in many cases lies on top of a further layer of gravel and crushed stone, which can also be up to 0.50 m deep. Another layer of looser clay with a thickness of 0.40-0.50 m follows. However, the sequence of layers in the area varies widely, and fine sand can often be found at ca. 1.00 m below the surface. These circumstances sometimes have an intense impact on the finds, affecting the bones the most. The anthropological finds, which on average lie at a depth of 0.80-1.00 m, but can also be deeper than 2.00 m, are better preserved in a softer environment than in a harder one. In some situations, the bones are reduced to a powder.¹¹ There are also extreme cases where the buried material is incrustated with the adjacent soil due to the capillary effect and the resulting salination.¹²

Although the excavation of the settlement by IsMEO (later IsIAO) under Maurizio Tosi began in 1967, it was 1972 when the first excavation work on the Graveyard started. Unlike the settlement area, which is often littered with ceramic sherds due to aeolian weathering, no discoveries were observed on the surface of the Graveyard. The remarkable point about this area is the absence of any recent destruction, a key scientific research requirement. The first Italian investigations lasted until 1978 under Marcello Piperno¹³ and uncovered 230 graves with over 300 burials in an area of 3000 square metres. 1997 saw the start

9. Jux - Kempf 1983: 28ff.

10. Sajjadi 2003: 21ff.

11. In strong winds, it is hard not to inhale the bones if the powder is blown into your face while excavating.

12. See G9509 A and G9509 B (fig. 4 and fig. 21).

13. Piperno - Salvatori 2007: 9.



Fig. 1: distribution of use areas of Shahr-i Sokhta and central archaeological operations (based on Sajjadi 2003: 23, fig. 2).



Fig. 2: the eastern profile of square NFG showing the geological layers around a grave, which burial chamber edge (Grave Type 4 - Catacomb) can be seen reaching downwards from the surface to the left of the 2 m scale (compare fig. 22 c) (photo KRVAVAC by 2018).

of new excavations in the Graveyard, which continue to this day, with more than 700 more graves excavated under the overall direction of Sayyed Mansur Sayyed Sajjadi (ICHTO and RICHT). An international interdisciplinary archaeological campaign has been conducted since 2016 under the direction of Enrico Ascalone (MAIPS¹⁴). The present author participated in person in these campaigns as part of his PhD thesis.¹⁵

The project consists of collecting as much archaeological information as possible from the excavation area and the relevant storage facility. Of course, the emphasis was on the burials and finds from the Italian excavations of 1972-1978, many of which have been the subject of publications, most importantly M. Piperno and S. Salvatori (2007), who state that ‘a detailed specification of the grave objects taphonomy might encourage and facilitate further and deeper analysis of their functional significance and the importance of ritual order which often seems to be the case’.¹⁶ In this spirit, the results of the present author’s PhD thesis will include an assessment of the data which will hopefully be of use for future archaeological work.

14. MAIPS - Multidisciplinary International Archaeological Project at Shahr-i Sokhta directed by Prof. Enrico Ascalone.

15. Prof. Adelheid Otto and Prof. emer. Michael Roaf of the University of Munich/Germany, LMU Ludwigs-Maximilians-University, Institute of Near Eastern Archaeology, are supervising the PhD thesis, entitled ‘Moving Societies – Multivariate Analysis of the Graveyard of Shahr-i Sokhta’. <https://www.en.vorderas-archaeologie.uni-muenchen.de/persons/phd-students/krvavac/index.html> (01.03.2021).

Fortunately, it was possible to participate in the Graveyard excavations in 2018 and 2019. Unfortunately, for administrative reasons, access to the storage facilities housing the finds from the excavations of the last century was not possible, which is why a rescheduling was necessary and it was decided to concentrate on the discoveries from the most recent campaigns.

Heartfelt thanks are due to Enrico Ascalone and Seyyed Mansur Seyyed Sajjadi, who made it possible to participate in the archaeological campaigns in Shahr-i Sokhta, as well as to all the colleagues and friends of the excavation team for the many scientific discoveries, cultural impressions, adventures and delightful hours spent.

2. Investigations during the 2018 and 2019 Seasons in the Graveyards

In the 2018 campaign, excavations continued in Graveyard¹⁷ square NFG (Fig. 3), where two graves, G9500 and G9501, had already been found. A further 8 graves containing 13 burials, G9502, G9503, G9504, G9505 A, G9505 B, G9505 C, G9506 A, G9506 B, G9507, G9508 A, G9508 B, G9509 A and G9509 B, were recognised. These were at different depths, the maximum being 2.15 m (478.40 m above sea level), and belonged to grave types 2 and 4.¹⁸ In grave G9509,¹⁹ a catacomb (grave type 4) measuring ca. 2.50 m (S-N) x 1.50 m (Fig. 4), two individuals were found, probably a mother (G9509 A) and her child (G9509 B), on the basis of the anthropological data.²⁰ Stratigraphic observation reveals that the two knees/*Patellae* of G9509 A touch the two ischial bones of the hip/*Oses ischiae* of G9509 B, and there is a ca. 1 cm gap between the two skulls/*Craniae*. Thus, the two individuals must have been buried at the same time or in immediate succession, because the anthropological *in situ* position of G9509 A shows that

17. Rajab Mohammad Zaruri has been in charge of the Graveyard excavations for years, and he and his team deserve the warmest thanks.

18. Sajjadi 2003: 26ff fig. 4 and Piperno - Salvatori 2007: 17 fig. M.

19. Graves G9509 A and G9509 B were excavated in order to create a 3D-Structure for the SfM Model (see Fig. 20).

20. The anthropological recovery and conservation of the burials discovered during the 2018 season were undertaken by Iranian researchers assisted by the present author and Serena Siena, to whom I extend my sincere thanks for her excellent cooperation and deep insight into anthropology.



Fig. 3: a) CAD-Plan of the Graveyard's main Excavation Area with the Italian (green) and Iranian (purple) Investigations. b) Detailed and partly 'Corrected' Position of the Examinations in the Northern Part (Compare Fig. 18). c) Detailed part of Square IRV showing the different layers created by merging all information, as structure, skeletal, finds, Decoration Motifs and further.

G9509 B was not disturbed. An alabaster vessel under the right elbow of G9509 A is the only sign that it was moved when G9509 B was enclosed. Both individuals were placed in a foetal position facing south with their heads facing east, B in front of A. A is a young adult (up to 30 years) and B an older child (8-12 years). Their bones were in generally good condition, except the western ones, the upper surface of which, as already described, was mainly covered by a calcined layer up to 2 cm thick.

A total of two alabaster vessels were found, first as described and the other on the southern edge of the grave. Furthermore, two Pear-Shaped Beakers were found on the burial's southern edge and two Biconical Small Jars on its western

edge. The separate burial G9504, which was of a male and was positioned above the other two, could be regarded as the third part of the family.²¹

A further 14 graves were discovered in square NAQ: G9600, G9601, G9602, G9603, G9604, G9605, G9606, G9607, G9608, G9609, G9610, G9611, G9612 and G9613, of which two were empty, and one was of a dog. Burial G9606²² (Fig. 5) is of grave type 1 with the shape of a simple oval pit. Its edges were recognised at a depth of ca. 1.80 m. The human remains have a southeast-to-northwest orientation, measuring roughly 1.60 m (SE-NW) x 0.70 m. The foetal position is found again, this time with the head in the southeast facing northeast. Fortunately, the bones were in excellent condition except for the left hip/*Os ischium sinisterum*. The right hand/*Manus dextra*, with a sharply bent arm/*Membrum superius dextrum*, was found under the lower jaw/*Mandibula*, while the left was placed on the hip. Unfortunately, no artefacts were found, which makes dating very difficult. The individual was approximately 1.80 m tall, and anthropological analysis determines the sex as male, with a provisionally estimated adult age of 20-30 years. Due to the lack of grave goods, this grave could not be directly associated with any other burial.

3. Tachymetric survey and examination of the Graveyard for the creation of a CAD-based Plan

Topographic coordinates are essential for the proper use of a tachymetric plan based on CAD (Computer-Aided Design), as well as for 3D SfM Modelling and GIS and other software. In the course of the research and via contact with past and present excavation participants, it became apparent that only local coordinates were available. Fortunately, the excavation's topographer²³ helped to measure several points more precisely.²⁴

21. Dating the burial is difficult because the vessels are highly incrustrated.

22. G9606 was excavated by the present author in order to create a 3D Structure from Motion (SfM) Model (see Fig. 21).

23. Thanks are due to Giuseppe Minaya.

24. Special thanks are due to the Institute of Near Eastern Archaeology of the LMU and Prof. Adelheid Otto for the loan of the Leica Flexline TS06 R500 Plus Total Station for the 2019 Season.



Fig. 4: Square NFG - G9509 A and G9509 B (Compare 3D-Model Fig. 20) (photo M. Rahmani 2018).

Firstly, these include the central fixed points of the coordinate system, each quadrant of which measures 250 m along the edge, established by the Italian campaigns of the 1960s and 1970s and marked with concrete blocks. Secondly, the edges of the main excavation squares were traced during the Italian campaigns of 1972-1978 and the Iranian campaigns of 1997-2018. The third part of the data collection concerned the reference points for the 3D SfM Modelling of the newly discovered burials in the NAQ and NFG squares.

In total, over 450 different measurement points were recorded. Due to the lack of local reference points, it was necessary to take measurements with reference to the concrete blocks, in some cases at distances of over 750 m, in order to ensure their accuracy. In addition, verification measurements were taken in order to minimise the inaccuracy of measuring over large distances, which is mainly seen on the topographic DEM (Digital Elevation Model) (Fig. 6). In the end, these were performed by the present author with the prism attached to the tripod, as human assistance would have been too imprecise.



Fig. 5: Square NAQ - G9606 (Compare 3D-Model Fig. 21) (photo M. Rahmani 2018).

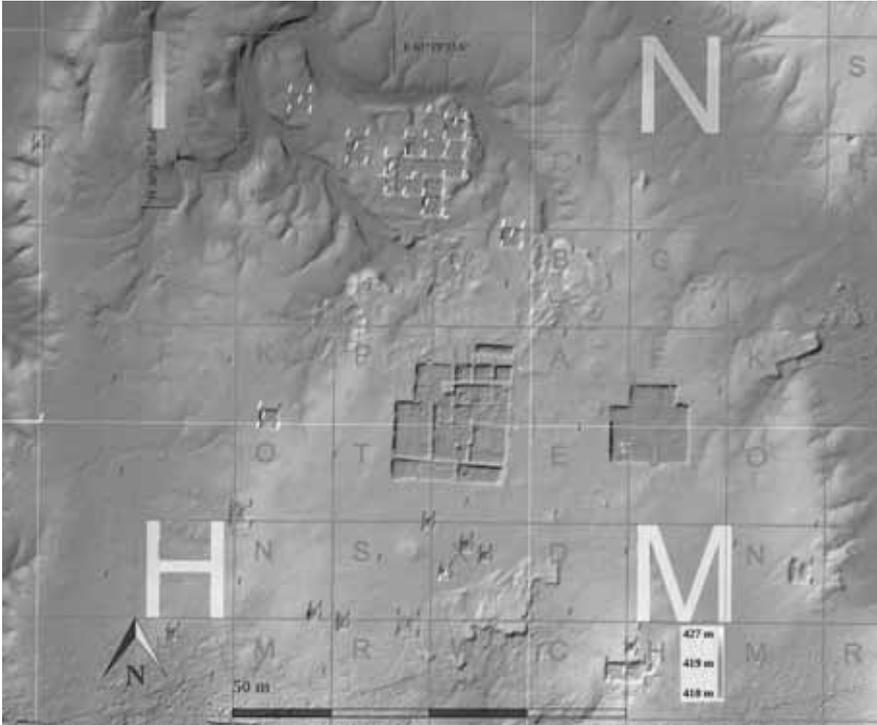


Fig. 6: DEM (Digital Elevation Model) shows the graveyard's northern topographic section and measured different tachymetric points (green, purple, grey) for various uses.

The work helped complete the digital mapping of the Graveyard, which the present author started and developed as part of his PhD thesis, initially focusing on the 1972-1978 Italian campaigns. By scanning various published plans,²⁵ the excavated squares and the burials' exquisite drawings, the framework was laid for the creation of a detailed CAD-based plan. The individual burials' correct position, together with their shape, bone remains and artefacts, were each placed in separate CAD layers in order to handle them as desired. Special attention was paid to the various ceramic forms, especially the decorative motifs,²⁶ which occur in large quantities and can provide accurate information about the time

25. Especially Piperno - Salvatori 2007.

26. Decorative motif will occasionally be shortened to DM in the text.

and type of use. Above all, the digital mapping enables data to be exported for use in GISs and other formats, and it optimises the integration of metadata with georeferencing for the visualisation of complex results. The site's division into a grid composed of squares measuring 250x250 m, 50x50 m and 10x10 m,²⁷ the smallest labelled with three letters, is highly commended. The same applies to the documentation of the finds, which was designed with this in mind, and the graves are labelled with reference to the 10 m squares, a system which is still applied by Iranian researchers today. Unfortunately, due to the enormous distances, their measurement caused problems because, on the one hand, the primary excavation grid is turned clockwise by about 0.49° to the north-south axis. On the other hand, the Graveyard's excavated squares are partly offset by up to 10 m in various cardinal directions. This issue makes it harder to geographically combine the various plans of the different excavation campaigns within a CAD environment, and above all to use applications supported by Global Positioning Systems such as QGIS (Quantum Geographic Information System).

The digital mapping was designed to be able to integrate new information as needed. However, because an essential aspect of the PhD thesis was the receipt of the latest .dwg files that Iranian colleagues had created with all the tombs excavated up to 2016 during the Iranian excavations, the individual CAD layers had to be synchronised. The synchronisation is possible because the same essential grid and coordinate system was used throughout the excavation campaigns.²⁸ In combination with each tomb's scanned drawings, each feature's correct position can be digitised and added to the existing scheme, creating a complete digital plan of the Graveyard. In this way, the excavated burial and settlement areas can be compared because the people who lived in the settlement were buried in the Graveyard, thereby establishing a connection between them.

27. Piperno - Salvatori 2007: 16 fig. L

28. Biscione et al. 1974: 32 fig. 5; Tosi 1983: fig. I; Piperno - Salvatori 2007: 16 fig. L; Sajjadi - Moradi 2015: 78 fig. 1a.

4. Study of the Artefacts

The pottery found in the Shahr-i Sokhta Graveyard (1123 finds) is highly varied and displays a variety of forms, with Truncated-Conical Bowls and Pear-Shaped Beakers being the most common, followed by Cylindrical-Conical Bowls, Biconical Small Jars and Ogival Jars, as well as other rarer variants (Fig. 7).

These represent only the results of the 1972-1978 Italian excavation campaigns, which were recovered from squares HNE, HRY, HTW, HYC, HYH, HYT, INK, IPQ, IPV, IPW, IRC, IRD, IRL, IRM, IRQ, IRR, IRV, IRW, IRX, IUB, IUC, IUP, IUQ, IUR, IUU, IWC, IWD, LNX, LSD and LSI.²⁹ The finds include imported Emir Grey Ware³⁰ from Southern Central Asia,³¹ Mundigak,³² Tepe Yahya/Bampur³³ and Nal.³⁴ In the published literature, settlement finds play the lead role in establishing the chronology and interregional contacts. Unlike the settlement finds, which are mostly fragmentary, the Graveyard pottery almost always consists of whole vessels deposited as unused grave goods. Thus, the Decorative Motifs, including secondary motifs and potter's marks, are exceptionally recognisable, since they appear in hundreds of different variants from all periods, on thousands of ceramic vessels. Excellent scientific work has been done to catalogue the Decorative Motifs and classify them into coherent groups with individual numbering and codification,³⁵ establishing the basis for further scientific work, including statistical analysis. The Decorative Motifs developed more intensively than the ceramic types, of which however they are often characteristic (Fig. 8).

Unfortunately, access to the finds from the 1970s excavations was impossible for administrative reasons. Therefore, it was necessary to observe finds from more recent excavations, which show exactly the same vessels with the same

29. Piperno - Salvatori 2007: 11-15 fig. B-K.

30. Piperno - Salvatori 2007; see SIS-Graves G716/2, G731/36, G754/8.

31. Sarianidi 1983: 186f and Biscione 1984: 69ff; see SIS-Graves G114/7, G706/4, G722/2.

32. Piperno - Salvatori 1983: 188f; see SIS-Graves G725 Inf./22 and G731/55, G731/56 ('Brandy Cups').

33. Mutin - Lamberg-Karlovsky 2013: Fig. 3.109; see SIS-Graves G725 Inf./51, G725 Inf./52, G731/41.

34. Piperno 1979: 128; see SIS-Graves G10/1&2, G55 Inf./1, G413/5.

35. Piperno - Salvatori 2007: 353-379 Decorative Motifs and Biscione-Bulgarelli 1983: 228-258. Other literature deals with vessel construction and the classification and codification of decoration motifs. See Gyselen - Lerouge 1983, Pracchia 1984, Nalesini 1984 and Moradi 2009.

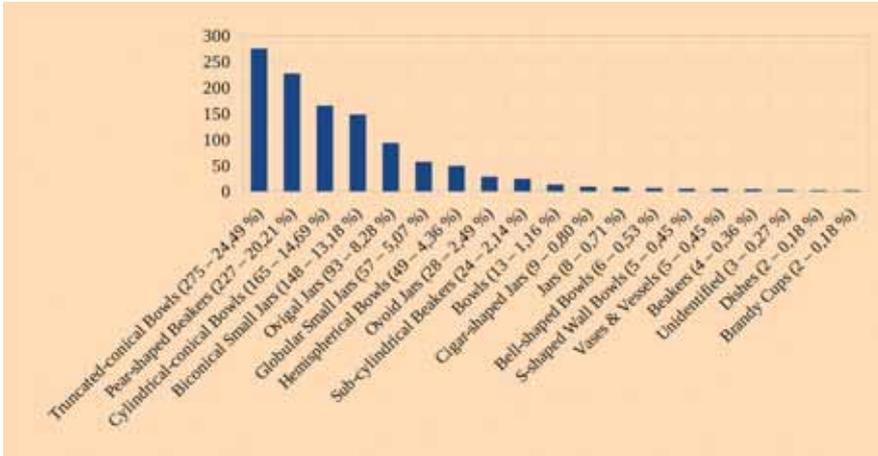


Fig. 7: total Ceramic Findings (1123) at the graveyard of Shahr-i Sokhta excavated by the Italian campaigns 1972-1978.

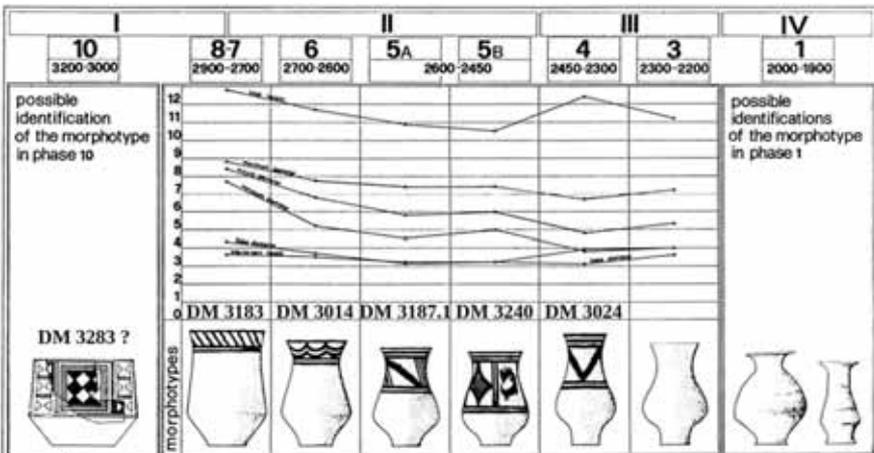


Fig. 8: chronological phases in correspondence with development of the Pear-shaped Beaker and its Decoration Motifs DM created with finds from the settlement (Vidale 1984: 88, fig. 11.7).

Decorative Motifs and also come from the Graveyard.³⁶ These include a Pear-Shaped Beaker of Phase 7 with a broad shape, large opening, rough surface and Decorative Motif DM 3183 (Fig. 9), and another Pear-Shaped Beaker of Phase 4 with a narrow shape, narrow opening, smooth surface and Decorative Motif DM 3240 (Fig. 10). The Truncated-Conical Bowl, relatively tall with a small opening, smooth surface and Decorative Motif DM 3015, belongs to Phase 6 (Fig. 11). The three vessels are in Buff Ware.

Given the intense anthropological interest, genetic, C-14 and strontium samples were taken from the accessible bone material of the deposit,³⁷ with a view to determining the exact archaeological age, individual age, sex and possible kinship relations. In total, samples were collected from 47 burials, mainly from the 1997-2003 excavations, except for one from 1977, of which eight samples were taken to Italy for intensive study. The selection criteria were mainly the type of pottery and the presence of a cylinder seal, and the age and sex of the deceased.

5. ‘Moving Societies - Multivariate Analysis of the Graveyard of Shahr-i Sokhta’: application of multivariate/statistical methods: preliminary results

A range of multivariate statistical analyses, such as seriation, correspondence analysis, cluster analysis and others, can be applied in various fields of archaeology, ‘die entweder auf chronologische, chorologische (= geographische) oder sozialen Faktoren basieren’.³⁸ Basically, the material to be studied is classified into types, ‘as with all methods of numerical taxonomy’.³⁹ Knowledge of mathematical and statistical processes is essential,⁴⁰ and in order to handle the inevitable metadata, specialised programmes such as CAPCA⁴¹ and GIS software are necessary.

36. Special thanks to Hossein Moradi for his helpful cooperation and scientific comments.

37. Thanks are due to Pier Francesco Fabbri, especially for his insightful anthropological explanations, and Georgia Vincenti, who expertly collected the samples.

38. Janssen 2002: 225 (our translation from German) ‘based on chronological, chorological, geographical or social factors’.

39. Roaf 1983: 10.

40. Bartholomew *et al.* 2008: 41-51 regarding Roaf 1983.

41. Madsen 2021; Eggert 2012: 241 and Kneissel 2010. <https://www.archaeoinfo.dk/> CAPCA, which is an Excel macro explicitly written for archaeological purposes by an archaeologist and freely available, ‘performs Principal Component Analysis, Correspondence Analysis and Metric Scaling [in] a Microsoft Excel environment’. Institutions of the Prehistoric and Early Historic Archaeology of Europe offer outstanding subject-specific solutions in computer-assisted combination statistical methodology.



Fig. 10: PSB with DM 3240 from G1640 and Inv.no 17266 (photo Krvavac 2019).



Fig. 9: Pear-shaped Beaker with DM 3183 and Inv.no 17364 (photo Krvavac 2019).



Fig. 11: Truncated-conical Bowl with DM 3015 from G5116 and Inv.no 17305 (Compare 3D-Model Fig. 23) (photo Krvavac 2019).

Grave no.	Age - preliminary (by MNI)	Sex - preliminary (by MNI)	Area	Year of excavation	Genetical sample no. (at MNI)	C-14 Sample no. (at MNI)	Strontium sample no. (at MNI)	Strontium-134 sample no. (at MNI)	Strontium-87/86 ratio	Strontium-137/86 ratio	Strontium-138/86 ratio	Strontium-136/86 ratio	Strontium-135/86 ratio	Strontium-134/86 ratio	Strontium-137/86 ratio	Strontium-138/86 ratio	Strontium-136/86 ratio	Strontium-135/86 ratio	Notes
02725	Adult - 25+	F	UP	1977 (1773)	01.A	01.B	01.C											02725 was the only female skeleton found in the area of the excavation. It is associated with 02743 F.	
02612	MAPI	MAPI	UK	2000 (1779)	01.A	01.B	01.C											Cylinder base	
02733	Adult - 25+	F	UP		01.A	01.B												02733 was the only female skeleton found in the area of the excavation. It is associated with 02743 F.	
02806	Adult - 25+	F	UK	2002 (1881)	02.A	02.B	02.C											02806 was the only female skeleton found in the area of the excavation. It is associated with 02807 F.	
02807	Adult - 25+	M	UP	2002 (1881)	02.A	02.B												02807 was the only male skeleton found in the area of the excavation. It is associated with 02806 F.	
02908	MAPI	MAPI	UP	2002 (1881)	01.A	01.B	01.C											02908 was the only skeleton found in the area of the excavation. It is associated with 02909 F.	
04111	Adult - 25+	M F	UP	2003 (1882)	03.A	03.B	03.C											04111 was the only skeleton found in the area of the excavation. It is associated with 04112 F.	
04449	Subadult - 10-17?	M	UP	2003 (1882)	03.A	03.B	03.C											04449 was the only skeleton found in the area of the excavation. It is associated with 04450 F.	

Fig. 12: Anthropological samples of graves with high archaeological interest from the Seasons 1997-2003 for genetical, C-14 and Strontium-Analysis.

Specifically, analysis of graveyards has only recently been applied in Near Eastern Archaeology,⁴² the dissertation by Janssen 2015 being very inspiring. The pre- and protohistoric archaeology of Europe⁴³ has a much longer tradition in this respect and often employs innovative methodology.⁴⁴

As already indicated, the present author's PhD thesis is a reappraisal of the excavations of the Graveyard of Shahr-i Sokhta. The results of the Italian excavations of the period 1972-1978 are examined as a closed corpus. As far as possible, the results of the Iranian excavations conducted since 1997 will also be included in order to have a higher quantity of data. However, a scrupulous separation of the data sets is unavoidable, because although the two teams' documentation and publication systems generally coincide, there are differences.⁴⁵ Of particular value is the undisturbed situation of discovery. Moreover, the individual burials are rarely even disturbed by neighbouring ones, which indicates that they were placed with great care with respect to each other. Due to the Graveyard's long period of use, there must have been above-ground markers even for the oldest burials. Thus, each undisturbed grave ideally represents a 'geschlossenen Fund',⁴⁶ i.e. a kind of information capsule, sealed at the moment of deposition, and all the

42. Eickhoff 1993; Hachmann - Penner 1999 and Novák *et al.* 2000.

43. Eggert 2012: 203-241.

44. Gutschmidt - Schumann 2010 and Hausmair 2015.

45. Similarities include the description of the finds and the type of information provided, and the systematics and typology of the finds. The differences concern excavation, survey methods and above all the language of the publications.

46. Eggert 2012: 209 (our translation from German) 'finds in a closed association'.

information found therein can be related to the buried person and in a broader sense to his or her social environment. Concerning the very high quantity of all the aspects mentioned, qualitatively robust results are guaranteed.

The chronological result is of extraordinary interest. A burial takes place at an exact point in time and is thus fixed. In comparison, a ceramic vessel has a *period* of use. Pottery vessels, especially those with a Decorative Motif, are excellently suited to subtle chronological determinations, and these appear with all types in high quantities in the SIS Graveyard. Seriation is appropriate in these cases, based on the ‘unimodal model’, of ‘regelhaften Verhaltens, und zwar vom seltenen Auftreten über die höchste Verbreitungsphase hin zum Auslaufen des Typs’.⁴⁷ It is crucial that types, in this case, the Decorative Motifs, occur in high quantities and overlap in time, so that ‘aus der Kombination der in einer Einheit vorkommenden Typen auf deren relative Datierung geschlossen werden kann’.⁴⁸ The graves have mainly been dated on the basis of the settlement chronology and its pottery and other data, or by means of parallels with other sites. A suitable combination will make it possible to determine and, in some cases, correct the dating.

5.1. Seriation of the Graveyard Squares excavated during the Italian Campaigns of 1972-1978: HNE, HRY, HTW, HYC, HYH, HYT, INK, IPQ, IPV, IPW, IRC, IRD, IRL, IRM, IRQ, IRR, IRV, IRW, IRX, IUB, IUC, IUP, IUQ, IUR, IUU, IWC, IWD, LNX, LSD and LSI

To collect data for the PhD thesis, naturally, the people in charge of the 1972-1978 excavations and their documentation, Sandro Salvatori and Alessandra Lazzari, were contacted.⁴⁹ The extensive communication that followed guided the understanding of numerous issues. The documentation pertaining to the SIS Graveyard finds of 1972-1978, including the catalogue numbers and sizes of the

47. Janssen 2003: 227 (our translation from German) ‘regular behaviour, from the rare occurrence through the highest phase of distribution to the end of the type’.

48. Janssen 2015: 15 (our translation from German) ‘from the combination of the types occurring in a unit, their relative dating can be deduced’.

49. Special thanks to Sandro Salvatori for his valuable help and support, and to Alessandra Lazzari.

finds, dating and other important information, was converted into digital table⁵⁰ format in the 1990s. However, the analysis of the Graveyard presented in the PhD is mainly based on the Graveyard Catalogue dataset in M. Piperno and S. Salvatori (2007). Because there are discrepancies between the 1990s digital table and the publication, the entire table had to be reviewed and supplemented with the more detailed data from the later publication. Specifically, the numbering of the Decorative Motifs on the pottery had to be checked because there seem to have been varying versions over the course of the decades.⁵¹ In the end, more than 50,000 pieces of archaeological information on structures and finds were individually examined. Only the graves, called objects, together with the vessels with Decorative Motifs,⁵² are under consideration here, focusing on their central motif, considered as a variable.

In seriation, overlaps of objects and variables in at least two-fold combinations are necessary. That means that a burial (object) must contain at least two vessels with different Decorative Motifs (variable) and that the same Decorative Motif must appear on vessels in at least two burials to continue the chain of correspondence with further objects and variables.⁵³ If these conditions are not met, the burials and Decorative Motifs containing the information are mathematically eliminated. In addition, a weighting of individual characteristics is possible: ‘Bei beiden [...] Verfahren - Korrespondenzanalyse und Seriation - handelt es sich um das multivariate statistische Verfahren (Kombinationsstatistik), die dazu dienen, eine zunächst schwer überschaubare Datenmenge nach Ähnlichkeiten bezüglich der

50. Its abbreviation is ‘SSINV’, corresponding to Shahr-i Sokhta INVentario (Italian) or INVentry (English). A small part of the table can be seen in Cortesi *et al.* 2008: 19 Table 2.

51. Piperno and Salvatori 2007: 353-379, Decorative Motifs, and Biscione - Bulgarelli 1983: 228-258, Catalogue. On closer observation, some code numbers used in the cataloguing of the Decorative Motifs in the various publications are seen to have been skipped, probably for editorial reasons. The SSINV record follows its own numbering, with only partial correspondence to the publications.

52. On various types of vessels, the same Decorative Motifs appear repeatedly and are grouped. In general, the well-known Italian mineral water brand ‘San Pellegrino’, founded in 1899, serves as an example. The distinctive logo and bottle shape changed over time, depending on needs, content, quantity, fashion, etc., but the overall appearance is unmistakable.

53. As an exception, if there is only one variable, it can be duplicated rather than eliminated, but only if there is a high quantity of the same variable elsewhere in the dataset.

Vergessenschaftung zu ordnen'.⁵⁴ Of the original 177 graves and 277 decorative motifs, 91 and 71 are respectively related to each other after seriation (Fig. 13). In principle, the more diagonal the representation, the more coherent the correspondence, with the objects and variables placed in their rightful place.

Verification of the result is indispensable. For this purpose, the SSINV data set was used for the burials because 47 have already been dated to the various phases based on the settlement chronology (Fig. 13: Yellow column 'SSINV Dated 1999 - Graves (Phase)'). The remaining 44, which have not, are also now ordered since they are related to the previously dated ones (Fig. 13: Turquoise column 'Seriation 2021 Ordered - Graves'). Finally, an overall relative chronological sequence of burials can be obtained (Fig. 13: Yellow and turquoise column 'SSINV 1999 and 'Seriation 2021 Ordered - Graves (Phase)'). It is noticeable that the phase sequence is highly consistent, with individual outliers such as G0413, which was dated very early in SSINV, or G0712, which was dated very late. Ultimately, changes will probably have to be made here. An additional verification of the order is possible based on the excavation documentation for multiple burials. For example, 'the order of burial in this group of tombs may have been as follows from the earliest to the most recent: G 22 E (C); G 22 E (B); G 22 (A); G 22 D; G 22 A; G 22 B and C'.⁵⁵ The relative chronological sequence is correct, as shown by the fields marked in red (Fig. 13: Graves column 'Shahr-i Sokhta Graveyard – Italian Campaigns 1972-1978 Grave Number'), with G0022E - ABC as the oldest, G0022D in the middle and G0022B the most recent burial. Grave G0022A is excluded from the seriation because it has only one painted vessel and G0022C is

54. Janssen 2015: 15 (our translation from German) 'Both [...] methods - correspondence analysis and seriation - are multivariate statistical methods (combination statistics) that serve to sort an initially difficult-to-understand mass of data in accordance with similarities concerning the relationships'. For an example of seriation, see *ibid.* p.43 Abb. 6.

55. Piperno - Salvatori 2007: 62. Grave G0022E - ABC on p. 66f Figs. 118 and 119 plays a significant role. In addition to the non-inventoried vessel G22E/2 with DM 0055, which occurs only once in the entire data set and is thus eliminated, it contains the decisive vessel G22E/1 Inv. no. 6488 with DM 3183, which unfortunately only appears once, as in Graves G16/3 Inv. no. 6213, 54 Fig. 81 and G703/2 Inv. no. 7952 p.236f fig. 553. DM 3183 appears in Graves G0044 and G0749INF twice (G44/7 Inv. no. 6284 and G44/8 Inv. no. 6285, 99 fig. 197; G749 Inf./5 Inv. no. 8522 and G749 Inf./16 Inv. no. 8533 p. 318f, fig. 758 and fig. 759) and a total of 8 times in the whole data set. In order to keep G22E, given its important role in the data set, DM 3183 was mathematically duplicated, as in G0016, G0703 and G0746.

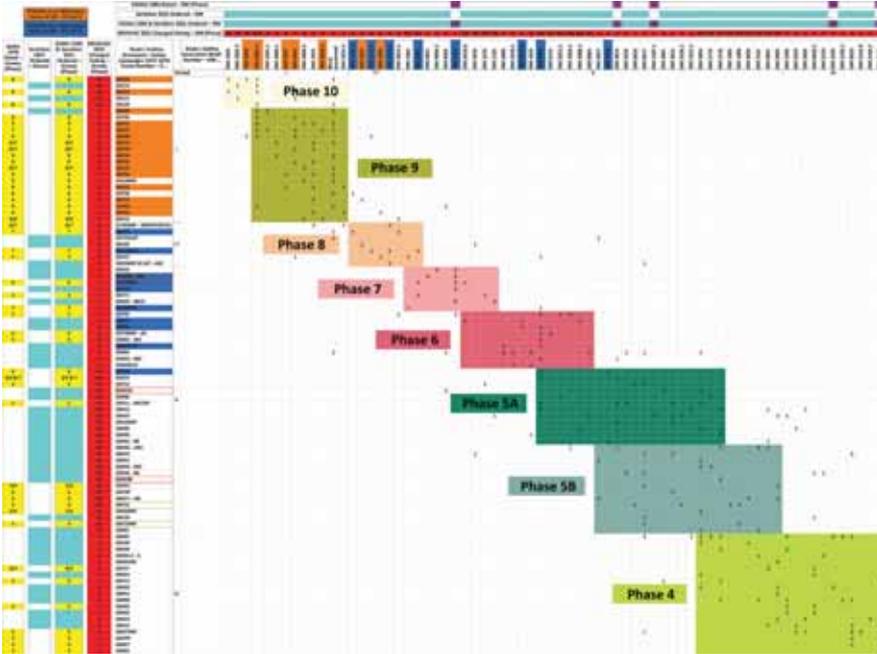


Fig. 13: seriation Table of Data based on Correspond Analysis of the Graveyard of Shahr-i Sokhta - Italian campaigns 1972-1978 (Grave- & Decoration Motif DM-Numbers according to Piperno - Salvatori 2007). Yellow fields: SSINV 1999 Dated - Graves (Phase) Dating by Settlement Excavation Data. Purple fields: Vidale 1984: 99 Fig. 11.7 - Fig. 8. Dated - Decoration Motif (Phase). Turquoise fields: Seriation 2021 Ordered - Graves and DM. Orange fields: Bonora *et al.* 2000: 503 Fig. 5 - Fig. 14. Dated Graves & DM - (Period I). Blue fields: Bonora *et al.* 2000: 500 Fig. 3 - Fig. 15. Dated Graves & DM (Period II). Red bordered fields: Special Stratigraphic Situation of the Graves G22 (Piperno - Salvatori 2007: 62). Green bordered fields: Dated Graves by Salvatori - Tosi 2005: 283, 286f. Red fields: Krvavac 2021 Changed Dating - Graves & DM (Phases). Main Area: Phasing of the Seriation.

excluded because it was empty. Adding to this is the parallel consideration of the Decorative Motif results, for which there are fewer possibilities for comparison. Fig. 8 shows an illustration of a somewhat older chronology table from Vidale 1984, in which some Decorative Motifs are directly related to the phases or periods.⁵⁶ Among them are DM 3283(?),⁵⁷ DM 3183, DM 3014, DM 3178.1, DM 3240 and DM 3024, all except the first also appearing in the result of the seriation (Fig. 13: Purple row ‘Vidale 1984 Dated - DM Phase’) and in the correct relative chronological order. The majority of the remaining Decorative Motifs were placed in relation to each other and the burials by analysis alone (Fig. 13: Turquoise row ‘Seriation 2021 Ordered - DM’). Finally, the complete sequence of the ‘Decorative Motifs’ relative chronology is evident (Fig. 13: Purple and turquoise row ‘Vidale 1984 and Seriation 2021 Ordered - DM’).

Under Sandro Salvatori’s direction, a statistical analysis of the oldest graves and their finds was carried out. The result of the cluster analysis was a similarity matrix that ‘strongly indicates [...] a sharp separation of Period I (phases 10 and 9) graves from those of phases 8-7’.⁵⁸ A large part of the graves and Decorative Motifs from Period I (Fig. 14 marked in orange with G0740, G0756, G0722, G0757, G0716, G0721, G0710, G0135, G1102, G0730, G0139, G0754, G0109, G0720, G0415, G0130 and DM 3043, DM 3297, DM 3259, DM 0004.1(?), DM 3040. 1(?), DM 3289, DM 3260)⁵⁹ and Period II (Fig. 15 marked in blue with G0107, G0406, G0741, G0738SUP, G0022E - ABC, G0746, G0749INF, G0723, G0055SUP and DM 3202.6, DM 3105.1, DM 3111.1, DM 3176. 1, DM 0003, DM 3183, DM 3278, DM 0002) can be found in the seriation in Fig. 13 (Fig. 13: Orange fields ‘Bonora *et al.* 2000 Dated Graves & DM - (Period I)’ and blue fields ‘Bonora *et al.* 2000 Dated Graves & DM - (Period II)’). As expected, they

56. For more recent dating, see Salvatori - Tosi 2005: 281.

57. DM 3283 (?) is neither listed in Piperno - Salvatori 2007: 353-379 Decorative Motifs nor in Biscione - Bulgarelli 1983: 228-258 Catalogue. It is probably a sherd of the Central Asian type from early Period I.

58. Bonora *et al.* 2000: 501.

59. It should be noted that in Bonora *et al.* 2000: 500, fig. 3 and 503, fig. 5, not all tombs and Decorative Motifs are depicted, and some DMs are probably marked incorrectly with special characters in Fig. 14 and Fig. 15.

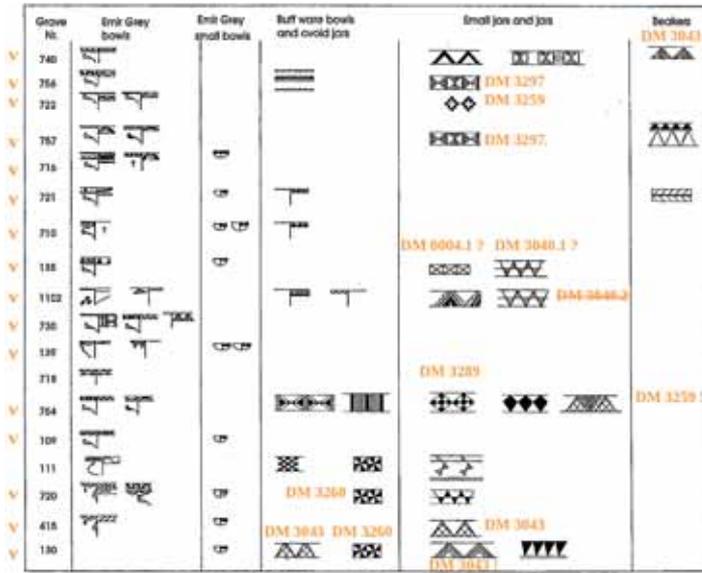
are found in the oldest area, i.e. at the top left of the seriation table in Fig. 13 (Orange and blue fields in Graves column 'Shahr-i Sokhta Graveyard - Italian Campaigns 1972-1978 Grave Number' and Decorative Motifs column 'Shahr-i Sokhta Decoration Motif Number - DM...'). The postulated separation between the periods is undoubtedly evident. However, there are also decorative motifs that occur in both periods, such as DM 3105.1, DM 3259, DM 3111.1, DM 3289, DM 3176.1 and DM 3014.1, which appear for the first time in late Period I and attest to continuity with Period II, which again raises the question of which period Phase 8 belongs to (Fig. 16),⁶⁰ with G0413, as described below, demonstrating the problem.

Typical of Phase 10 are DM 1063 and DM 3202.3, with DM 0004.1 clearly attesting to a clear transition to Phase 9 as it occurs in nine graves, and DM 3260 conceivably showing a secondary one. DM 3202.1, DM 3008.1, DM 3297, DM 3008.5, DM 1053, DM 3040.1 and DM 1054.1 occur only in Phase 9, thereby characterising it. It is necessary 'to point out the presence, in Grave 413, of a jar with ear lugs, decorated with a frieze filled with two superimposed chains of solid lozenges [...], possibly recalling the nose lugs of the Jemdet Nasr period'.⁶¹ The finds from G0413 represent the interregional connections of the Shahr-i Sokhta Graveyard, and are thus useful for establishing a more exhaustive chronology (Fig. 13: Green bordered block in Graves column 'Shahr-i Sokhta Graveyard - Italian Campaigns 1972-1978 Grave Number - G...'). DM 3271⁶² on the jar is unique in the analysed data, so it was eliminated, but the grave was placed in the seriation (Fig. 13) at the end of Phase 9, since it has, as mentioned, Decorative Motifs typical of Phase 9 (DM 3008.5 and DM 3040.1), which it seems are the last of their kind. Nevertheless, G0413 includes DM 3014.1 as a new Decorative Motif, which is mainly attributed to Phase 8 and later phases and very probably marks a *terminus post quem*. G1003INF - ABCDEFGHIJKL shows a very similar situation, with DM 1053 and DM 1054.1 as the last of Phase 9 and DM 3176.1 as

60. Salvatori - Tosi 2005: 284.

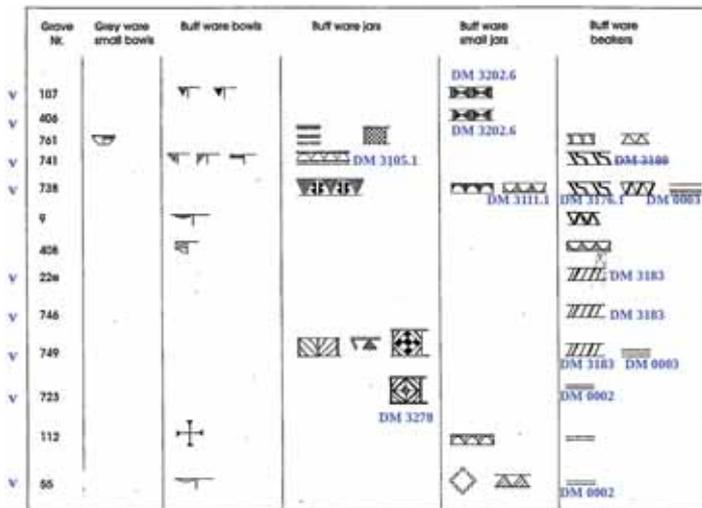
61. Salvatori - Tosi 2005: 283.

62. Piperno - Salvatori 2007: 221f G413/1 Inv. no. 7037 DM 3271.



Painted decoration motives recurring on different vessel shapes (Period I).

Fig. 14: similarities (orange marks) of analysed burials and DM with Fig. 13 (Bonora *et al.* 2000: 503; Fig. 5).



Painted decoration motives recurring on different vessel shapes (Period II).

Fig. 15: similarities (blue marks) of analysed burials and DM with Fig. 13 (Bonora *et al.* 2000: 500; Fig. 3).

typical of Phase 8. Further concentration on these points for future analysis is necessary. Phase 7 has slight overlaps with Phase 8 and Phase 6, and the typical representative is DM 3183, together with the already mentioned special grave G0022E - ABC. In Phase 6, only DM 3006, DM 3228.1 and DM 3202.6 appear in this phase alone. DM 0003 occurs in Phase 8, but mainly Phase 6 and Phase 5, and consists, however, only of two simple parallel lines at the vessel rim, enabling its consideration as an example of 'sog. „Durchläufer', also Typen, die über mehrere Phasen hinweg im Fundmaterial vertreten sind'.⁶³ We may cite two 'Durchläufer' here: DM 0017 occurs in Phases 8, 6, 5A, 5B and 4, while DM 3003 occurs in Phases 6, 5A, 5B and 4. The division of Phase 5 into two parts is quite permissible, as Phase 5A shares Decorative Motifs DM 3053.1, DM 2008.1 and DM 0065 with Phase 6, and Phase 5B shares Decorative Motifs DM 3056 and DM 3161 with Phase 4. Overall, DM 0016, DM 3015 and DM 3236.1 are unique to Phase 5, with DM 3278, DM 3178.1 and DM 2081 unique to Phase 5A, and DM 1065 and DM 1008 unique to Phase 5B. A closer look at 'graves 731 and 725 inf. [...] points to a Phase 5b/beginning Phase 4 date for both'⁶⁴ (Fig. 13: Green bordered fields in Graves column 'Shahr-i Sokhta Graveyard - Italian Campaigns 1972-1978 Grave Number - G...'), and the vessels are seen to have interregional connections with Tepe Yahya Period IV C. However, the two graves pose challenges for the seriation because they both have unique pottery finds that are eliminated from the analysis along with the Decorative Motifs.

Dates in yrs BC	Shahr-i Sokhta Revised C14 Sequence	
	Period	Phase
1700		
1800	IV	0
1900	GAP	
2000		
2100	IV	1
2200		2
2300		3
2400	III	4
2500		5
2600	II	6
2700		7
2800		8
2900	I	9
3000		10
3100		↓

Fig. 16: Salvatori - Tosi 2005: Fig. 12.

63. Gutschmiedel - Schümann 2010: 24 (our translation from German) so-called 'through-runners', i.e. types that are represented in the finds over several phases'.

64. Salvatori - Tosi 2005: 286.

Changing DM 3231.3⁶⁵ in Grave G0731 (G731/24) Inv. no. 8063 to DM 3236.1,⁶⁶ which is highly similar and can be seen as a variant, created a match with G0010 (G10/8) Inv. no. 6133,⁶⁷ which also has DM 3236.1. The DM was thus doubled, allowing its placement in the seriation,⁶⁸ but further investigation is necessary. Phase 4 shares other characteristics with phase 5B, and it features DM 3240 and DM 3160.1. DM 3162.6, DM 3166.1 and DM 3024, located in the lower right corner of the seriation (Fig. 13), play a unique role, possibly suggesting Phase 3. This phase is difficult to grasp due to the quantitative absence of vessels with Decorative Motifs, but the distinctive zoomorphic potter's marks on 'period III motifs'⁶⁹ may be of use.

As has already been noticed, the relative chronology of burials and decoration motifs is changed by the seriation result (Fig. 13: Red column 'Krvavac 2021 Changed Dating - Graves (Phase)' and red row 'Krvavac 2021 Changed Dating - DM (Phase)'). Additional research will entail targeted analysis to resolve specific issues. As frequently shown, quantity is more significant for the quality of the results than single extraordinary finds.

6. GIS-based Digital Mapping of the Results

The next step was the mapping of the results obtained. Using CAD, the various maps and the structure and find layers, an exact basis was created. This included the very extensive corrected table of the features and finds and the classification of the burials into chronological phases obtained by the seriation. Using QGIS,⁷⁰ it is easy to visualise all these data together (Fig. 17). As previously recognised,⁷¹

65. Piperno - Salvatori 2007: 292 G731/24 Inv. no. 8063, fig. 686 and Piperno - Salvatori 2007: 371, decorative motifs.

66. Piperno - Salvatori 2007: 371, decorative motifs.

67. Piperno - Salvatori 2007: 40 G10/8 Inv. no. 6133, fig. 45.

68. Prof. emer. Michael Roaf (personal communication) said that it would make sense to group together some of the very similar decorative motifs listed, as the typification may be excessive in some cases.

69. Sajjadi 2015a: 12.

70. QGIS 2021 <https://qgis.org/en/site/forusers/download.html> (01.03.2021). The open-source version, QGIS 3.18 Zürich, was used after preparing the necessary layers with CAD.

71. Bonora et al. 2000: 513, fig. 14 and fig. 15.

the oldest burials are found in the south (HTW, HYC, HYH, HYT, IPQ, IPV, IPW, IUB, IUC, IUP, IUQ, IUR, IUU), i.e. the squares excavated by the Italian Campaigns (Fig. 17: Yellowish shades corresponding to Phases 10, 9 and 8).

Only two Phase 8 burials are present in the northern area. Phases 7 and 6 (Fig. 17: Red shades) occur rarely but are scattered throughout the area. Representatives of Phases 5A, 5B and 4 (Fig. 17: Green shades) are found in the south but mostly in the north (INK, IRC, IRD, IRL, IRM, IRQ, IRR, IRV, IRW, IRX, IWC, IWD).

Indeed, the Shahr-i Sokhta Graveyard is enormous, and surprises await the forthcoming excavations and analyses, especially when the results of the Iranian excavations are added. The areas around squares IPQ, IPV, IPW, IUB, IUC, IUP, IUQ, IUR, IUU, which were once isolated in the south, were extensively excavated by the Iranian campaigns, and are now joined up (Fig. 3).⁷² Thus, the assumption that the oldest burials were first laid out in a largely random fashion, buried at a distance from each other or in local groups, appears to be confirmed. Over time, later burials filled in the gaps, resulting in the present densely packed conformation. Information from the discoveries, such as burial depth and form and the position of the grave goods, can provide more insight into this question.

7. 3D-Visualisation

Archaeology is also destruction. The context of finds must be excavated appropriately and documented in order to ensure traceability for present and future researchers. In Graveyard Archaeology especially, and in the absence of a fixed building structure, precise surveying is indispensable, as the individual burials often appear to be freely distributed with respect to the direction of excavation. After the skeleton level has been reached, the burials remain open only for a short time in order to document them photographically, possibly from several positions, draw them and describe them. Afterwards, the finds are recovered, and

72. Sajjadi 2015b: 14 fig. 12.

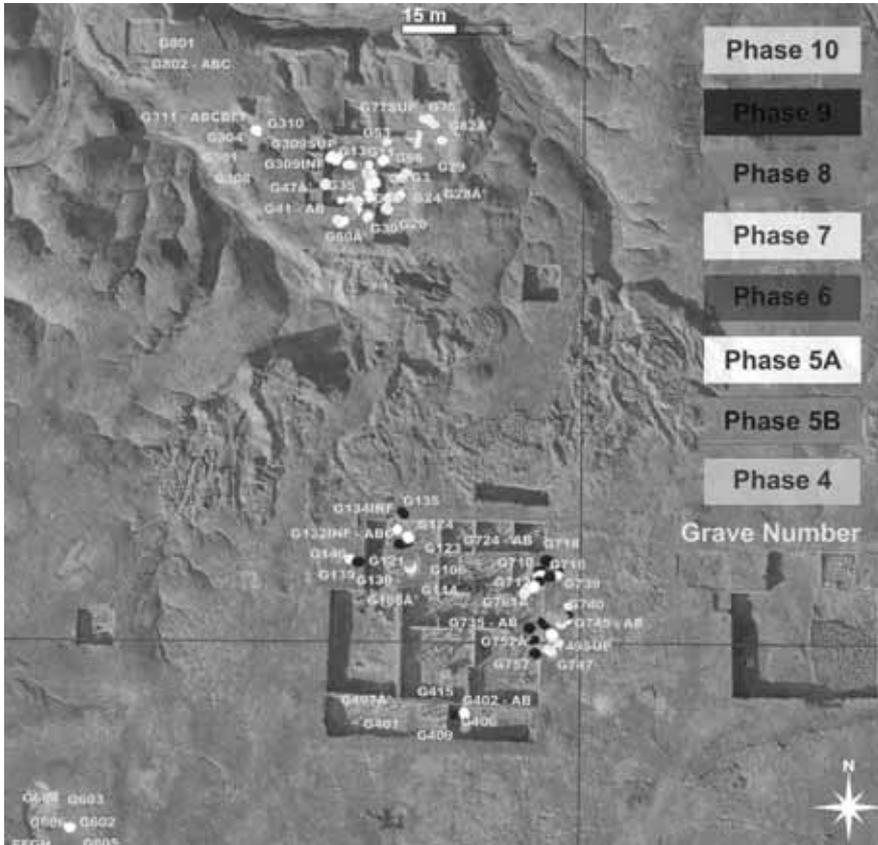


Fig. 17: GIS-Plan based on the CAD-Layers showing the chronological dating. Each analysed and remaining grave of the Seriation on Fig. 13 is shown. The Phases and their colours are set analogously. It is evident that the older graves (Phases 10, 9, 8) are in the more southerly area, those of middle age (Phases 7, 6) in both and the youngest (Phases 5A, 5B, 4) primarily in the north.

the context of the find disappears forever. This two-dimensional description has to give way to 3D-Documentation, whose aim and main advantage is the precise observation of the find in retrospect, since ‘three-dimensional reconstruction is the automatic or assisted generation of a 3D-Model that is a precise copy of a real object’.⁷³

In the meantime, photogrammetry ‘has become a cost-effective and versatile technique that is currently widely applied for three-dimensional documentation of archaeological heritage sites’.⁷⁴ Similarly, it has long been possible to quickly record the 3D structure of an object to be documented, thanks to the ‘remarkable technological leap [...] with both a substantial increase in the possible frequency of three-dimensional terrain surveying and the ease in which associated methods can be applied’.⁷⁵ An archaeologist always has a camera and can use simple gadgets to enable the use of SfM (Structure from Motion) models, focusing on lighting conditions and sharpness when taking photographs. If possible, a light camera⁷⁶ with a fixed focal length should be used, in order to be able to record images of the terrain and medium-sized structures with an autopole. Photographs of small objects need to be taken from an exact distance. Successive overlapping images must be acquired using appropriate methods in order to correctly create the 3D models afterwards with the proper software,⁷⁷ since ‘Structure from Motion’ entails calculating 3D-Surfaces with 2D image information acquired from a number of different perspectives. In addition, ‘Structure from Motion beschreibt den Prozess der 3D Oberflächenberechnung mit 2D Bildinformationen aus unterschiedlichen Perspektiven. Damit 3D Punkte aus 2D Bilddaten berechnet werden können, ist es zuerst notwendig den Bildverband zu orientieren. Dies geschieht durch eine Kombination von photogrammetrischen Algorithmen. Im speziellen sind dies die Merkmalspunktdetektion und -extraktion, Zuordnung homologer Punktepaare, relative Orientierung von Bildpaaren, robuste Schätzer

73. Torres *et al.* 2012: 1.

74. Brandolini *et al.* 2020: 34.

75. Micheletti *et al.* 2015: 1.

76. A Sony Alpha 6300 4K camera with a Sony Ø49 E 2.8/16 0.24m/0.8ft lens was used to capture the 3D SfM-Models shown below.

77. Plets *et al.* 2012: 886-890, fig. 2 and fig. 3; Nikolaeva 2018 for methods and practical usage.

zur Ausreißerdetektion und die Bündelblockausgleichung⁷⁸.⁷⁸ Thus, local or GPS-oriented tachymetric reference points specify the 3D-Model and can be connected to other measurements or model objects for mapping and visualisation.

8. 3D SfM (Structure from Motion) Terrain Models

The Northern 'Italian Squares' (Fig. 18)

One terrain model represents the area of the earlier Italian Graveyard excavation squares (IRL, IRM, IRQ, IRR, IRV, IRW, IRX, IWC and IWD) and the later Iranian additions (IRS, IRU and IWE). Even though more than 40 years have passed since the last excavation work, one of the Italian campaigns main excavation areas is still visible. The largest of the early campaigns' contiguous excavation areas is shown in detail in Figs. 3a, 3b and 3c.

A total of 1178 photos were taken from a height of approx. 3.00 m, systematically walking across the area in rows and aligned with 1369040 tie points. From this, a dense cloud with 45631790 points and a 3D-Model with 1014039 faces were created. For reference, 16 points were measured tachymetrically at the corners of the respective squares.

Workshop 26 (Fig. 19)

Situated in the middle of the settlement area, Workshop 26 extends over an area of approximately 55 m (E-W) x 50 m. The prominent corridor in the middle characterises the area and suggests a secular function. To protect against erosion, the architectural remains, which are up to more than 2 m high, were covered with raffia and clay plaster. The intricate, angular spatial structure presented difficulties for the creation of a 3D-Terrain Model. In accordance with a consistent system, the corners of all individual rooms were photographed in parallel paths across the terrain.⁷⁹

78. Tud 2021 (our translation from German) 'Structure from Motion describes the process of calculating a 3D surface using 2D image information acquired from various perspectives. To calculate 3D points from 2D image data, it is first necessary to orientate the image composite using a combination of photogrammetric algorithms for feature point detection and extraction, assignment of homologous point pairs, relative orientation of image pairs, robust detection of outliers and bundle block adjustment'.

79. 3D SfM models based on photography performed by a drone can cover a larger area, but the precision is not sufficient for smaller-scale situations.

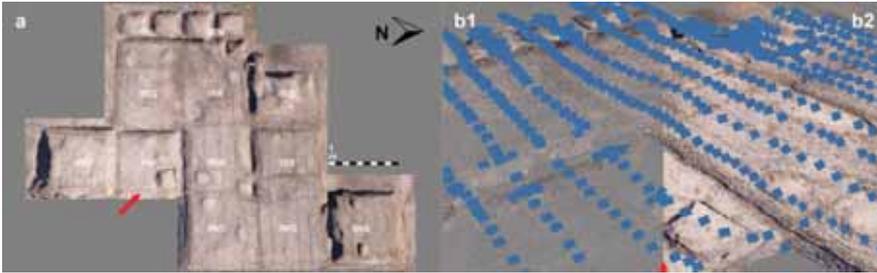


Fig. 18: SfM a) The planar Orthomosaic of the 3D-Model (1014039 faces) at the quadrants IRL, IRM, IRQ, IRR, IRS, IRU, IRV, IRW, IRX, IWC, IWD, IWE with the tachymetric Reference Points (16). b1) The aligned Tie Points (1369040) amidst the Camera Positions (1178). Merged with b2) The Densecloud (45631790) and other Camera Positions.



Fig. 19: SfM a) The planar Orthomosaic of the 3D-Model (68684549 faces) at Workshop 26. b) The Dense Cloud (42748842) with the aligned Camera Positions (972). c) An isometric Orthomosaic with the tachymetric Reference Points (67). d) Detailed Orthomosaic of the Corridor.

Thus, a total of 972 photos were taken, aligned with 624904 tie points. The dense cloud has 42748842 points and the 3D model 68684549 faces. A group of 67 tachymetrically measured points is used for reference.

9. Application of 3D-SfM to Graves

G9509 A and G9509 B - Fig. 20

The double burial G9509 A and B (Fig. 4), probably of a mother and child, produced a very satisfying 3D-Model. The preparation of the remains proved to be particularly difficult, as the two persons, the grave goods and the lower part of the grave itself were very heavily encrusted, hindering recognition of the details, which can be seen especially in the skull of G9509 A.

A total of 353 photographs were taken, aligned with 388547 tie points. The dense cloud has 99776831 points and the 3D model 4668803 faces. Four points were tachymetrically measured for reference.

G9606 (Fig. 21)

Quite outstanding is G9606, whose skeletal remains were very well preserved but unfortunately were not accompanied by grave goods. The SfM method can be used to obtain unique perspectives from a range⁸⁰ of positions. Fig. 21a is a merged image of two different photographs with a local DEM (a1) where the edge of the burial pit can be seen very well, more clearly than in the photorealistic planar orthomosaic (a2) or the photograph of the grave itself (Fig. 5). Moreover, the bones are sharply delineated. Fig. 21b and Fig. 21c show orthomosaics of the skull seen from different angles, in which the growth sutures and teeth are clearly visible. The unique position of the right hand under the mandibula can also be seen. Finally, Fig. 21d shows a detailed orthomosaic of the lower postcranium and pelvis. The enormous advantages of 3D representation, which enables any observation position to be simulated and extracted, are seen clearly here. This facility is of the highest archaeological and anthropological interest.

For the 3D documentation, 442 photographs were taken, from which 217005 tie points were created. The dense cloud consists of 33500051 points, and the

80. DEM - Digital elevation model based on 3D computer graphics.

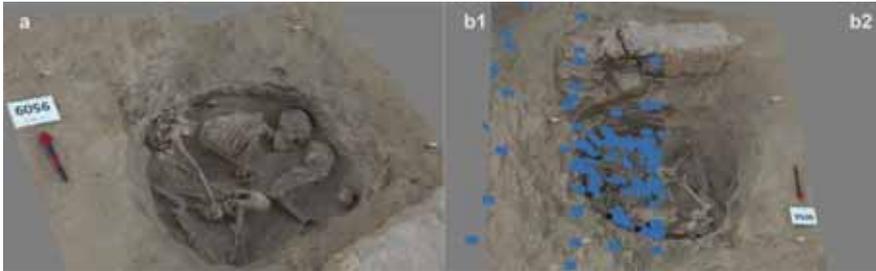


Fig. 20: SfM a) Isometric Orthomosaic of the 3D-Model (4668803 faces) of Grave G9509 A and B at Square NFG (Compare Fig. 4). b1) The aligned Tie Points (388547) amidst the Camera Positions (353). Merged with b2) The Densecloud (99776831) and the tachymetric Reference Points (4).



Fig. 21: SfM a1) DEM (3564x4005) of Grave G9606 at Square NAQ showing the edges of Grave Type 1 – Simple Pit. Merged with a2) Planar Orthomosaic of the 3D-Model (2103428 faces) (Compare Fig. 5). b1) Detailed Orthomosaic. Merged with b2) Dense Cloud (33500051) amidst the Camera Positions (442) and tachymetric Reference Points (4). c) Detailed Orthomosaic of the *Cranium*. d) Detailed Orthomosaic of the *Pelvis* and lower *Postcranium*.

3D model has 2103428 faces. For reference, four points were tachymetrically measured. The DEM has a size of 3564x4005 pixels, at 0.418 mm/pixel.

Grave in square MEY (Fig. 22)

The reconstructed grave in square MEY,⁸¹ covered with raffia and clay plaster to protect against erosion, shows another possibility of SfM. First, a local terrain model of the grave and the burial shaft was created. In the second step, a model of the grave was created using suspended light sources and merged with the first using reference points, enabling 3D virtual entry to the tomb despite the destruction. The generated profile, which shows a typical Type 4 grave, is extraordinary (see Fig. 2).

A total of 262 photographs were taken, from which 146784 tie points were created. The dense cloud has 29893620 points and the 3D model has 1992898 faces. Eight points were tachymetrically, measured for reference.

10. 3D SfM applied to small finds

Truncated-Cone Bowl (Fig. 23)

Photorealistic orthomosaics were generated of the truncated conical bowl from Grave G5116 with Inv. no. 17305 and DM 3015 (see Fig. 11). The profile and all possible viewing positions are represented, with the potter's mark on Fig. 23c being particularly striking. Drawn on millimetre paper, precisely positioned tachymetric target marks served as virtual reference points.

In total, 52 photographs were taken, which were aligned with 23743 tie points. The dense cloud has 1307427 points and the 3D-Model has 261454 faces. Overall, 4 virtual reference points were set.

11. Conclusion

The *graveyard* of Shahr-i Sokhta is exceptional and offers various possibilities for investigation, not only in itself but also in a wide-ranging regional and cross-

81. When the photos were taken for the 3D SfM modelling in December 2018, the grave was completely intact. In December 2019, it was almost destroyed by brief but heavy rain, which caused the edges of the shaft to collapse.



Fig. 22: SfM a) Planar Orthomosaic of the 3D-Model (1992898 faces) of a restored grave at Square MEY (Compare Fig. 2 and Fig. 4). b1) An isometric Orthomosaic with a view into the chamber. Merged with b2) The Dense Cloud (29893620) amidst the Camera Positions (262) and the tachymetric Reference Points (8). c) Negative Profile Orthomosaic showing the Grave Type 4 - Catacomb. d) Foto of the destroyed grave after heavy rain.



Fig. 23: SfM a) Planar Orthomosaic of the 3D-Model (261454 faces) of a Truncated-Conical Bowl with DM 3015 (Compare Fig. 11). b1) Tie Points (23743) amidst the Camera Positions (52) and Reference Points (4). Merged with b2) Orthomosaic of the Profile. c) Isometric Orthomosaic showing a Potter's Sign on the inside.

border context. For the ongoing excavation work, the compilation of SfM 3D Documentation, which is now standard practice, together with adequate surveying, provides a significant opportunity to collect large quantities of data and process them digitally. The associated finds, especially unique artefacts such as the game from tomb G731⁸² or the artificial eye from tomb G6705, can be viewed from a new archaeological perspective thanks to the 3D display. This cost-effective method, which has a low error rate, is suitable for large-scale documentation.

The quantity of data on finds from the graveyard of Shahr-i Sokhta since 1972 is impressive but it poses challenges in terms of observing them in an all-

82. Piperno - Salvatori 2007: 294, G731/48 Inv. no.8087, fig. 691.

encompassing context and relating them to each other. Multivariate/statistical analysis can handle these metadata and, if used correctly, reveal inherent patterns with which to interpret them. In this way, chronological difficulties can be resolved more easily.⁸³ It is possible to correlate the results of the analysis with those of the settlement, since the same painted vessels are found in both areas. The ongoing excavation work in the 'Eastern Residential Area' is yielding chronologically useful data on the settlement's early phases (10, 9 and 8), complementing the work conducted on Area 33, which concerns the middle phases, enabling the establishment of chronological markers with which to calibrate the seriation. This work will also provide support for further analysis, especially when the Iranian excavations' datasets are added. Likewise, C14 data also has the potential to provide assistance. Careful mapping of the finds may also yield sociological answers, since the people buried in the graveyard lived in the settlement.

The once centrally located settlement with diverse international connections is difficult to access nowadays, a fact which has probably also saved the site from destruction. This circumstance has been very advantageous for the intensive scientific investigations carried out so far and makes it possible to start something new. The management of the site and the finds ensures their survival while ensuring adequate presentation. Shahr-i Sokhta's extraordinary situation has secured it a place on UNESCO's World Heritage List.⁸⁴

83. Jarrige *et al.* 2011: 29.

84. Shahr-i Sokhta (Islamic Republic of Iran) (C 1456), The World Heritage Committee, Decision: 40 COM 7B.38 (40th Session, Istanbul/UNESCO 2016).

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Zoomorphic Patterns on the Pottery Vessels of Shahr-i Sokhta

Seyyed Mansur Seyyed Sajjadi
Iranian Center for Archaeological Research
m_sajjadi@hotmail.com

Abstract

The pottery of Shahr-i Sokhta includes unpainted and painted buff, grey and (more rarely) red and polychrome vessels. The patterns painted on the vessels are divided into two main groups: geometric and natural. The former are composed of a variety of abstract geometric shapes constructed from horizontal, vertical, oblique or broken lines to form complex combinations. The latter group includes natural landscape features, such as mountains, plains, lakes and trees, and animal and bird motifs. Animal motifs can be seen in other ancient sites on the Iranian plateau and neighbouring lands. Inspired by the natural environment, the artists of these regions represented animals on pottery vessels with special purposes in mind, the painters of Shahr-i Sokhta favouring goats, deer and birds.

1. Introduction

The surface of Shahr-i Sokhta is covered in millions of pottery fragments, and every time it rains or strong winds blow, thousands of buried sherds emerge

from under the surface of the loose and crumbly soils of this site. The amazing amount of pottery shows on the one hand the mass production of pottery vessels, and on the other hand the employment of a large number of inhabitants in the pottery industry and related activities, all indicating the existence of a society characterised by high levels of pottery consumption. The size of the city, its large population, its long life, its commercial activities and trade with both the surrounding area and distant lands and the multiplicity of its satellite villages, are some of the reasons for its abundant pottery production (Fig. 1).

Shahr-i Sokhta pottery is very similar to that of the Eastern regions of the Iranian Plateau, the southern shores of the Persian Gulf, Bampur, Oman, the Quetta Plain, Mundigak, Namazga, Qara Tappeh and Geoksior, as well as samples found in Shahdad and Jiroft. From a general point of view however, this pottery is a local product and is not seen in other ancient sites, near or far from this city,



Fig. 1: concentration and distribution of pottery fragments and discards on the surface of Shahr-i Sokhta.

except for a few specimens in one or two sites, such as Bampur and Mundigak (Figs. 2-4).

The pottery of Shahr-i Sokhta consists mainly of painted and unpainted Buff and Grey Ware, a small quantity of Red Ware and some polychrome specimens. These containers range from unpainted and very simple bowls to large jars, cylindrical beakers, cups with stands, tubular teapots and simple buff-coloured trays. The pottery of Shahr-i Sokhta is not considered a fine pottery type, and it seems that its producers paid more attention to mass production than grace and elegance. This can be seen from the large number of pottery workshops located approximately 22 km from Shahr-i Sokhta in the dry delta of the Rud-i Biaban river, which during Periods II-III was the area's main centre of pottery production (Figs. 5-7).

The designs on the pottery of Shahr-i Sokhta are divided into two main groups: geometric patterns and natural motifs. Most of the designs are composed of a

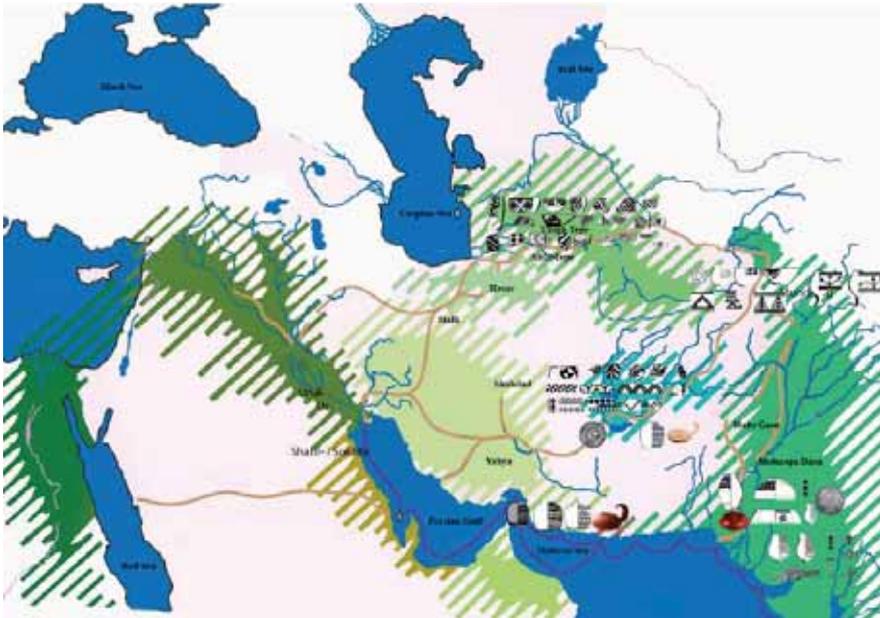


Fig. 2: pottery similarities between Shahr-i Sokhta and other major sites in 'Middle Asia' (Sajjadi 2016).



Fig. 3: G.N.9031. Pottery assemblage.



Fig. 4: unpainted and painted pear-shaped beakers (Sajjadi 2007).



Fig. 5: painted Buff Ware bowls.



Fig. 6: painted globular and cylindrical jars.

variety of abstract geometric designs, ranging from horizontal, vertical, oblique and broken lines to highly complex combinations, which have been studied in detail by scholars (Biscione - Bulgarelli 1983; Moradi 2009) (Figs. 8-9).

The other group includes motifs inspired by the natural landscape, such as mountains, plains, lakes, trees and the like, as well as animal and bird motifs. Each of these phenomena is a reflection of the climate, geography, flora and fauna of the region.

Perhaps the most common patterns, seen on a variety of dishes, involve water currents, typically painted on containers that are directly related to liquids and water. Plant motifs, including shrubs, trees and leaves, can also be seen on a



Fig. 7: polychrome *Khamiru*: 1. Modern production in the Baluchistan area; 2, 3 and 4. Specimens from graveyard.

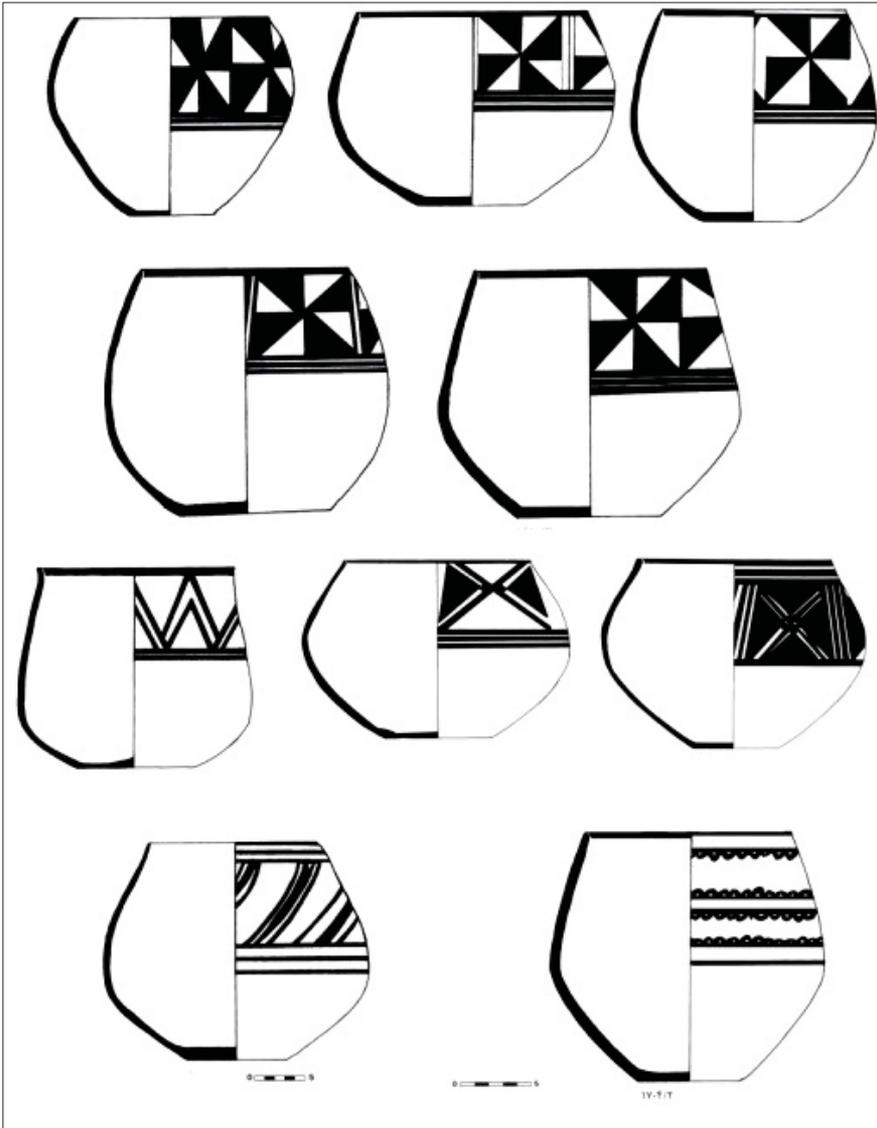


Fig. 8: geometric patterns. Painted Buff Ware (Phases 8-9).

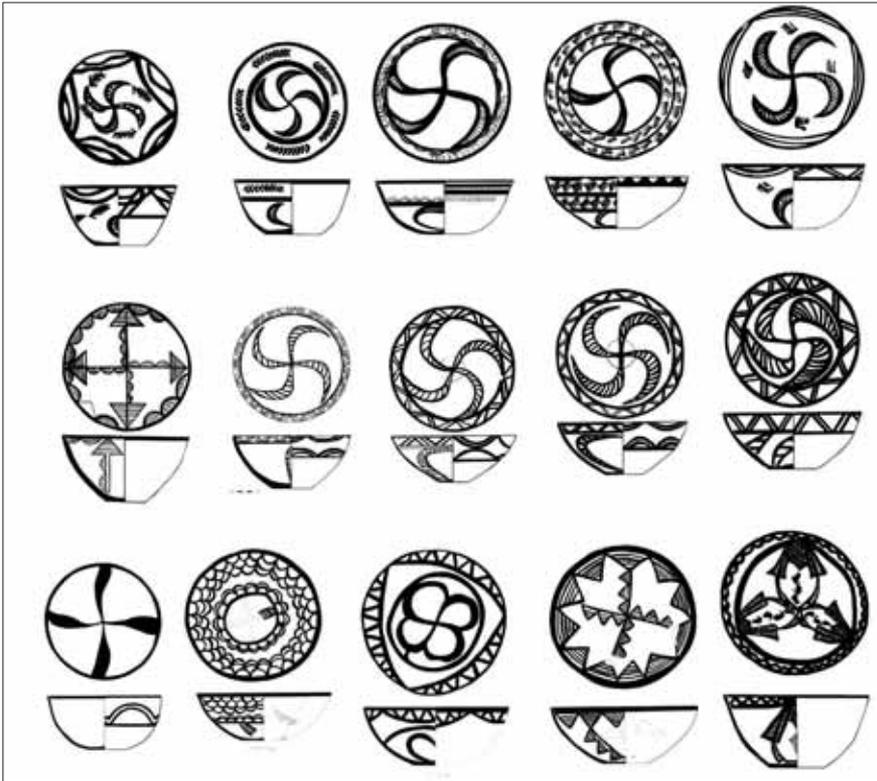


Fig. 9: painted Grey Ware bowls (Phases 6-8).

variety of dishes, pear-shaped beakers and cups with flared stands. In addition, various shrubs, leaves and aquatic plants, as well as combinations of plants, rivers, plains and lakes, are represented on plates (Fig. 10).

2. Animals on pottery

Some of the Shahr-i Sokhta pottery designs closely reflect the nature of the Sistan plain and the wider region. Rivers, lakes, islands (Mount Khajeh), various plants, especially aquatic plants, and fish are well represented in these designs. The movement of water is represented in almost all of them, flowing from the perimeter of the vessel to its centre, although in some cases, it is still water that

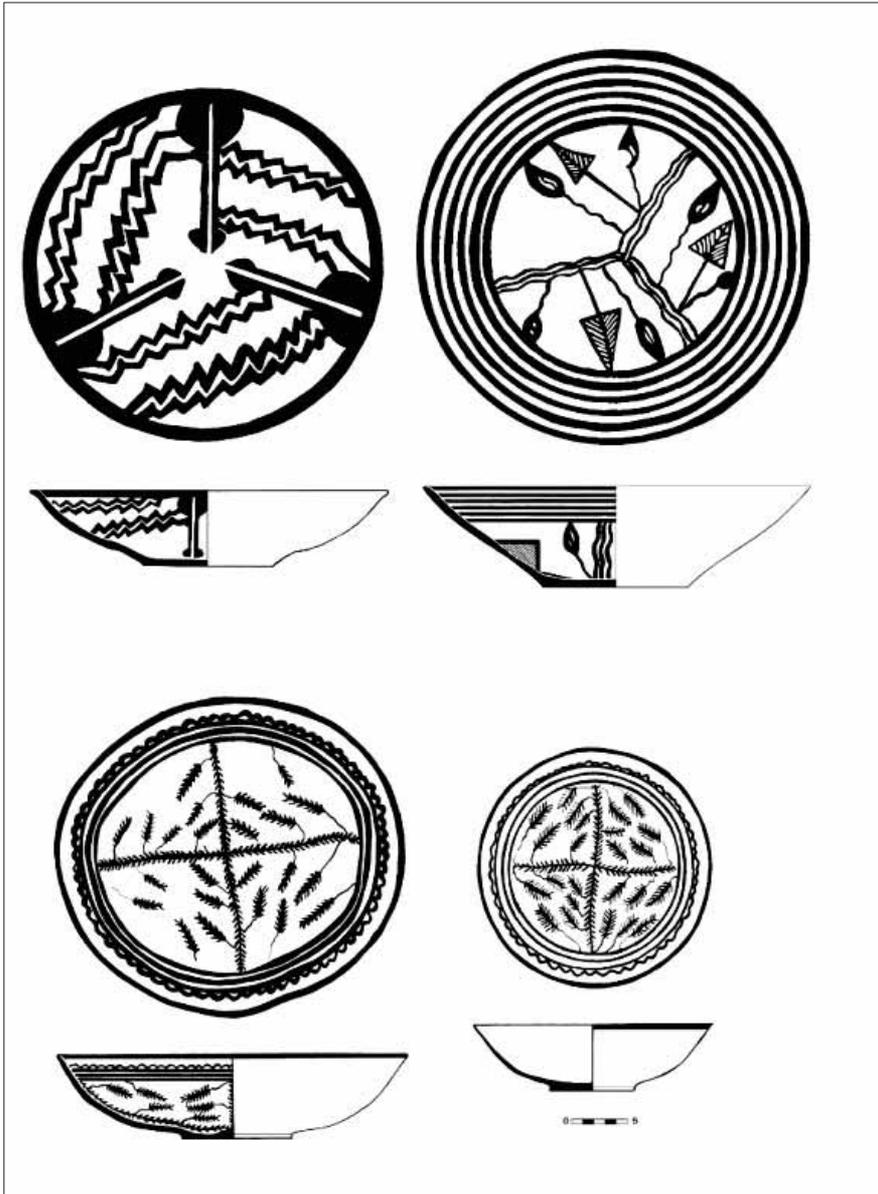


Fig. 10: combinations of water and plants.

can be interpreted as a lake. This can clearly be seen in plate no. 1705/50. The designs inside this plate can be considered a reflection of the geographical ‘map’ of the Sistan plain and Hamun river delta (Sajjadi 2017).

Sistan’s main geographical features include plains, islands, rivers and lakes, and in the designs on this dish, the swampy plains of Sistan and its rivers, islands and fish are clearly shown. During the rainy years, aside from the lakes, the lowlands become large swamps, and the presence of fish in these swamps is not far from the mind. The only high and mountainous feature of this plain is Mount Khajeh, which forms an island in the middle of Hamun Lake and the only way to reach it is to use a *tutan*, a local type of boat. According to historical evidence, there were once several rivers and streams in the plain, the most important of which are mentioned in the *History of Sistan* (15-16). These features can be seen on a number of painted Buff Ware plates (Fig. 11).

Another group of vessels that are decorated with natural and especially animal motifs are Buff Ware cups with stands. These cups with animal motifs, especially birds and goats, can be seen in all areas of Iran, reflecting the surrounding environment of the ancient inhabitants. Almost all of these animal motifs are stationary, and the same is true for the animal motifs of Shahr-i Sokhta. Usually in these motifs, the shape of an animal, goat or bird is repeated uniformly on the body of the vessel: no movement is seen, and only slight differences can be seen between them. But this is not true of the painted patterns seen on the Buff Ware cups with stands recovered from G.N.731/42 (Piperno - Salvatori 2007). This catacomb grave is probably the tomb of one of Shahr-i Sokhta’s more prominent inhabitants, who in any case was socially distinct from other people. In this burial, in addition to the above-mentioned cup, exceptional objects such as a wooden spoon, the complete set of a wooden game and other objects were also found.

As already mentioned, artists and painters sought to show local natural and environmental conditions on countless pottery vessels reflecting prehistoric and proto-historic life in all areas of the Middle East. However, the artist who painted Buff Ware cup with stand No. 42 showed his creativity not only by painting his favourite design, but by seeking to convey the concept of movement in the



Fig. 11: flowing water and herds of animals.

depicted animal. The design on the cup represents a scene with a goat and a plant. In five different movements, it targets the desired bush or shrub, it approaches the shrub, it raises its front legs to jump onto the shrub, it clings to the shrub and finally in the last movement it eats the shrub (Figs. 11-12).

Another specimen, with a possible ritual role, was found in excavations in 2018 from G.N.9410. It is a polychrome jar whose entire outer surface is covered with patterns. The main motifs are three goats, which apparently rise on one side of a stepped structure and descend on the other. At the top of the structure there is another small structure in the shape of a building, and above this structure

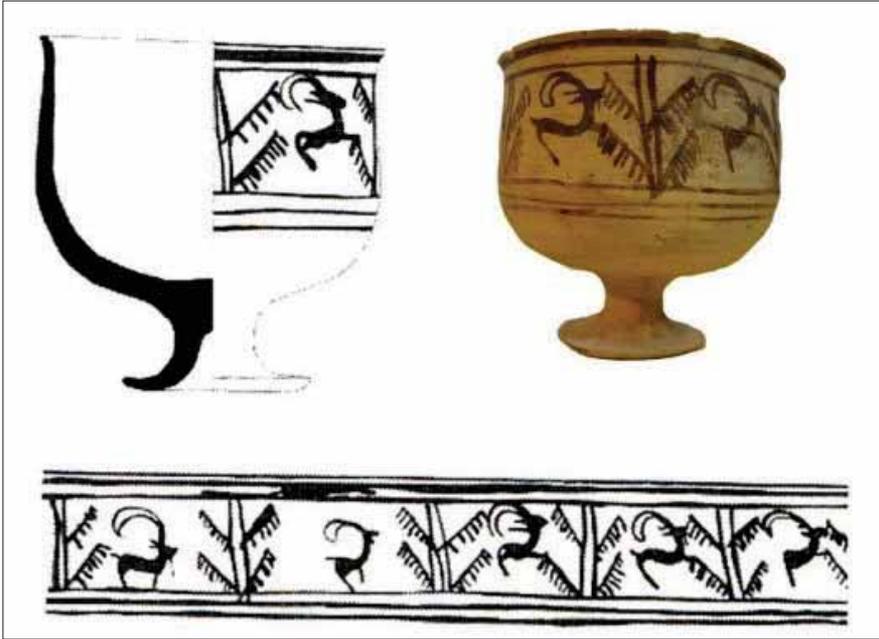


Fig. 12: cup with jumping goat (Sajjadi 2004).

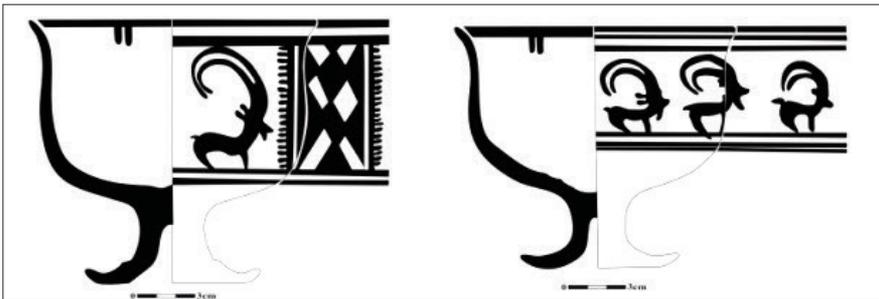


Fig. 13: stationary goat designs.

there are six triangles that combine to form a unique pattern. These designs can probably be interpreted as goats that climb a mountain to be sanctified, complete the circumambulation of the temple (the small structure), are consecrated by the priest for sacrifice and climb down the other side, while the sun shines on them and the whole stepped mountain or structure rests on the shoulders of a very abstract figure of a man (Fig. 14).

The most abundant and diverse animal motifs in the Shahr-i Sokhta pottery assemblage depict goats and deer in various forms with various horn arrangements, including goats with outstretched bodies on jars, combinations of goats and mountains, rows of goats, horned goats, goats and goat-kids, goats drawn upside down on bowls, goats in deep bowls, herds of goats on the bodies of vessels, birds in flight on jars, birds (bustards) in flight and herds of goats on plates and deer of various species (Figs. 15-21).

Birds, which are shown in various painted forms, are the most abundant animal figure after goats. The motifs include: sitting birds on the body of the jar,

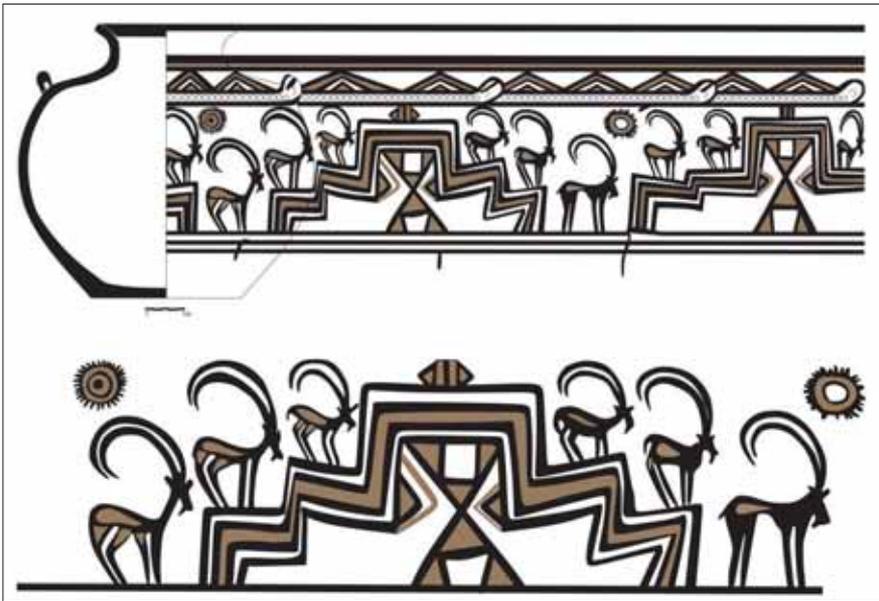


Fig. 14: polychrome jar from G.N.9410.

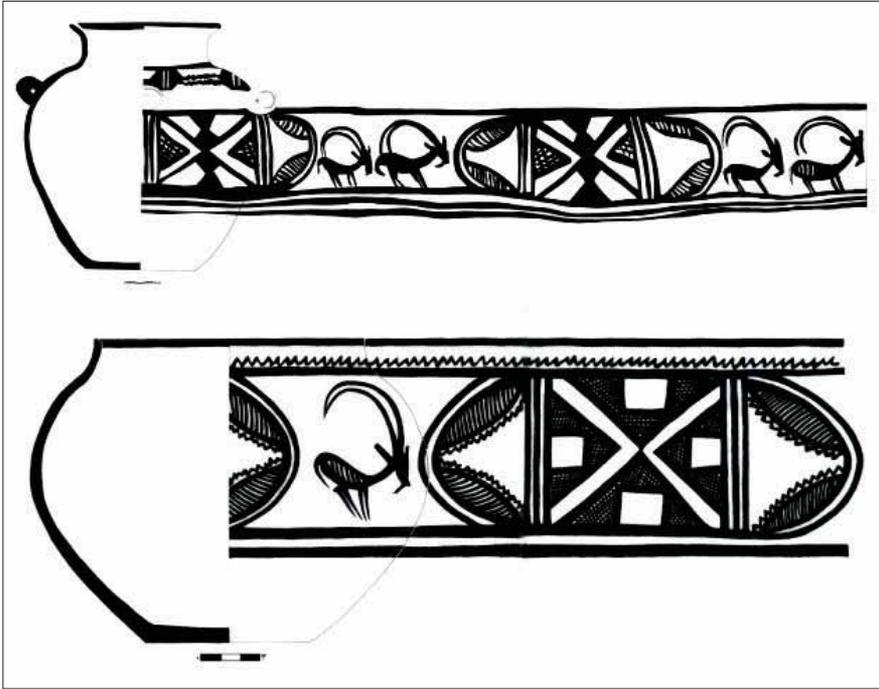


Fig. 15: combinations of multiple goats and a single goat with geometric patterns.

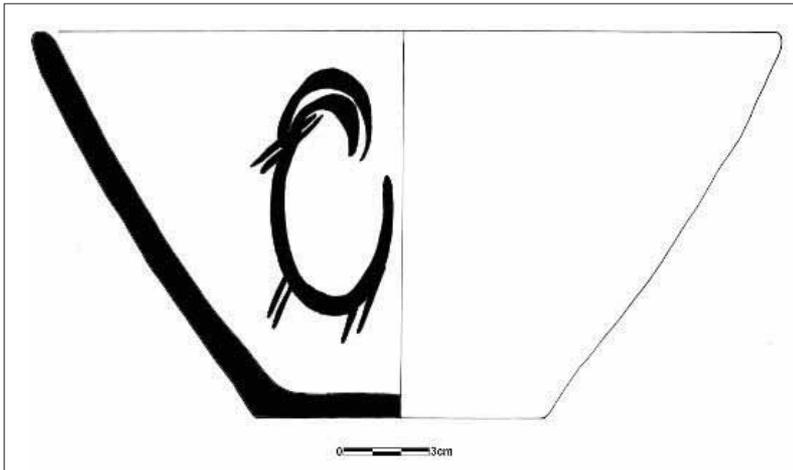


Fig. 16: lone goat on the interior surface of a bowl.



Fig. 17: goats with arched horns facing backwards and plants.

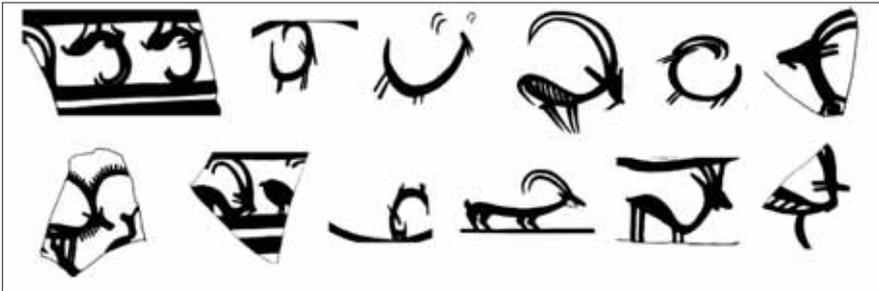


Fig. 18: goats and goat kids with outstretched bodies and turned-back horns.

rows of birds flying around cups, birds on the body of jars, sitting birds on cups with stands, standing birds, birds on the shoulders of jars and birds in flight (Figs. 22-26).

Other animals, such as reptiles, snakes and scorpions, are also depicted by the painters of Shahr-i Sokhta. Snakes in particular can be seen in various forms, singly and in combination. There are motifs of this animal crawling alone on the outer bodies of jars, as well as combinations of three snakes on the internal surfaces of Buff Ware vessels. Other reptile patterns include snakes inside bowls, on the bodies of bowls, on the shoulders of jars and on the external surfaces of bowls (Figs. 27-29).

In addition to the above-mentioned animals, other types painted on pottery include fish on plates or on the external surfaces of dishes, scorpions on the external surfaces of jars and in bowls, monkeys on plates and ram's heads on the shoulders of jars (Figs. 30-31).

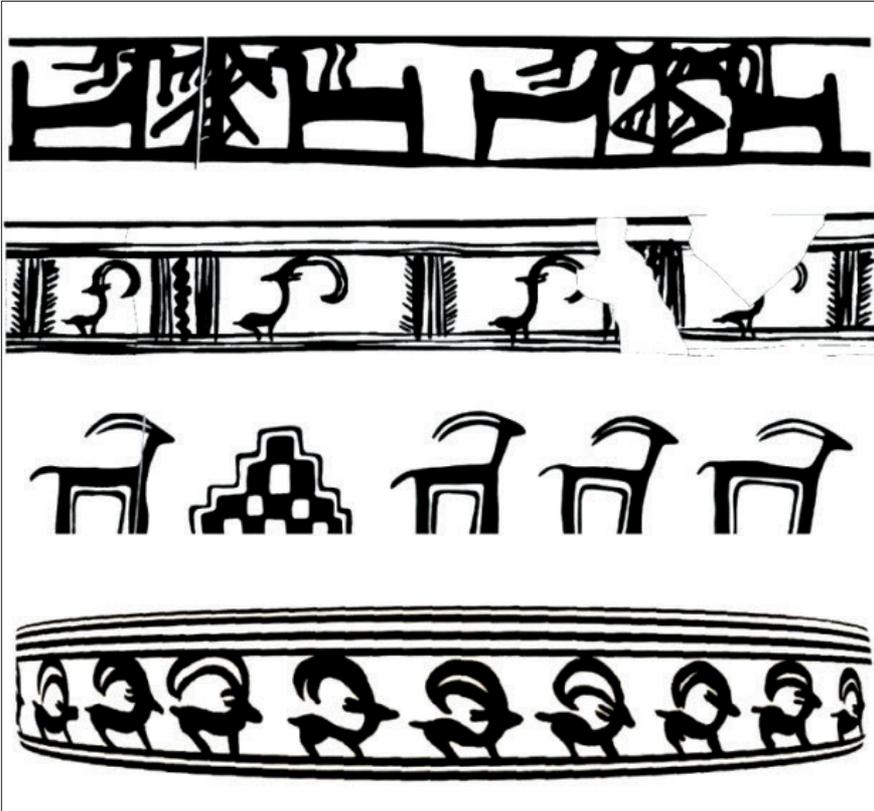


Fig. 19: rows of stationary goats.

No human figures have been found on the pottery of Shahr-i Sokhta. During the excavations of 2019, a pottery fragment with three standing creatures in a row was found. The lower parts of this piece of pottery are missing and therefore it is difficult to identify the creatures. However, considering the triangular bodies, hanging arms and claws, they may represent human figures with bird heads (Fig. 32).

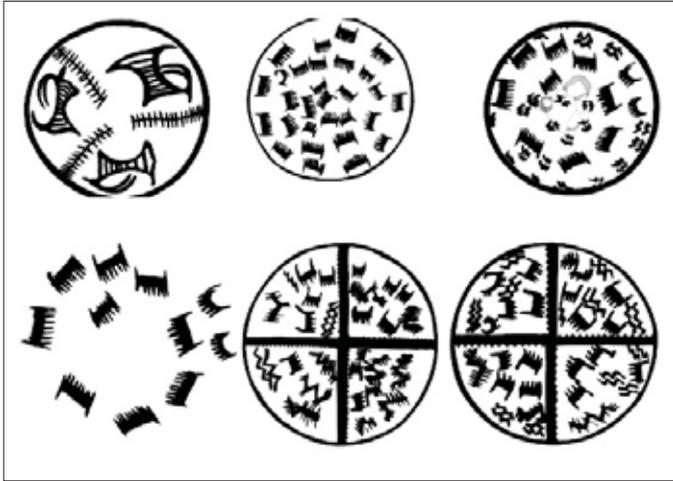


Fig. 20: herds of goats.

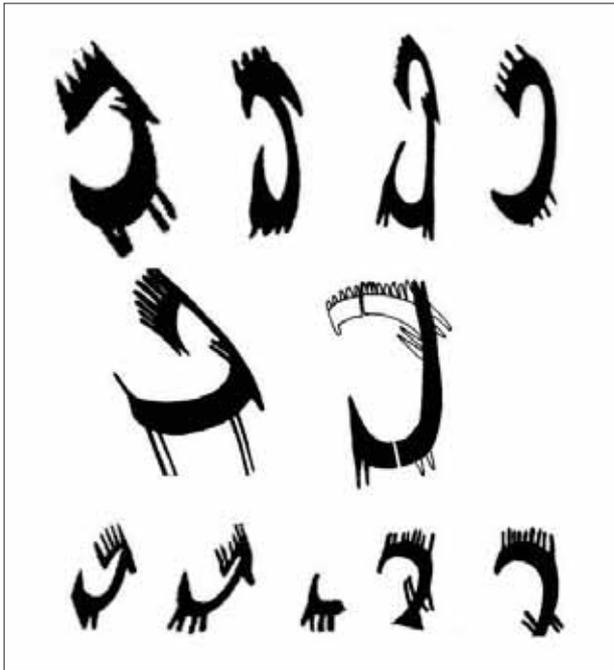


Fig. 21: types of deer (Moradi 2009).

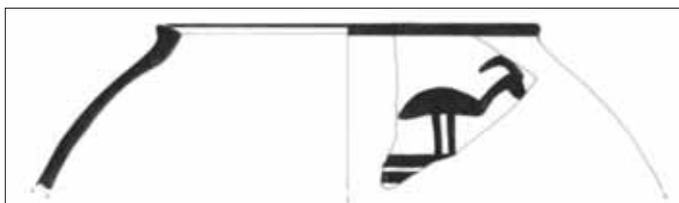


Fig. 22: lone bird.

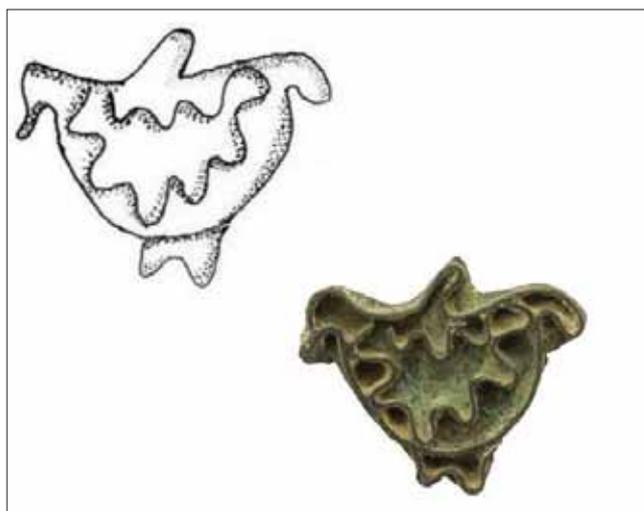


Fig. 23: bustard talisman? (Sajjadi 2016)



Fig. 24: waterfowl.

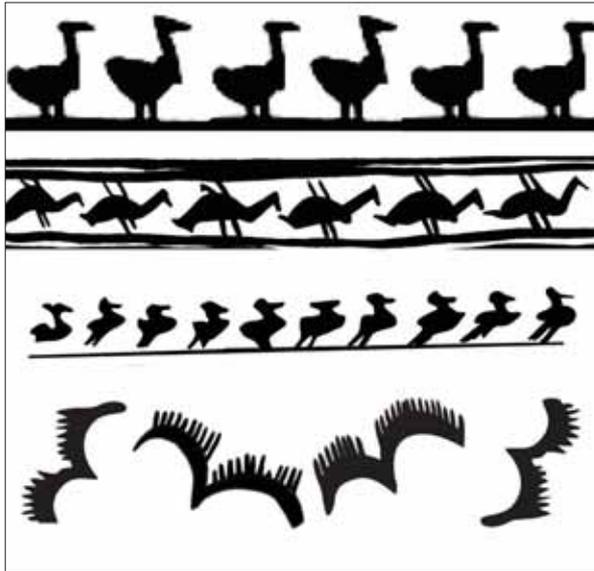


Fig. 25: standing, sitting and flying birds.

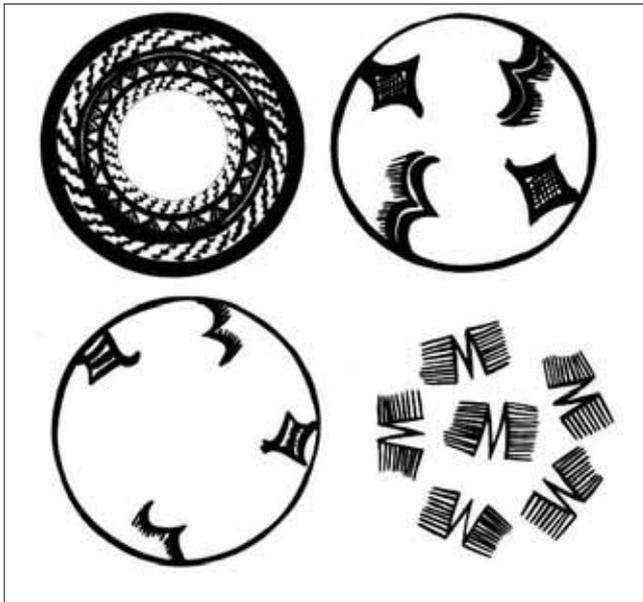


Fig. 26: flocks of birds inside Buff Ware vessels.

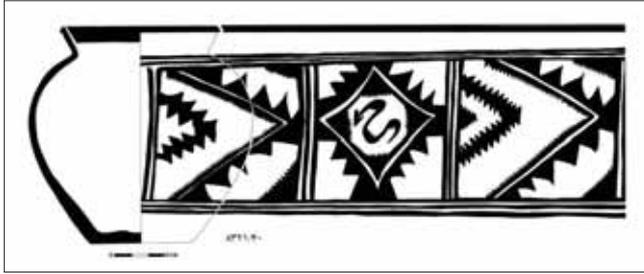


Fig. 27: combined snakes and geometric patterns on Buff Ware jars.



Fig. 28: snake relief on a Buff Ware cup with stand.

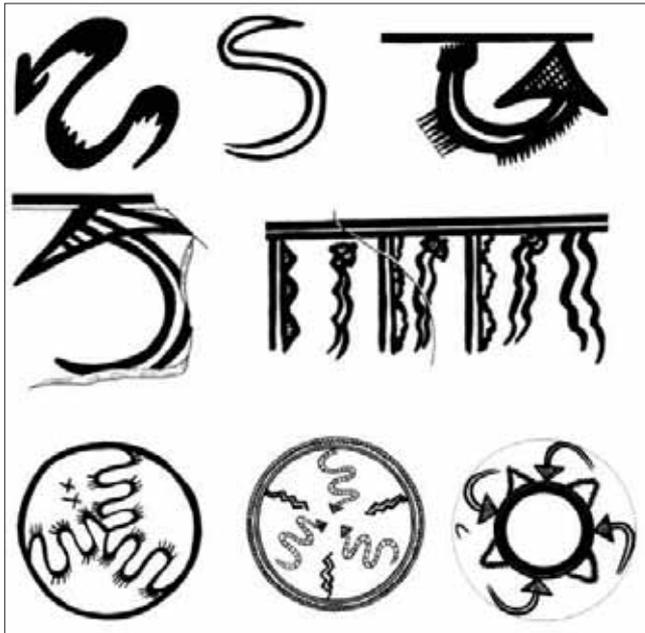


Fig. 29: snake motifs in various forms.



Fig. 30: fish in a bowl (Piperno 1986).



Fig. 31: fish, scorpions, dogs, rams and zebras.

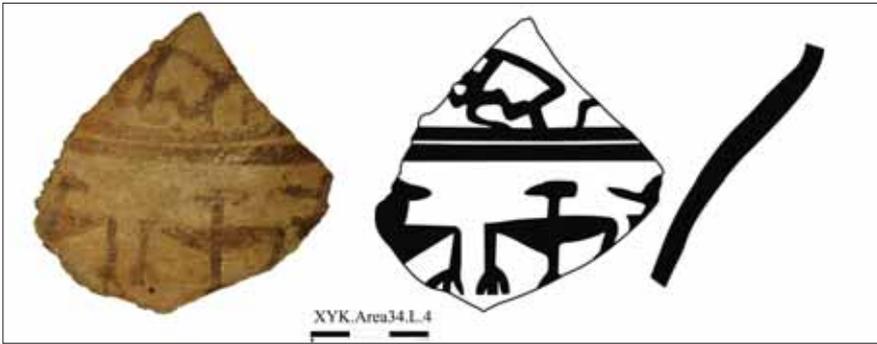


Fig. 32: human image.

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Alabaster Vessels from Shahr-i Sokhta

Seyyed Mansur Seyyed Sajjadi and Sareh Amini
Iranian Center for Archaeological Research
m_sajjadi@hotmail.com;samini350@gmail.com

Abstract

During the excavations in Shahr-i Sokhta, alabaster and marble objects in various forms including dishes, cups, mortars, seals, beads, torches and discs were found in residential areas and the graveyard. Indeed, based on the available evidence, it seems that this city was a centre of production of such artefacts in the first half of the third millennium BC. Unlike most marble vessels, the alabaster objects are typically small cosmetic bottles. These objects were usually made of two parts, a rectangular or cylindrical body and a separate lid. The Shahr-i Sokhta samples are smaller than those of central Asia and some of them have decorated bodies.

1. Alabaster items

The excavated objects discovered in Shahr-i Sokhta include items related to daily life, such as vessels, items used for ritual and worship, human and animal figures, slings, instruments related to business and economics such as seals and seal impressions, administrative objects, jar stoppers, round and triangular laminae, textiles, rope, wooden objects, various type of beads, metal objects and tools

(Sajjadi 2017). Alabaster objects, mostly various types of vessel, are another important group of objects produced in this site.

During the excavations, many marble objects such as dishes, seals, beads, cosmetics bottles, torches, discs, etc. were also found. Hundreds and hundreds of marble vessels, intact and broken, have been recovered from the residential area and the cemetery of Shahr-i Sokhta. Based on the available evidence, it seems that this site was a centre of marble production in the first half of the third millennium BC in the eastern Iranian plateau, supplying the markets of neighbouring settlements and exporting to distant lands. The chronological distribution of marble vessels shows that a significant percentage were found in tombs that belonged to Shahr-i Sokhta Periods I and II, indicating that the production of such vessels was at its highest in these periods, falling significantly in Period III. In more than 90% of the graves only one marble vessel was found and in less than 10% of the graves two, three or four vessels were found. The marble objects of the city, especially the marble vessels and their various details, have been extensively studied and described (Ciarla 1979; 1981; 1985; 1990; Shirazi 2007; 2009; Boccuti *et al.* 2015; Festuccia 2019; Sajjadi - Mohammadi Sefidkhani 2019).

The present article does not provide descriptions of the types of alabaster, marble and other stone artefacts, but only introduces some of the recently found marble objects.

One group of marble objects is made up of cosmetics bottles. These objects are usually found in the graves of women, but they have also been seen in the grave goods of men and children. These objects were usually composed of two parts: a rectangular or cylindrical prism and a separate lid. The specimens recovered from Shahr-i Sokhta are smaller than those of Central Asia, and all of them contain cosmetics such as kohl. Some cosmetics bottles have decorations on their outer body and in at least one case (G.N.9022/8), the object is decorated with white stones. In addition to marble, cosmetics bottles made of other materials have been found, including a horn-shaped terracotta cosmetics container. The lid is usually

made of the same material as the body of the container, but there are exceptions, such as the one found in G.N.1405, where the bottle itself is made of black stone, most probably soapstone, and the lid is made of white streaked marble (Fig. 1).

There are three groups of cosmetics bottles with different structural characteristics. The first group and probably the oldest is almost cylindrical, with the body decorated with small rounded inlaid stones. The second group, mostly dated to Shahr-i Sokhta Periods II and III, has a conical or cubic body, or a body with a circular cross section. A variant of this group has a more or less everted stand and is related to Period IV. The third group includes cones with a curved cap in the shape of an animal horn and is associated with Periods II and III (G.N.1405/17 and G.N.1615/5) (Fig. 2).

As mentioned, other objects with the same characteristics but different functions have been found. These are mainly torches made of marble and terracotta. The main differences between the torches and the cosmetics containers are their size and their contents (Sajjadi - Shahin 2017). The torches are up to 15 cm tall, while the height of the tallest cosmetics container is about 10 cm. The torches of Shahr-i Sokhta are exclusively cylindrical, with a circular cross section (Fig. 3).

Another group of marble objects is composed of relatively large beads, sometimes believed to be spindle whorls, although considering their location in tombs, they seem to have had a ritual function (Sajjadi 2019). In such cases, beads were placed on the forehead, under the pelvis, or under the lumbar vertebrae. These beads were made of marble, soapstone, terracotta and, in very rare cases, bone (Fig. 4).

Marble vessels (Fig. 5) are made with a very special delicacy, which is proof of the development of the lathes used for emptying out the cavity inside the stone block and the methods used for polishing (Fig. 6). Some of these containers are really small and very delicate, including two miniature bowls (G.N.3203/9 and G.N.9120/12, which are 2.5 and 2.8 cm in height, 3.3 and 3.7 cm in diameter and only 1.2 and 1.5 cm at the base respectively (Fig. 7).



Fig. 1: inlaid cosmetics bottle, G.N.9022, marble and soapstone bottle, G.N.1405.



Fig. 2: types of cosmetics bottles: 1. G.N.9022/8; 2. G.N.9029/9; 3. Workshop 26 Cat. No. 26187; 4. G.N.9032/8; 5. G.N.8725/106; 6. G.N.8725/101; 7. G.N.8718/8; 8. G.N.8826/5; 9. G.N.9024/11.



Fig. 3: types of torch.



Fig. 4: large beads.



Fig. 5: collection of marble vessels discovered in G.N. 1394.



Fig. 6: incomplete containers and pieces taken out of a cylindrical container.

It should be noted that the objects found include various recycled objects, such as stone figurines that had lost their original use for some reason and were used as polishing tools for stone or pottery. The same is true for marble vessels and other objects: when a container was broken, it was then used for a different function after polishing the edges of the broken parts (Fig. 8).

The marble vessels discovered can be divided into three main groups: cylindrical vessels, conical vessels, and cups with stands, in addition to other shapes and forms such as small jars, rimmed bowls and the like. One of the most exceptional shapes ever found at Shahr-i Sokhta is a small jar (G.N.8906/5), not seen before among the marbles of Shahr-i Sokhta, which seems to be imported (Fig. 9).



Fig. 7: small miniature bowls: 1. G.N.9229/12; 2. G.N.9203/3; 3. G.N.2812/1.



Fig. 8: reused fragments: 1. G.N.5705/1; 2. G.N.8824/4; 3. G.N.2909/2; 4. G.N.7930/3.

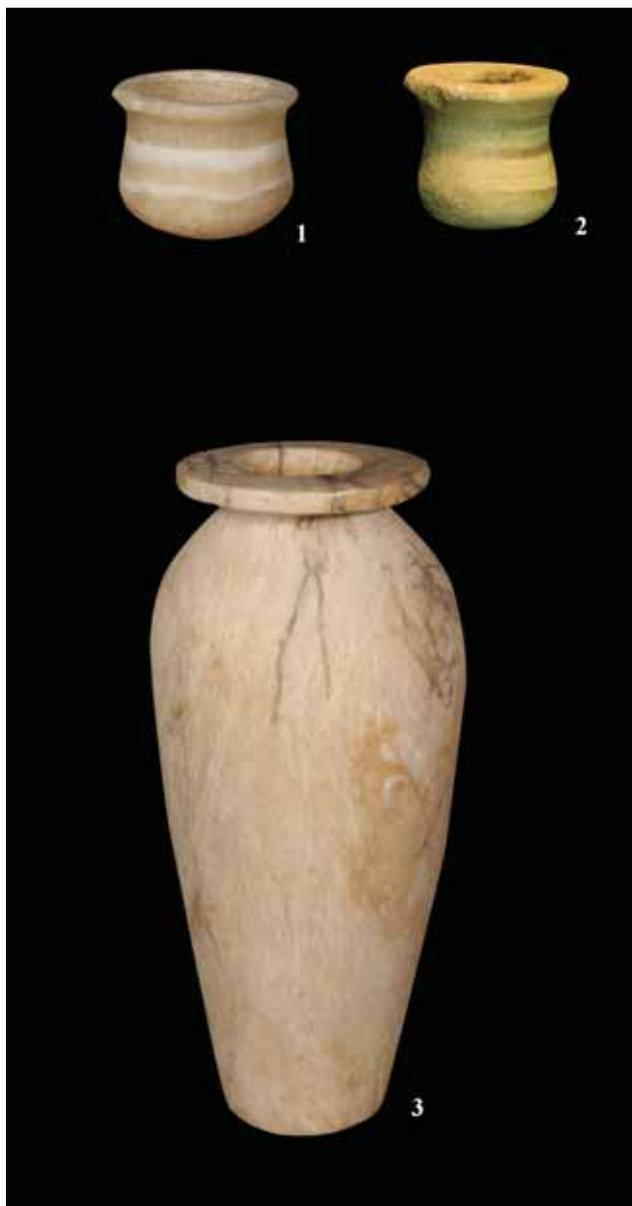


Fig. 9: rare shapes of marble vessels: 1. G.N.9022/10; 2. G.N.4314/28; 3. G.N.8906/5.

In a collection of 523 marble objects excavated from 168 graves, there were 214 containers including bowls, mortars and cups with stands. The numerical superiority of vessels compared to graves indicates that some had more than one container. The number of artefacts in a grave can be considered as an index of the social status of the deceased (Fig. 10).

The marble vessels of Shahr-i Sokhta are typically divided into two main categories: cones (bowls and cups with stands) and cylinders (mainly mortars). The four main forms are bowls, cups, mortars and jars.

Bowls

Marble bowls consist of conical vessels in various sizes (Fig. 11). They are found in the graves of females, males, children, infants and unidentified individuals (Fig. 12). They usually have a flat, smooth and robust body (Fig. 13) and can be deep, shallow and open-mouthed (Fig. 14). The largest bowl was found in a male grave (G.N.1704/6) and the smallest in a female grave (G.N.2905/2) (Fig. 8:2).

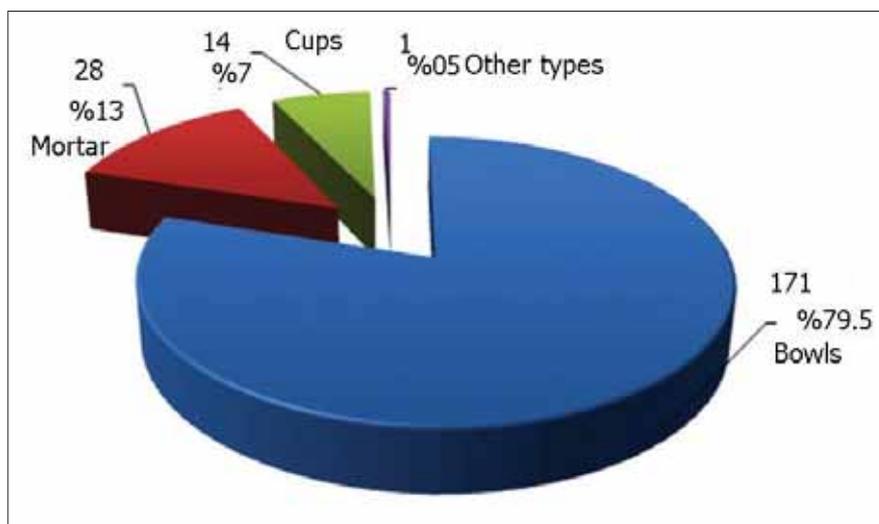


Fig. 10: frequency of marble vessels in the graveyard of Shahr-i Sokhta (Sajjadi - Mohammadi Sefidkhani 2019).

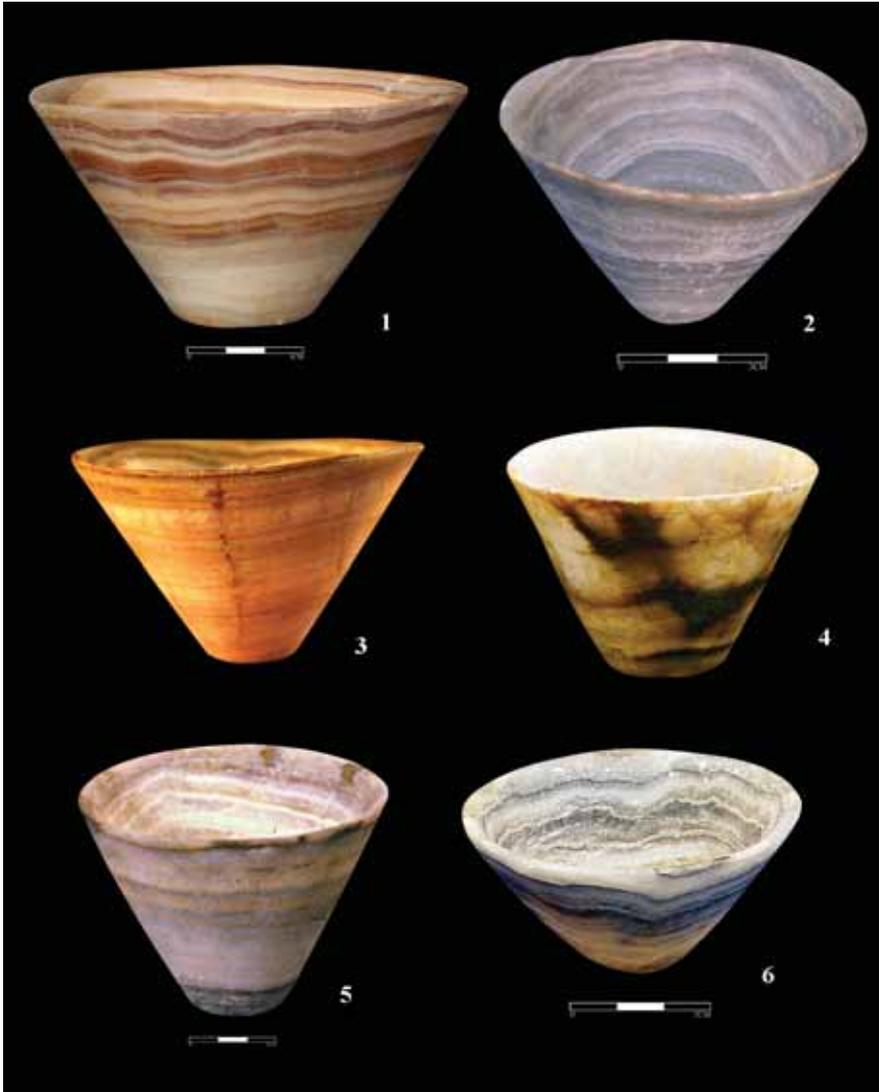


Fig. 11: types of bowl: 1. G.N.8823/8; 2. G.N.1300/9; 3. G.N.8305/6; 4. G.N.6704/4; 5. G.N.1516/4; 6. G.N.1516/4.

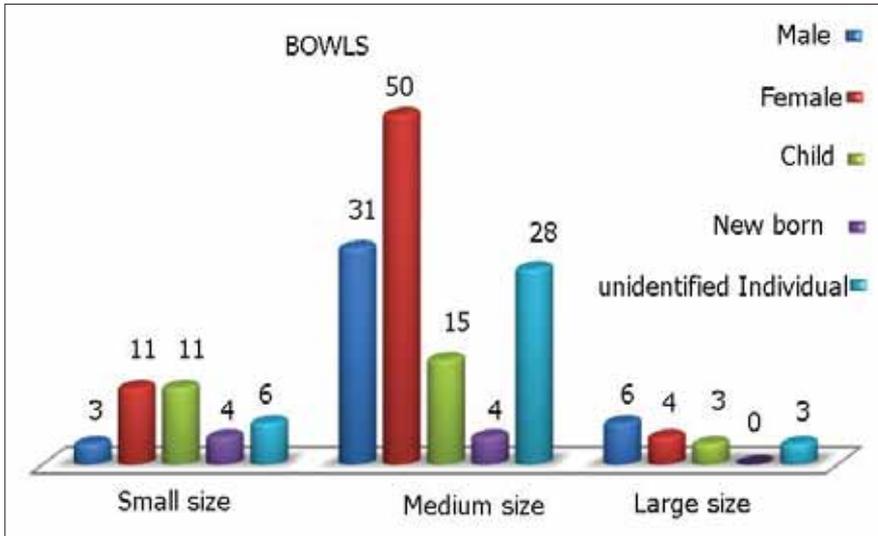


Fig. 12: frequency of bowls by gender and age of the deceased.

The majority of the small bowls were found in the graves of children and infants.

Cups with stands

Cups with stands are in the group of double-cone vessels (Figs. 15-16). These containers vary little in size, are less widely distributed and are divided into small, medium and large groups. In this case, too, the small cups are from children's graves and the medium and large cups are from adult burials (Fig. 17).

The smallest container is from the grave of a child (G.N.8510/3) and the largest is from the grave of a female (G.N.1716/6). These cups are almost equally divided across genders and ages.

Mortars

Mortars belong to the group of cylindrical vessels (Figs. 18-19). The same analytical process as was used with the bowls applies to mortars. Both the largest mortar (G.N.1615/24) and the smallest mortar (G.N.4314/28) belong to male individuals. Mortars come in two main forms: tall mortars with cylindrical bodies

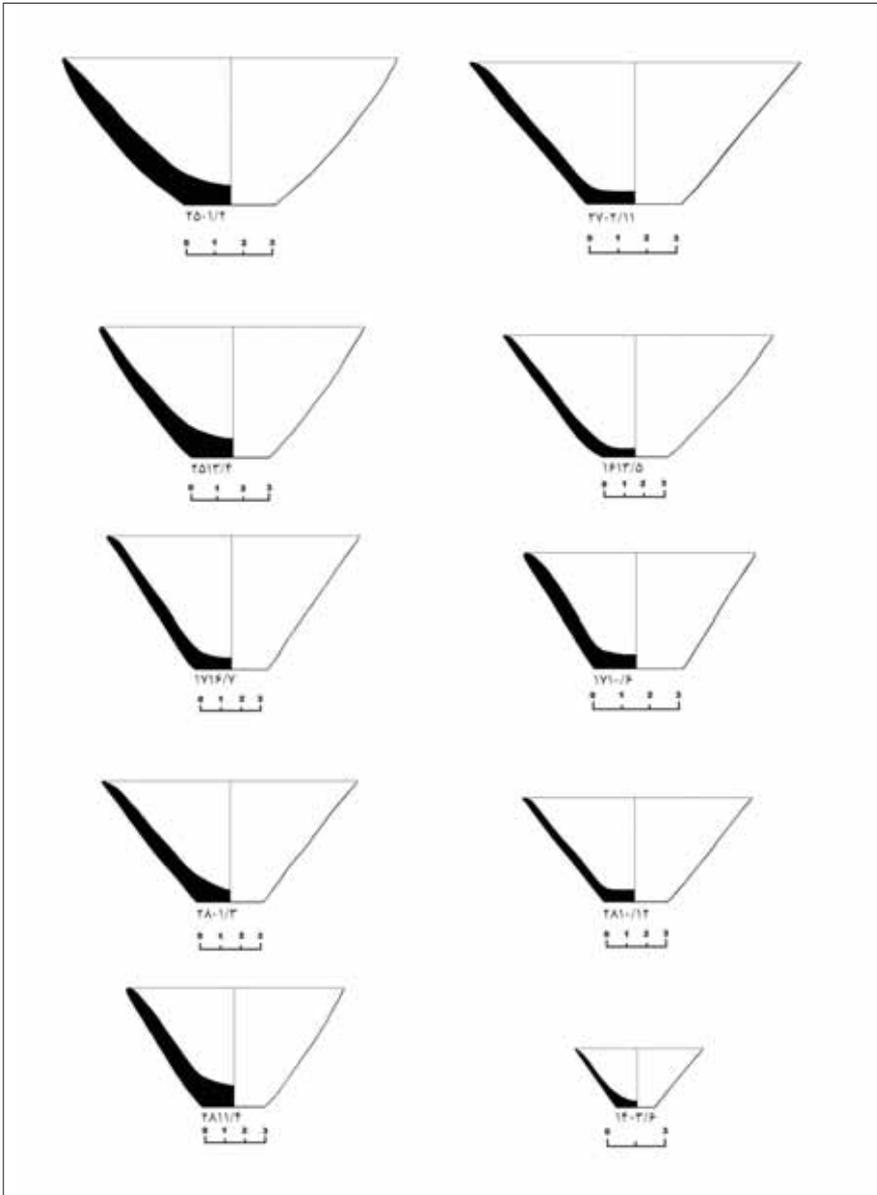


Fig. 13: deep Marble Bowls (Shirazi 2007: tab. 95).



Fig. 14: deep and Shallow bowls with open mouths.

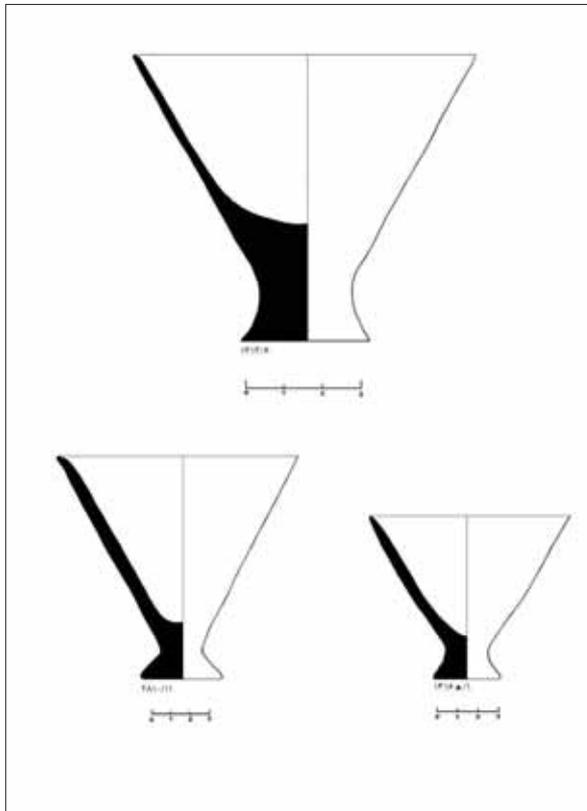


Fig. 15: cups with stands (Shirazi 2007: Tab. 97).

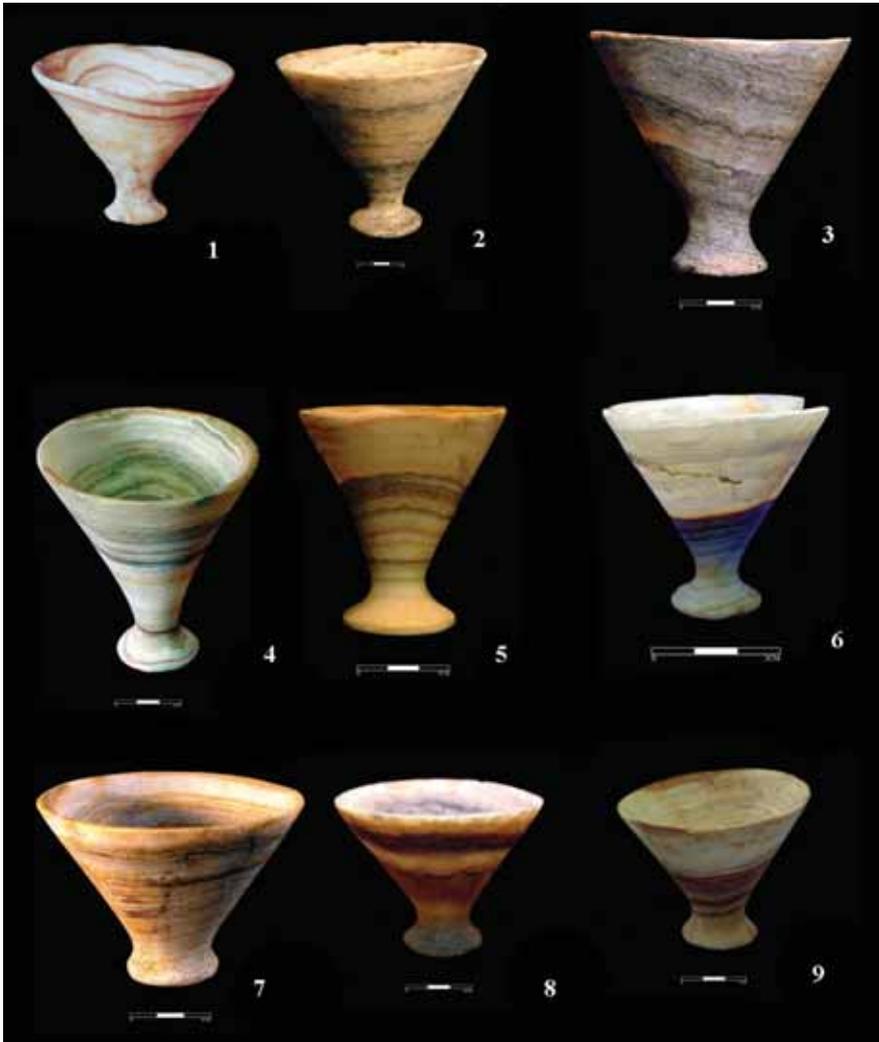


Fig. 16: types of cup with stand: 1. G.N.2810/11; 2. G.N.1716/6; 3. G.N.4314/6; 4. G.N.3208/5; 5. G.N.4303/3; 6. G.N.4306/1; 7. G.N.8119/4; 8. G.N.7809/6; 9. G.N.1413/6.

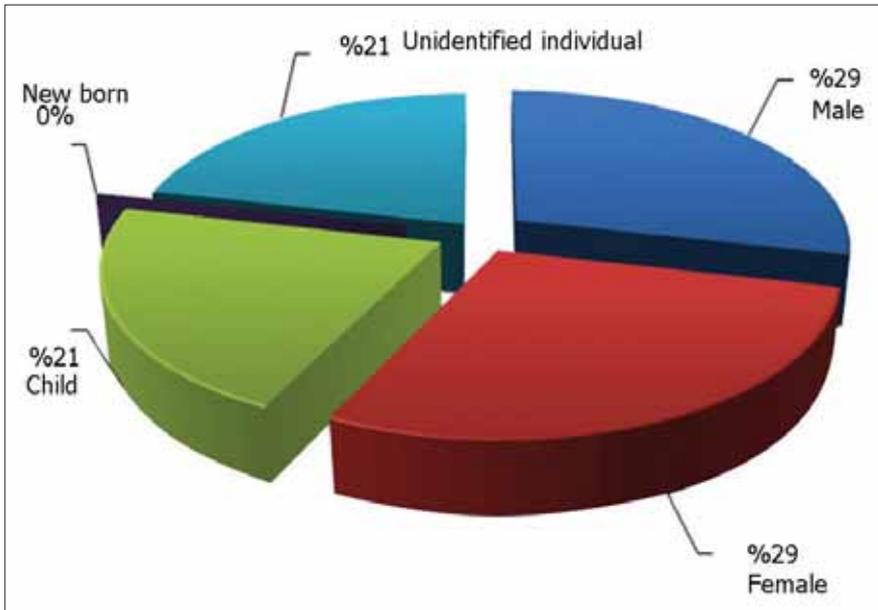


Fig. 17: frequency of cups with stands among genders and ages groups (Sajjadi - Mohammadi Sefidkhani 2019).

and short mortars with open mouths (Fig. 20). In terms of gender, female burials account for 36% of the mortars and males for about 30% (Fig. 21).

As mentioned before, marble items are found in both residential areas and the graveyard, but most of the complete vessels are from graves. In Shahr-i Sokhta ten different types of tomb structure have been reported (Sajjadi 2007), with marble vessels found only in four: 1, 2, 4 and 9. Among these four types of tomb structure, the greatest number of marble vessels are from bipartite graves (type 2), followed by simple pits (type 1), catacombs (type 4) and circular graves (type 9) (Fig. 22).

The distribution of marble artefacts in Shahr-i Sokhta cemetery can be examined in terms of their association with males, females, children, infants and unidentified individuals. The female group has the highest number of marble vessels, followed by males, individuals, children and infants. Given the prestige of marble vessels and their abundance in the female group, there may be a link



Fig. 18: types of mortar: 1. G.N.7817/13; 2. G.N.2903/2; 3. G.N.8914/8; 4. G.N.8315/1; 5. G.N.8603/8; 6. G.N.1400/2; 7. G.N.1403/6; 8. G.N.1200/00; 9. G.N.9005/11.

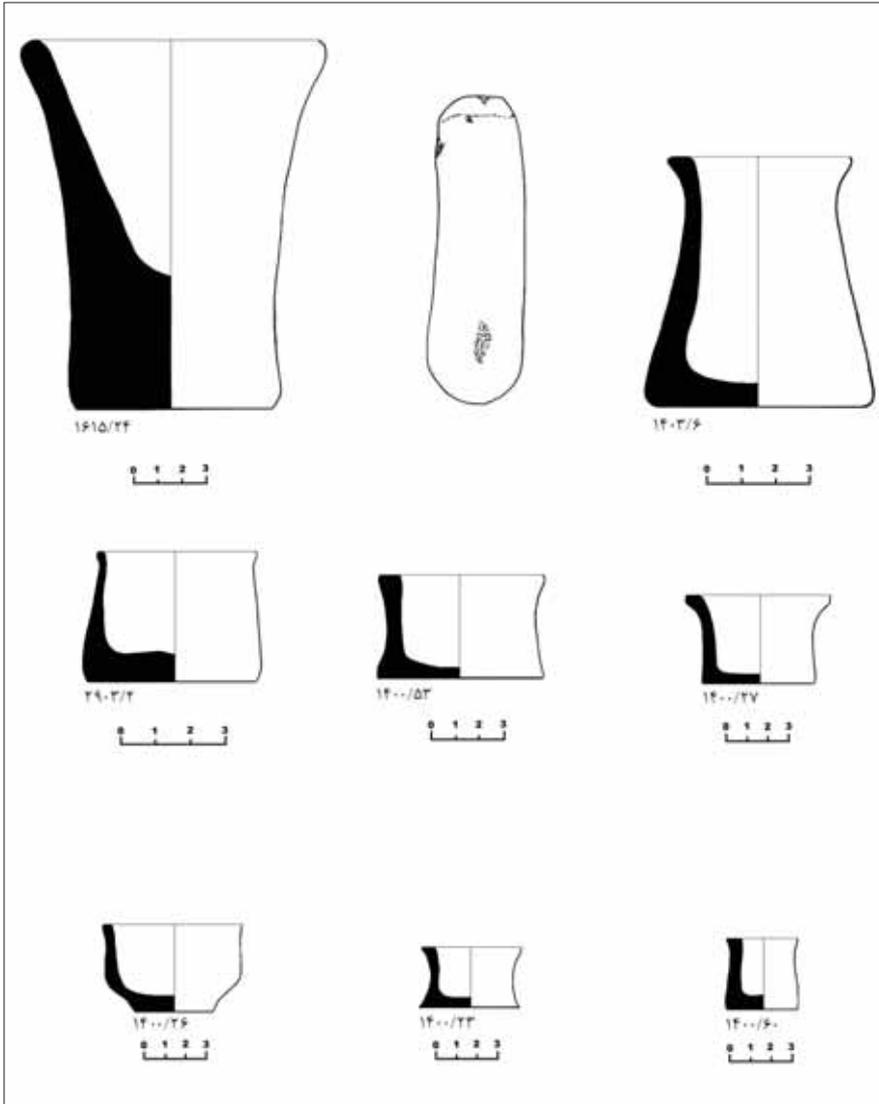


Fig. 19: cylindrical mortars (Shirazi 2007).



Fig. 20: tall and short mortars: 1. G.N.5005/51; 2. G.N.7817/13.

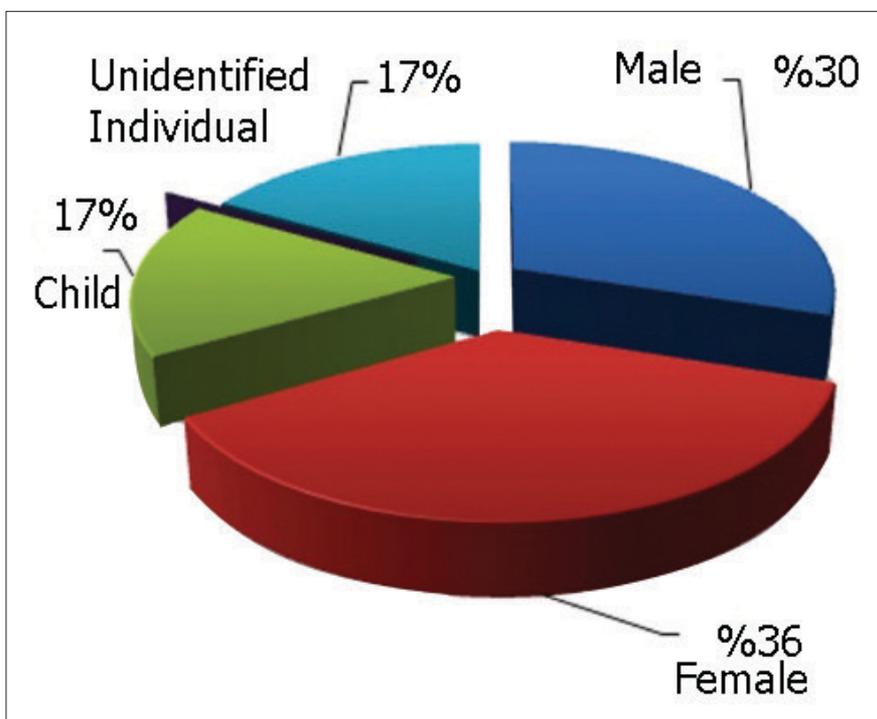


Fig. 21: distribution of the mortars across genders and age groups (Sajjadi - Mohammadi Sefidkhani 2019).

between women and the aesthetic and decorative aspects of the artefacts. In this regard, we should mention that in some groups of graves, a number of marble vessels have been seen that cannot be attributed to a specific gender, but rather must be assigned to both sexes.

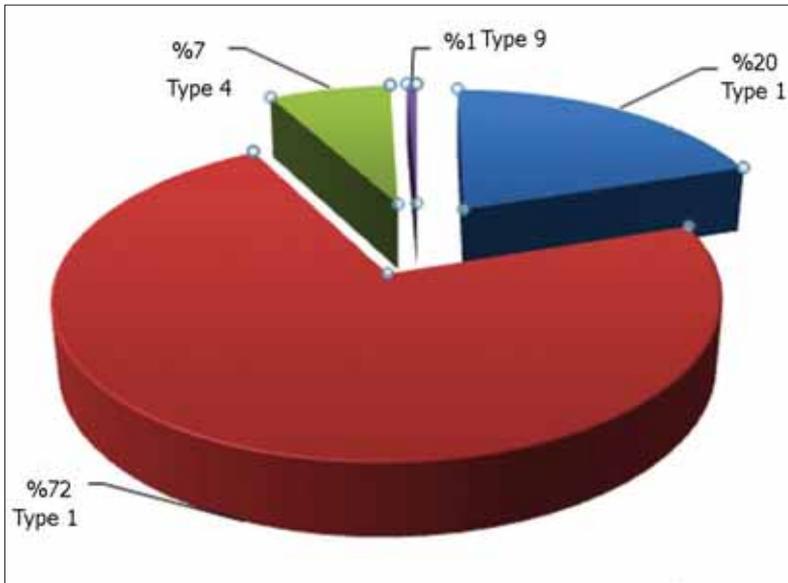


Fig. 22: distribution of marble vessels across grave types (Sajjadi - Mohammadi Sefidkhani 2019).

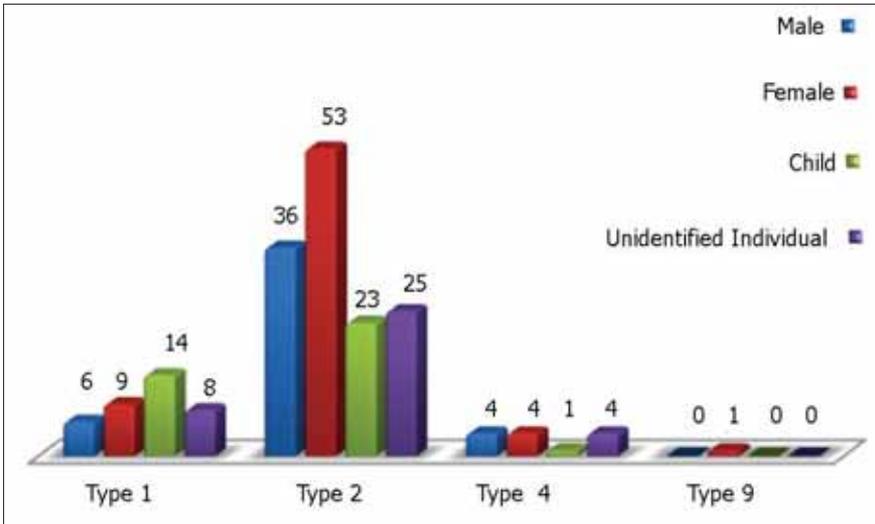


Fig. 23: distribution and abundance of marble vessels in different types of graves by gender and age group.

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The Alabaster Vessels of Building 33: Shahr-i Sokhta Archaeological Campaign 2019

Silvia Festuccia
'Suor Orsola Benincasa' University of Naples
silviafestuccia29@gmail.com

Abstract

The aim of the study on the alabaster brought to light in 'Building 33' by the Italian Multidisciplinary Archaeological Project at Shahr-i Sokhta (MAIPS) directed by Prof. Enrico Ascalone, is to identify, in this preliminary phase of the research conducted from 2018 to 2019, their typology and conduct petrographic analyses to examine the mineralogical appearance, structure and fabric of the stone.

1. Introduction

The settlement of Shahr-i Sokhta is situated on a terrace between the endorheic delta of the river Hirmand to the north-east, whose headwaters are in the mountains of the Hindu Kush in Afghanistan, and one of its broad terminal lakes, the Hamun-i Hirmand to the west. The hydrographic axes of this vast plain have always been the main vectors for its inhabitants, who have traditionally supported themselves with an essentially rural economy, integrated with livestock rearing, fishing and handicraft.

Shahr-i Sokhta is located in an optimal position due to its proximity to sources of raw materials, especially stone (Costantini - Tosi 1977: fig. 334), with primary outcrops and areas of collection.

Identified around the site were numerous satellite settlements, of small dimensions, in which detritus resulting from the processing of various types of raw material, including calcite, was discovered. In Rud-i Biyaban and above all in Tepe Graziani (Ciarla 1985: 420), a village with an area of about 2 hectares 5 km east of Shahr-i Sokhta, numerous unfinished cylindrical beads, fragments of alabaster statues and detritus produced by stonemasons were brought to light. The specialisation in production of stone artefacts in Shahr-i Sokhta seems to have reached a peak around the mid third millennium: so far two processing areas have been brought to light in the site, one of which, for the production of seals and artefacts in semiprecious stone, was located in the 'Central Quarters' (Salvatori - Vidale 1997: 77-78) and the other, for the creation of beads in turquoise and lapis lazuli, in the north-western sector (Piperno 1973; Biscione *et al.* 1974: 40-45; Bulgarelli 1981). Numerous finished materials in calcite were both used in the settlement and exported elsewhere.¹

2. Archaeological analysis of the alabaster vessels

Distributional and quantitative analysis of alabaster artefacts from Phase II.6A-B, Phase II.5A-B and Phase III.4 found on the surface and in situ.

The 2019 archaeological campaign further added to the already large quantity of alabaster pottery found during the 2018 archaeological mission, expanding our knowledge of this material, which was used mostly for the production of vessels.

The alabaster vessels were discovered in a fragmentary condition, both on the surface during the survey of Area 33 (23 fragments) and in context during the excavation (20 fragments).

1. The site of Shahr-i Sokhta is fundamental for understanding the commercial contacts between this area and the civilisations of Sumer in southern Iraq, Elam in south-western Iran and others in the Persian Gulf and Indus Valley during the Bronze Age (Piperno - Salvatori 1982; Amiet 1986; Kenoyer 1991; Potts 1994; Lamberg-Karlovsky 1996: 128-216; Crawford 1998; Kenoyer 1998; Cortesi *et al.* 2008). In relation to their symbolic value, the alabaster artefacts make it possible to study the circulation of material goods, trade and exchange, and relations of influence and domination among the various settlements of the Near East.

Fragments of alabaster artefacts from the survey of Area 33

A detailed survey of the area that includes 'Building 33', the 'Western Building', the 'Eastern Building' and the 'House of the Courts' led to the discovery of numerous fragments of alabaster vessels and an intact bowl (SiS. 19.33.305). Most of the calcite fragments are from conical bowls of small to medium size, while a smaller number are from containers/mortars.

Catalogue number	Locus	Vessel
1	Surface	SiS.19.33.59 (Fig. 1)
2	Surface	SiS.19.33.60 (Fig. 2)
3	Surface	SiS.19.33.61 (Fig. 3)
4	Surface	SiS.19.33.62 (Fig. 4)
5	Surface	SiS.19.33.63 (Fig. 5)
6	Surface	SiS.17.33.99 (Fig. 6)
7	Surface	SiS.19.33.65 (Fig. 7)
8	Surface	SiS.19.33.66 (Fig. 8)
9	Surface	SiS.19.33.67 (Fig. 9)
10	Surface	SiS.19.33.68 (Fig. 10)
11	Surface	SiS.17.33.134 (Fig. 11)
12	Surface	SiS.19.33.70 (Fig. 12)
13	Surface	SiS.19.33.71 (Fig. 13)
14	Surface	SiS.19.33.72 (Fig. 14)
15	Surface	SiS.19.33.73 (Fig. 15)
16	Surface	SiS.19.33.74 (Fig. 16)
17	Surface	SiS.19.33.75 (Fig. 17)
18	Surface	SiS.19.33.76 (Fig. 18)
41	Surface	SiS.19.33.1
27	Surface	SiS.19.33.204 (Fig. 27)
29	Surface	SiS.19.33.229 (Fig. 29)
34	Surface	SiS.19.33.305 (Fig. 34)
35	Surface	SiS.19.33.307 (Fig. 35)

Tab. 1: distributional analysis of the alabaster artefacts found on the surface in Area 33.

Distributive and quantitative analysis of alabaster artefacts found in situ

During the second campaign, archaeological activities were conducted in the southern part of 'Building 33'.

The alabaster vessels were mostly found in the ‘House of the Courts’, where 12 fragments were unearthed, 8 in L.122, one in L.127, one in L.142, one in L.159 and the last in L.182. Five fragments were found in the ‘Western Building’, one in L.137 of the squatter phase, one in L.176 and three in L.169. The last three alabaster artefacts were found in the ‘Eastern Building’, all in L.149. The function of this locus is still not clear.

Catalogue number	Locus	Artefact	Dating
19	L.122	SiS.19.33.77 (Fig. 19)	2850-2620 BC ‘House of the Courts’
20	L.137	SiS.19.33.78 (Fig. 20)	2620-2600 BC ‘Western Building’
40	L.122	SiS.19.33.84	2850-2620 BC ‘House of the Courts’
21	L.122	SiS.19.33.85 (Fig. 21)	2850-2620 BC ‘House of the Courts’
22	L.122	SiS.19.33.89 (Fig. 22)	2850-2620 BC ‘House of the Courts’
23	L.122	SiS.19.33.90 (Fig. 23)	2850-2620 BC ‘House of the Courts’
24	L.122	SiS.19.33.91 (Fig. 24)	2850-2620 BC ‘House of the Courts’
25	L.122	SiS.19.33.115 (Fig. 25)	2850-2620 BC ‘House of the Courts’
26	L.122	SiS.19.33.184 (Fig. 26)	2850-2620 BC ‘House of the Courts’
27	L.127	SiS.19.33.208 (Fig. 28)	2850-2620 BC ‘House of the Courts’
28	L.169	SiS.19.33.234 (Fig. 30)	3000-2850 BC ‘Western Building’
30	L.169	SiS.19.33.239 (Fig. 31)	3000-2850 BC ‘Western Building’
31	L.169	SiS.19.33.241 (Fig. 32)	3000-2850 BC ‘Western Building’
32	L.142	SiS.19.33.243 (Fig. 33)	2850-2620 BC ‘House of the Courts’
36	L.159	SiS.19.33.323 (Fig. 36)	2850-2620 BC ‘House of the Courts’
42	L.182	SiS.19.33.325	2850-2620 BC ‘House of the Courts’
43	L.176	SiS.19.33.331	3000-2850 BC ‘Western Building’
37	L.149	SiS.19.33.372 (Fig. 37)	3000-2850 BC ‘Eastern Building’
38	L.149	SiS.19.33.375 (Fig. 38)	3000-2850 BC ‘Eastern Building’
39	L.149	SiS.19.33.376 (Fig. 39)	3000-2850 BC ‘Eastern Building’

Tab. 2: distributional analysis of the alabaster artefacts found in situ in ‘Building 33’.

3. Morphology and typology

In the material from the 2018 excavation campaign² two main forms were identified: the truncated cone-shaped bowl and the mortar with a square cross-section.

2. See Festuccia 2019 ‘Studio preliminare del vasellame in alabastro dal ‘Building 33’ a Shahr-i Sokhta: tipologia e analisi petrografiche’, in Ascalone - Sajjadi 2019: 165-194.

The forms of the alabaster artefacts discovered in ‘Building 33’, the ‘Western Building’, the ‘Eastern Building’ and the ‘House of the Courts’ are the same as those identified during the research conducted at the site of Shahr-i Sokhta from 1967 to 1978 by IsMEO based in Rome³ and since the late 1990s by the team headed by S.M.S. Sajjadi in grave goods in the necropolis⁴.

Alabaster was commonly used for the production of containers of small and medium size from bowls to mortars. Regarding the morphology of the truncated cone-shaped bowls,⁵ Type 1⁶ is an open form, with a simple profile and a flat base, of small or medium size, with three sub-types distinguishable by the rims. The rims all belong to the category of ‘indistinct rims’, which do not have a clear boundary between them and the wall of the vessel and can be sharpened, flattened or rounded by the craftsman.

The type of rim in the truncated cone-shaped bowls is considered an element of distinction giving rise to three types:

Type 1a	Sharp
Type 1b	Flat
Type 1c	Round

3. A careful analysis of the craftsmanship and typology of the alabaster vessels of Shahr-i Sokhta was conducted by Ciarla from the late 1970s to the mid 1980s. The study examined 1280 fragments of calcite vessels gathered from the surface of the site of Shahr-i Sokhta and kept in the Museo Nazionale d’Arte Orientale in Rome. Of these, only 80 had a complete profile (Ciarla 1981). Discoveries of calcite vessels on the surface had been made in the first ever excavation campaign in Shahr-i Sokhta, which identified, among other items, conical bowls (Tosi 1968: 41-42, figs. 19a, g, i, and 20a) in the ‘Central Quarters’ (Vidale - Salvatori 1997).

4. Sajjadi 2003a *et al.* See especially the note on alabaster vessels by R. Shirazi (2002): 66-74, figs. 33, 35.

5. In the study published by Casanova on the corpus of alabaster vessels from Susa of the third and second millennia BC kept in the Louvre, the forms seen in Series XI and XII are comparable to those of Shahr-i Sokhta (Casanova 1991: 36, plates 8-9, figs. 8-10).

6. For comparisons with conical and truncated cone-shaped bowls found elsewhere, see: Susa (Mecquenem 1934: figs. 21:7, 60:26; 1943, fig. 71:11; Le Breton 1957: figs. 40: 4, 42: 1, 2, 5; Stève - Gasche 1971: plate 15:15), Aliabad (Gautier-Lampre 1905: figs. 288, 290, 293), Shahr-i Sokhta (Ciarla 1981: figs. 3a, 4a, 4f, 4i, 8, 12; Tosi 1983a: 179, figs. 16-17), Mundigak (Jarrige - Tosi 1981: fig. 3a, third from the right), Bactria (Pottier 1984: n. 195) and Tarut (Burkholder 1984: n. 16c; Potts 1989: fig. 15 from the right). In Mesopotamia, parallels have been found in Ur (Hall - Woolley 1927: plate LXI, type XVIII; Woolley 1934: plate 176, U. 11818, U. 12673; plate 241-243, RC 13, 14, 16, 19, 20a, 24, 25; Woolley 1955: type JN 27; Woolley 1974: plate 51, Ur III type V), Girsu (Heuzev-Sarzec 1884-1912: plate 44b.1) and Sippar (Walker - Collon 1980: pl. 27-21).

The number of bowls with a sharpened rim suggests that this feature was intentionally added during the process of manufacture, whereas the rounded rim and above all the flattened rim seem to be accidental and could thus be the result of an error on the part of the craftsman during production.

In all cases the bases are flat, without feet. In some cases, the base is not perfectly flat, but slightly convex, so they would not be stable when placed on a flat surface.

The diameter and height of the vessels vary from as little as a few centimetres, 2.5×1.4 cm, for the smallest bowls to 20×30 cm, deduced from the largest fragments (Tab 3).

The bases discovered in a fragmentary condition appear to be circular; in some cases they are flat and in others slightly convex, giving clues as to their function. Some of the conical bowls discovered are of small and medium size, varying only slightly from one to the other, suggesting that they were stacked on top of each other.

The alabaster vessels with a quadrangular cross-section, interpretable as mortars e.g. SiS.17.33.134 (Fig. 23), have parallels in the 'Eastern Residential Area' and in Mundigak⁷. In this case, the shape does not appear to be distinctive from the chronological point of view.

The alabaster vessel fragments examined in our study are listed in the catalogue following the text below.

4. The manufacturing process

The entire repertoire of stone artefacts from this area is made of a highly ductile material that does not require the type of heat treatment that is absolutely necessary when working with metal and clay. Indeed, calcite lies between 1 and 2 on the Mohs scale of mineral hardness, which is based on the empirical criterion of the

7. On the vessels with a quadrangular cross-section, see Vidale - Salvatori 1997: fig. 248, 12. These are similar to those discovered in the 'Eastern Residential Area' (Tosi 1969a: fig. 234; Ciarla 1979: fig. 8) and very similar to what is seen in Mundigak in levels dated to Period IV, 1 (Casal 1961: fig. 134, 15).

Catalogue number	Form	Type
1 SiS.19.33.59 (Fig. 1)	Bowl	Rim Type 1a
2 SiS.19.33.33 (Fig. 2)	Bowl	
3 SiS.17.33.35 (Fig. 3)	Bowl	Rim Type 1a
4 SiS.17.33.21 (Fig. 4)	Bowl	
5 SiS.17.33.88 (Fig. 5)	Bowl	Rim Type 1b
6 SiS.17.33.89 (Fig. 6)	Bowl	Rim Type 1a
7 SiS.17.33.91 (Fig. 7)	Bowl	Rim Type 1a
8 SiS.17.33.95 (Fig. 8)	Bowl	Rim Type 1a
9 SiS.17.33.96 (Fig. 9)	Bowl	Rim Type 1a
10 SiS.17.33.97 (Fig. 10)	Bowl, base	
11 SiS.17.33.98 (Fig. 11)	Bowl	Rim Type 1a
12 SiS.17.33.99 (Fig. 12)	Bowl	
13 SiS.17.33.103 (Fig. 13)	Bowl, base	
14 SiS.17.33.104 (Fig. 14)	Bowl	Rim Type 1a
15 SiS.17.33.105 (Fig. 15)	Bowl	
16 SiS.17.33.128 (Fig. 16)	Bowl	Rim Type 1a
17 SiS.17.33.129 (Fig. 17)	Bowl	Rim Type 1b
18 SiS.17.33.130 (Fig. 18)	Bowl	Rim Type 1b
19 SiS.17.33.131 (Fig. 19)	Bowl	Rim Type 1c
20 SiS.17.33.132 (Fig. 20)	Bowl	
21 SiS.17.33.133	Bowl	Rim Type 1b
22 SiS.17.33.134	Mortar, base	
23 SiS.17.33.135	Bowl	
24 SiS.17.33.136 (Fig. 24)	Bowl	Rim Type 1a
25 SiS.17.33.137 (Fig. 25)	Mortar?	
26 SiS.17.33.138 (Fig. 26)	Bowl	Rim Type 1b
27 SiS.17.33.139 (Fig. 27)	Bowl	Rim Type 1a
28 SiS.17.33.141 (Fig. 28)	Bowl	

Tab 3: morphology and typology of the artefacts discovered in 2019.

ability of a harder material to scratch a softer material. It can thus be considered a soft stone, more easily shaped than other types of stone present in this area. The forms obtained from the processing of alabaster reveal the techniques used to extract the material from the calcite pebbles present in Shahr-i Sokhta. These entailed drilling, rotating the bit in one direction then the other, applying pressure that was necessarily irregular, using a range of a range of tools, probably in combination with chiselling.⁸

Zonal EDS showed that the circular grooves observed inside some samples contained residues that differed from the surrounding matrix. Consisting of concentrated aluminium and silicon compounds, these residues have a chemical composition similar to that of the local sands, which may have been used as abrasives during the reduction process. Alternatively, the residue may have become detached from the stone drill bit that was used for excavating the cavity. However, post-production and post-depositional processes may also have led to this result. In some cases, the presence of copper residues was also identified, raising questions on the use of tools made of this metal (in combination with abrasives) during the production of the calcite bowls. This aspect clearly merits a more detailed study by means of further investigations, since the copper residues may also derive from substances that were contained in the vessels, such as cosmetics.

The ESEM and EDS analyses have provided a better understanding of the drilling process, the interaction between the drill bits and the walls of the bowl, the possible combination with other techniques for the creation of the cavity (for example chiselling), the probable use of abrasives during production, and lastly the interesting relationship between abrasives and copper tools in the production of calcite bowls.

8. A recent article (Boccuti *et al.* 2015) presented the preliminary results of non-destructive investigations of the surface of 5 samples of calcite from Shahr-i Sokhta, performed in the Museo Nazionale d'Arte Orientale in Rome. The analyses were conducted by environmental scanning electron microscope (ESEM) fitted with an energy-dispersive X-ray spectrometer (EDS). The characteristics of these samples were similar to those of the alabaster vessels discovered in the excavation of 'Building 33'.

5. Provenance of the calcite

From the very start of the research, the large quantity of alabaster discovered on the surface of the buildings and in the tombs indicated the presence of quarries in the vicinity of Shahr-i Sokhta.

The nearest alabaster quarries to the site discovered to date are those of Malekh Siah Kuh near Zahedan, about 120 km from Shahr-i Sokhta, where deposits of calcite gravel and washed pebbles were discovered. The Chagai Hills in Afghanistan, about 280 km away from Shahr-i Sokhta, have secondary deposits of alabaster in the form of washed pebbles of marble-onyx contained in terraces of varying dimensions of the late Tertiary - early Quaternary, which are also found in Kuh-i Khan Nashin in the basin of the Hirmand in Pakistan, about 250 km east-north-east of Shahr-i Sokhta.

Considerable quantities of alabaster are also recorded in the veins and secondary deposits of the eastern part of Kuh-i Birjand, which separates one of the inland lakes of the deltaic basin of Sistan from the depression of Lut to the west. In that area there are low hills consisting of sediments of the Tertiary and of recent Quaternary, particularly rich in materials including rounded pebbles 15-50 cm in diameter. Sources of calcite are also relatively common in the basin of the lower Hirmand.

What needs to be highlighted in this preliminary phase of the study, with reference to the geological map, is the presence near Shahr-i Sokhta of various Pliocene and Pleistocene alluvial deposits. These are composed of pebbles of various rocks, including calcite, in some cases brought from long distances by the river Hirmand, on whose delta the settlement of Shahr-i Sokhta lies.

Sources of calcite are relatively frequent in the lower Hirmand basin, and Shahr-i Sokhta is situated in the terminal stretch of the river. The outcropping rock, exposed by exogenous agents such as tectonic movements, could shed material that is transformed into polished pebbles as it is transported by the river. In the geological map of the area, Shahr-i Sokhta lies in a stony alluvial plain, characterised by various types of sedimentary deposit, some of which contain washed pebbles. The sedimentary deposits near Shahr-i Sokhta might well have

been the sources of alabaster in the form of pebbles, representing a rich natural resource for the production of vessels in calcite.

During the survey conducted in the area of 'Building 33', a washed pebble was discovered. Of small dimensions, it was shown by petrographic analyses carried out in 2018 to be composed of alabaster.

Calcite pebbles of small and medium size might have been the main raw material used for making the vessels of Shahr-i Sokhta, where semi-processed pebbles were found on the surface.⁹

6. Conclusions

The study of the alabasters of Shahr-i Sokhta is still in the preliminary phase. The excavations performed during the archaeological campaigns have shown that most of the vessels found *in situ* in the 'House of the Courts', the 'Western Building' and the 'Eastern Building' were unearthed in administrative areas.

The morphology of the vessels is homogeneous. Mostly bowls of medium size (only one fragment of a mortar is attested), they may be distinguished by their rims into three types; Type 1a (sharp), Type 1b (flat) and Type 1c (round).

The geological map highlights alluvial sedimentary deposits in the area of Shahr-i Sokhta, with the presence of calcite pebbles. From the technological point of view, these pebbles can be associated with the vessels. Research in the wider region will help us to analyse in greater detail the quarries of this material and the process of extraction.

The new excavations confirm the fundamental role of Shahr-i Sokhta in the lithic industry and technology of the cultures of the third millennium in Iran, the valley of the Indus and southern Turkmenistan.

9. Ciarla - Bökönyi 1985: fig. 4 cylindrical, fig. 5 conical.

Catalogue of alabaster vessels 2019

Fig. 1

SiS.19.33.59	Area 33
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	orange veining on a pale background
Condition	fragmentary
Length	6.5 cm
Width	4.5 cm
Thickness	0.8 cm
US/Locus	SiS.19.33.1/26
Level	surface

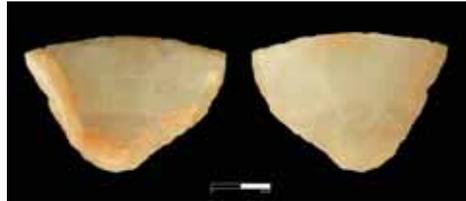


Fig. 2

SiS.19.33.60	Area 33
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	orange veining on a pale background
Condition	fragmentary
Length	5.3 cm
Width	4.8 cm
Thickness	1 cm
US/Locus	SiS.19.33.1/17
Level	surface

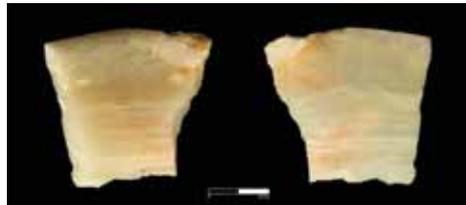
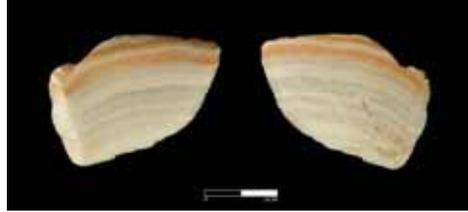


Fig. 3

SiS.19.33.61	Area 33
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	white veining on a beige background
Condition	fragmentary
Length	4.6 cm
Width	3.1 cm
Thickness	0.5 cm
US/Locus	SiS.19.33.1/15
Level	surface

**Fig. 4**

SiS.19.33.62	Area 33
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	orange veining on a beige background
Condition	fragmentary
Length	5 cm
Width	3.4 cm
Thickness	0.7 cm
US/Locus	SiS.19.33.1/7
Level	surface

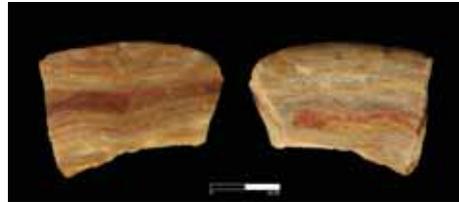


Fig. 5

SiS.19.33.63	Area 33
Form	triangular
Type	processing waste
Description	medium-sized piece of laminar processing waste
Colour	orange veining on a beige background
Condition	intact
Length	5.9 cm
Width	5.2 cm
Thickness	1.9 cm
US/Locus	SiS.19.33.1/13
Level	surface

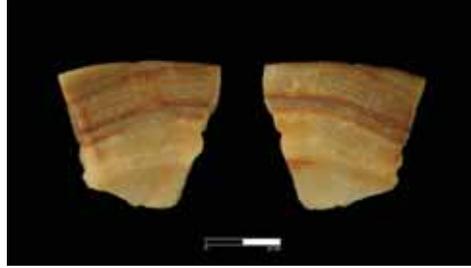
**Fig. 6**

SiS.19.33.64	Area 33
Form	mortar?
Type	not classifiable
Description	medium-sized cylindrical mortar, flat bottom
Colour	grey veining on white background
Condition	fragmentary
Length	3.9 cm
Width	3.8 cm
Thickness	1.5 cm
US/Locus	SiS.19.33.1/24
Level	surface



Fig. 7

SiS.19.33.65	Area 33
Form	bowl
Type	1b
Description.	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, flattened at the edge
Colour	orange veining on a beige background
Condition	fragmentary
Length	4.2 cm
Width	3.8 cm
Thickness	0.7 cm
US/Locus	SiS.19.33.1/10
Level	surface

**Fig. 8**

SiS.19.33.66	Area 33
Form	bowl
Type	not classifiable
Description	flat small base
Colour	orange veining on a beige background
Condition	fragmentary
Length	4.5 cm
Width	2.1 cm
Thickness	0.6 cm
US/Locus	SiS.19.33.1/18
Level	surface

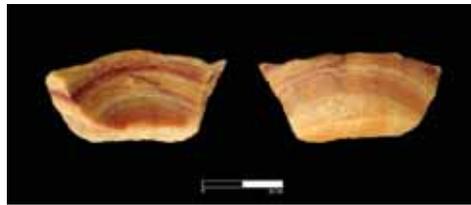


Fig. 9

SiS.19.33.67	Area 33
Form	bowl
Type	not classifiable
Description	large wall fragment
Colour	orange and beige veining on a pale background
Condition	fragmentary
Length	5.7 cm
Width	5.2 cm
Thickness	1.0 cm
US/Locus	SiS.19.33.1/9
Level	surface

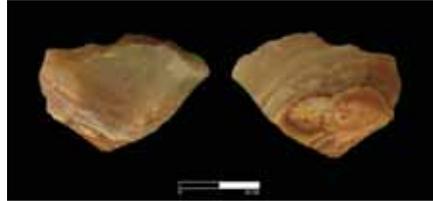
**Fig. 10**

SiS.19.33.68	Area 33
Form	bowl
Type	1b
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, flattened at the edge
Colour	light monochrome with whitish veining
Condition	fragmentary
Length	2.5 cm
Width	2 cm
Thickness	0.7 cm
US/Locus	SiS.19.33.1/11
Level	surface



Fig. 11

SiS.19.33.69	Area 33
Form	bowl
Type	not classifiable
Description	medium-sized slightly rounded base
Colour	orange and beige veining on a beige background
Condition	fragmentary
Length	4.0 cm
Width	1.7 cm
Thickness	0.9 cm
US/Locus	SiS.19.33.1/19
Level	surface

**Fig. 12**

SiS.19.33.70	'Building 33'
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	white veining on a pale yellowish background
Condition	fragmentary
Length	3.2 cm
Width	4.7 cm
Thickness	0.6 cm
US/Locus	SiS.19.33.1/16
Level	surface

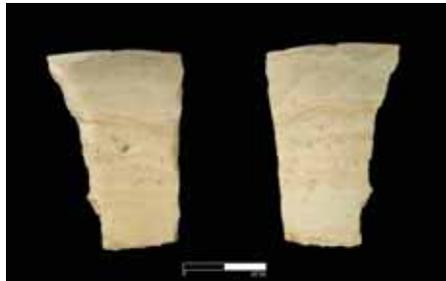
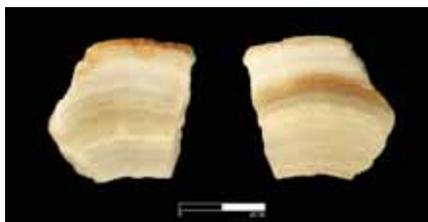


Fig. 13

SiS.19.33.71	'Building 33'
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	light monochrome
Condition	fragmentary
Length	3.0 cm
Width	3.1 cm
Thickness	0.7 cm
US/Locus	SiS.19.33.1/6
Level	surface

**Fig. 14**

SiS.19.33.72	'Building 33'
Form	mortar
Type	not classifiable
Description	simple cylindrical shape or small mortar with closed mouth, everted-flaring ring and flat base.
Colour	pink, orange and light veining
Condition	fragmentary
Length	1.5 cm
Width	2.5 cm
Thickness	0.3 cm
US/Locus	SiS.19.33.1/8
Level	surface

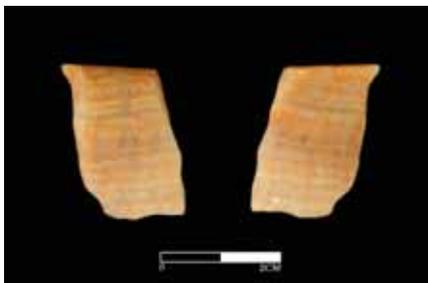
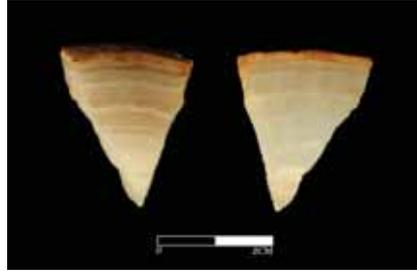


Fig. 15

SiS.19.33.73	'Building 33'
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	beige and light veining on a light background
Condition	fragmentary
Length	3.1 cm
Width	1.4 cm
Thickness	0.8 cm
US/Locus	SiS.19.33.1/12
Level	surface

**Fig. 16**

SiS.19.33.74	'Building 33'
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	white veining on a pale yellowish background
Condition	fragmentary
Length	4.1 cm
Width	2.2 cm
Thickness	0.7 cm
US/Locus	SiS.19.33.1/22
Level	surface

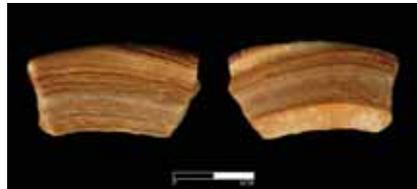


Fig. 17

SiS.19.33.75	Area 33
Form	not classifiable
Type	not classifiable
Description	medium-sized wall fragment
Colour	orange veining on a light and pale yellowish background
Condition	very fragmentary
Length	4.6 cm
Width	3.3 cm
Thickness	0.6 cm
US/Locus	SiS.19.33.1/20
Level	surface

**Fig. 18**

SiS.19.33.76	Area 33
Form	mortar
Type	not classifiable
Description	medium-sized cylindrical mortar, everted-flaring ring and flat base
Colour	pinkish and pale veining on a beige background
Condition	fragmentary
Length	2.5 cm
Width	3.2 cm
Thickness	0.7 cm
US/Locus	SiS.19.33.1/14
Level	surface

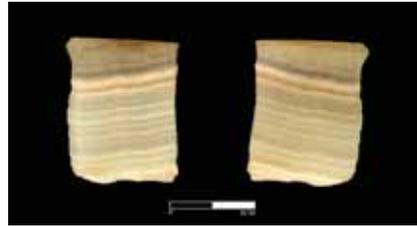
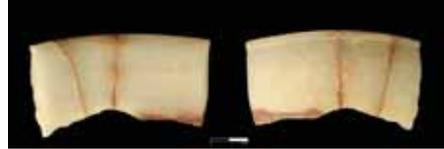


Fig. 19

SiS.19.33.77	'House of the Courts'
Form	bowl
Type	1b
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, flattened at the edge
Colour	longitudinal Bordeaux veining on light background
Condition	fragmentary
Length	9.1 cm
Width	4.4 cm
Thickness	0.7 cm
US/Locus	L.122
Dating	2850-2620 BC

**Fig. 20**

SiS.19.33.78	'Western Building'
Form	spindle whorl
Description	flat circular
Colour	pale on one side, beige on the other side
Condition	intact
Diameter	3.7 cm; diameter hole 0.9 cm
Thickness	0.9
US/Locus	L.137
Dating	2620-2600 BC
US/Locus	L.122
Dating	2850-2620 BC

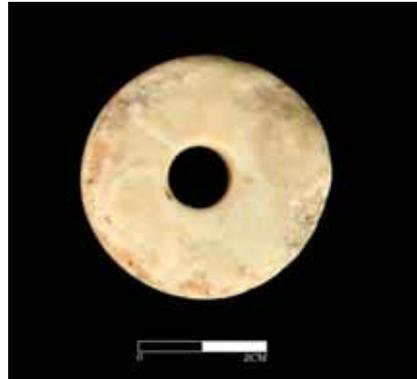


Fig. 21

SiS.19.33.85	'House of the Courts'
Form	bowl
Type	not classifiable
Description	medium-sized wall fragment
Colour	light monochrome
Condition	fragmentary
Length	4.9 cm
Width	1.5 cm
Thickness	0.7 cm
US/Locus	L.122
Dating	2850-2620 BC

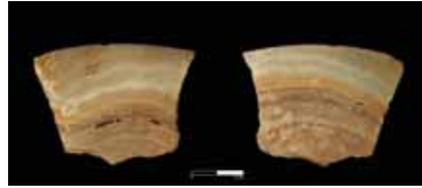
**Fig. 22**

SiS.19.33.89	'House of the Courts'
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	white and grey veining on a light background
Condition	fragmentary
Length	1.8 cm
Width	2.1 cm
Thickness	0.3 cm
US/Locus	L.122
Level	cleaning/surface
Dating	2850-2620 BC



Fig. 23

SiS.19.33.90	'House of the Courts'
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	orange and white veining on a beige background
Condition	fragmentary
Length	2.4 cm
Width	2.9 cm
Thickness	0.6 cm
US/Locus	L.122
Dating	2850-2620 BC

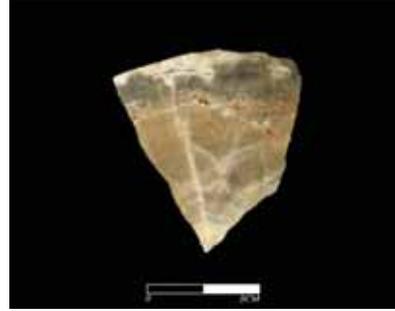
**Fig. 24**

SiS.19.33.91	'House of the Courts'
Form	bowl
Type	1b
Description	large open truncated cone-shaped bowl, simple profile, indistinct rim, flattened at the edge
Colour	orange veining on light background
Condition	fragmentary
Length	11.2 cm
Width	8.7 cm
Thickness	1 cm
US/Locus	L.122
Dating	2850-2620 BC



Fig. 25

SiS.19.33.115	'House of the Courts'
Form	bowl
Type	not classifiable
Description	medium-sized wall fragment with wavy profile
Colour	monochrome light
Condition	fragmentary
Length	4.2 cm
Width	2.7 cm
Thickness	1 cm
US/Locus	L.122
Dating	2850-2620 BC

**Fig. 26**

SiS.19.33.184	'House of the Courts'
Form	bowl
Type	not classifiable
Description	small wall fragment, semicircular shape
Colour	bichrome light
Condition	fragmentary
Length	4.2 cm
Width	2.7 cm
Thickness	1 cm
US/Locus	L.122
Dating	2850-2620 BC

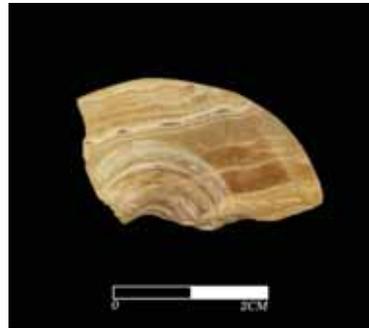


Fig. 27

SiS.19.33.204	Area 33
Form	bowl
Type	not classifiable
Description	small wall fragment, semicircular shape
Colour	bichrome light
Condition	fragmentary
Length	4.2 cm
Width	2.7 cm
Thickness	1 cm
US/Locus	cleaning-surface
Level	surface

**Fig. 28**

SiS.19.33.208	'House of the Courts'
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	beige veining on a light background
Condition	fragmentary
Length	3.5 cm
Width	5.7 cm
Thickness	0.6 cm
US/Locus	L.127
Dating	2850-2620 BC



Fig. 29

SiS.19.33.229	Area 33
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	monochrome light
Condition	fragmentary
Length	4.1 cm
Width	2.6 cm
Thickness	1.4 cm
US/Locus	cleaning-surface
Level	surface

**Fig. 30**

SiS.19.33.234	'Western Building'
Form	bowl
Type	not classifiable
Description	medium-sized wall fragment
Colour	beige and orange veining on a light background
Condition	fragmentary
Length	2 cm
Width	2.3 cm
Thickness	0.5 cm
US/Locus	L.169
Dating	3000-2850 BC

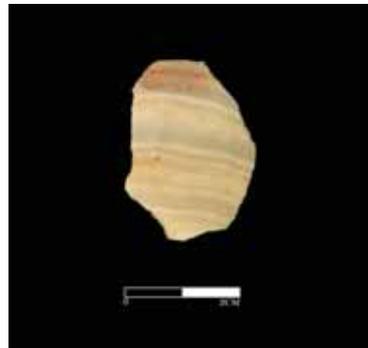


Fig. 31

SiS.19.33.239	‘Western Building’
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	orange and grey veining
Condition	fragmentary
Length	14 cm
Width	7.6 cm
Thickness	1 cm
US/Locus	L.169
Dating	3000-2850 BC

**Fig. 32**

SiS.19.33.241	‘Western Building’
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	beige and orange veining on a light background
Condition	fragmentary
Length	6.2 cm
Width	6.3 cm
Thickness	1 cm
US/Locus	L.169
Dating	3000-2850 BC

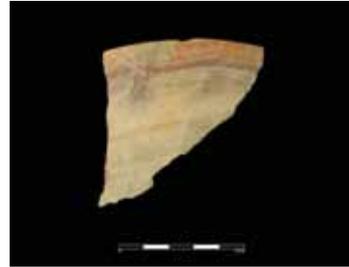


Fig. 33

SiS.19.33.243	'House of the Courts'
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	orange and grey veining
Condition	fragmentary (4 fragments)
Length	9.1 cm
Width	10.9 cm
Thickness	1 cm
US/Locus	L.142
Dating	2850-2620 BC

**Fig. 34**

SiS.19.33.305	Area 33
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	orange and veining on a light background
Condition	intact
Length	12.5 cm
Width	7.5 cm
Thickness	1 cm
US/Locus	surface
Level	surface



Fig. 35

SiS.19.33.307	Area 33
Form	bowl
Type	not classifiable
Description	medium-sized wall fragment
Colour	monochrome light
Condition	fragmentary
Length	5.1 cm
Width	2.8 cm
Thickness	1 cm
US/Locus	surface
Level	surface

**Fig. 36**

SiS.19.33.323	'House of the Courts'
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	orange and veining on a light background
Condition	fragmentary
Length	2.9 cm
Width	3.4 cm
Thickness	0.8 cm
US/Locus	L.159
Dating	2850-2620 BC

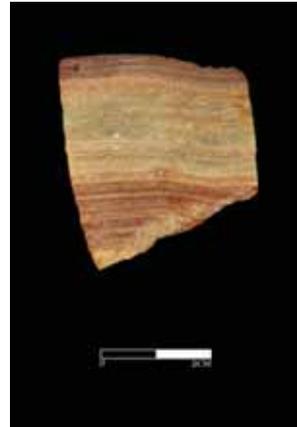


Fig. 37

SiS.19.33.372	'Eastern Building'
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	monochrome light
Condition	fragmentary
Length	5.0 cm
Width	2.3 cm
Thickness	0.8 cm
US/Locus	L.149
Dating	3000-2850 BC

**Fig. 38**

SiS.19.33.375	'Eastern Building'
Form	bowl
Type	not classifiable
Description	medium-sized slightly rounded base
Colour	orange and beige veining on a beige background
Condition	fragmentary
Length	6.5 cm
Width	3.4 cm
Thickness	0.9 cm
US/Locus	L.149
Dating	3000-2850 BC



Fig. 39

SiS.19.33.376	‘Eastern Building’
Form	bowl
Type	1a
Description	medium-sized open truncated cone-shaped bowl, simple profile, indistinct rim, sharp at the edge
Colour	orange veining on a light background
Condition	fragmentary
Length	3.5 cm
Width	2.7 cm
Thickness	0.7 cm
US/Locus	L.149
Dating	3000-2850 BC



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Wooden and Reed Objects from Shahr-i Sokhta

Seyyed Mansur Seyyed Sajjadi
Iranian Center for Archaeological Research
m_sajjadi@hotmail.com

Abstract

During the excavations in Shahr-i Sokhta, many items made of organic materials including wood and reeds were found in residential areas and the graveyard. The archaeological layers have yielded remnants of wood, charred structures, fabrics, plant fibres, rope, animal bones and marine organisms, each of which provides useful information. The study of these samples helped the initial reconstruction of the natural environment of Sistan and the Hirmand river and lake Hamun, showing that the lower stretch of the river and its main branches had abundant vegetation in the third millennium BC. The most frequent objects made of these materials are baskets, carpets, combs and wooden boxes.

Wooden and reed items

Among the artefacts and other items found during the excavations in the residential areas and graveyard of Shahr-i Sokhta, a considerable number were composed of organic materials.

The survival at Shahr-i Sokhta of countless specimens of plants and animals, some of large dimensions, as well as artefacts produced from them, is mostly

due to the regional climate. Among the waste and soils of the various layers, the excavations have found the remains of wood, textiles, fabrics, plant fibres, ropes, animal bones, marine crustaceans and more.

Examination of specimens of plant and tree species found in Shahr-i Sokhta has contributed greatly to the reconstruction of the natural environment of Sistan, especially the Hirmand River and Lake Hamun. The study of these samples has shown that during the life of the city, the lower part of the Hirmand River and its main tributaries had dense coverage of plants such as *Populus*, *Acer*, *Ulmus* and *Fraxinus*. The wood of these trees, especially the trunks and branches of poplar, was transported to other areas along streams and branches of the Hirmand River. These parts of Sistan, then as now, were covered in various types of Tamarix, which grows on the margins of dry lands, and its growth follows the seasonal floods affecting the lake. The remains of small plants and tall reeds (*Phragmites*), found in various parts of the archaeological site on the broad area by the lake near the site, show that the area had abundant vegetation. These plants, in addition to *Juncus* and *Cyperus*, probably formed dense groves of reeds. The presence of a large quantity of plant-based rope fragments (Fig. 1) and fishing nets, the remains of freshwater fish and crustaceans and the presence of countless bones of birds that nest in canebrakes and reedbeds, as well as signs of slow-flowing streams, are all further evidence of the existence of a natural, green environment at that time (Costantini - Tosi 1978).



Fig. 1: plant based rope.

Many artefacts and objects made of reeds and other plants have been found in Shahr-i Sokhta, which distinguishes this area from other ancient sites on the Iranian plateau. In a number of graves, objects made of straw have also been recovered in various forms, some fairly well-preserved. The use of rush mats to cover the floor of the tomb was common, and rush mats have been seen in graves from all periods. In some cases, the walls of the tombs were also covered with mats (Figs. 2 and 14: 3). The rush mat of G.N.1900 was in poor condition with destroyed parts, but the specimen from G.N.1400, measuring 130 by 50 cm, was reasonably well conserved (Figs. 3 and 14: 2).

Fragments and remnants of wicker baskets and wiskets in various sizes have been found among the graves. In some cases, food and other offerings are placed in cloth bags or wicker baskets, which in turn are placed inside a container, usually a bowl. Large wicker baskets, along with other objects, were placed in various parts of the tomb. In one case (G.N.1709), two wicker baskets were found next to each other (Sajjadi 2007). Circular baskets of various sizes have been found in



Fig. 2: the wall of GN.2700.

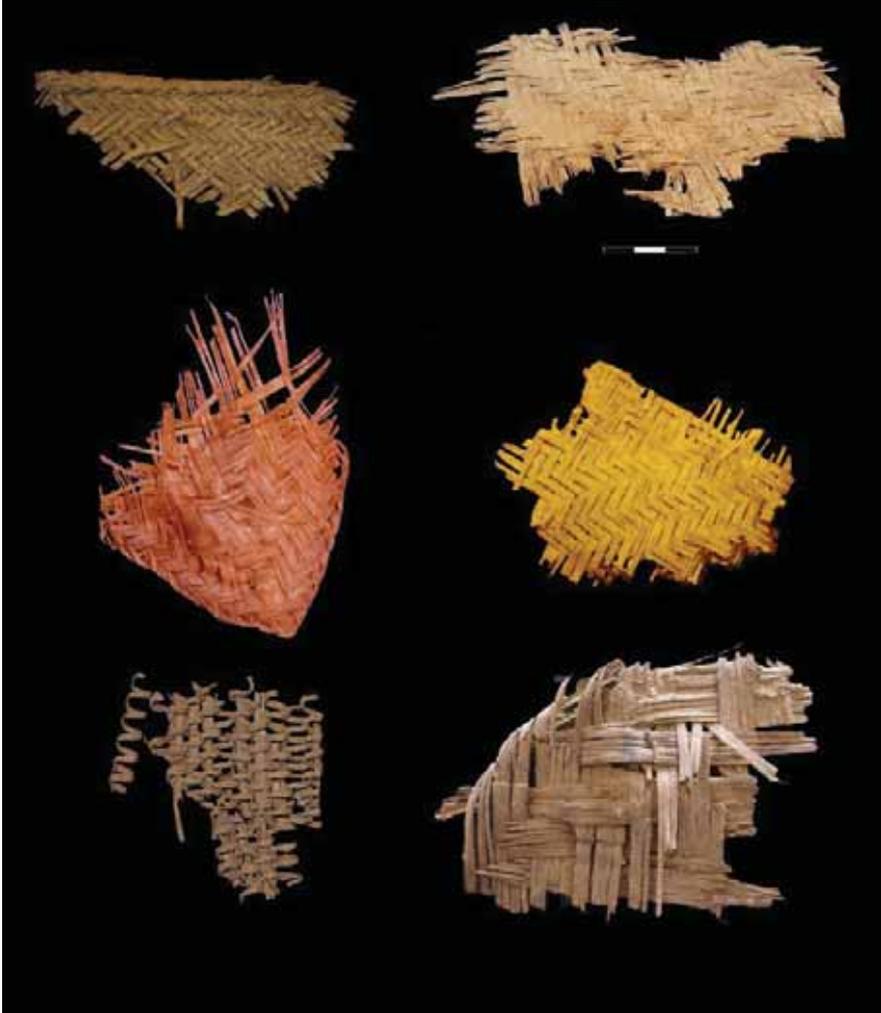


Fig. 3: types of rush mats.

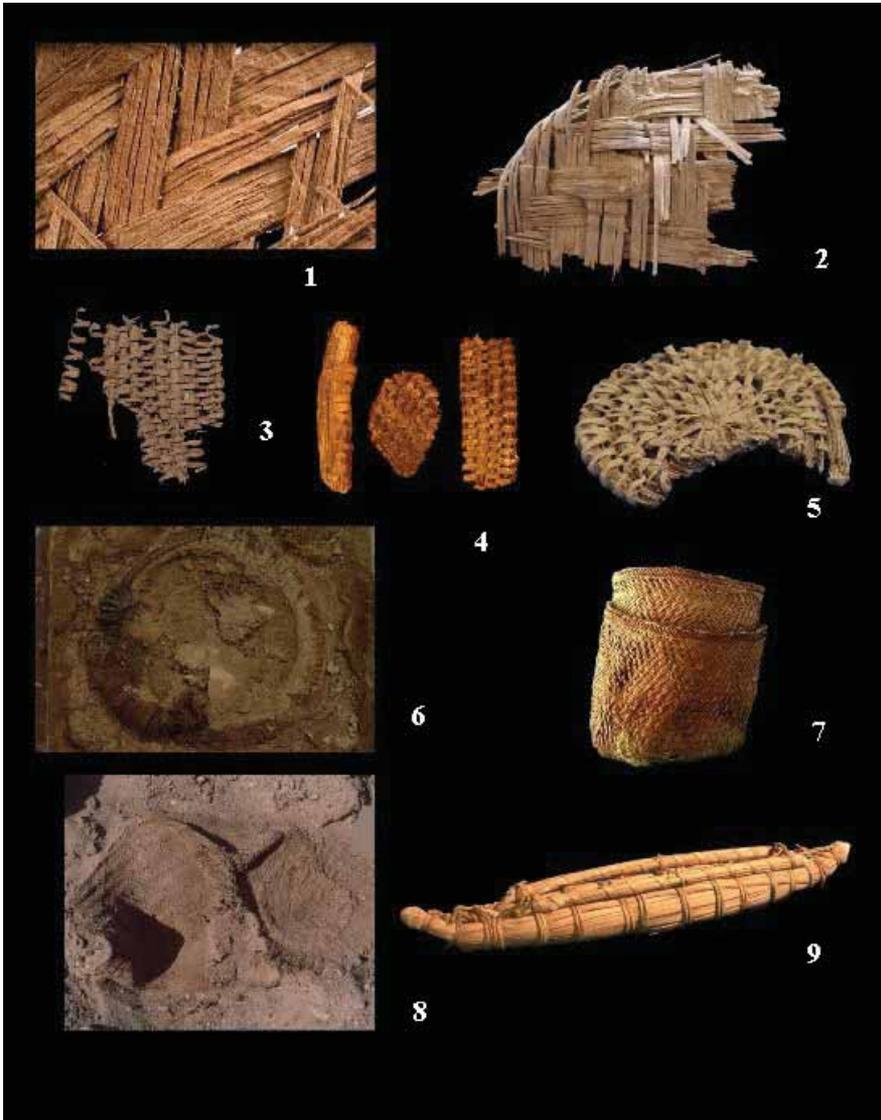


Fig. 4: various objects made of reeds from Hamun lake: 1-3. Fragments of mats; 4-5. Remains of baskets from Workshop No. 1; 6. Recovering a basket; Workshop No. 1; 7. Two baskets from G.N.5803; 8. Two baskets from G.N.1709; 10. *Tutan* (a local boat made of reeds from Hamun lake).



Fig. 5: G.N.1400. Right to left: wooden ladle; wooden box; metal mirror.



Fig. 6: G.N.5803. Baskets and leather bag.

graves from Periods II and III (Fig. 4). The largest basket, with a diameter of 33 cm, was found in G.N.1400, while only about 12 cm is left of the height of the basket found in G.N.1405.

In G.N.1400, the remains of four wicker baskets were found. In the same grave, the body of a young woman was deposited on a wicker mat with her makeup basket containing a wooden mirror box (Figs. 5 and 16: 2), a comb, a mortar, a cosmetics bottle and a pin, next to a small Grey Ware bowl for mixing ingredients, in a basket that was placed close to her head (Sajjadi 1982).

Another notable case is G.N.5803, which belongs to a 13 years old girl, whose grave goods included two baskets without handles and a leather bag (Sajjadi 2017b) (Fig. 4: 7; 6).

Apart from the remains of objects made of reeds, the remains of wood can be seen in various forms such as fragments, branches, objects, firewood and charcoal. The most common types of wood found in this site are *Populus*, *Haloxylon*, *Fraxinus* and *Tamarix*, as well as *Acer*, *Celtis*, *Pistacia*, *Ulmus* and *Vitis*. Other types of vegetation that are not native to the Sistan region have also been found, including *Dalbergia sissoo*, *Adenanthera Pavoniana* and *Adina Cordifolia*. The inhabitants of Shahr-i Sokhta used these woods to make precious and luxury objects such as combs, boxes and small wooden figurines (Costantini 1977; 1979). Ebony probably existed on the borders of Sistan and in the sedimentary valleys of south-eastern Iran as well as in western Pakistan, and its presence in Shahr-i Sokhta indicates trade over short-to-medium distances. *Adenanthera Pavoniana* and *Adina Cordifolia* are tree species that cannot be grown in Sistan or its surrounding regions, because they grow in temporary groves with small deciduous trees. In ancient times, as today, the original home of these trees was the hot and humid lands of north-western India. These woods travelled distances of up to 2,000 kilometres through lands with various climates and characteristics to reach the site, and again they constitute evidence of long-distance trade. Also found in Shahr-i Sokhta are some small fragments of palm wood, which are the first ancient specimens of palm (*Phoenix dactylifera*) to be found in Sistan and Baluchistan (Costantini and Costantini Biasini 1985).

The wood, roots and foliage of these trees were used in various ways. The roofs of houses were first covered with large beams, usually of poplar wood, and then covered with mats and foliage (Fig. 7). In addition to its use as fuel for warming homes and cooking, wood provided energy and power for industrial kilns and furnaces making a variety of everyday objects and utensils.

The wooden objects of Shahr-i Sokhta are very diverse and include decorative pins and other items, spindles, fireworks, figurines, beads and all kinds of tools and industrial utensils and the like (Figs. 8-10). These objects were found both in residential areas and the graveyard. A notable example of this group of wooden objects is a game board found in catacomb G.N.731. Microscopic examination of this board in cross section shows that it was made of the wood of a 60-year-old ebony tree. It was carved with blades of varying size, including fine chisels, creating the shape of a snake on the background of a chequerboard, its movement showing the location of the game pieces (Piperno - Salvatori 2007)

Combs are another wooden object found in both the cemetery and the residential area. The combs are usually made of precious woods such as ebony (*Dalbergia sissoo*) and *Fraxinus*, in various sizes between 5 and 25 cm. Regarding their structure, three distinct groups have been identified. Simple crescent-shaped handles (Figs. 11: 1; 20: 1); crescent-shaped handles with appendages on each end (Figs. 11: 2; 19: 1-4); and crescent-shaped handles with an appendage on one end (Figs. 11: 3-4; 18: 1-6). Most of the combs are not decorated, but some specimens have a kind of decoration on their handles. The handle of a comb from Workshop 1 (Cat. No. 2912) is decorated with six parallel vertical lines (Fig. 12). The decorative design on the handle of comb No. 679 from Building no. 1 is very impressive, the geometric patterns being very similar to those seen on the pottery of Shahr-i Sokhta I and Namazga III (Fig. 13) (Sarianidi 1983: 196, Fig. 6). Undoubtedly, some of these combs were used in the spinning process. Reconstruction of a spinning comb 25 cm wide recovered from the residential area clearly shows this type of usage (Costantini 1977: 24).



Fig. 7: 'Eastern Residential Area', ceiling beams. Above: Room No. 88; below: Workshop 35.

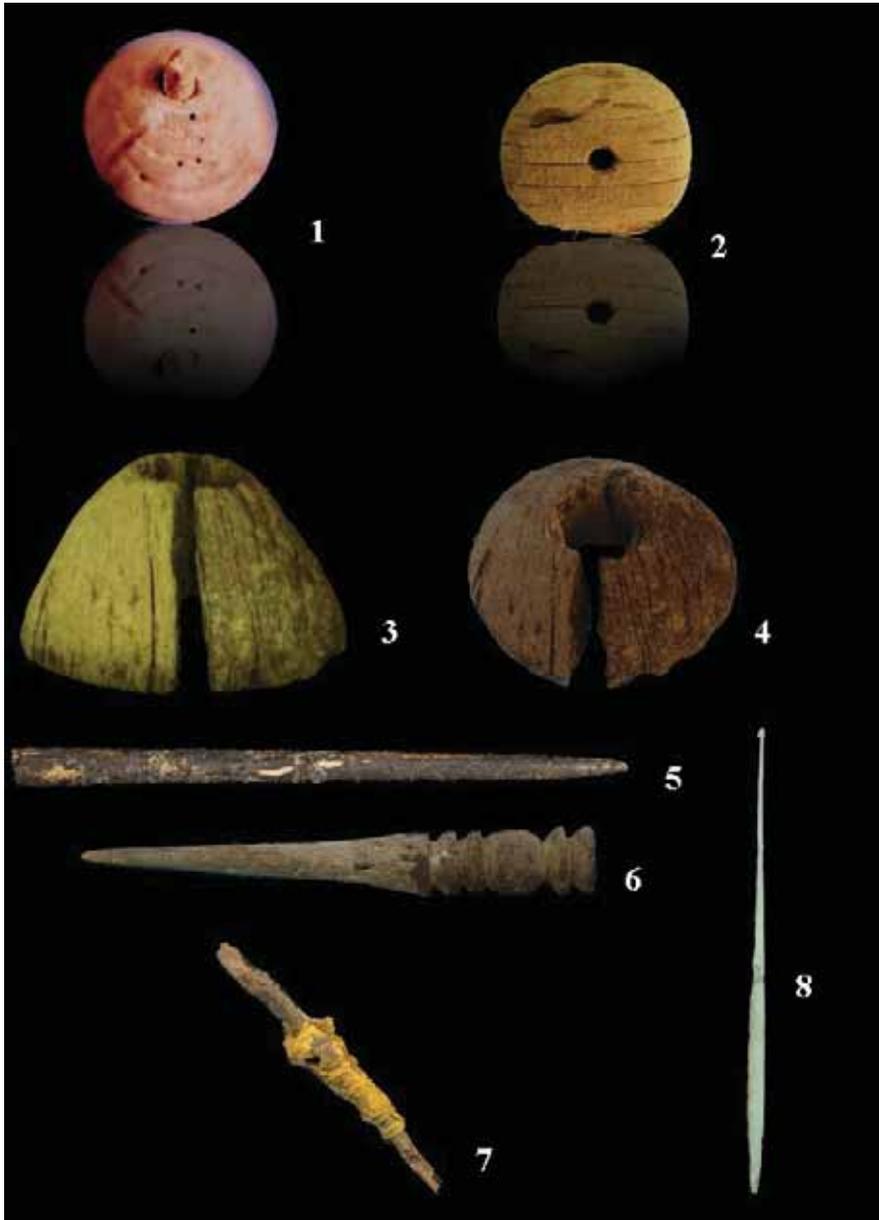


Fig. 8: wooden objects: 1-4 Spindle whorls; 5. Undecorated pin; 6. Decorative pin; 7. Knitting needle; 8. Pulley.

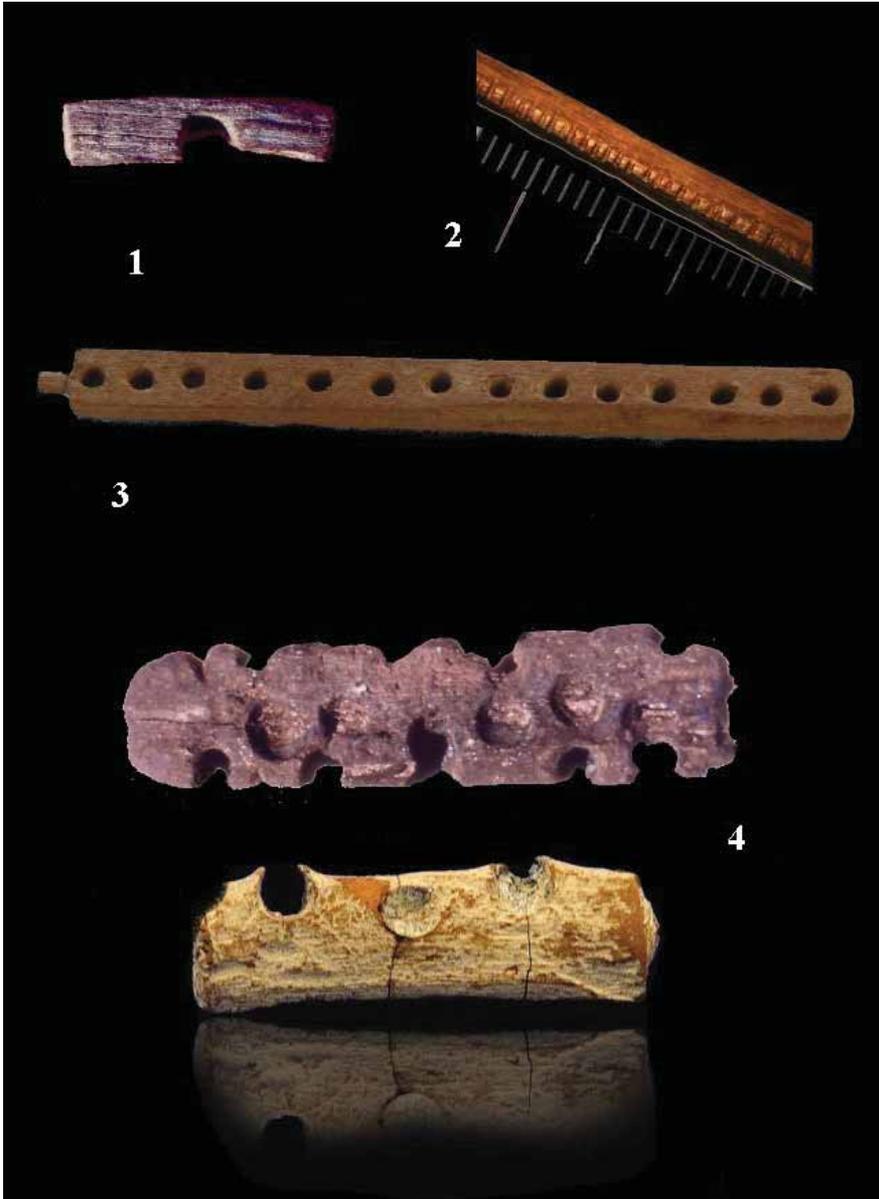


Fig. 9: wooden objects: 1. Fragment of a wooden tool; 2. 'ruler'; 3. Decorative fragment; 4. Kindling.



Fig. 10: 1. wooden figurines; 2 wooden horn.

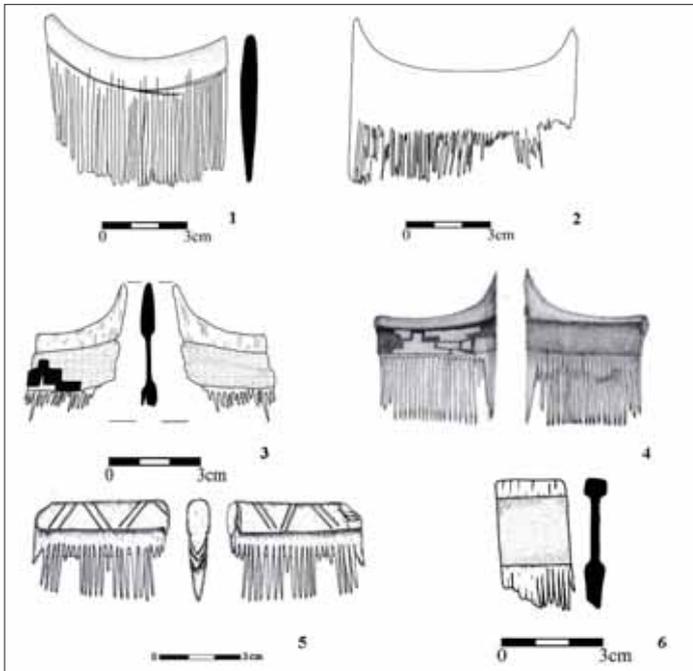


Fig. 11: types of comb handle. Workshop 1: 1. Crescent-shaped handle, Cat. No. 1758; 2. Crescent-shaped handle with two appendages, Cat. No. 638; 3-4. Crescent-shaped handles with one appendage, Cat. Nos. 675, 679; 5-6. Flat handles, Cat. Nos. 2912, 1810.



Fig. 12: wooden comb with decorated handle. Workshop 1, Cat. No. 2912.



Fig. 13: Namazga III and Shahr-i Sokhta I pottery patterns on the handle of a wooden comb. Workshop 1, Cat. No. 679.

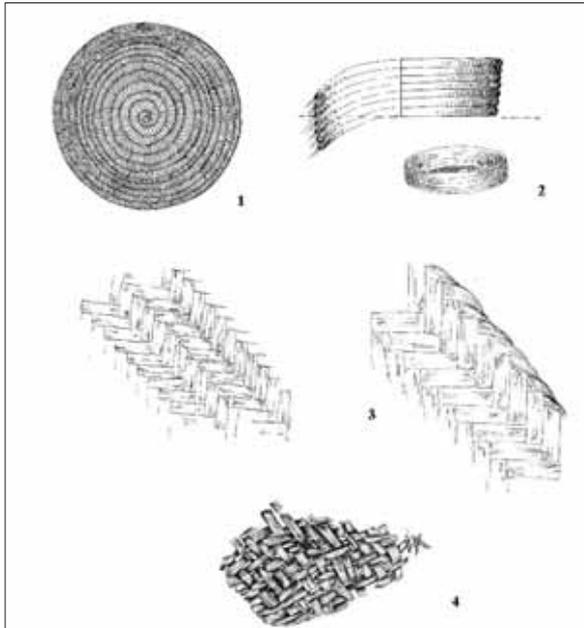


Fig. 14: wicker items: 1. Basket, G.N.1400; 2. Mat, G.N.1400; 3. Wall covering, G.N.2700.

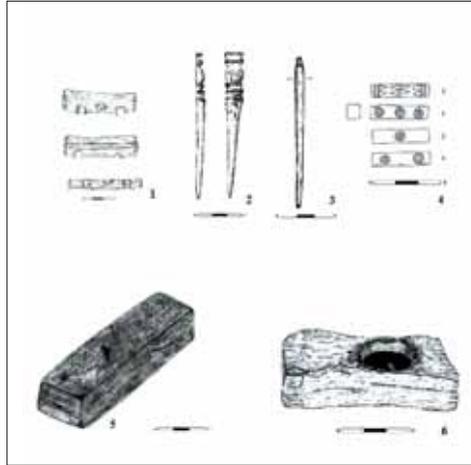


Fig. 15: wooden items: 1. Kindling; 2-3. Pins; 4. Beads; 5. Wood fragment; 6. Work tool.

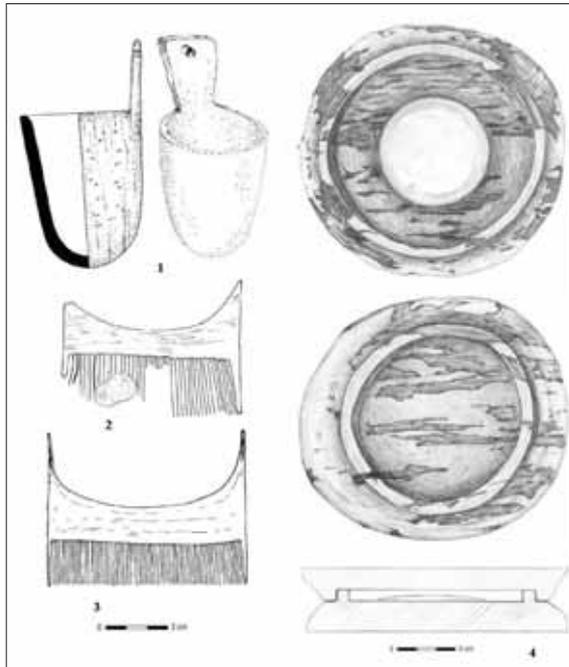


Fig. 16: wooden items: 1. ladle, G.N.1400; 2. Comb, G.N.1400; 3. Comb, G.N.1401; 4. Mirror box G.N.1400.

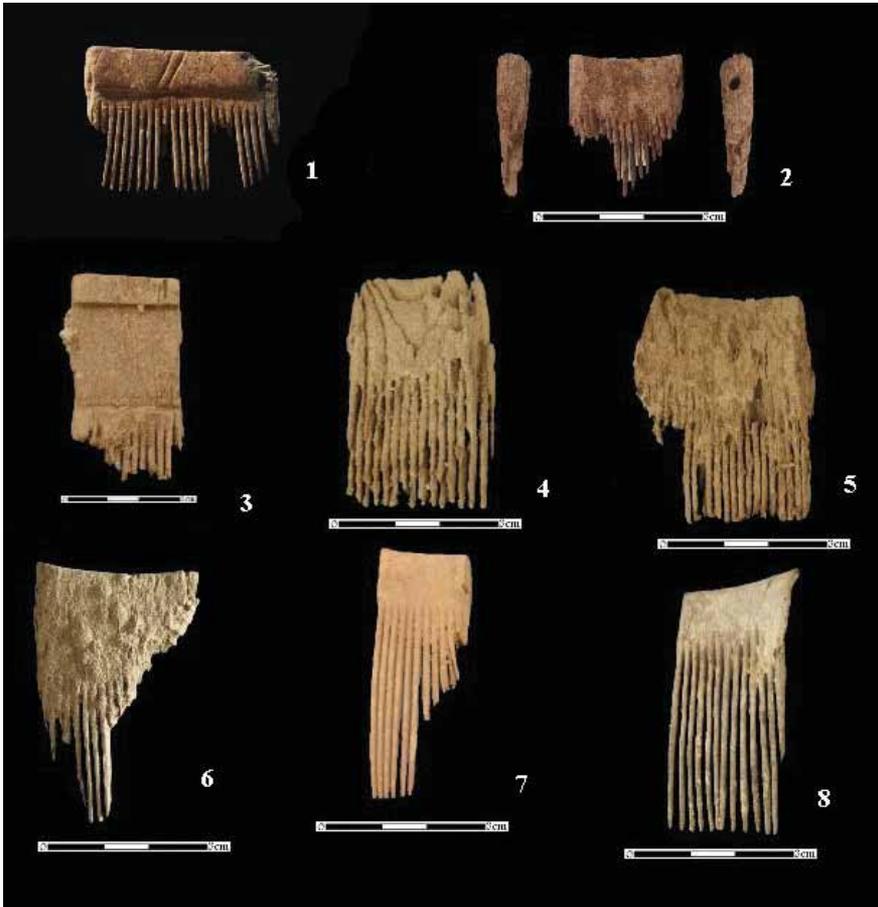


Fig. 17: combs with straight handles, Workshop No. 1: 1. Cat. No. 2912; 2. Cat. No. 2937; 3. Cat. No. 1810; 4. Cat. No. 617; 5. Cat. No. 2405; 6. Cat. No. 2404; 7. Cat. No. 1796; 8. Cat. No. 2405.

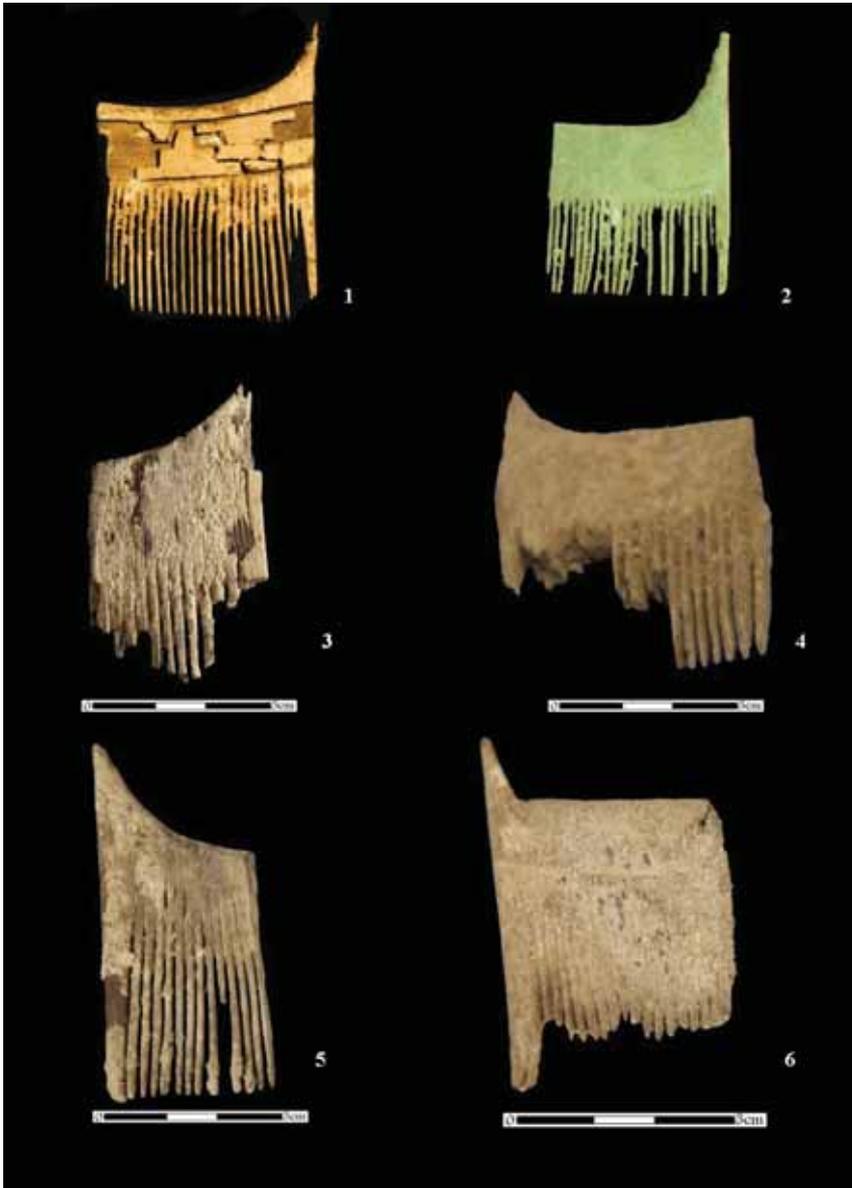


Fig. 18: combs with semi-crescent-shaped handles and appendages on one end. Workshop 1: 1. Cat.no. 679; 2. Cat. No. 795; 3. Cat. No. 2406; 4. Cat. No. 1955; 5. Cat. No. 2397; 6. Cat. No. 2401.

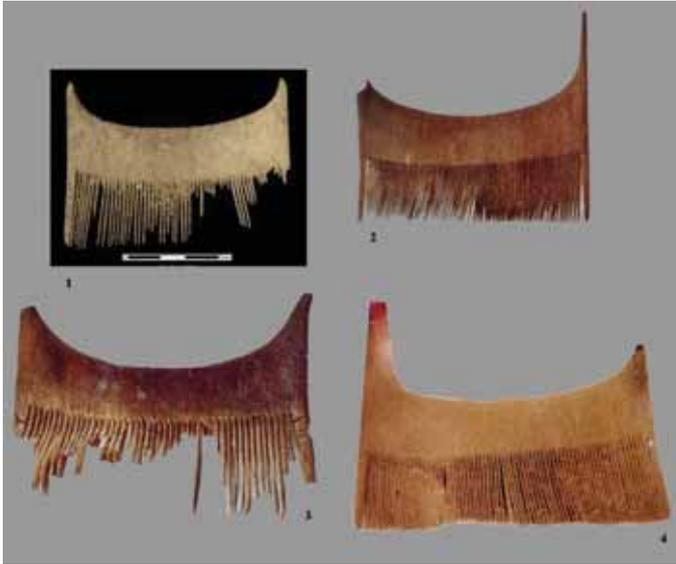


Fig. 19: combs with semi-crescent-shaped handles and appendages on both ends: 1. Workshop No. 1, Cat. No. 2396; 2. G.N.1404/3; 3. G.N.1713/62; 4. G.N.1400/62.



Fig. 20: combs with simple crescent-shaped handles, Workshop No. 1: 1. Cat. No. 1757; 2. Cat. No. 1656; 3. Cat. No. 312; 4. Cat. No. 1758; 5. Cat. No. 820; 6. Cat. No. 1758.

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The Iron IV Period in Eastern Iran: an Overview of the Research

Vittoria Cardini

University of Rome – Sapienza

cardini.vittoria@gmail.com

Abstract

The article shows the state of art about studies on Iron IV/Achaemenid period (550-330 BC) in the eastern part of Islamic Republic of Iran. Researches comprehends surveys and excavations from past to present, with a preliminary aspects of pottery production contexts divided in two macro-areas, North and South regions, with mentions of major part of every sites investigated. The Iron IV/Achaemenid period in this area is mostly unknown and limited and just few sites are investigated and published. One of difficult to distinguish the assemblages of material culture is the continuity of local traditions in the Iron Age period and the independence of production from political changes. Anyway, we can understanding different pottery characteristics from north to south regions, but partially this depend to the type of context in which the sites are inserted.

1. Introduction

In the past, Iranian archaeology concentrated on the heartland of the Achaemenid Empire, specifically its palatial dimension. Our knowledge of villages and other

parts of the empire is therefore limited, in some cases almost non-existent. In the 20th century, excavations focused on the residential areas of Persepolis (Sumner 1986) and Susa (Ghirshman 1952), in the regions of Fars and Khuzestan. Recently, research in these locations has resumed, sometimes leading to exceptional discoveries, as in Tol-e Ajori (Askari Chaverdi *et al.* 2016) and Pasargadae (Gondet *et al.* 2016) in Fars. However, once again attention has mainly been paid to the most important sites at the core of the Achaemenid Empire (Briant - Boucharlat 2005). At present, archaeological evidence of the Iron IV/Achaemenid period in eastern Iran is limited.

Concerning terms and chronology, following Boucharlat's comments (Boucharlat 2005) on the use of the phrase 'Achaemenid period' for materials and contexts, we prefer the more strictly archaeological term 'Iron IV' to 'Achaemenid', which encompasses cultural and socio-political concepts.

With regard to material culture, our knowledge of the eastern regions in this period is still incomplete. The independence of pottery production from political developments is reflected in the Iron IV period, especially given the continuity with the local traditions of Iron III, seen above all in morphologies rather than types of vessel (Boucharlat - Haerinck 1992). Despite imperial unification, pottery production – and material culture generally – is not homogeneous throughout Iran but remains divided into nine main 'pottery regions' (Boucharlat - Haerinck 1992).

The focus of this paper is the archaeological evidence of the Iron IV period from eastern Iran, divided into two macro-areas, north and south. The north-eastern area includes the modern provinces of Golestan, Gorgan and Khorasan, and the south-eastern area the modern province of Sistan-Baluchistan (Fig. 1).

2. Research in the north-eastern area

The north-eastern part of Iran is a little-known area, especially with regard to the Iron IV period. The first investigations of the territory were carried out in the 1980s-90s (Venco Ricciardi 1980; Kohl - Heskell 1980; Gropp 1995) and it was immediately clear that several local cultural groups had inhabited the area in



Fig. 1: Achaemenid sites in the Eastern part of Iran.

the Bronze Age and Iron Age, leaving abundant evidence. A subsequent survey (Vahdati 2008) again highlighted the shortage of knowledge of this territory from an archaeological point of view, especially regarding the Iron IV period. Specifically, the late Iron Age remains one of the least known periods in the archaeology of north-eastern Iran. The only excavated Iron IV settlements in this region are the sites of Turang Tepe (Deshayes 1976; 1979; Cleuziou 1985; Bessenay-Prolonge - Vallet 2018), Yarim Tepe (Crawford 1963, Kohl - Heskell 1980), Āq Tepe (Shahmirzadi - Nokandeh 2001) and Narges Tepe (Abbasi 2007) (Fig. 2)

Turang Tepe consists of a main tepe and some lower mounds: Iron IV period remains were identified in level VA, but only in the main mound, and there is no evidence that the plain was occupied during this period (Deshayes 1976; Deshayes 1979; Boucharlat 2005). The materials from the Iron IV period are limited in quantity and it takes careful study to distinguish them from those of Iron III. The same goes for the architecture, which does not differ significantly from that of Iron II and III, or indeed from that of the Seleuco-Parthian period (Boucharlat 2005).



Fig. 2: Golestan, Gorgan and Khorasan areas.

The Iron IV remains from Yarim Tepe are mentioned in a small number of publications and a survey report (Crawford 1963; Kohl - Heskell 1980). Āq Tepe is a graveyard with 16 tombs dated to the Iron III-IV period, and Narges Tepe has been investigated by means of eleven trenches conducted on behalf of the Iranian Center for Archaeological Research. Unfortunately, the data on the materials from these two sites are unpublished or not very well documented.

The recent excavation of Tappeh Rivi, located in North Khorasan, brought to light new evidence of the Iron IV period in this part of Iran. Since 2012, thanks to the presence of the Iranian Cultural Heritage, Handicrafts and Tourism Organization, joined in 2016 by the Tehran branch of the Deutsches Archäologisches Institut, the Tappeh Rivi Project (TRP) was launched. The project's purpose is the recovery and protection of the site (Jafari 2013; Jafari 2015; Jafari - Thomalsky 2016; Jafari *et al.* 2019), which is threatened by modern activities, especially those related to the extraction of clay. At least two monumental buildings demonstrate the superregional importance of the site from the Iron IV period onwards, in a region of Iran that can be considered unexplored in archaeological terms (Jafari - Thomalsky 2016).

Affected by a similar lack of knowledge is the South Khorasan region. Nevertheless, near Birjand, the recent excavations at Tappeh Takhchar Abad and the surveys at Qal'eh Asrar and Do-Kuhe, directed by Mohsen Dana of the Iranian Research Institute of Cultural Heritage and Tourism (RICHT), have found new evidence, especially for a monumental building dated to the Iron IV period (Dana 2018; 2019).

3. Research in the south-eastern area

The main evidence of the Iron IV period in this south-eastern part of Iran was brought to light at the site of Dahane-ye Gholaman, located about 30 kilometres southeast of Zabol city in the Sistan region. The first excavations were conducted by the IsMEO Italian archaeological mission (directed by U. Scerrato) in the 1960s and 1970s (Scerrato 1962; 1966), followed by the archaeological mission of the Iranian Cultural Heritage, Handicrafts and Tourism Organization (directed by S.M.S. Sajjadi) between 2000 and 2006 (Sajjadi 1997; Sajjadi 1998). Geophysical prospections were then conducted under the aegis of the Iranian Cultural Heritage, Handicrafts and Tourism Organization and the Iranian Center for Archaeological Research (directed by K. Mohammadkhani) between 2008 and 2012 (Mohammadkhani 2012; 2018). The archaeological evidence recovered includes residential, public, administrative and religious structures, and indicates intense, planned urbanisation (Fig. 3).

In southern Sistan, at least 110 sites possibly from the Iron IV period were detected during a recent survey of the area (Mehrfarin 2012; 2016), revealing pottery production similar to what is attested at several other sites from the same period in Iran and neighbouring countries (Maresca 2018). In the first phase of this survey, conducted in the northern part of Sistan in 2008, the only site discovered was that of Dahane-ye Gholaman. In the second phase (Mehrfarin 2012: fig. 2), conducted in the desert area in the southern part of the region, Iron IV sites of varying dimensions were found (Mehrfarin 2016). The chronology of the sites was determined, the pottery was classified and the surface finds were recorded on the basis of evidence from Dahane-ye Gholaman, Sorkh Dagh (Afghanistan), Pasargadae and Persepolis (Mehrfarin 2016).



Fig. 3: south Khorasan and Sistan areas.

3.1. Pottery in context

Surveys in North-Eastern Iran

In the Iron IV period the area of the Atrak valley and Esfarāyen plain still had strong links with Central Asia, as seen in the Yaz II and III materials found in several sites (Venco 1980; Vahdati 2008). According to Lecomte (Lecomte 2005: 461-478), the Archaic Dehistan culture and relative pottery assemblage continued through the Iron IV period. In Central Asia however, the pottery is basically homogeneous, bearing no resemblance to that of the Iranian plateau. The Iron IV materials of the Atrak valley continue the trend of the previous period, specifically the Yaz II-III and Archaic Dehistan cultural areas. The most widespread pottery in the Iron IV period in the Atrak valley consists of a red type ranging from red-orange to brown-orange, generally highly burnished and wheel-turned. The most typical shapes are carinated bowls and cylindrical-conical beakers: the similarity to the pottery of Central Asia is evident (Lhuillier - Bendezu Sarmiento 2018; Bruno 2019). The most substantial difference lies in the colour of the clay, that of the Atrak valley being red, while that of Central Asia is buff (Venco 1980).

Turang Tepe

Turang Tepe has yielded few materials from the Iron IV period. According to Boucharlat (Boucharlat 2005), the reddish ware type and some of the shapes of the Iron III period are maintained, although technical elements and morphological details make it possible to determine the chronology, especially for the carinated vessels and ‘bayonet rims’ (Deshayes 1976: fig. 10; Cleuziou 1985: fig. 18 and 24). The dating to the Iron IV period is based on a few pottery shapes similar to those from Pasargadae and a three-winged socket arrowhead. The break with the previous period is marked by the disappearance of the light-coloured wares typical of Iron III, which accounts for the majority of materials recovered from Turang Tepe (Boucharlat 2005).

Tappeh Rivi

The pottery from Tappeh Rivi was recently classified into six main groups, including several sub-variants (Jafari *et al.* 2019), although the classification of vessel forms is still in progress. Due to our incomplete knowledge of the ancient pottery of the region, the classification presented is provisional, but ware groups II and V appear in larger amounts in the Iron IV layers. Ware group II presents colours from light red to orange, with three variants – IIA, IIB and IIC – distinguished by the type of inclusions and the coarseness of the fabric. The surfaces of this ware group can be smoothed, polished or covered with a brownish or buffish slip. The other ware group - V - presents two variants, red (VA) and brown (VB), both characterized by very fine clay and absence of visible mineral inclusions. The surfaces of this ware group can be covered by a reddish or brownish slip. One hypothesis is that this ware group represented a specific fine ‘palace ware’ (Jafari *et al.* 2019).

Tappeh Takhchar Abad

Mohsen Dana has sought to determine the common pottery characteristics of the region, proposing a type of ware painted with bird motifs as diagnostic of the Iron IV period in eastern Iran (Dana 2019). The most frequent forms are carinated, tulip-shaped and S-shaped bowls.

Dahane-ye Gholaman (South-Eastern Iran)

Dahane-ye Gholaman has been the subject over time of many pottery studies and analyses, being one of the most extensively studied sites of the Iron IV period, but data on some of the pottery remains unpublished. From the old Italian excavations conducted by Is.I.A.O., eleven different ware groups were distinguished among the pottery assemblage stored in Italy (Maresca 2010; 2019). Fabric DG1 presents a light red colour with medium-sized and large mineral and plant tempers and the surfaces are mostly covered by a whitish slip. It is attested in thick-walled handmade shallow basins, handmade globular bowls, large wheel-made globular jars with a wide shallow neck and large wheel-made hole-mouthed cylindrical jars. Fabric DG1.1 presents colours from reddish to yellow, with limited amounts of small mineral tempers, and the surfaces are covered by a whitish slip, sometimes smoothed. It is attested in shallow handmade truncated-cone basins with very thick walls, large wheel-made truncated-cone basins with moulded rims, truncated-cone bowls and many medium-sized and large globular and cylindrical jars. Fabric DG1.2 presents colours from reddish to yellow with limited amounts of small mineral tempers, and the surfaces are covered by a whitish slip. It is found in very large wide-mouthed truncated-cone basins with moulded rims, carinated bowls and medium-sized and large globular and cylindrical jars. Fabric DG2 is a rough ware with colours ranging from reddish to yellow and medium-sized and large mineral tempers. It is attested in globular cooking pots. Fabric DG3 presents colours from reddish to yellow with limited amounts of small mineral tempers, and the surfaces are covered by a pinkish or reddish slip, sometimes smoothed or burnished. It is attested in tall truncated-cone bowls with burnished surfaces decorated with parallel horizontal lines near the rim and zigzag vertical lines on the lower part of the vessel, burnished shallow dishes, medium-sized and small truncated-cone and hemispherical bowls and ovoid jars. Fabric DG3.1 presents colours from reddish to yellow with large amounts of small mineral tempers, and the surfaces are covered by a pinkish slip, sometimes smoothed or burnished. It is attested in truncated-cone basins with moulded rims, carinated bowls, small truncated-cone bowls and biconical

collared bowls, often burnished. Fabric DG3.2 presents colours from reddish to yellow with limited amounts of very small, barely visible mineral tempers, and the surfaces are sometimes covered by a slip or burnished. It is found in thin-walled and truncated-cone burnished bowls, shallow burnished dishes, globular bowls with plain or ribbed wall profiles, carinated bowls with a prominent horizontal rim and small and medium-sized ovoid jars with shallow narrow necks. Fabric DG3.3 presents a light red colour with limited amounts of very small mineral tempers, and the surfaces are mostly covered by a slip and smoothed. It is seen in several types of carinated bowls, burnished biconical collared bowls with vertical or inverted necks, hemispherical bowls with rounded rims and cylindrical and oval jars. Fabric DG3.8 presents a light red colour with small and medium-sized mineral tempers, and the surfaces are covered by a slip, sometimes burnished. It is attested in large truncated-cone basins with moulded rims, hemispherical bowls, carinated bowls with moulded horizontal rims, truncated-cone thin-walled bowls with burnished surfaces and biconical collared bowls. Fabric DG4 presents colours from light reddish to brown with large amounts of small mineral tempers, and the surfaces are covered by a slip. It is seen in medium-sized ovoid jars with shallow necks and rounded rims, larger globular jars with wide shallow necks and bowls. Fabric DG7 is a medium-fired rough ware with large amounts of highly visible mineral tempers. It is limited to a single rim fragment of a small handmade cooking pot with a shallow narrow neck (Maresca 2010; 2019).

Two characteristics of the site are the relative morpho-typological homogeneity of the ceramic assemblage and the high degree of standardisation in the manufacturing processes (Genito 1990; Maresca 2010). Some shapes, such as the large cylindrical and globular jars with lower carination, are associated with the Central Asian Late Bronze Age pottery tradition, while others reflect a more local ceramic horizon, such as the bowls with a carinated profile and the cylindrical-conical beakers. The pottery assemblages from Nad-i Ali period I (Ghirshman 1939), Mundigak VI and VII (Casal 1961) and Kandahar (Whitehouse 1978) in Afghanistan are considered to be the best sources of parallels with the pottery attested in Dahane-ye Gholaman (Genito 1990; Maresca 2019).

Iranian archaeologists subsequently studied the pottery assemblage from the site. The pottery was classified into eight groups based on the colour of the surfaces and the morphological characteristics (Zehbari *et al.* 2015a). The researchers published articles on the cultural interactions between Zranka (the ancient name of Dahane-ye Gholaman) and other eastern Satrapies of the Achaemenid empire, focusing on the pottery tradition (Mehrafarin *et al.* 2013). They also compared the pottery from the eastern Iranian territories with that of the Province of Fars during the Achaemenid period (Zehbari - Mehrafarin 2014) and examined the relationships between pottery production at Dahane-ye Gholaman and the western regions of the Achaemenid empire (Zehbari *et al.* 2014). One study specifically focused on the cylindrical-conical beakers attested at the site (Zehbari *et al.* 2015b). The rims of these cylindrical-conical beakers were classified into seven groups and twenty-one variants based on their profiles. The morphology of this type of beaker, unknown in the ceramic assemblages of other Iron IV sites, suggests that they are an original vessel shape from Dahane-ye Gholaman. The Iranian team also performed archaeometric analyses, especially by X-Ray Diffraction (XRD) and X-Ray Fluorescence (XRF), on pottery fragments from Dahane-ye Gholaman (Sarhaddi Dadian *et al.* 2015; 2017), demonstrating that the raw material for pottery production was local.

4. Conclusion

In conclusion, information regarding the Eastern part of Iran during the Iron IV period is scarce, and there are essentially two only sites relating to this period that have been continuously investigated and are the subject of published descriptions: Tappeh Rivi in the north and Dahane-ye Gholaman in the south. Clearly, the evidence is not sufficient to propose any type of regional model, and for now we can only highlight the characteristics that emerge from the ceramic study, in any case still of a preliminary nature. The differences in pottery production between the north and south of the country's eastern regions are considerable: in summary,

we can say that in the north there is a greater trend towards the production of local shapes with a minimal presence of imports, as can be seen from the forthcoming studies of Tappeh Rivi, while in the south there are closer contacts and influences with Central Asia and, in part, with the great Achaemenid capitals of the west, as shown by the site of Dahane-ye Gholaman. So far, researchers have not found any major points of contact between the material cultures of these two sites, although this may also depend, at least partially, on the type of context in which the sites are situated. However, as research progresses, it is expected that new details may appear that will lead to a better understanding of these aspects.

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Catalogue of Stone Objects

**Seyyed Mansur Seyyed Sajjadi, Sareh Amini and Seyyedeh
Medi Rahmani**

**Iranian Center for Archaeological Research
m_sajjadi@hotmail.com; samini350@gmail.com;
media.rahmany@gmail.com**

Abstract

Various stone objects, tools and waste items were found in the graveyard and residential area of Shahr-i Sokhta, with significant amounts scattered over the surface. These items are mainly ornaments, tools or practical objects in everyday use, made of rubble from river beds or basalt. Most of these items were used without additional carving or other processing. This group of objects includes pestles; cylindrical and cubic pounders; long, almost cylindrical and oval abraders; other work tools such as sharpeners, cuboid tools, circular or oval discs and flat work surfaces in a variety of geometric shapes.

1. Stone items

Items made of various materials including stone objects and tools were found during excavations in the graveyard and residential areas of Shahr-i Sokhta, and a significant amount of these materials and objects were scattered on the surface of

the site. The stone objects mainly consist of tools, utensils, ornaments and items used in daily life. Shahr-i Sokhta marble was widely used, and it seems that this area was a centre of production of various types of marble vessel (Ciarla 1979; 1981; 1985; 1990; Shirazi 2007; Boccuti *et al.* 2015; Festuccia 2019; Sajjadi - Sefidkhani 2019). However, unlike sites such as Shahdad (Hakemi 1997) and Konar Sandal (Majidzadeh 2003), chlorite/soapstone was less commonly used and is limited to small objects such as figurines (Figs. 2, 3), seals (Fig. 4) and decorative beads (Sajjadi 2017). The use of semiprecious stones such as jade, agate, turquoise and lapis lazuli (Fig. 5) was common (Tosi 1970; 1974a; 1974b; Bulgarelli 1981; 1998; Vidale - Lazzari 2017; Sajjadi, 2017; Beheshti *et al.* 2019). Tools and other practical objects used in daily life were mostly made of rubble from river beds and basalt rock. Most of these stone objects, with some exceptions such as grinding stones, were used in their natural form without additional carving or other processing (Figs. 6-9).

This group of objects includes pounders (hammers) including pestles, cylindrical and cubic pounders; abraders, some long and almost cylindrical; oval tools and grinding stones; other tools including sharpeners, cuboid tools, circular or oval disks and flat work surfaces in a variety of geometric shapes, mostly rectangular.

The present photographic catalogue deals with this group of stone objects. In the present catalogue, except for some very clear cases, no attempt has been made to show the type of use and function of objects and tools. On the other hand, in some rare cases and due to the possible variety of use of an item, a single object appears in two different groups of objects.

There is substantial evidence that these objects and tools were made at the site itself or in its satellite sites (Figs. 10-11). The remains of various workshops of varying dimensions, including pottery kilns, metallurgical furnaces and so on, are scattered along the road between Zahedan and Shahr-i Sokhta (Fig. 12).

Catalogue



Fig. 1: alabaster vessels; 1. Bowl, G.N. 32; 2. Bowl, G.N. 4207/3; 3. Cup on cylindrical stand, G.N. 3208/5 ; 4. Cup on cylindrical stand, G.N. 1413/6; 5. Mortar, G.N,9005/10.

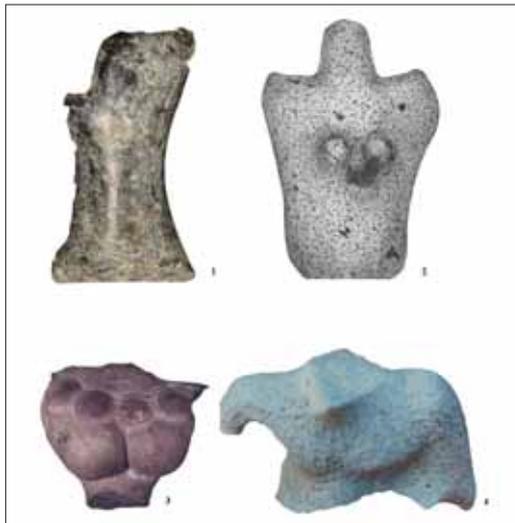


Fig. 2: anthropomorphic figurines: 1. Chlorite/soapstone male figurines, Workshop 26 Cat. No.26139; 2. Female figurines, surface survey; 3. Female figurines, surface survey; 4. Female figurines with a neckless, surface survey.



Fig. 3: zoomorphic figurines: 1. Chlorite/soapstone bird figurines, surface survey; 2. Animal figurine? G.N. 8606/5; 3. Cow figurine, surface survey; 4. Cow figurine, lapis lazuli, surface survey.



Fig. 4: chlorite/soapstone items: 1. Inlaid bead, surface survey; 2. Bowl, surface survey; 3. Inlaid bead, surface survey; 4. Stamp seal, surface survey.



Fig. 5: lapis lazuli wastage.



Fig. 6: stone mortars.



Fig. 7: chlorite/soapstone metates: 1. G.N.9018/29; 2. G.N.1713/8; 3. G.N.3910/4; 4. Workshop 29. Cat.No. 29020.

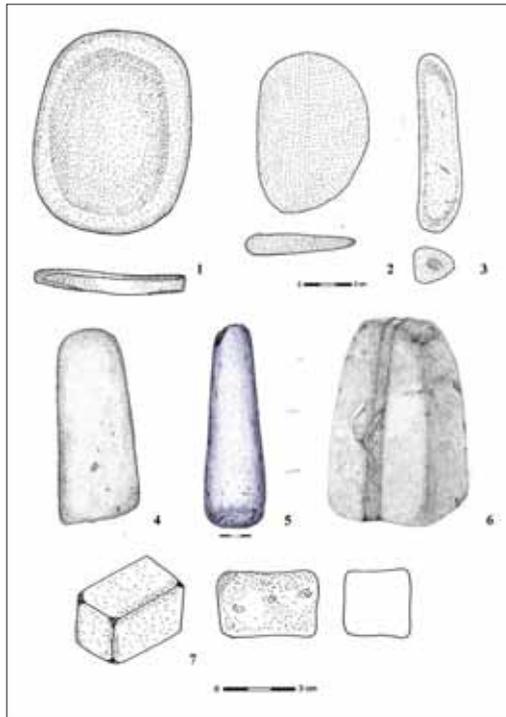


Fig. 8: stone tools.



Fig. 9: 1. Palette, G.N.1713/8; 2. Rounded stone, G.N.2511/5; 3. Sharpener, G.N.2503/3; 4. Mortar pestle, Workshop 1 Cat. No. 864; 5. Mortar pestle, Workshop 4 Cat. No. 4282; 6. Grooved cap-stone, G.N.3907/2; 7. Cubic stone, G.N.2901/2.



Fig. 10: unfinished items.

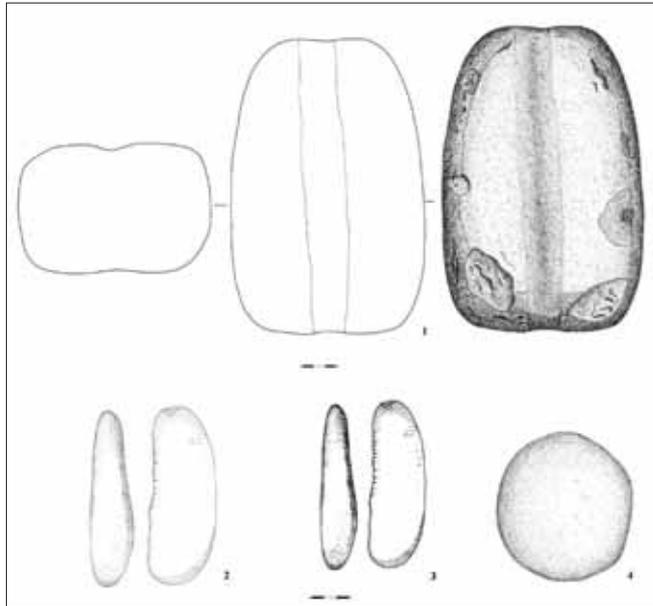


Fig. 11: stonemason's tools in the grave of a craftsman.



Fig. 12. small workshops along the Zahedan-Zabol road.

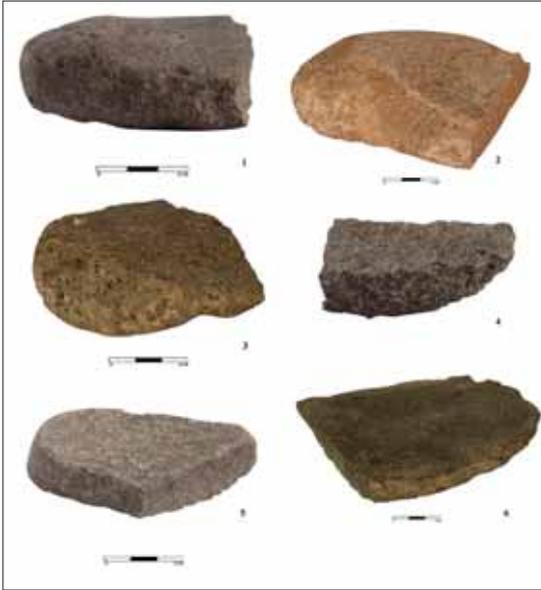


Fig. 13: grinding stones, surface survey.



Fig. 14: grinding stones, surface survey.

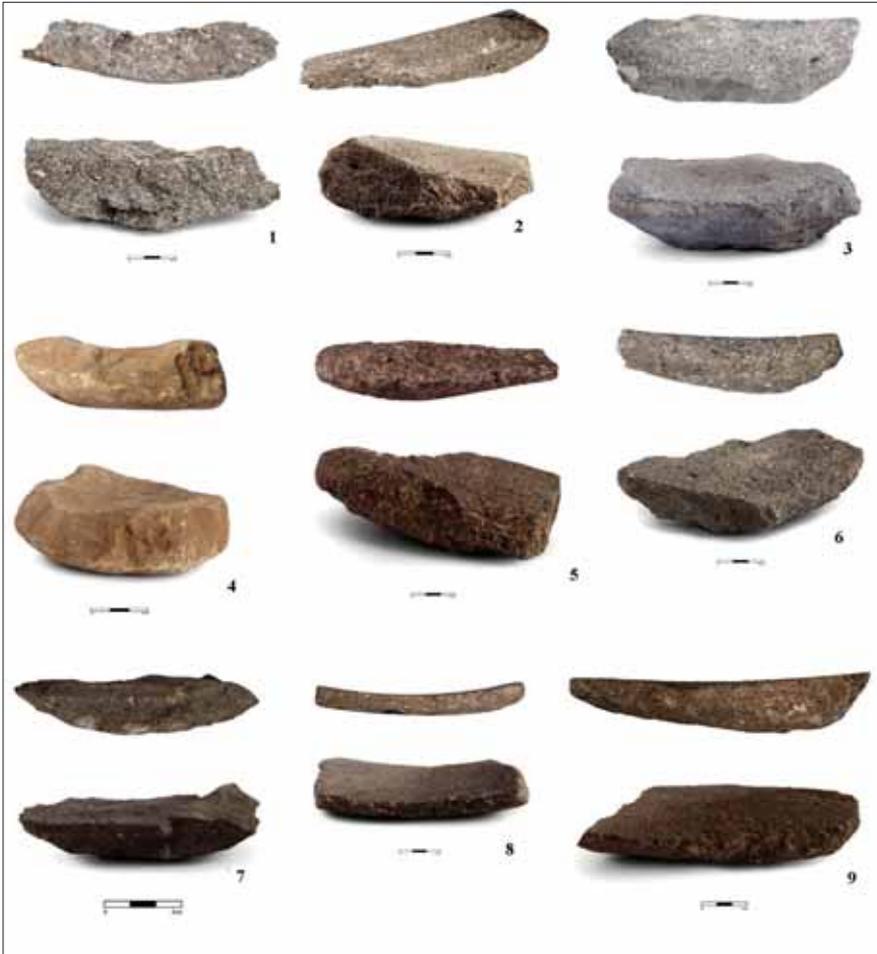


Fig. 15: grinding stones: 1-6, 8. Surface survey; 7. G.N.6104/4; 9. G.N.6104/3.

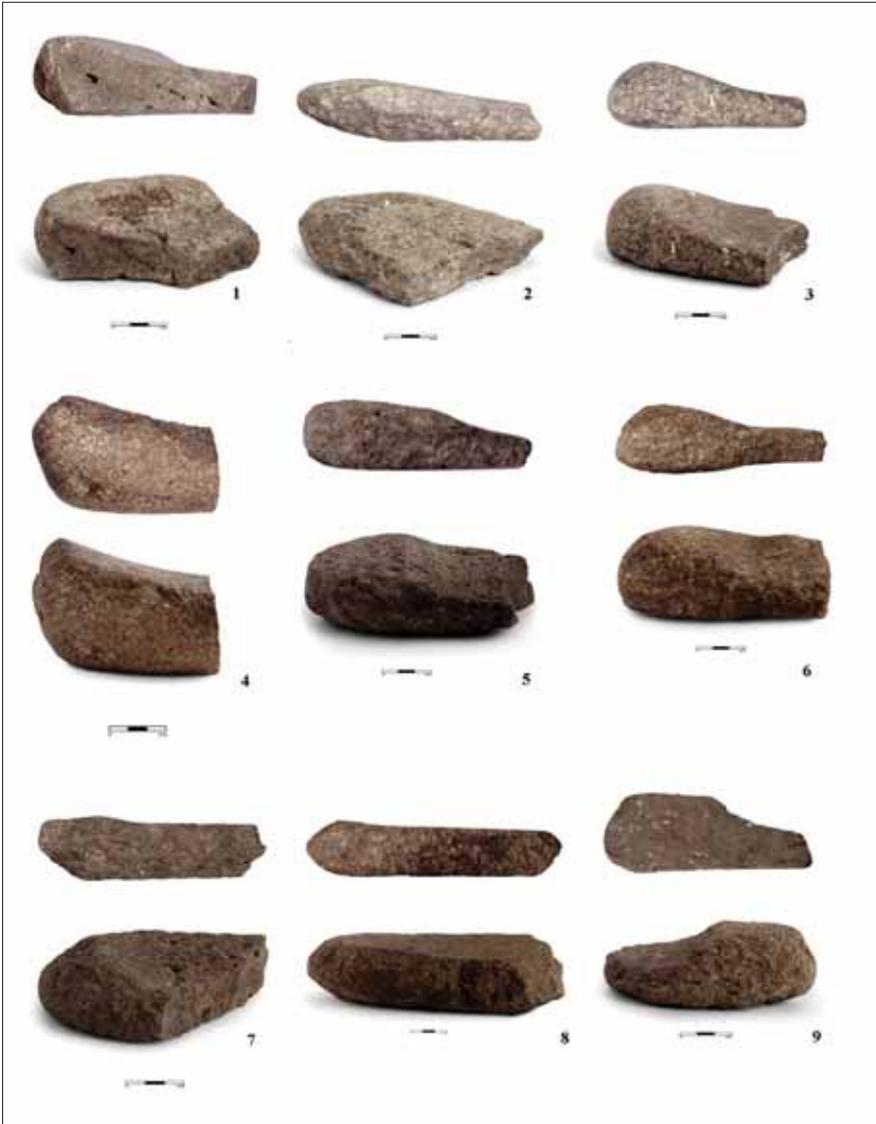


Fig. 16: grinding stones: 1-3, 5-9. Surface survey; 4. GN.3509/8.

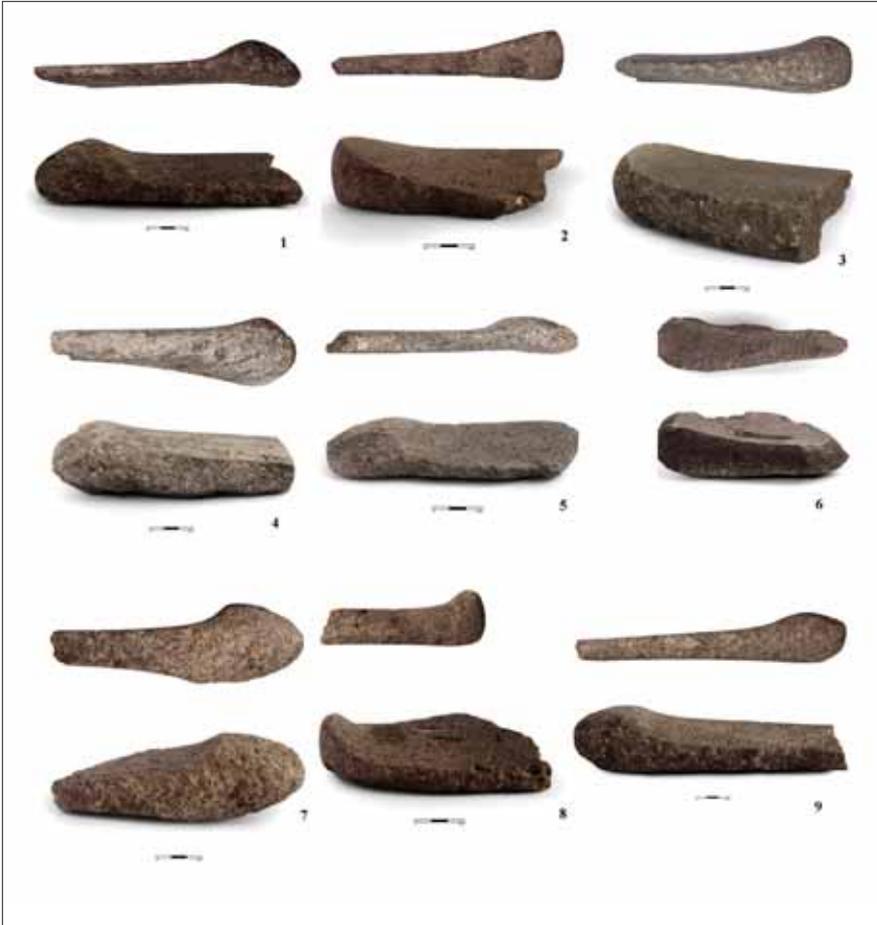


Fig. 17: grinding stones, surface survey.



Fig. 18: work tools. Rectangular and polished stone plates: 1. Area 33 Cat. No. 33xx9; 2, 5. Surface survey; 3. G.N.7703/2; 4. Surface survey.

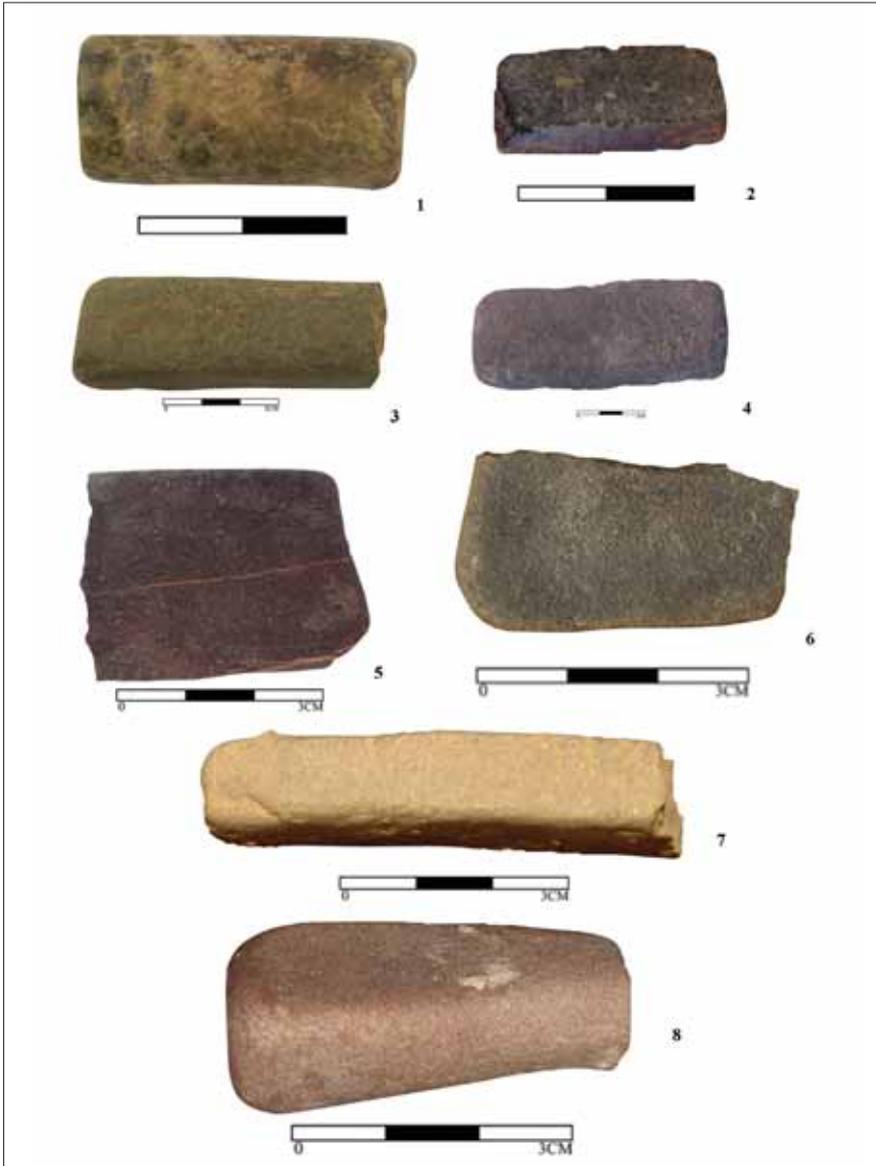


Fig. 19: work tools. Rectangular and square polished stone plates: 1. Workshop 36 Cat. No. 36009; 2. Workshop 4 Cat. No. 2164; 3. Workshop 36 Cat. No. 36001; 4. G.N.1519; 5. Area 33 Cat. No. 33034; 6. Workshop 28 Cat. No. 28098; 7. Workshop 1 Cat. No. 2501; 8. Workshop 26 Cat. No. 26171.

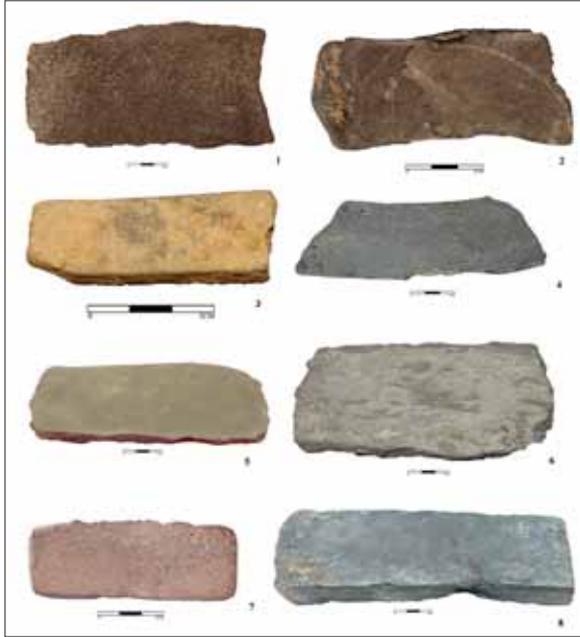


Fig. 20: work tools. Rectangular and square polished stone plates: 1. Workshop 26 Cat. No. 26091; 2. Workshop 26 Cat. No. 26061; 3. Workshop 1 Cat. No. 2502, with a smooth and heat-treated surface; 4. G.N.8601/4; 5. G.N.5302/1; 6. G.N.5202/1; 7. G.N.1519/8, with a flat and porous surface; 8. Surface survey.

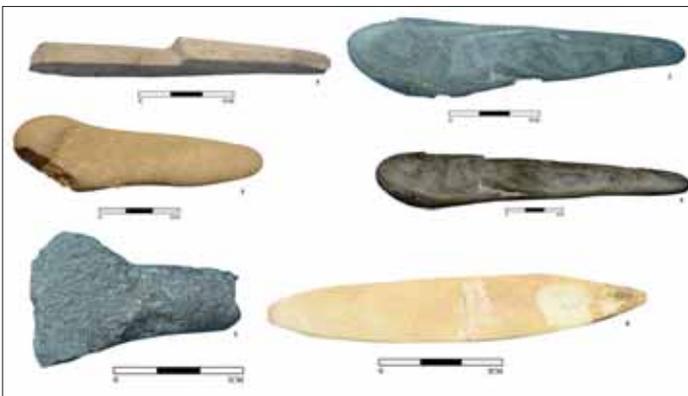


Fig. 21: cutters and sharp items: 1. G.N.5809/18; 2. Surface survey; 3. Workshop 24 Cat. No. 2412; 4-5. Surface survey; 6. G.N.5302/3.

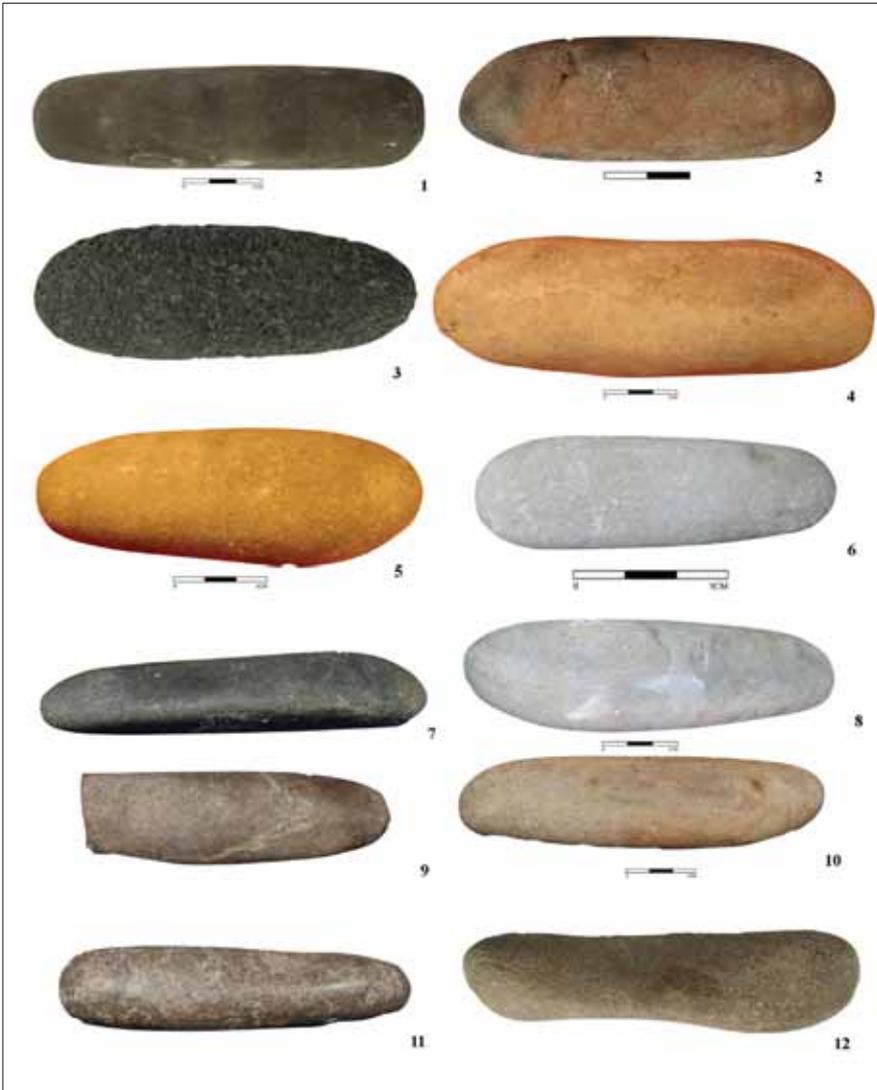


Fig. 22: long and narrow tools, in some cases cylindrical with one or two slight concavities and traces of heating: 1. Item with concavity, Area 33 Cat. No. 33548; 2. Item with concavity and traces of heat, Area 33 Cat. No. 33548b; 3. Area 33 Cat. No. 33xx1; 5. Cylindrical item with almost imperceptible concavity; 6. Item with two concavities, surface survey; 7. Item with concavity, surface survey; 8. Surface survey; 9. Cylindrical item, surface survey; 10. Item with concavity, surface survey; 11. Item with concavity, surface survey; 12. Item with concavity, surface survey.

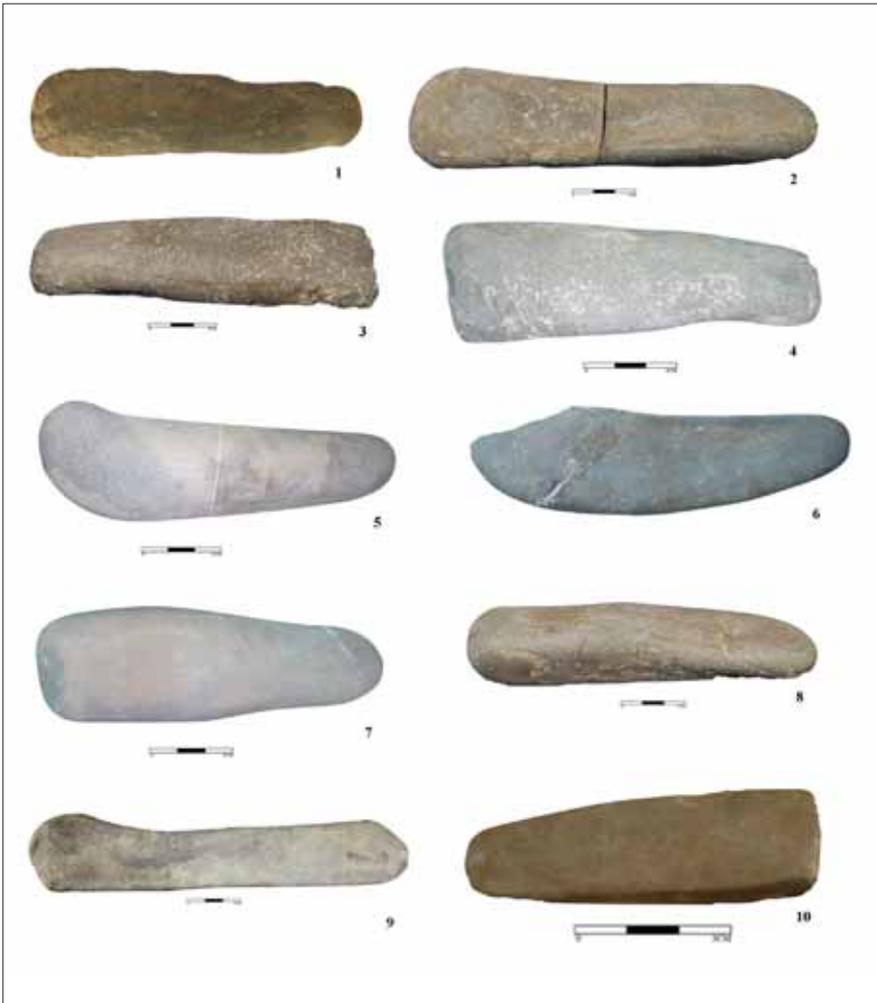


Fig. 23: long, flat and wide tools with almost imperceptible concavities: 1. Item with long concavity and traces of heat, Area 33 Cat. No. 33441; 2. Item with concavity, surface survey; 3. Item with almost imperceptible concavity, surface survey; 4. Surface survey; 5. Almost circular item, surface survey; 6. Item with almost imperceptible concavity, surface survey; 7. Flat item, surface survey; 8. Item with two concavities, surface survey; 9. Item with concavity, surface survey; 10. G.N.7834/9.

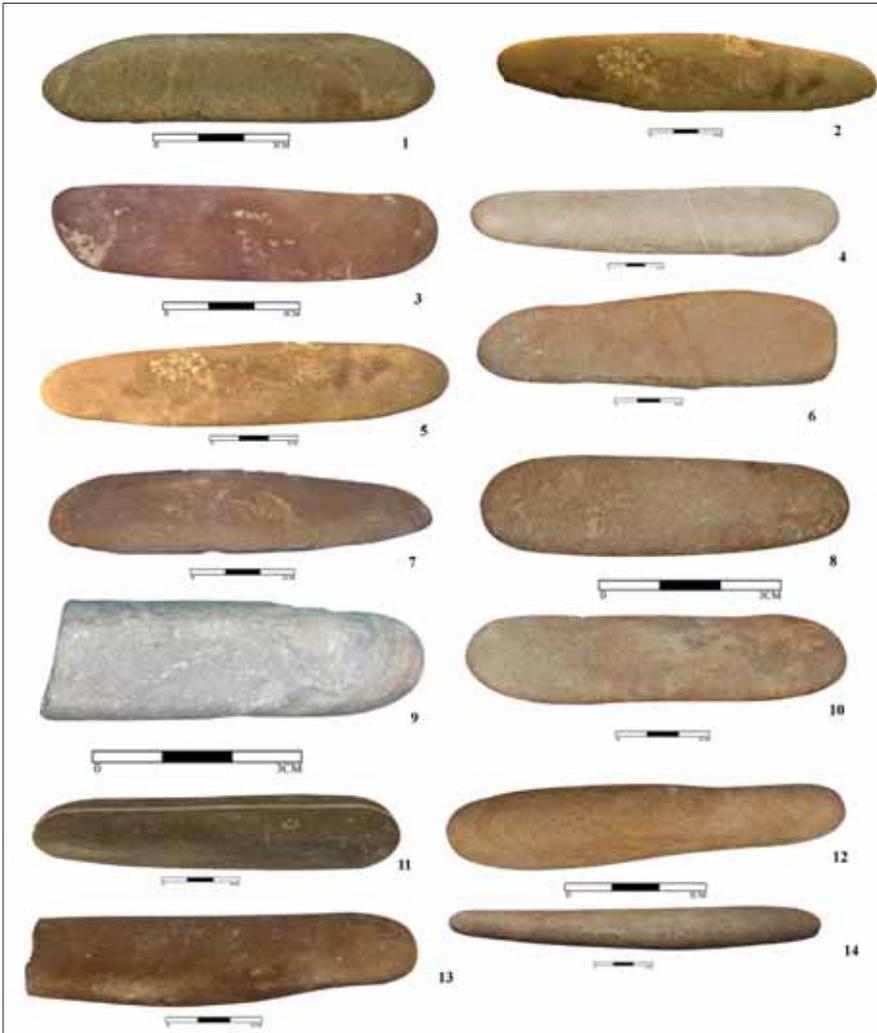


Fig. 24: long, almost oval tools with slight concavities and traces of heating: 1. Item with slight concavity, G.N.9333/7; 2. Cylindrical item with slight concavity, surface survey; 3. Item with flat surface, G.N.8617/14; 4. Item with slight concavity, surface survey; 5. Item with slight concavity, traces of heating, G.N.8119/3; 6. Item with slight concavity, traces of heating, surface survey; 7. Item with slight concavity, G.N.6511/2; 8. Item with slight concavity, surface survey; 9. Item with slight concavity, surface survey; 10. Item with slight concavity, traces of heating, surface survey; 11. Item with slight concavity, traces of heating, surface survey; 12. Item with slight concavity, G.N.8913/8; 13. Item with slight concavity, surface survey; 14. Rod with slight concavity, Workshop 26 Cat. 26151.

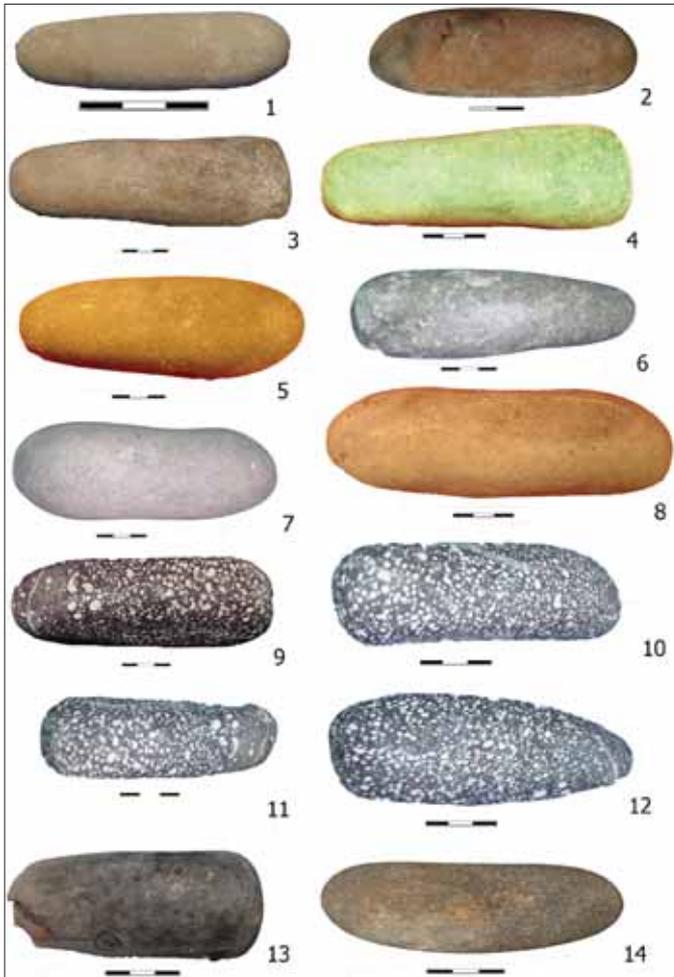


Fig. 25: long, almost oval tools with flat surfaces, slight concavities and traces of heating: 1. Almost cylindrical item with concavity and traces of heating, surface survey; 2. Item with concavity, Area 33 Cat. No. 33420; 3. Item with concavity, surface survey; 4. Item with concavity, surface survey; 5. Item with slight concavity, Workshop 18 Cat. No. 18096; 7. Item with slight concavity, surface survey; 8. Item with slight concavity, Workshop 18 Cat. No. 18104; 9. Roughly cuboid item with slight concavity on two sides, surface survey; 10. Item with slight concavity, surface survey; 11. Item with slight concavity, surface survey; 12. Item with slight concavity, surface survey; 13. Almost regular cube with slight concavity on two sides, surface survey; 14. Item with concavity, G.N.9024.

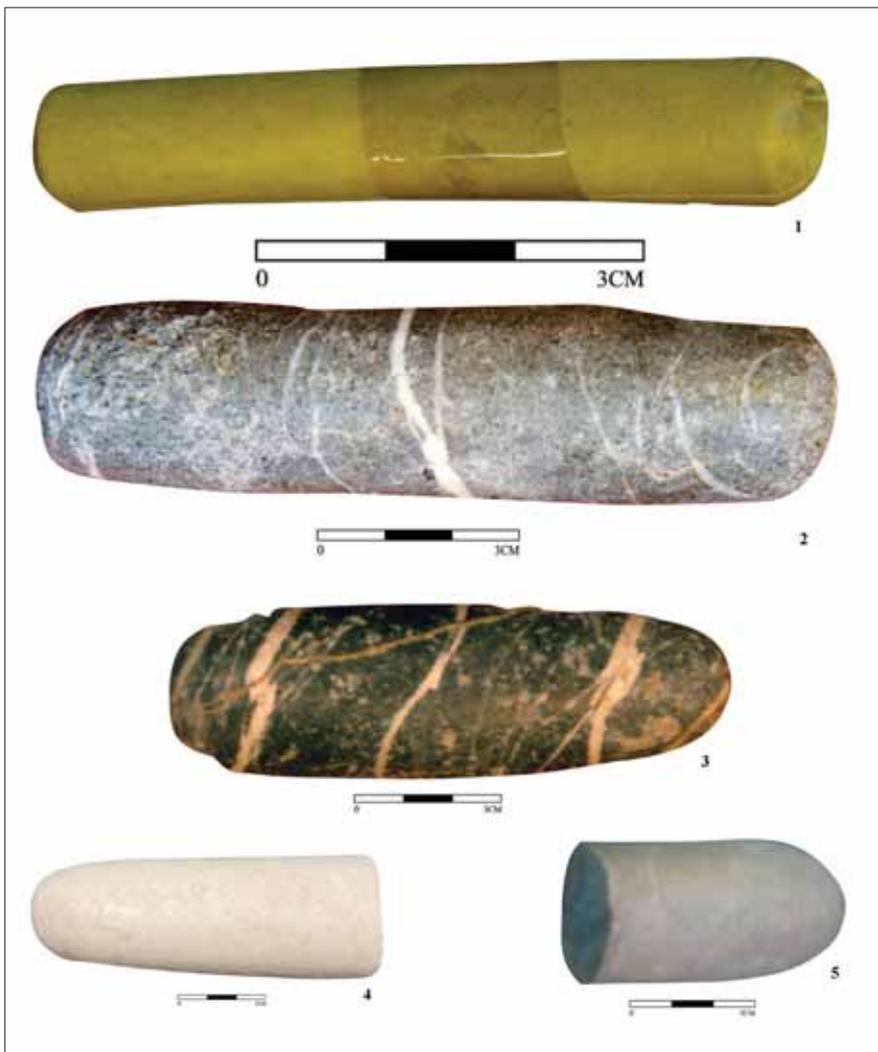


Fig. 26: cylindrical tubes and pestles: 1-3. Polished cylindrical tubes, surface survey; 4-5. Mortar pestles, surface survey.

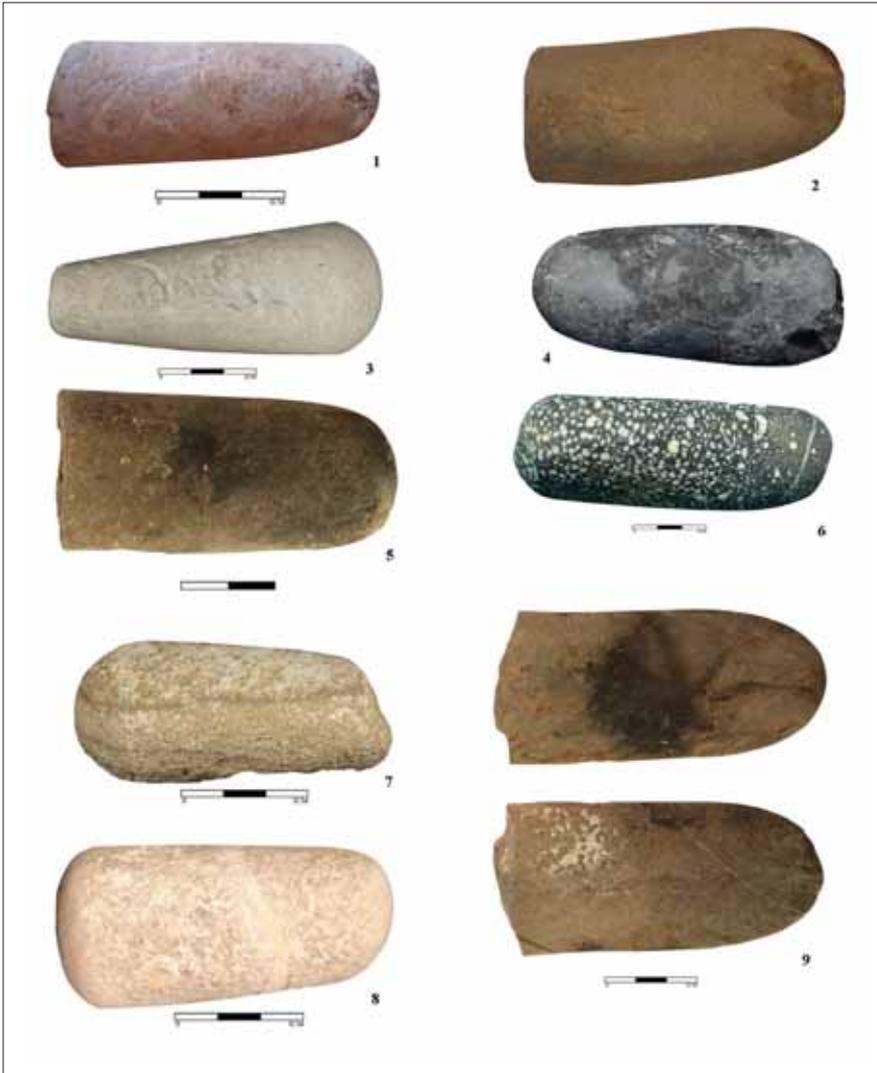


Fig. 27: broad and long cylindrical tools with slight concavity and traces of heating: 1. Pestle, Workshop 1 Cat. No. 864; 2. Pestle, Area 33 Cat. No. 33xx2; 3. Item with flat surface, surface survey; 4. Item with concavity, surface survey; 5. Cylindrical item with slight concavity and traces of heating, Area 33 Cat. No. 33584; 6. Item with slight concavity on two sides, Workshop 11 Cat. No. 1116; 7. Surface survey; 8. Item with flat surface, Workshop 26 Cat. No. 26060; 9. Item with traces of heating, Area 33 Cat. No. 33341.

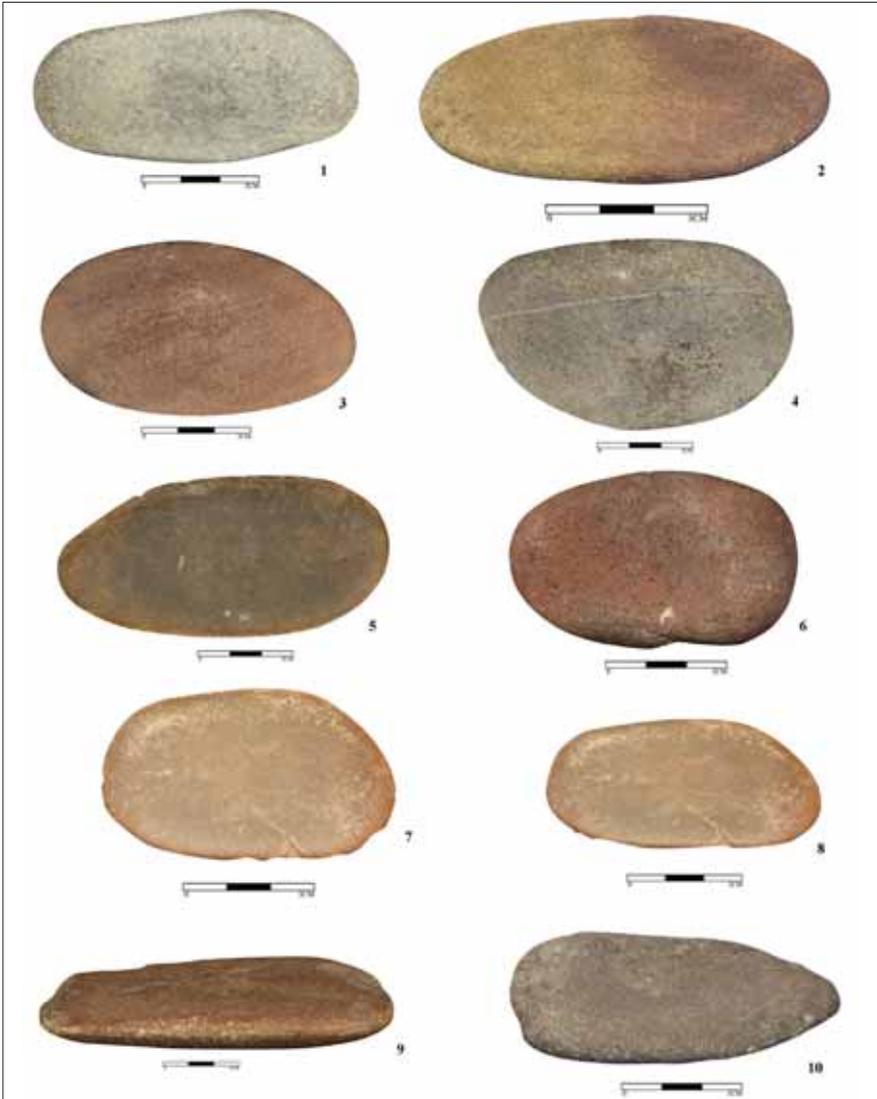


Fig. 28: almost oval stone plates, flat or concave: 1. Item with concavity and concave surface, surface survey; 2. Item with concavity and concave surface, G.N.6508/6; 3. Item with slight concavity, Workshop 26 Cat. No. 26192; 4. Item with concave surface, surface survey; 5. Item with concavity and concave surface, traces of heating, Workshop 28 Cat. No. 28129; 6. Item with concavity and concave surface, Workshop 28 Cat. No. 28130; 7. Concave item, G.N.7809/7; 9. Item with flat and polished surface, G.N.9345/11; 10. Item with concave surface, G.N.5505/1.

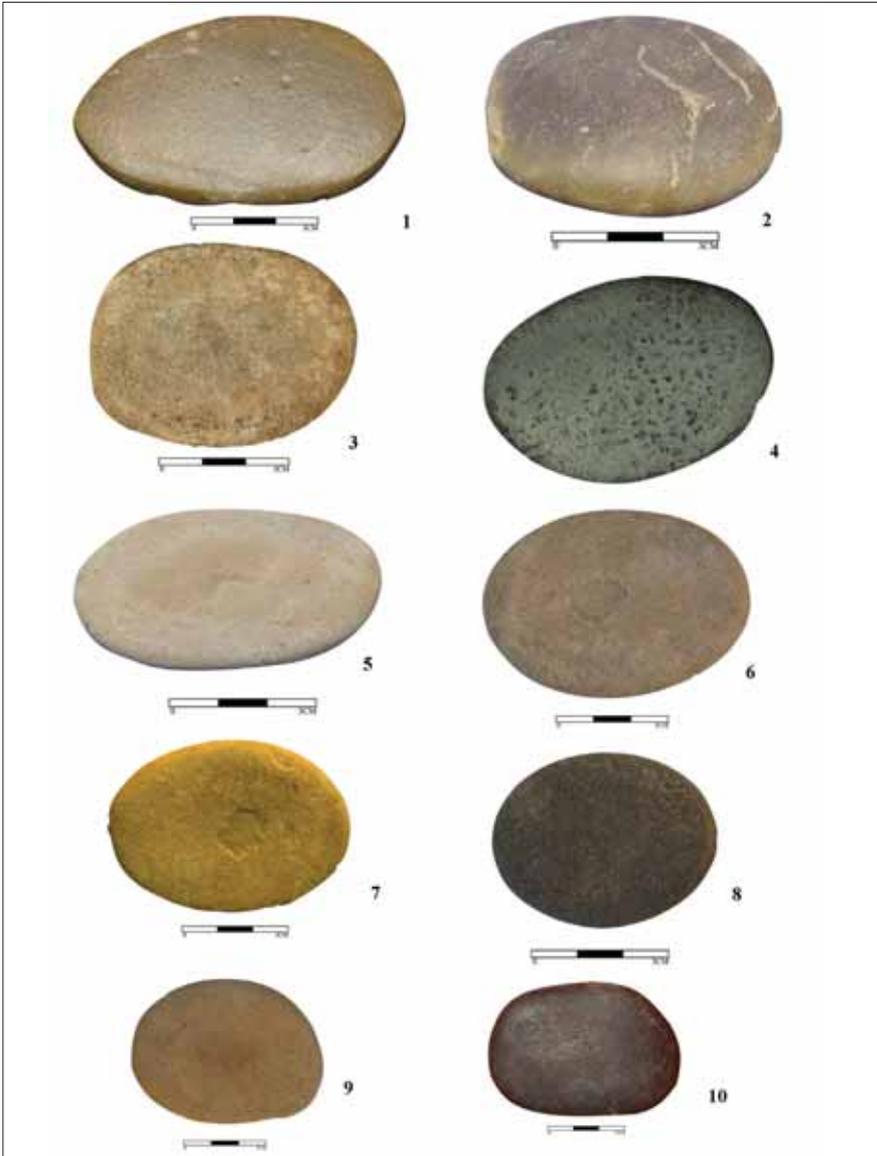


Fig. 29: almost oval stone plates, flat or concave: 1. Item with flat and polished surface, surface survey; 2. Area 33 Cat. No.33xx3; 3. G.N.9338/6; 4. Area 33 Cat. No.33xx4; 5. G.N.5902/4; 6. G.N.2912/4; 7. G.N.2912/4a; 8. Item with slight concavity, G.N.3106/4; 9. G.N.3107/2; 10. Item with traces of heating, Area 33 Cat. No. .33xx5

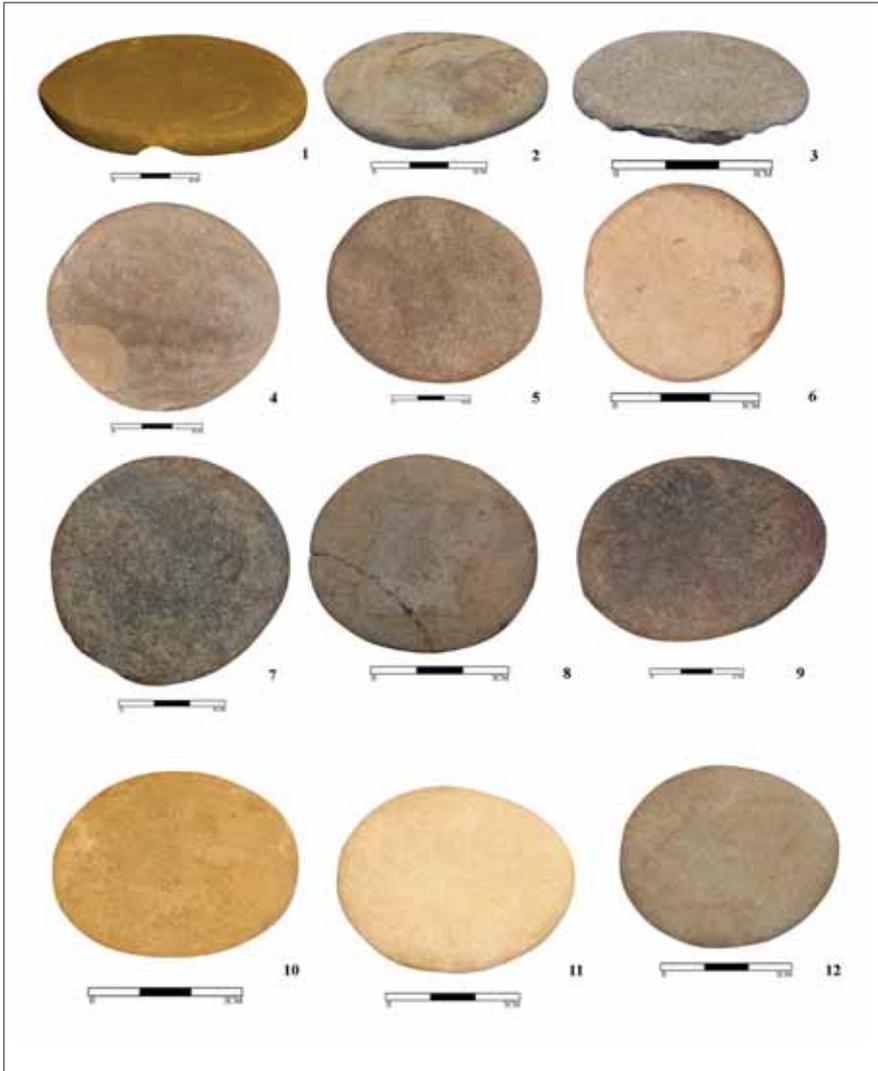


Fig. 30: circular stone disks, concave with slight concavities and traces of heating: 1. Item with flat polished surface with very slight concavity, G.N.4214/5; 2. G.N.5701/1; 3. G.N.5717/8; 4. G.N.8917/3; 5. Area 33 Cat. No. 33046; 6. Workshop 18 Cat. No. 18083; 7. Surface survey; 9. G.N.8313/11; 10. G.N.6905/4; 11. G.N.7801/2; 12. 7801/85.



Fig. 31: stone disks with slight concavities and traces of heating: 1. Item with slight concavity, surface survey; 2. Item with slight concavity, G.N.5717/8; 3. Item with slight concavity, G.N.5727/8; 4. Item with slight concavity and traces of heating, G.N.5902/4; 5. Item with slight concavity, G.N.7004/11; 6. Item with slight concavity, G.N.2903/29; 7. Item with slight concavity, Workshop 26 Cat. No. 26945; 8. Item with slight concavity, Workshop 26 Cat. No. 26047; 9. Item with traces of heating, surface survey; 10. Item with traces of heating, surface survey; 11. G.N.9407/5; 12. G.N.3105/9; 13. Item with grooved body, Area 33 Cat. No. 33xx6; 14. Item with grooved body, Area 33 Cat. No. 33xx7; 15. Grooved item, surface survey; 16. Grooved item, surface survey.

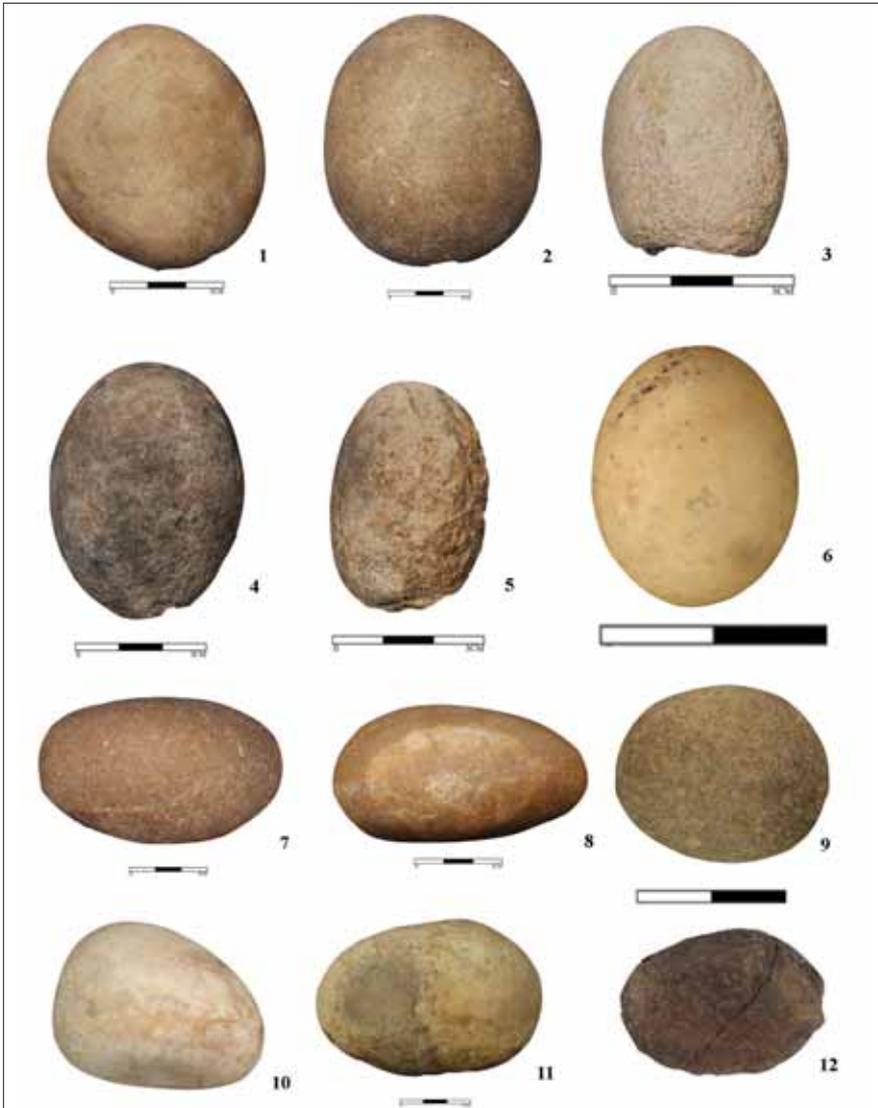


Fig. 32: egg-shaped grinding tools: 1-5. Items with slight concavities, surface survey; 6. Item with slight concavity, Area 33 Cat. No. 33418; 7. Item with slight concavity, G.N.8616/23; 8. Item with slight concavity, G.N.9031/56; 9. Item with slight concavity, Area 33 Cat. No. 33xx8; 10. Item with irregular shape and slight concavity on two sides, Area 33 Cat. No. 33x10; 11. Item with slight concavity, G.N.9727/2; 12 Area 33 Cat. No. 33x11.



Fig. 33: spherical grinding tools: 1. Area 33 Cat. No. 33583; 2. Item with slight concavity, Area 33 Cat. No. 33045; 3-5. Area 33 Cat. No. 33x12; 6. Workshop 23 Cat. No. 23012; 7. Workshop 26 Cat. No. 26034; 8. Workshop 23 Cat. No. 23012; 9. Item with slight concavity, surface survey; 10. G.N.8321/47; 11. Surface survey; 12. G.N.8917/2; 13-14. Surface survey.

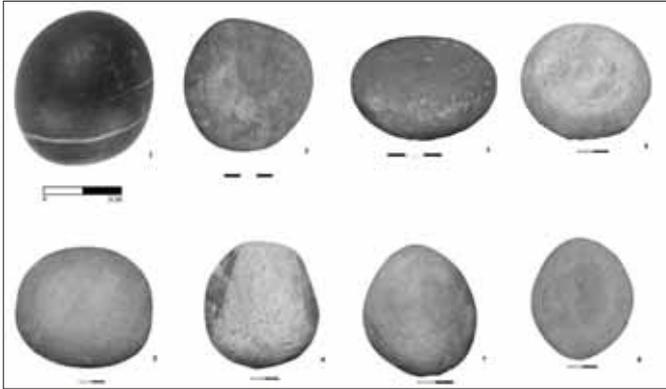


Fig. 34: hemispherical grinding tools: 1. Item with polished surface and concavity, Area 33 Cat. No. 33439; 2. Item with slight concavity and traces of heating, G.N.9344/7; 3. Item with slight concavity, G.N.9209/2; 4-8. Items with slight concavities.

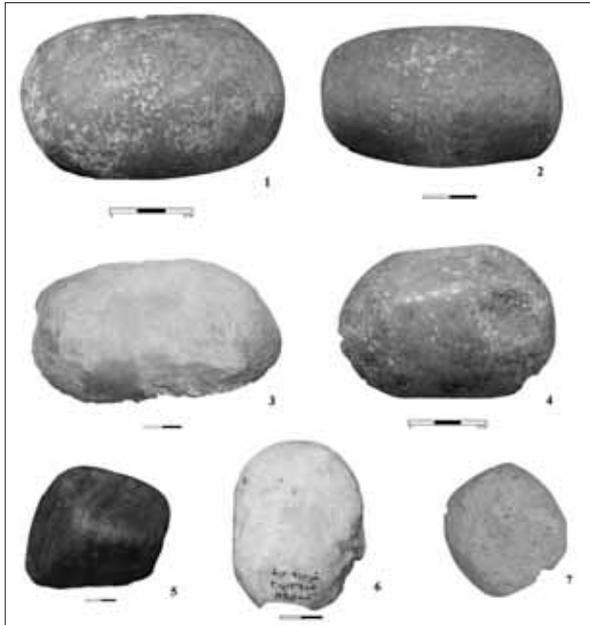


Fig. 35: stone grinding tools, roughly cuboid: 1. Item with concavity, G.N.8918/2; 2-3. Items with concavities, surface survey; 4. Polished item, Workshop 11 Cat. No. 1127; 5. Polished item with slight concavity, surface survey; 6. Workshop 1 Cat. No. 865; 7. Item with slight concavity, Area 33 Cat. 33xx13.



Fig. 36: stone columns: 1. Conical item, surface survey; 2. Conical polished item, surface survey; 3. Cylindrical item, surface survey; 4. Unfinished conical item, surface survey; 5. Cylindrical polished item, surface survey; 6. Grooved conical item, surface survey.



Fig. 37: stone vessels and mortars: 1-2 and 4-5. Mortars, surface survey; 3. Workshop 4 Cat. No. 4325; 6. Mortar, G.N.1615/24; 7. Beaker, Workshop 1 Cat. No. 818; 8. Workshop 4 Cat. No. 4188/4; 9. Chlorite beaker, Workshop 4 Cat. No. 4188.

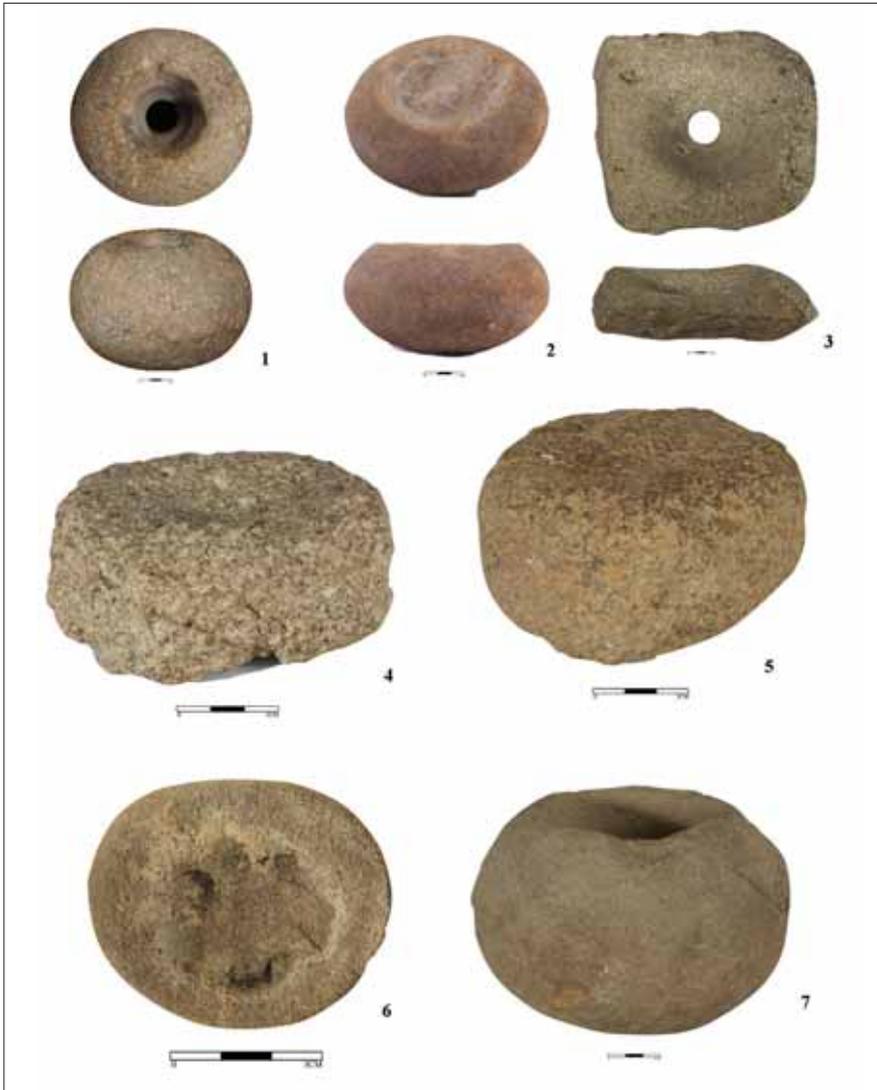


Fig. 38: spherical and cuboid stone items: 1. Possible pivot with a hole, Workshop 26. Cat. No. 26144; 2. Concave hemispherical item, surface survey; 3. Rectangular item with a hole, surface survey; 4. Square concave item, possibly a pivot, surface survey; 5. Concave cylindrical item, surface survey; 6. Concave hemispherical item, G.N.9215; 7. Spherical item with a hole, surface survey.

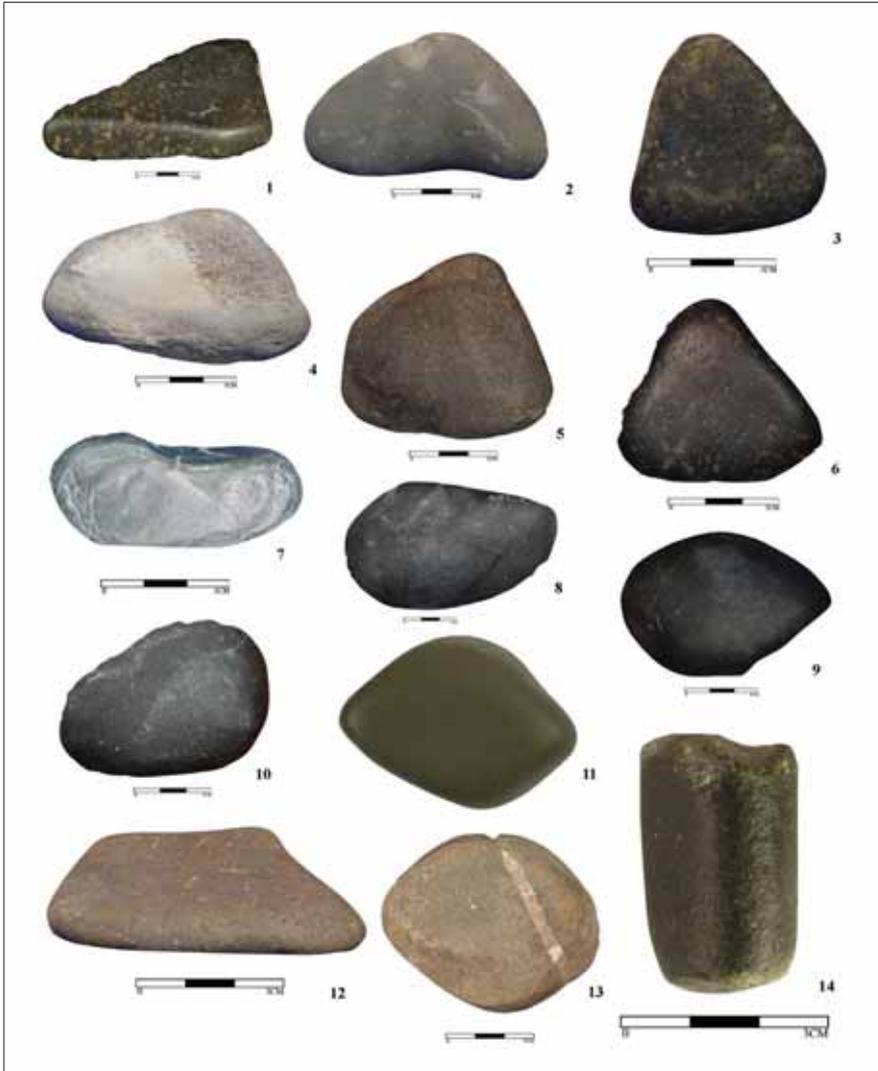


Fig. 39: other shapes including triangles and irregular shapes: 1. Polished triangle with slight concavity, Workshop 28 Cat. No. 28131; 2. Triangle, G.N.6007/6; 3. Triangle with slight concavity, Workshop 1 Cat. No. 1971; 4. Triangle with slight concavity, G.N.5301/5; 5-10. Irregular shaped items with slight concavities, surface survey; 11. Polished trapezoid item with slight concavity, Area 33 Cat. No. 33x14; 12. Irregular shaped item, almost square, with slight concavity, G.N.5812/2; 13. Concave grooved square item, G.N.9411/4; 14. Grooved cylindrical item, Area 33 Cat. No. 33xx15.

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Part III
Bioarchaeological Researches

Traumatology in a Human Sample from the Necropolis of Shahr-i Sokhta

Pier Francesco Fabbri^{2,3} and Giorgia Vincenti^{1,2}

¹Department SAGAS, Università di Firenze, Firenze.

²Physical Anthropology Laboratory, Università del Salento, Lecce.

³Department of Cultural Heritage, Università del Salento, Lecce.

pierfrancesco.fabbri@unisalento.it and g.winning@virgilio.it

Abstract

The site of Shahr-i Sokhta is located in south-eastern Iran, in the region of Sistan-Baluchistan, and represents one of the most important Iranian protohistoric sites. During the three MAIPS campaigns (2017, 2018, 2019) we studied 69 individuals in good condition brought to light by the Iranian team's excavations. The sample consisted of 41 female and 28 male individuals, which were examined for the presence of antemortem and perimortem traumas. The presence of antemortem but not perimortem traumas was detected in 16 individuals (8 males and 8 females), among whom the traumas were accidental in 11 individuals and intentional in the remaining 5. Given the lack of fatal injuries, the picture that emerges from this preliminary study of bone traumas, admittedly based on a limited sample, is consistent with the traditional view of the site and its inhabitants as being generally nonviolent.

1. Introduction

The site of Shahr-i Sokhta is located in south-eastern Iran, in the region of Sistan-Baluchistan, and represents one of the most important Iranian protohistoric sites, with a long occupation from 3550-2000 BC (Ascalone - Fabbri 2019). From the original nucleus located in the current eastern residential area, the settlement shifted westwards in the late I and early II Periods, experiencing gradual growth until reaching its maximum extension during Phase 3 of the III Period (making it one of the largest settlements in the entire Near and Middle East). The end of the III Period saw a rearrangement of the settlement layout in its central and eastern parts, followed in the IV Period by a phase of decline that lasted until life in the settlement abruptly ceased (Ascalone - Fabbri 2019). Shahr-i Sokhta, along with major settlements in the Indus valley, ceased to exist, the victim of a crisis that archaeological research has attributed, not without uncertainty, to radical and sudden climate change, critically damaging to settlements whose subsistence relied on the region's water resources. During its 14 centuries of life, the city may have seen a succession of up to 97,000 inhabitants, with an average of 1,550 and a peak of 5,000-10,000 in the central centuries of its existence (Ascalone - Fabbri 2019).

Unlike contemporary Bronze Age sites (Harappa and Mohenjo Daro, associated with the Indus culture, and Gonur Depe, associated with the Bactria-Margiana archaeological complex), Shahr-i Sokhta does not feature any defensive structures (Tosi 1968), suggesting that the population tended to be nonviolent or at least did not feel threatened by external elements.

2. Materials and methods

In 50 years of research, the only recorded burial area discovered at the site is that of the currently investigated necropolis, occupying an area of about 20-25 ha (Sajjadi 2015). From 1972 until 2015, excavations, conducted first by Italian and later Iranian researchers, brought to light approximately 1,100 burials from an estimated 40,000 inhumations (Pardini - Sarvari - Negahban 1976; Sajjadi

2015; Ascalone - Fabbri 2019). Significant variability in the state of conservation of the skeletons from the necropolis was documented. They include optimally preserved individuals still featuring both tissues and hair (Lorentz 2010), as well as individuals recorded either in fragmentary condition or with extensive forms of corrosion (Sajjadi 2015; Ascalone - Fabbri 2019).

For the purpose of this study, adult specimens in a good state of preservation from primary burials were selected. Sex was determined with reference to hipbone characteristics and measurements conducted using Phenice's visual method (1969), DSP (Murail *et al.* 2005), the presence and morphology of the preauricular sulcus (Bruzek 2002) and the greater sciatic notch (Walker 2005). Age was estimated from the morphology of the pubic symphysis (Todd 1920), the auricular surface (Buckberry-Chamberlain 2002; Lovejoy *et al.* 1985) and epiphyseal fusion (Ferembach - Schwidetzky - Stloukal 1977). Data related to the analysed individuals, their sex and estimated age are presented in Table 1.

The sample consists of 41 females (59.42%) and 28 males (40.58%), percentages that are in line with site data. In the study of 105 individuals by Macchiarelli and Passarelli (1988), 46% of the sample were male and 54% female; likewise, in the work by Abdolkarim *et al.* (2017) of 349 individuals 41% were male and 59% female.

The sample analysed here was divided into four age groups: adults, i.e. individuals who had reached skeletal maturity with fused secondary ossification centres but lacked other elements for age estimation; young adults, i.e. individuals aged between 18 and 35; middle-aged adults, i.e. individuals aged between 36 and 50; and old adults, i.e. individuals with an estimated age of over 50 (Tab. 2). For the purpose of this study, macroscopically visible *antemortem* and *perimortem* traumas were documented. *Antemortem* is defined as a trauma showing evidence of bone regeneration (Walker 2001). *Perimortem* traumas are defined as injuries that may have occurred either before death, but show no signs of healing, or shortly after death when the bone is still fresh and retains its viscoelastic nature (Buikstra - Ubelaker 1994; Ubelaker - Adams 1995). Bone, like any material,

has a tendency to break in a predictable manner depending on the forces applied, creating various types of fractures (Lovell 1997) that reflect their aetiology. A fracture represents an abrupt interruption of a segment and can be traumatic (i.e. caused by external forces applied to the bone) or spontaneous, the latter resulting from pathological processes (Ortner 2003; Kimmerle - Baraybar 2008; Lovell 1997; Agnew - Bolte 2012). In medicine, the word *injury* refers to damage caused by a trauma and *trauma* refers to an accidental or intentional injury caused by *hard contact with the environment* (Stedman 1982). Accidental injuries are defined as all those injuries resulting from events that occur unexpectedly, whereas the concept of violent injuries carries with it the implication of human intentionality with the use of physical force intended to injure, harm or kill third parties (Walker 2001; Martin - Harrod 2015).

The most common accidental injuries are from falls or are directly connected to the lifestyle of the individual (Agnew - Bolte 2012).

With injuries from falls, the traumas are often concentrated on the upper limbs, involved in breaking a fall by extending the arms forwards so as to reduce impact with the hard surface (Meena *et al.* 2014). Indicative of this type of mechanics are radius fractures such as the Galeazzi fracture, involving the junction of the middle and distal thirds of the diaphysis, or Colles' fracture, involving the distal diaphysis and the articular surface of the radius (Lovell 1997). As for the clavicle, these cases affect the junction of the middle and lateral thirds (Lovell 1997). In 21.5% of cases the lower limbs are involved (mainly tibia and fibula fractures resulting from ankle sprains) and head injuries feature in only 2.5% of cases (Gelbard *et al.* 2014). In falls from heights, the most common injuries are rib fractures, followed by head, spine, lower limb, upper limb and finally pelvis fractures (Petaros *et al.* 2013). Indicative of this type of fall are vertebrae subject to crushing injuries created by vertical force transmitted along the spine following a fall on the feet or pelvis (Adams - Hamblen 1999).

Other than fall fractures, which have well-codified trauma patterns, the remaining accidental injuries arising from collisions have no univocal

interpretation and can be distinguished from intentional injuries by the lack of traumas concomitant with typical patterns of violence (Walker 2001). As mentioned earlier, rib fractures are often related to trauma from a fall, but it should be noted that ongoing strain on the rib cage leads to stress fractures, usually as a result of habitual work or of persistent coughing or vomiting (Lovell 1997). Other common accidental injuries are those of the second metacarpal (caused either by a direct blow or by compressive force) and femoral diaphysis (Lovell 1997; Haughton *et al.* 2012).

Areas where fractures caused by intentional injuries are often found are the skull, the ulna (parry fracture) and the metacarpals (boxer's fracture) (Lovell 1997; Djuric *et al.* 2006; Soong - Got - Katarincic 2010).

As for the skull, studies of modern specimens have shown that in cases of interpersonal violence there is a prevalence of injuries to the splanchnocranium and that the most frequently affected area is that of the nose and cheekbones (Walker 2001; Lovell 1997; Komar - Lathrop 2006). In blunt force traumas, the most frequently affected area is in contrast the neurocranium, particularly the frontal bone. In these cases, the fracture is quite often localised on the left side due to a predominance of right-handed aggressors (Lovell 1997; Djuric *et al.* 2006; McNulty 2016). The presence of a skull fracture may not by itself be indicative of intentional injury, since in cases of interpersonal violence, concomitant injuries affecting areas of the postcranial skeleton are almost always recorded (Djuric *et al.* 2006).

The term 'parry' is used to describe a fracture of the ulna near the mid or distal diaphysis that does not involve the radius (Jurmain 1999; Judd 2008). This type of fracture is often used as direct evidence of interpersonal violence, given that the trauma results from an attempt to avoid a blow to the head with a blunt weapon (Grauer - Roberts 1996; Lovell 1997; Adams - Hamblen 1999; Jurmain 2001; Walker, 2001). However, these fractures may also be the result of accidental injuries (such as a fall on to an outstretched hand). Thus, in order to define the type of injury (whether accidental or intentional), it is always desirable to assess the presence of concomitant traumas (Judd 2008).

In cases of interpersonal violence, the metacarpals are involved and are fractured by the impact of a closed fist on a hard surface (hence the term ‘boxer’s fracture’). Fractures of the fourth and fifth metacarpals are typical, mainly affecting the distal end, while fractures of the second and third metacarpals are far less common (Soon - Got - Katarincic 2010; Gudmundsen - Borgen 2009).

Comparison between samples of the number and location of traumas is difficult due to differences in sample composition, particularly concerning age and social origin, and the non-homogeneity of the survey methods. With these limitations in mind, a bibliographical review was carried out for evidence of traumas in the populations of the region including the Jiroft culture, the Bactria-Margiana area and the Indus valley civilisation. For the Jiroft culture, to which Shahr-i Sokhta belongs, no anthropological data is available. For the Indus Valley, a sample consisting of a minimum 252 individuals including immatures was analysed at Harappa (Robbins Schug *et al.* 2012; Lovell, 2014). Also in the Indus Valley, a sample of 35 individuals was investigated at Farmana (Mushrif-Tripathy *et al.* 2012), together with another 37 at Rakhigarhi (Woo *et al.* 2018). Data is also recorded for Lothal (Sarkar 1972) and Kalibangan (Sharma 1999), both of which are cited in Lovell (2016). For the Bactria-Margiana area, the only available site is Gonur Depe, where evidence of traumas on adults and immatures has been published in a series of papers (Babakov *et al.* 2001; Dubova - Rykushina 2007; Kufferine - Dubova 2013). The study carried out at Kerma (Judd 2004), a geographically distant site with slightly later dating (1750-1550 BC) located in present-day Sudan, was also considered for two reasons: the analysed sample consists of adult individuals of known sex with complete or nearly complete skeletons, like those of Shahr-i Sokhta; during the examined period the site was involved in a number of conflicts, the trauma study confirming a high degree of interpersonal violence.

3. Discussion

To evaluate possible differences in the number and types of injuries experienced by the male and female individuals it is necessary to consider their demography,

given that the probability of having suffered a trauma increases with age and thus, all other things being equal, an older sample will experience more traumas than a younger one. Demographic evaluation is hindered however by the percentage of adults whose age was undetermined, about a quarter of the sample, the percentage being higher among males (35.7%) than females (19.5%); Table 2. In order to include the adults of undetermined age, the latter were assumed to be equally distributed across the three different age groups. Table 3 shows the data from the adults of known age combined with the redistributed data from the adults of undetermined age. The Fisher Exact Test produced a value of 0.21, indicating that the difference between the male and female samples is not statistically significant, making it possible to compare them and to assess whether there are sex-related differences in the recorded traumas.

Of the 69 analysed individuals, 16 (23.2%) showed trauma outcomes, none of which occurred *perimortem*. In 11 cases, the documented traumas can be classified as accidental (Tab. 4) and in 5 cases as intentional (Tab. 5). Comparing the raw data, no differences between male and female individuals are noted in either the former (5 males, 6 females) or the latter (3 males and 2 females). However, if we take into account the fact that the male sample ($n = 28$) is numerically inferior to the female sample ($n = 41$), we see that the percentage of males affected by traumas is higher than females (Tab. 6). Although the difference between males and females is not statistically significant, the prevalence of intentional traumas is more than twice as high in the former as the latter. As for individuals with multiple traumas, there is no big difference between males ($3/28 = 10.7\%$) and females ($6/41 = 14.6\%$).

Regarding the topography of the individual traumas ($n = 34$), these are shown in Table 7, along with those of the Kerma sample (Judd 2004).

Traumas were documented mainly on the trunk and upper limbs, which together account for almost three-quarters of all those observed. The difference with respect to the distribution recorded at Kerma is close to the threshold of statistical significance ($p = 0.0775$).

Among the Indus culture sites, the largest sample was documented at Harappa ($n = 252$, Robbins Schug *et al.* 2012, Lovell 2014), although detailed comparisons are not possible due to the fact that this also includes immature and incomplete skeletons. However, it is interesting to note (i) that 34.8% (8/23) of the traumatised individuals had suffered multiple injuries compared to the 10.1% in Shahr-i Sokhta, (ii) that most of the traumas, 58.1% (18/31), were located on the skull compared to 14.7% recorded in the sample under review and (iii) that in the five individuals presenting *perimortem* traumas, violence was probably the cause of death while no cases of *perimortem* violence were recorded in Shahr-i Sokhta. Of the 35 individuals from Farmana (Mushrif-Tripathy *et al.* 2012), a single head trauma was recorded whereas no evidence of trauma was detected in the 37 individuals from Rakhigarhi (Woo *et al.* 2018). Based on Lovell 2016, in both the samples from Lothal (Sarkar 1972) and Kalibangan (Sharma 1999), one *perimortem* blunt force trauma is reported.

Of the 304 individuals from Gonur Depe (Babakov *et al.* 2001), only two traumas were found, one of which was *perimortem* and consisted of an arrowhead in the spine. The relatively small number of traumas is justified by the authors with reference to the poor state of preservation of the remains, but later studies (Dubova - Rykushina 2007; Kufterin - Dubova 2008, 2013) increased the number of traumas observed at the site, including two more cases of *perimortem* wounds.

4. Conclusions

The lack of defensive structures at the site suggests that the population of Shahr-i Sokhta was not threatened by external enemies to the extent that fortifications were necessary. This does not exclude that in the absence of external threats, internal forms of violence could have existed between different groups occupying the site. In order to analyse these aspects, the best indicator is osteological data, as human remains provide direct evidence of interpersonal violence (Walker 2001; Doretti - Snow 2003; Kimmerle 2004). Traumatic injuries are not subject to the interpretative difficulties posed by literary sources, such as historical documents and ethnographic reports (Walker 2001). In Shahr-i Sokhta, from a

sample of 69 individuals, 34 *antemortem* injuries were found in 16 individuals, none of which were attributable to sharp force traumas. *Perimortem* injuries are absent and therefore none of the examined individuals died as a direct and rapid consequence of violence. Furthermore, no differences were found in the prevalence of traumas between men and women, neither for traumas interpreted as accidental nor as intentional. The latter were generally of low intensity, with the possible exception of a male individual from grave 3912. In contrast, cases of lethal violence and stab wounds are seen in other osteological samples from the region, in particular the Indus valley, even in small samples such as those from Lothal (Sarkar 1972) and Kalibangan (Sharma 1999). The traumas detected and the context of discovery led Robbins Schug *et al.* (2012) to conclude that there were socially differentiated forms of violence at Harappa, although subsequent analysis by Lovell (2014; 2016) does not support this hypothesis. A number of cases of *perimortem* (Dubova - Rykushina 2007) and sharp force traumas (Babakov *et al.* 2001; Dubova - Rykushina 2007) were also observed in Gonur Depe.

From this preliminary study of bone traumas in the necropolis of Shahr-i Sokhta, despite the limited number of analysed samples, a picture emerges that is consistent with the traditional view of the site as hosting a nonviolent society: most of the detected traumas can be interpreted as accidental and there are no cases of *perimortem* or sharp force traumas. In contrast, the latter are not absent in less numerous samples from the Indus Valley sites and Gonur Depe.



Fig. 1: rib fracture in external view.

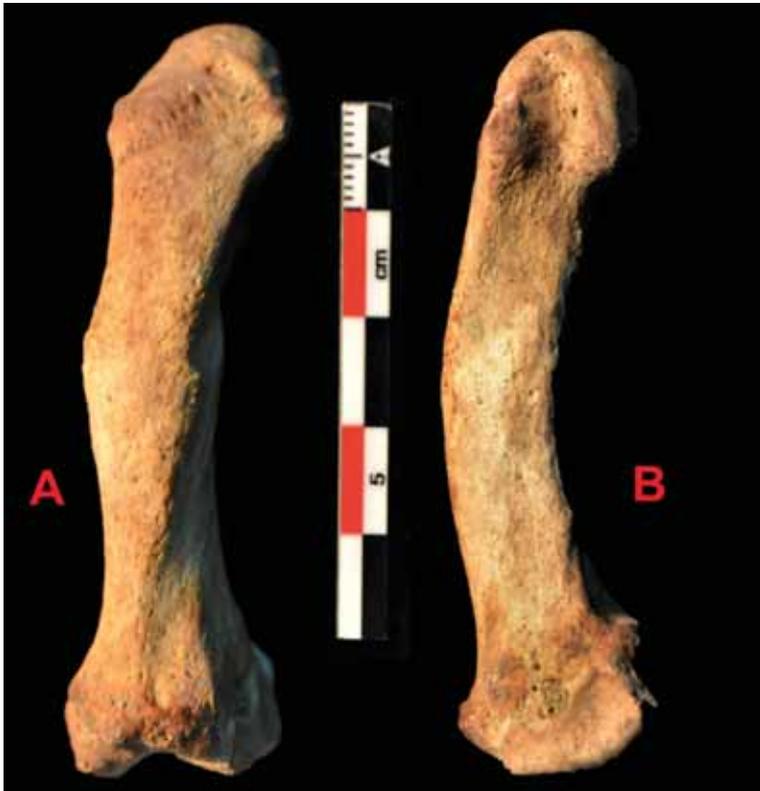


Fig. 2: 2nd metacarpal in dorsal view (left) and lateral view (right).



Fig. 4: Left: femur in anterior view. Right: magnification of the fracture in medial view; extensive osteomyelitis can be seen on the surface of the bone.



Fig. 3: radius in medial view, with Galeazzi fracture.



Fig. 5: depressed oval-shaped fracture on the frontal bone.

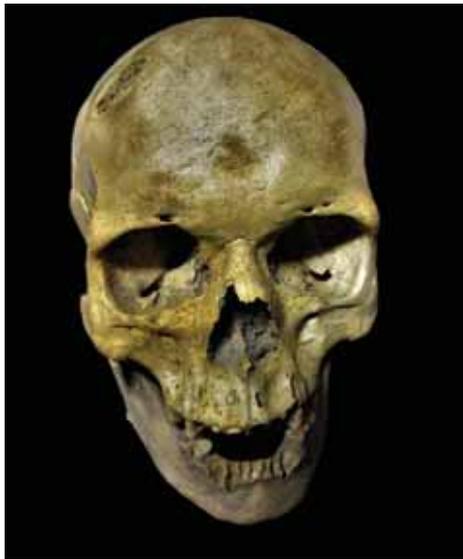


Fig. 6: depressed fracture on the left side of the frontal bone.



Fig. 8: right first rib, sternal manubrium, sternum, and rib fragments in anterior view. In the inset A), right first rib in anterior view; B) deformation of the articular surface of the right first rib.



Fig. 7: fracture on the right zygomatic.



Fig. 9: right ulna, parry fracture in anterior view.



Fig. 11: 5th metacarpal, boxer's fracture, in lateral view (left) and dorsal view (right).



Fig. 10: 2nd metacarpal in dorsal view (left) and lateral view (right).

Individual	Square	Sex	Age
725	IUP	F	YOUNG ADULT
745	IUP	M	ADULT
1302	IUC	M	ADULT
1400	IUG	F	ADULT
1411	IUG	M	YOUNG ADULT
1609	IUK	F	MIDDLE-AGED ADULT
1610	IUK	F	MIDDLE-AGED ADULT
1703	IUA	F	ADULT
1705	IUA	F	ADULT
2702	HTR	F	MIDDLE-AGED ADULT
2706A	HTR	M	ADULT
2802	IUF	M	YOUNG ADULT
2903	HYJ	M	YOUNG ADULT
3100	IUM	M	OLD ADULT
3109	IUM	M	MIDDLE-AGED ADULT
3201	IUR	M	MIDDLE-AGED ADULT
3208	IUR	F	YOUNG ADULT
3211	IUR	F	YOUNG ADULT
3309	IUH	F	MIDDLE-AGED ADULT
3310	IUH	F	ADULT
3400	IPV	F	OLD ADULT
3401	IPV	F	MIDDLE-AGED ADULT
3402	IPV	F	MIDDLE-AGED ADULT
3502	IPW	M	MIDDLE-AGED ADULT
3903	IPU	M	MIDDLE-AGED ADULT
3909	IPU	F	MIDDLE-AGED ADULT
3912	IPU	M	MIDDLE-AGED ADULT
4215	NTY	F	OLD ADULT
4301	HYI	F	MIDDLE-AGED ADULT
4403	IUS	M	ADULT
4408	IUS	F	MIDDLE-AGED ADULT
4502	IUN	F	MIDDLE-AGED ADULT
4603	MID	M	YOUNG ADULT
4700	MII	F	YOUNG ADULT
5100	HYM	F	YOUNG ADULT

5116	HYM	M	MIDDLE-AGED ADULT
5203	IPP	M	OLD ADULT
5207	IPP	F	MIDDLE-AGED ADULT
5604	HYR	F	MIDDLE-AGED ADULT
5802	MDX	F	YOUNG ADULT
5806	MDX	F	YOUNG ADULT
5902	HOJ	M	ADULT
6703	MJN	F	MIDDLE-AGED ADULT
6705	MJN	F	YOUNG ADULT
6904	NFR	F	YOUNG ADULT
7005	NFM	M	YOUNG ADULT
7702	NAM	F	ADULT
7704	NAM	F	ADULT
7705	NAM	F	OLD ADULT
7907	NFC	M	ADULT
7917	NFC	M	ADULT
8308	MJO	F	YOUNG ADULT
8309	MJO	M	YOUNG ADULT
8615	MJT	F	YOUNG ADULT
8617	MJT	F	YOUNG ADULT
8619		F	ADULT
8725	MJJ	F	MIDDLE-AGED ADULT
8808	NFK	F	YOUNG ADULT
9016	NFP	M	YOUNG ADULT
9022	NFP	M	OLD ADULT
9029	NFP	M	ADULT
9209	NFQ	F	ADULT
9211	NFQ	M	YOUNG ADULT
9213	NFD	M	ADULT
9216	NFQ	F	MIDDLE-AGED ADULT
9321	NFA	F	MIDDLE-AGED ADULT
9408	MJE	M	ADULT
9417	MJE	F	MIDDLE-AGED ADULT
9613	NAQ	M	YOUNG ADULT

Tab. 1: sample studied: number, square, sex (F females, M males) and age of finds.

	M		F	
	n	%	N	%
Young Adult (20-35)	9	32.1%	12	29.3%
Middle-aged Adult (36-50)	6	21.4%	18	43.9%
Old Adult (50+)	3	10.7%	3	7.3%
Adult n.d.	10	35.7%	8	19.5%
	28		41	

Tab. 2: distribution of individuals by sex and age class.

	M		f		m+f	
	N	%	n	%	n	%
Young adult (20-35)	14	50.0%	15	36.4%	29	41.9%
Middle-aged adult (36-50)	9	33.3%	22	54.5%	31	45.9%
Old adult (50+)	5	16.7%	4	9.1%	9	12.2%
Total	28		41		69	

Tab. 3: age composition of the sample from Shahr-i Sokhta.

Individual	Age	Sex	Period	Conservation	Trauma
3502	MA	M	3?	Incomplete	Healed fracture on right parietal
4408	MA	F	1,2	Complete	Healed fractures on 4 ribs
4301	MA	F	2	Complete	Healed fracture on rib (Fig.1) Crushing injury on eighth thoracic vertebra
3201	MA	M	2	Complete	Healed fracture on rib Healed fracture on 2nd metacarpal (Fig. 2) Healed fracture on proximal half of left fibula
5604	MA	F		Complete	Healed fracture on acromial half of right clavicle
9022	OA	M		Incomplete	Healed fracture on distal end of right ulna
3402	MA	F	2	Complete	Healed Galeazzi fracture on left radius (Fig. 3)
3903	MA	M	2?	Incomplete	Healed Colles' fracture on left radius
3909	MA	F	1,2	Complete	Healed Colles' fracture on left radius Healed mid-diaphysis fracture on left femur
2702	MA	F	1	Incomplete	Healed fracture in centre of left femur diaphysis (Fig.4) Healed fractures on 4 cervical vertebrae
5116	MA	M		Incomplete	Healed fracture on proximal half of right tibia

Tab. 4: accidental traumas found on individuals from Shahr-i Sokhta: YA = young adult; MA = middle-aged adult; OA = old adult; A = adult of undetermined age; F = female; M = male. Periods are taken from the literature (Sajjadi, 2007; Sajjadi *et al.* 2003; Sajjadi *et al.* 2006).

Individual	Age	Sex	Period	Conservation	Trauma
5207	MA	F		Complete	Healed depressed fracture on frontal (Fig. 5) Healed fracture mid-diaphysis on 2nd right metacarpal
1302	A	M	1	Incomplete	Healed fracture on zygomatic process Healed depressed fracture on frontal (Fig. 6)
3208	YA	F	2	Complete	Healed fracture on right zygomatic (Fig. 7) Healed fracture in centre of diaphysis 5 th right metacarpal
3912	MA	M	1,2	Complete	Sternum rib synostosis (Fig. 8) Healed parry fracture on right ulna (Fig. 9) Healed fracture mid-diaphysis on 2nd right metacarpal (Fig. 10)
1411	YA	M	?	Complete	Healed fracture on distal end of right 5 th metacarpal (Fig. 11)

Tab. 5: intentional traumas found on individuals from Shahr-i Sokhta: YA = young adult; MA = middle-aged adult; OA = old adult; A = adult of undetermined age; F = female; M = male. Periods are taken from the literature (Sajjadi, 2007; Sajjadi *et al.* 2003; Sajjadi *et al.* 2006).

	Individuals	with traumas	% with traumas		p
M+F	69	16	23.2%	All traumas	0.4001
M	28	8	28.6%		
F	41	8	19.5%		
M	28	6	17.9%	Accidental	0.3337
F	41	5	14.6%		
M	28	3	10.7%	Intentional	0.3892
F	41	2	4.9%		

Tab. 6: traumas on individuals from Shahr-i Sokhta.

	Shahr-i Sokhta	%	Kerma	%
Skull vault	3	8.8%	20	14.8%
Face	2	5.9%	6	4.4%
Torso	14	41.2%	25	18.5%
Upper arm	11	32.4%	60	44.4%
Lower arm	4	11.8%	24	17.8%
Total	34		135	

Tab. 7: trauma distribution in Shahr-i Sokhta and Kerma (Judd 2004).

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New Data on Animal Exploitation at Shahr-i Sokhta (Iran): Preliminary Results from the Analysis of Animal Remains Found in Area 33

Claudia Minniti and Alberto Potenza

Università del Salento, Via D. Birago 64, 73100 Lecce, Italy.

alcospot@yahoo.it; claudia.minniti@unisalento.com

Abstract

This paper presents the results of recent zooarchaeological analyses conducted at Shahr-i Sokhta (Iran) as part of the MAIPS project, which developed from cooperation between the University of the Salento and the Iranian Center for Archaeological Research and seeks to apply a multidisciplinary approach to the study of the Hirmand valley, Shahr-i Sokhta and their archaeological contexts. Between 2017 and 2019, archaeological research was carried out in the area known as Area 33, bringing to light stratigraphic deposits and domestic features dated to periods III and II (ca. 3000 to 2450 BC). Using the diagnostic zones method, about 800 animal remains were recorded; they contribute to a better understanding of animal exploitation at the site from the fourth to the second millennia BC. A more refined chronology, based on new archaeological excavations and 14C dating, allowed us to group the faunal data into three main chronological phases and to establish the broad stability of husbandry strategies over time.

1. Introduction

This paper presents zooarchaeological analyses currently being performed at Shahr-i Sokhta (Iran) as part of the MAIPS project and as part of a PhD research project which is being carried out by one of the authors. Arising from cooperation between the University of the Salento and the Iranian Center for Archaeological Research, the project aims to apply a multidisciplinary approach to the study of the Hirmand valley, Shahr-i Sokhta and their archaeological contexts.

Since 2017, archaeological research has been carried out in the area known as Area 33, bringing to light stratigraphic deposits and domestic features dated to periods II and III (Salvatori - Tosi 2005). This paper discusses the preliminary results of the analyses of the animal remains collected between 2017 and 2019.

2. Materials and methods

All the animal remains were identified. Mammal and bird remains were recorded and counted before undergoing quantification analysis using a selective diagnostic zone approach (Davis 1992; Albarella - Davis 1994) with minor modifications.¹ The scientific nomenclature of domestic animals follows Gentry - Clutton-Brock - Groves (2004).

Attempts were made to distinguish between sheep and goats on the basis of teeth and post-cranial elements using the criteria described in Boessneck (1964; 1969), Kratochvil (1969), Payne (1985), Halstead - Collins - Isaakidou (2002), Prummel - Frisch (1986) and Zeder - Lapham (2010).

1. The mammals 'diagnostic zones' include: cranium (zygomaticus), atlas, axis, scapula (glenoid articulation), distal humerus, proximal radius, proximal ulna, carpals 2-3, distal metacarpal (ungulates), third and fourth metacarpals (suids and carnivores), pelvis (acetabulum, ischial part), distal femur, distal tibia, astragalus (lateral half), calcaneum (sustentaculum), scapocuboid, distal metatarsal (ungulates), third and fourth metatarsals (suids and carnivores), distal metapodial (ungulates), third and fourth metapodials (suids and carnivores) and the proximal parts of the 1st, 2nd and 3rd phalanges. For birds, the following were always recorded: scapula (articular end), proximal coracoid, distal humerus, proximal ulna, proximal carpometacarpus, distal femur, distal tibiotarsus, and distal tarsometatarsus. Horncores and antlers were also identified but not used for quantification analysis. The proximal head of the humerus, distal part of the radius, distal ulna, proximal head of the femur and proximal tibia were recorded and used in the ageing and other analyses but not used for quantification. All other fragments of interest – such as non-countable elements from rarer species or parts displaying butchery/processing marks or pathological conditions – were always recorded but not used for quantification analysis.

Mortality data were derived from the long bones' state of epiphyseal fusion in accordance with Silver (1969) for cattle and Bullock - Rackham (1982) for caprines, and from wear stages of mandibular teeth, following Grant (1982) for cattle, and Payne (1973; 1987) for sheep/goats. Cattle mandibles were also assigned to the general age categories outlined by O'Connor (2003: 160) and caprine mandibles to those of Payne (1973).

Bones and teeth were measured in accordance with the criteria described in von den Driesch (1976), Davis (1992) and Albarella - Davis (1994).

The number of identified specimens (NISP) was calculated for all taxa but the minimum number of individual (MNI) was only calculated for the most common taxa. The MNI was calculated by simply dividing the total number of fragments of each element by the number present in the body. This was facilitated by the recording system, considering only non-repeatable fragments.

The animal remains were generally found in a fair state of preservation, albeit fragmented, partly due to the high incidence of salt crystals at the site, which corroded the bones. Signs of gnawing by rodents were observed frequently while those of carnivores were less frequent.

More than 2000 animal fragments were recovered, of which about 800 were recorded and analysed.

A more refined chronology, based on new stratigraphic data and ^{14}C dates (see Ascalone in this volume) allowed us to group the faunal data into three main chronological phases that proved to be evenly balanced (Fig. 1):

- Layer 4 (ca. 3000-2850 BC), corresponding to SIS II.6 (Salvatori - Tosi 2005) and associated with the 'Western Building' and 'Eastern Building', with an NISP of 316 (38%);
- Layer 3 (ca. 2850-2620 BC) corresponding to SIS II.5a and associated with the 'House of the Courts', with an NISP of 335 (41%);
- Layer 1 (ca. 2600-2450 BC), corresponding to SIS III.4-3 and associated with 'Building 33', with an NISP of 175 (21%).

No animal remains were found in the layers dated to Layer 2 (ca. 2620-2600 BC), referred to as the 'Squatter phase', but this is not surprising as this

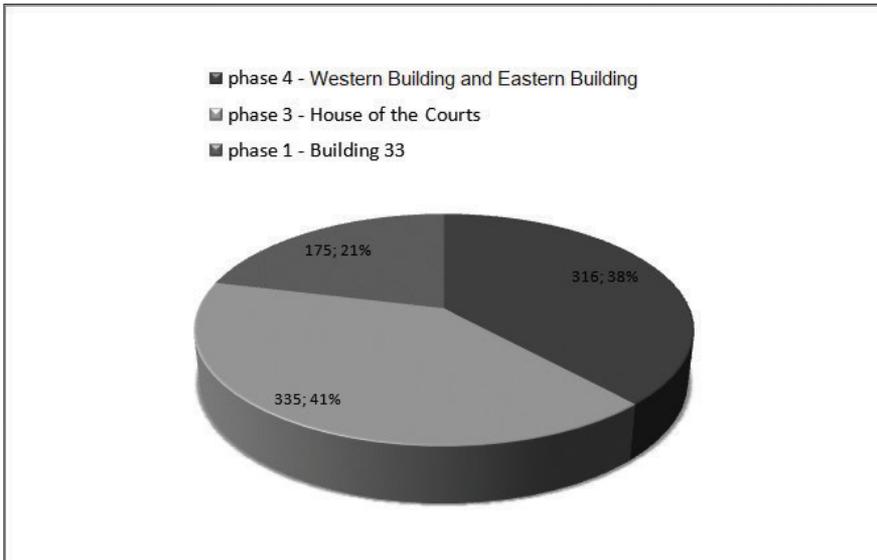


Fig. 1: Shahr-i Sokhta, Area 33. Stratigraphic provenance of animal remains.

corresponds to a of abandonment of the area, which was used for metalworking activities (Ascalone in press).

3. Overview of the assemblage

In terms of both NISPs and MNIs, the animal bone assemblages are dominated by the remains of the main domestic animals (Tab. 2). In all phases, sheep and goats were the most common species, followed by cattle, whereas pigs were completely absent. The frequency of cattle increases over time, at the expense of caprines, when the division into phases is taken into account (Fig. 2).

Dogs were also recorded in all phases but with fewer remains than the other domesticated animals.

Wild species of mammals and birds, as well as fish, are present, albeit in smaller numbers. Rodent bones are significantly represented but must be interpreted as the remains of scavengers, unlike those of the other animals, which were exploited by the inhabitants of Shahr-i Sokhta.

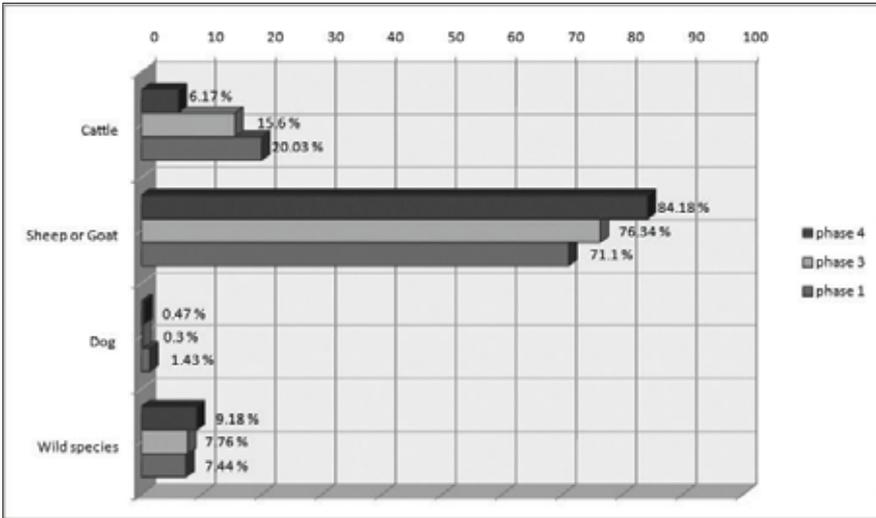


Fig. 2: Shahr-i Sokhta, Area 33. Frequency of the main species per phase.

Cattle

The cattle remains were identified as belonging to humped cattle. Both the NISP and MNI suggest an increase in frequency over time, passing from ca 7% to 22% of the remains and from two to four individuals (Tab. 3).

The frequency of skeletal elements per phase was calculated using the MNI rather than the NISP, to eliminate bias arising from elements that occur more frequently in the body. For Layers 4 and 3, the highest MNIs were calculated from forelimb bones (humerus or radius), and for phase 1 from hindlimb elements (pelvis and calcaneum). Few remains of teeth and cranial elements were found. Only two fragments of horncores were identified.

Examining the data on epiphyseal fusion (Tab. 4), the proportion of cattle that had reached skeletal maturity before death was high. However, in Layers 4 and 3, some bones belonged to sub-adult (18-36 months) and young (12-18 months) individuals, while in Phase 1 only one of the remains is from an animal aged less than 36 months. These data suggest that cattle were used as draught animals in all phases, with a minor interest in beef production. The data from teeth wear stages are consistent with those of the fusion of epiphyses (Tab. 5).

Butchery marks were observed on just two cattle bones (an astragalus from Layer 4 and a calcaneum from Layer 3). No traces of burning were found, the only exception being three phalanges from Layer 3 (Fig. 3).

A total of 49 vertebrae and 50 large ribs were also identified as probably belonging to cattle, currently the only large mammal species identified in this area. No thoracic vertebrae with spina bifida were noted, and very few ribs and vertebrae show butchery marks.

Few biometric data are available; however, they show that the majority of bones belonged to small specimens and only one calcaneum was from a larger individual.

Caprines

Sheep and goats are largely dominant in all phases, although their frequency decreases over time from 93% to 78% in terms of the NISP of the main domesticates and from 16 to 11 individuals on the basis of the MNI. Sheep are always more numerous than goats (Fig. 4), although for a large amount of the caprine remains it was not possible to distinguish between the two genera.

All body parts are represented, but the most frequently preserved element is the distal humerus (Tab. 6). Few fragments of horncores were found, the majority belonging to goats.

Analysis of epiphyseal fusion suggests that in all phases, most caprines reached the age of five. Only 3-8% of individuals were slaughtered before reaching the first year of age and just under a third between the first and the fourth years of age (Tab. 7). These data suggest that caprines were generally managed so as to maintain herd numbers and were exploited for secondary products (mainly fleeces and hides). They were slaughtered at the age when the quality of fleeces and hides usually declines (4-6 years).

Tooth wear stage data confirm the results of the epiphyseal fusion analysis but enable better interpretation of the use of sheep and goats, which may have been exploited for different purposes.



Fig. 3: Shahr-i Sokhta, Area 33. Three burnt cattle first phalanges from US 34, phase 3 - 'House of the Courts' .

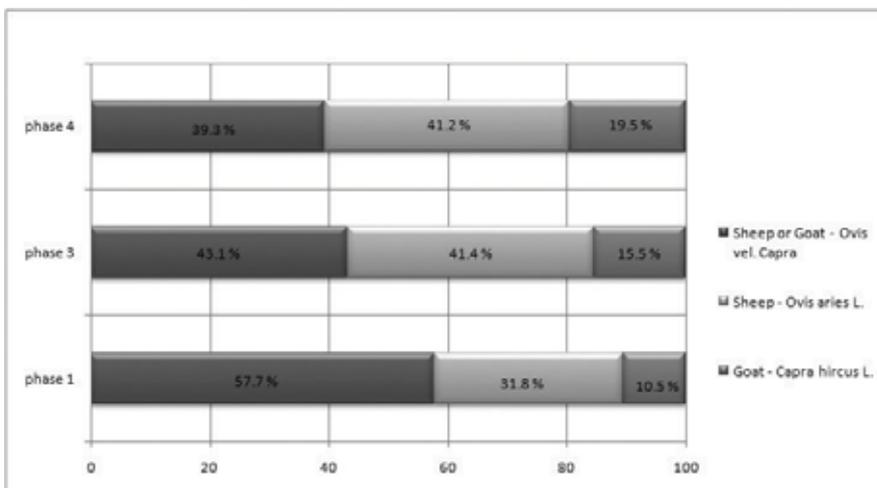


Fig. 4: Shahr-i Sokhta, Area 33. Ratio of sheep to goats for each phase.

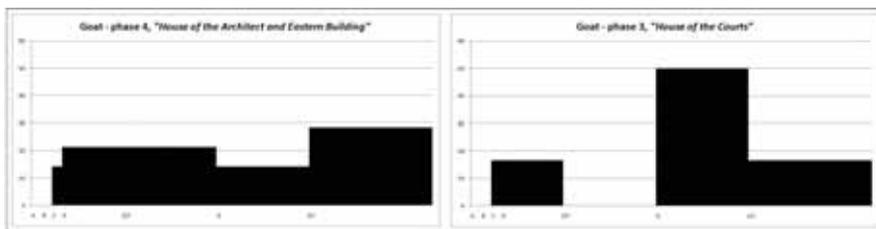


Fig. 5: Shahr-i Sokhta, Area 33. Mandibular teeth wear in goats, from Layer 4 ('Western Building' and 'Eastern Building') and Layer 3 ('House of the Courts'), following Helmer - Gourichon - Vila 2007.

Few data on goats are available. They show that in Layer 4 almost equal percentages of individuals were slaughtered between the first and the third years of age and between the fourth and the tenth years, whereas in Layer 3 one third of goats before reaching the second year but the majority after the fourth year. No data are available on goat mortality from Layer 1 (Tab. 8).

Data on sheep mortality show that in all phases most of them were slaughtered after the fourth year of life, while only 20-30% of animals were slaughtered between six months and the fourth year of age (Tab. 9).

These results and their relative correlation with categories of caprine management (Helmer - Gourichon - Vila 2007) suggest that goats were partly slaughtered for meat and partly after prolonged breeding before obtaining the hides (Fig. 5); sheep were mainly exploited for their fleeces and secondarily for mutton (Fig. 6). The low percentages of sheep and goats slaughtered at a young age may indicate that milk was not important in the inhabitants' diet. However, a certain interest in milk might be indirectly reflected by the slaughtering of individuals (in these cases females) between two and four years of age and, to a lesser degree, between four and six years, when milk production decreases.

Butchery marks are visible on a large number of caprine bones: half of the caprine samples bear traces of the dismemberment of carcasses and filleting (Fig. 7). Butchery marks are also present on medium-sized ribs that probably belonged to sheep and goats. Extensive burning was also noted, particularly on the epiphyseal extremities of long bones, suggesting that body parts were severed at the joints before being roasted.

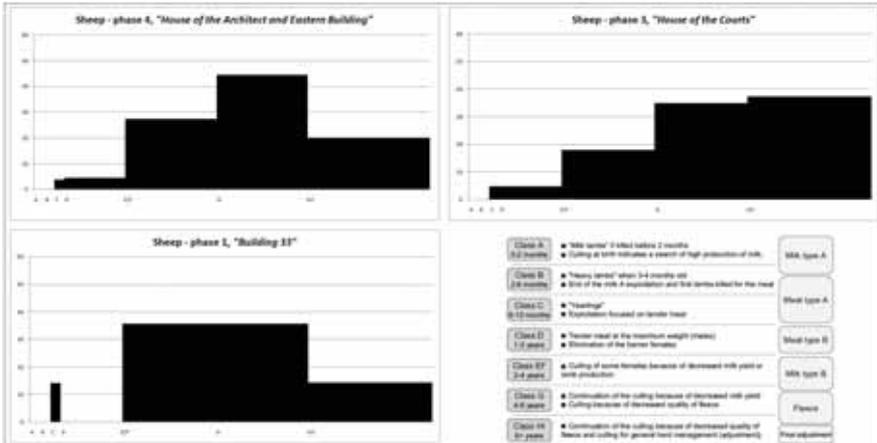


Fig. 6: Shahr-i Sokhta, Area 33. Mandibular teeth wear in sheep, all phases, following Helmer - Gourichon - Vila 2007.



Fig. 7: Shahr-i Sokhta, Area 33. Butchery marks on a caprine distal humerus seen in dorsal view.

Withers height estimated for sheep using Teichert coefficients (1975) ranges from 50.5 to 71.5 cm (Tab. 10). Plots of bone measurements show a certain variability in sheep and goats, with both small and large individuals, probably due to the presence of both sexes and maybe also to different breeds.

Dogs

The dog is represented in all phases of occupation of Area 33, albeit to a limited extent. The specimens are generally adults, apart from a young dog aged less than 12 months from Layer 4. Biometric analysis suggests the presence of large individuals; one of them was 64.4 cm tall, based on Clark's coefficients (1985). Gnawing marks by carnivores were observed on a dog pelvis from Layer 1 (Fig. 8).

Wild species

Wild species are present in all phases, but in lower numbers than domesticates. The remains of wild mammals include gazelle, wild goat (Fig. 9) and urial, the last two identified on the basis of biometric parameters. Many rodent bones and a fish vertebra not identified to species level are also documented.

Bird remains are represented in all phases but there are more in Layer 3 than any other (Tab. 11). They belonged to several migratory bird species. The Eurasian coot and the pochard are documented in all phases and account for the majority of bird bones found at Area 33. The grey heron and the cormorant are documented only in Layer 4, and the wild goose only in Layer 3.

4. Discussion

This preliminary study of the animal remains found in Area 33 shows that in all three chronological phases domesticated animals accounted for 92% to 96% of remains. Caprines always dominated, followed by cattle, which increased over time from 7% to 22%. Intensive husbandry of domesticated ruminants is appropriate for an environment of open spaces with low vegetation, located near streams or lakes, such as the one that characterized the settlement. Pigs are completely absent in all phases.



Fig. 8: Shahr-i Sokhta, Area 33, Layer 1 (Building 33). Dog pelvis with carnivore bites.



Fig. 9: Shahr-i Sokhta, Area 33, Layer 4 ('Western Building' and 'Eastern Building'): distal humerus of *Capra aegagrus* (left) and *Capra hircus* (right).

These results are perfectly in line with those from previous studies carried out on other parts of the site (Caloi - Compagnoni 1977; Bököny - Bartosiewicz 2000; Minniti 2019).

Other sources suggest the presence of suids in Sistan, and the reasons for their apparent exclusion from the diet of the inhabitants of Shahr-i Sokhta still need to be clarified.

Cattle were always primarily used for the plough and only secondarily slaughtered for meat. The exploitation of cattle as draught animals seems to intensify in Layer 1. All the cattle remains are currently identified as belonging to domestic breeds and probably to the humped and humpless forms already documented at Shahr-i Sokhta. Their measurements generally match the data documented by previous studies (Bököny - Bartosiewicz 2000).

Sheep and goats provided meat, fleeces and hides in all phases. Their mortality profiles are consistent with those of other domestic areas previously studied (Bököny - Bartosiewicz 2000: 126-127). Given the absence of perinatal and very young caprines in the samples, milk production seems to have been negligible in Area 33. However, we should bear in mind that several young sheep and goat remains were found in tombs as funerary offerings (Sajjadi 2008a; 2008 b; 2010). This suggests that data from Area 33 may not reflect the general pattern of husbandry followed at the site. Further analyses conducted in other areas are expected to provide new information that will improve our understanding of caprine exploitation at Shahr-i Sokhta.

The measurements of sheep long bones generally lie within the range already documented in previous studies but they also highlight the presence of small individuals that were not previously documented (Bököny - Bartosiewicz 2000: tab. 4). They also show a slight decrease in the size of sheep over time.

In all phases, dogs are represented by a small number of remains, which are believed to belong to large animals, probably used in pastoral activities.

Wild animal remains are rare in all phases. Their scarcity confirms the marginal role of game in the inhabitants' diet that has already been seen in previous studies.

The main wild species in Area 33 (gazelle, wild goat and urial) are consistent with low vegetation that is conducive to pasture. Layers 4 and 3 yielded abundant rodent remains. These belonged to commensal animals, as shown by the numerous gnawing marks found on the other bones.

The discovery of a fish vertebra in a layer dated to Layer 1 suggests that fishing also played a role, albeit a marginal one.

The bird remains found in Area 33 belonged to migratory bird species; these data are consistent with the results of previous analyses of other samples (Bulgarelli 1977; Cassoli 1977).

Unsurprisingly, they are associated with marshes, small lakes and streams, which characterize the environment of the site.

All the bird species detected were edible, with the exception of the cormorant. Previous studies have shown that birds were hunted for food at this site (Gala - Tagliacozzo 2014), and the long bones of some species were secondarily used to make so-called 'pourers' (Potenza 2019). In the case of cormorants, their use in fishing activities has been suggested (Cassoli 1977).

5. Conclusion

Our paper presents preliminary results from the study of a new faunal sample found at Shahr-i Sokhta by the MAIPS project, specifically examining the data from Area 33, which are dated to Periods III and II. They generally confirm the animal economy shown by previous studies of the material carried out by the Italian Archaeological Mission between 1967 and 1978, but also reveal some small changes otherwise not detected until now. Despite the small size of the sample, the new data highlight the need to investigate the animal economy of the site in accordance with a more refined chronology.

The results discussed here are preliminary and future research in Area 33 will yield further material that will help to verify the scenario presented here.

Analyses of material from other areas of the site demonstrate the importance of comparing data from a range of buildings and areas, in order to obtain reliable knowledge of animal exploitation in Shahr-i Sokhta.

NISP					
Taxon	Layer 4	Layer 3	Layer 1	Tot.	%
Cattle - <i>Bos indicus</i> L.	19.5	52.25	35	106.75	12.9
Sheep or Goat - <i>Ovis</i> vel. <i>Capra</i>	104.5	110.25	71.75	286.5	34.7
Sheep - <i>Ovis aries</i> L.	109.5	106	39.5	255	30.9
Goat - <i>Capra hircus</i> L.	52	39.5	13	104.5	12.7
Dog - <i>Canis familiaris</i> L.	1.5	1	2.5	5	0.6
Urial - <i>Ovis orientalis vignei</i> Blyth	3		2	5	0.6
Wild goat - <i>Capra aegagrus</i> L.	1	1		2	0.2
Gazelle - <i>Gazella</i> sp.	2	4	3	9	1.1
Rodents - <i>Rodentia</i> ind.	5	12	1	18	2.2
Birds - <i>Aves</i> ind.	18	9	6	33	4
Fish - <i>Pisces</i> ind.			1	1	0.1
TOTAL	316	335	174.75	825.75	100

Tab. 1: Shahr-i Sokhta, Area 33. Number of identified animal remains (NISP) per Layer.

MNI			
Taxon	Layer 4	Layer 3	Layer 1
Cattle - <i>Bos indicus</i> L.	2	3	4
Sheep or Goat - <i>Ovis</i> vel. <i>Capra</i>	16	13	11
Dog - <i>Canis familiaris</i> L.	1	1	1
Urial - <i>Ovis orientalis vignei</i> Blyth	1		1
Wild goat - <i>Capra aegagrus</i> L.	1	1	
Gazelle - <i>Gazella</i> sp.	1	1	1

Tab. 2: Shahr-i Sokhta, Area 33. Minimum Number of Individuals (MNI) for the main mammal species per Layer.

CATTLE									
Elements	Layer 4			Layer 3			Layer 1		
	NISP	MNI	%	NISP	MNI	%	NISP	MNI	%
horncorn	-	-	-	2	1	-	-	-	-
cranium	-	-	-	1	1	-	-	-	-
upper deciduous/ permanent premolars	-	-	-	-	-	-	1	1	-
upper M1/2	-	-	-	3	1	-	3	2	-
upper M3	-	-	-	-	-	-	1	1	-
incisors	-	-	-	2	1	-	-	-	-
lower deciduous/permanent premolars	2	1	-	4	2	-	-	-	-
lower M1/2	2	1	-	3	2	-	2	1	-
lower M3	1	1	-	-	-	-	-	-	-
unidentified teeth	-	-	-	-	-	-	1	1	-
atlas	-	-	-	2	2	-	-	-	-
axis	-	-	-	1	1	-	1	1	-
scapula	-	-	-	4	2	-	-	-	-
humerus	3	2	100	3	2	-	3	2	-
radius	1	1	-	5	3	100	3	2	-
ulna	1	1	-	3	2	-	1	1	-
carpal	-	-	-	3	2	-	-	-	-
metacarpal	3	2	-	2.5	2	-	1.5	1	-
pelvis	2	1	-	2	1	-	7	4	100
femur	-	-	-	2	1	-	2	1	-
rotula	-	-	-	3	2	-	-	-	-
tibia	-	-	-	5	3	100	4	2	-
tarsal	4	2	-	6	3	100	2	1	-
astragalus	1	1	-	-	-	-	1	1	-
calcaneum	1	1	-	3	2	-	7	4	100
metatarsal	-	-	-	3.5	2	-	0.5	1	-
1 st phalanx	4	1	-	13	2	-	5	1	-
2 nd phalanx	2	1	-	5	1	-	2	1	-
3 rd phalanx	3	1	-	1	1	-	1	1	-

Tab. 3: Shahr-i Sokhta, Area 33. Body parts of cattle by Number of Identified Specimens (NISP) and Minimum Number of Individuals (MNI) for each phase. The MNI was calculated as follows: deciduous and premolars were divided by 6; first/second molars by 4; third molars by 2; phalanges by 8 and all other elements except metapodials and vertebrae by 2. Metacarpal = $(MC1+MC2/2+MP1/2+MP2/4)/2$; metatarsal = $(MT1+MT2/2 +MP1/2+MP2/4)/2$. % = frequency of an element expressed in relation to the most common (by MNI).

CATTLE										
Element	age of fusion	Layer 4		Layer 3		Layer 1				
		U	F	U	F	U	F			
scapula dist.	7-10 months	-	-	0	4	-	-			
pelvis acet.	7-10 months	-	-	0	2	0	5			
humerus dist.	12-18 months	1	2	0	3	0	2			
radius prox.	12-18 months	0	1	1	3	0	2			
1 st prox. phalanx	18 months	2	2	0	13	0	5			
2 nd prox. phalanx	18 months	0	2	1	4	0	2			
metacarpal dist.	24-30 months	1	1	0	2	0	1			
tibia dist.	24-30 months	-	-	1	1	0	1			
metatarsal dist.	24-36 months	-	-	0	3	-	-			
metapodial dist.	30-36 months	-	-	0	1	0	2			
calcaneum prox.	36 months	1	0	1	1	1	4			
femur prox.	42 months	-	-	1	0	-	-			
humerus prox.	42-48 months	-	-	-	-	0	1			
radius dist.	42-48 months	-	-	1	0	0	1			
ulna prox.	42-48 months	0	1	2	0	-	-			
femur dist.	42-48 months	-	-	0	1	0	1			
tibia prox.	42-48 months	-	-	1	2	0	2			

Tab. 4: Shahr-I-Sokhta, Area 33. Frequencies of unfused (U) and fusing/fused (F) bones of cattle; age of fusion following Silver (1969). Prox. = proximal; dist = distal; acet. = acetabulum.

Cattle, phase 4 - 'Western Building' and 'Eastern Building'

	C	V	E	H	U	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	
dp4																						
P4							1															
M1																						1
M2																1						
M3																1						
M1/2																						

Cattle, phase 3 - 'House of the Courts'

	C	V	E	H	U	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	
dp4																						
P4											1											
M1								1									1					
M2																						
M3																						
M1/2																						

Tab. 5: Shahr-i Sokhta, Area 33. Wear stages of individual cattle teeth from phase 4 ('Western Building' and 'Eastern Building') and phase 3 ('House of the Courts') following Grant (1982). Both mandibular and isolated teeth are included.

Elements	CAPRINES																	
	Layer 4						Layer 3					Layer 1						
	Western and Eastern Building						House of the Courts					Building 33						
	goat	sheep	S/G	MNI		%	goat	sheep	S/G	MNI		%	goat	sheep	S/G	MNI		%
NISP	NISP	NISP	NISP	MNI	%	NISP	NISP	NISP	NISP	MNI	%	NISP	NISP	NISP	NISP	MNI	%	
horncorn	1			-	-	2	2		-	-		3		1	-	-		
cranium	3	3	4	-	-	5	6	1	-	-		1	4	-	-			
up. decid/perm P			20	4	25			16	3	23.08				1	1	1	9.09	
upper M1/2			38	10	62.5			30	8	61.54				8	2	18.18		
upper M3			12	6	37.5			6	3	23.08				2	1	9.09		
incisors					-		1	1	1	7.69								
low. decid/perm P	11	28	3	7	43.75	9	27	5	7	53.85		2	11	3	3	27.27		
lower M1/2	9	36	2	12	75	9	27	7	11	84.62		2	10	4	4	36.36		
lower M3	3	14	3	10	62.5	3	8	3	7	53.85		1	4	3	4	36.36		
unidentified teeth					-					-								
atlas	2	2	2	6	37.5			1	1	7.69				3	3	27.27		
axis	2	3		5	31.25			4	4	8	61.54			4	4	36.36		
scapula	1	1	3	3	18.75	4	4	6	7	53.85				5	3	27.27		
humerus	4	18	9	16	100	3	14	9	13	100		5	5	12	11	100		
radius	9	8	6	12	75	5	8	18	12	92.31			5	1	3	27.27		
ulna	2	1	7	5	31.25		1	10	6	46.15			2	2	2	18.18		
carpal					-					-				1	1	9.09		
metacarpal	1	5	2.5	4	25	1	5	3.5	5	38.46		2		2.5	3	27.27		
pelvis	6	7	13	13	81.25	1	5	9	8	61.54		1	2	10	7	63.64		
femur	4	10	5	10	62.5	2	7	12	11	84.62			2	4	3	27.27		
rotula			2	1	6.25			1	1	7.69								
tibia	4	12	2	9	56.25	7	14	9	10	76.92		2	7	5	7	63.64		
tarsal			4	2	12.5			5	3	23.08								
astragalus	6	11	2	10	62.5	3	10	1	7	53.85		1	6	7	7	63.64		
calcaneum	2	4	3	5	31.25	5	7	4	8	61.54			4	1	3	27.27		
metatarsal	2	6	1.5	5	31.25		3	5.5	5	38.46			1	2.5	2	18.18		
phalanx 1st	5	18	5	4	25	8	18	4	4	30.77		2	7	3	2	18.18		
phalanx 2nd	3	2	1	2	12.5	4	4		2	15.38				1	1	9.09		
phalanx 3rd	1	1		2	12.5	3			1	7.69								

Tab. 6: Shahr-i Sokhta, Area 33. Body parts of sheep/goat by Number of Identified Specimens (NISP) and Minimum Number of Individuals (MNI) for each phase. Non-countable elements are not included. The MNI was calculated as follows: deciduous and premolars were divided by 6; first/second molars by 4; third molars by 2; phalanges by 8 and all other elements except metapodials and vertebrae by 2. Metacarpal = $(MC1+MC2/2+MP1/2+MP2/4)/2$; metatarsal = $(MT1+MT2/2+MP1/2+MP2/4)/2$. % = frequency of an element expressed in relation to the most common (by MNI).

CAPRINES							
		Layer 4		Layer 3		Layer 1	
Element	age of fusion	U	F	U	F	U	F
humerus dist.	-12 months	2	23	3	22	1	20
radius prox.	-12 months	1	13	1	16	0	6
pelvis acet.	-12 months	0	9	0	6	0	9
scapula dist.	12 months	3	2	2	8	1	4
1 st prox. phalanx	14-35 months	3	24	4	26	0	9
2 nd prox. phalanx	14-35 months	0	6	0	8	0	1
tibia dist.	35 months	0	13	3	19	3	10
femur prox.	35 months	2	7	6	5	0	2
femur dist.	48 months	2	8	8	2	2	0
metacarpal dist.	48 months	1	6	8	5	1	3
metatarsal dist.	48 months	0	7	4	3	1	2
metapodial dist.	48 months	2	0	1	0	1	4
tibia prox.	48 months	0	5	4	7	0	1
humerus prox.	48-60 months	3	1	0	2	-	-
radius dist.	48-60 months	1	7	9	6	-	-
ulna prox.	48-60 months	2	6	4	6	1	3
calcaneum prox.	48-60 months	3	6	4	10	2	3

Tab. 7: Shahr-i Sokhta, Area 33. Frequencies of unfused (U) and fusing/fused (F) caprine bones; age of fusion following Bullock - Rackham (1982). Prox. = proximal; dist. = distal; acet. = acetabulum.

<i>Capra hircus</i>		Layer 4		Layer 3	
		Western Building and Eastern Building		House of the Courts	
Payne categ.	age	NISP	%	NISP	%
A	0-2 m.	0	0	0	0
B	2-6 m.	0	0	0	0
C	6-12 m.	1	14.3	1	16.7
D	1-2 years	1.5	21.4	1	16.7
E	2-3 years	1.5	21.4	0	0
F	3-4 years	0	0	0	0
G	4-6 years	1	14.3	3	50
H	6-8 years	1	14.3	0	0
I	8-10 years	1	14.3	1	16.7
Total		7	100	6	100

Tab. 8: Shahr-i Sokhta, Area 33. Goat mandibular teeth wear stage from phase 4 ('Western Building' and 'Eastern Building') and phase 3 ('House of the Courts'), following Payne (1973).

<i>Ovis aries</i>		Layer 4		Layer 3		Layer 1	
		Western Building and Eastern Building		House of the Courts		Building 33	
Payne categ.	age	NISP	%	NISP	%	NISP	%
A	0-2 m.	0	0	0	0	0	0
B	2-6 m.	0	0	0	0	0	0
C	6-12 m.	1	3.8	1	4.8	1	14.3
D	1-2 years	1.17	4.5	1	4.8	0	0
E	2-3 years	3.64	14	1.88	9	1.25	17.9
F	3-4 years	3.45	13.3	1.88	9	1.25	17.9
G	4-6 years	11.54	44.4	7.36	35	2.5	35.7
H	6-8 years	1.2	4.6	5.76	27.4	1	14.3
I	8-10 years	4	15.4	2.12	10.1	0	0
Total		26	100	21	100	7	100

Tab. 9: Shahr-i Sokhta, Area 33. Sheep mandibular teeth wear stage per phase, following Payne (1973).

<i>Ovis aries</i>	Layer 4				Layer 3			
	n.	min.	mean	max.	n.	min.	mean	max.
radius	1		65.1		1		67.7	
metacarpus	4	60.3	65.2	70.0	2	50.5	58.0	65.6
metatarsus	1		62.3		1		71.5	

Tab. 10: Shahr-i Sokhta, Area 33. Sheep withers heights, estimated in accordance with Teichert (1975).

NISP			
Birds	Layer 4	Layer 3	Layer 1
Gray heron - <i>Ardea cinerea</i> L.	1		
Pochard - <i>Aythya ferina</i> L.	7	4	2
<i>Aythya sp.</i>		1	
Wild goose - <i>Anser anser</i> L.		1	
<i>Anser sp.</i>		1	
Coot - <i>Fulica atra</i> L.	9	2	2
Cormorant - <i>Phalacrocorax carbo</i> L.	1		
Aves ind.			2
TOTAL	18	9	6

Tab. 11: Shahr-i Sokhta, Area 33, number of identified bird remains (NISP) per Layer.

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New Methodological Approaches to the Study of Human-environment Interactions at Shahr-i Sokhta

Girolamo Fiorentino¹, Marco Madella²⁻³ and Ignazio Minervini¹

¹ Laboratory of Archaeobotany and Palaeoecology. Department of Cultural Heritage. University of the Salento.

² CaSEs Research Group, Department of Humanities, Universitat Pompeu Fabra, Barcelona, Spain.

³ ICREA, Barcelona, Spain.

**girolamo.fiorentino@unisalento.it; marco.madella@upf.edu;
ignaziomine@gmail.com**

Abstract

This paper presents the results of the new archaeobotanical analysis carried out at the site of Shahr-i Sokhta, in the light of the new data emerging from the 2019 excavations of ‘Building 33’ and the new palaeoenvironmental research strategies inside the site (Trench 36) and in the immediate surroundings. The recent research campaign also adopted a multiproxy palaeoenvironmental approach to the study of micro- and macro- plant remains, digging sampling pits in the dry bed of a depression inside the site (the intermediate area) and another pit immediately outside the settlement in the broad dry bed of the river Hirmand

(the off-site area). The site represents a key place for understanding the different aspects of mankind's management of natural resources during the Bronze Age and the different modes of human-environment interaction.

1. Introduction

This paper comes a few years after the first publication on the resumption of the archaeobotanical and palaeoenvironmental investigations in the site of Shahr-i Sokhta, in the light of the new data emerging from the 2019 excavations of 'Building 33' and the new palaeoenvironmental research strategies inside the site and in the immediate surroundings.

The on-site archaeobotanical research adopted a strategy of targeted spatial archaeobotanical sampling in order to investigate the distribution of micro- and macro- plant remains with reference to a functional reading of the spaces of the various loci of 'Building 33' during two of the structure's phases of occupation. New on-site sampling strategies were also applied to the exposed part of a trench dug during previous excavations (Trench 36), in order to stratigraphically investigate other phases of occupation of the site based on systematic sampling of the deposits of discarded material in a midden.

The recent research campaign also adopted a multiproxy palaeoenvironmental approach to the study of micro- and macro- plant remains, digging sampling pits in the dry bed of a depression inside the site (the intermediate area) and another pit immediately outside the settlement in the broad dry bed of the River Helmand (the off-site area).

2. Sampling strategies

The archaeobotanical investigations entailed the adoption of various approaches to sampling and analysis, based on the identification of three different types of area to be investigated (Fig. 1):

- on-site areas lying within the settlement characterised by human activities (with specific intervention during the excavation of Building 33 and investigations in Trench 36);

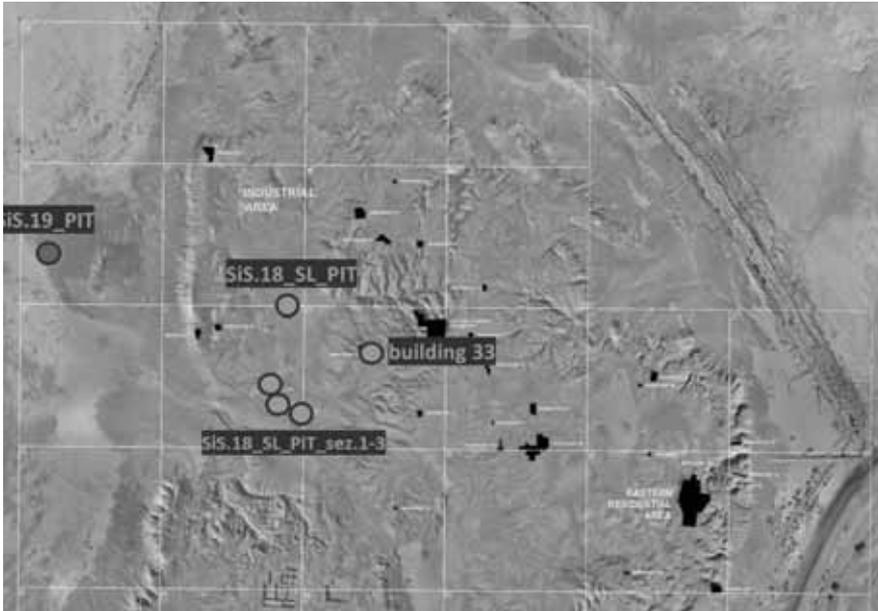


Fig. 1: view of the site of Shahr-i Shokta with the areas subject to archaeobotanical and palaeoenvironmental investigation.

- off-site areas more directly influenced by palaeoenvironmental and palaeoclimatic regional dynamics, especially the bed of the River Helmand (with stratigraphic trenches outside the settlement);
- an intermediate area, i.e. an area that was plausibly influenced by environmental variations but was also directly affected by the settlement's human activities (with a trench inside the depression next to 'Building 33', which may have functioned as a reserve of water for the settlement).

On-site investigations: Building 33

During the excavation of 'Building 33', in the 2017, 2018 and 2019 campaigns, a series of standard-volume sediment samples (5 litres) were taken. Concentrations of combusted remains, identified by visual inspection, were also collected. The sampling approach sought to take account of the stratigraphy of the phases of occupation and the spatial distribution of the remains.

The sediment gathered was dry-sieved through 4 mm, 1 mm and 0.5 meshes, in accordance with the procedures established during the 2017 campaign (Fiorentino - Minervini 2019). On the basis of the functional division of the various sectors of 'Building 33' proposed by E. Ascalone (2019: 19-37), the recovered remains were then grouped into three sectors for the subsequent analyses:

- the kitchens in the northern part of the building (L.34; L. 36; L. 37)
- the staterooms in the central part (L.19; L.21)
- the residential sector (upper levels of L.19; L.6)

The spatial sediment sampling was intensified in the course of the 2019 campaign, especially in loci 156, 149 and 142, all outside 'Building 33'. An area 4 m by 3 m was marked out and subdivided into squares of 60 cm by 60 cm. The objective was to better determine the function of the spaces and recover those types of plant remains with the greatest information potential (phytoliths and starch grains) (Fig. 2).

A further distinction was made between samples pertaining to the structure's two different phases of occupation, separating material from the building's older



Fig. 2: systematic spatial sampling in the area of Building 33 for the analysis of micro-remains.

phase (period III – phase 5b/4: L.15; L.16) from that of its more recent phase (period III – phase 4-3).

On-site investigations: Trench 36

Archaeological excavations in the site of Shahr-i Sokhta are traditionally characterised by large deep trenches, enabling vertical stratigraphic verification, in various parts of the site, which have made it possible to investigate and determine the periods and phases of occupation. These are significant stratigraphic contexts that can also provide key information on diachronic variations in the use of plants and the dynamics of formation of midden deposits. Middens are characterised by homogeneous patterns of accumulation of plant remains in terms of the dynamics of use-reuse-discard, and they contain high concentrations of organic residues of various kinds. Studying them can thus provide a long-term view compared to the contextual synchronic analysis associated with the systematic spatial excavation of other areas.

The 2019 excavation campaign saw the start of the investigations in one of these trenches, Trench 36, located in the eastern part of Shahr-i Sokhta, immediately to the east of the *Eastern Residential Area*. The trench was reopened in order to conduct microstratigraphic verification of the deposit's accumulation patterns. This entailed systematic vertical samplings (Fig. 3) aimed at the recovery of plant micro-remains (phytoliths) and macro-remains (charcoals, seeds and fruits). Further samplings of archaeobotanical remains were conducted for the purposes of C14 dating and analysis of stable isotopes (carbon and nitrogen). The sediment gathered for the analyses of plant macro-remains was wet sieved through 4 mm, 1 mm and 0.5 mm meshes. The plant material selected was partially analysed and determined and the results will be presented in another publication, together with those of the micro-remains.

Investigations in off-site and intermediate areas

Regarding the sampling strategies in the intermediate area, the investigation of the exploratory pit, about 200 cm deep, dug during the 2018 excavation campaign (Fig. 4), was extended.



Fig. 3: systematic vertical sampling in Trench 36.



Fig. 4: sampling in the pit of the depression inside the site.

In order to obtain as detailed a picture as possible of the dynamics of the depression, sampling was also performed along the walls of one of the dry tributaries that flowed into the depression both in the past and today (Fig. 5).

The analyses of pre-washed bulk samples are still in progress. The objective, as previously mentioned, is to identify any correlation between water levels in this depression lying within the site and the dynamics of occupation of the settlement, especially the adjacent 'Building 33', located next to the depression itself. The off-site investigations entailed manually excavating a pit outside the site to a depth of 150 cm, in an area of relatively low dynamism along the course of the River Helmand (Fig. 6).

The analyses serve to reconstruct the dynamics of the river and its palaeohydrology, in parallel with the investigations already under way in the area (Hamzeh *et al.* 2016) but with greater chronological resolution, helping to determine any correlation with the settlement's various phases of life.

3. Materials and methods

The macroscopic plant component was directly selected and determined in the archaeobotanical laboratory in the MAIPS's storage facility in Shahr-i Sokhta with the aid of a stereomicroscope and a reflected-light metallographic microscope.

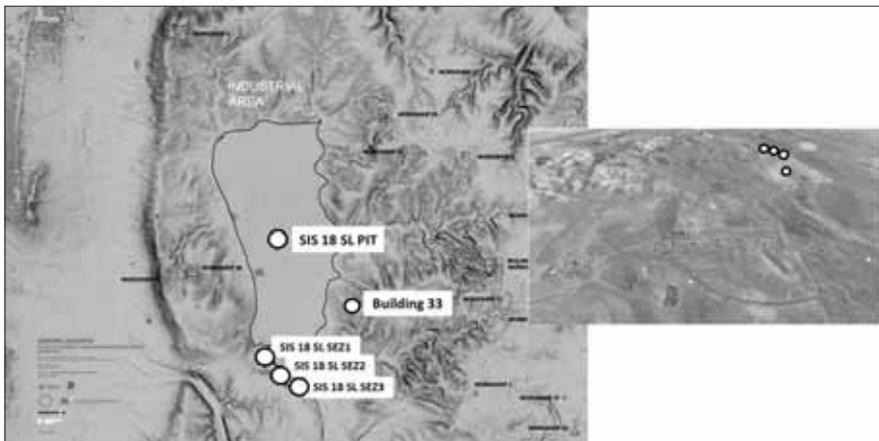


Fig. 5: distribution of the sampling inside the depression and on the walls of one of its tributaries.



Fig. 6: sampling in the off-site pit.

The anthracological remains (fragments of combusted woody tissue) were identified by reading the three fundamental cross-sections of the anatomy of wood (transversal, tangential, radial), observed at 100 to 400x magnification. Taxonomic determination was performed with reference to samples of current vegetation gathered in the area and dichotomous keys found in atlases of wood anatomy (Neumann *et al.* 2001; Schweingruber *et al.* 2011).

Analysis of the carpological component (seeds, fruits and other parts of the plant) entailed morphological and biometric recognition of the remains observed in various views, comparison with the collection of current samples gathered in the region and reference to specific carpological atlases, especially regarding the Poaceae family (Katz *et al.* 1965; Jacomet, 2006; Nesbit, 2006).

The sediment samples used for the analysis of the microscopic plant component were first tested to verify the presence of phytoliths and then prepared for transport and subsequent processing in the laboratory of the CaSEs Research Group of the Universitat Pompeu Fabra in Barcelona, where the analyses are currently in progress.

4. Results

Here we present the results of the anthracological and carpological analyses performed on plant macro-remains recovered during the 2017 and 2018 excavation campaigns in 'Building 33'.

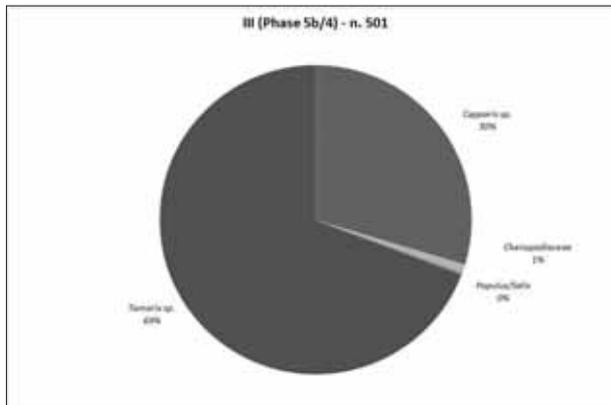
Anthracological analyses

In total, 1250 charcoal fragments were analysed (Tab. 1). Of these, 749 were classed as pertaining to phase 4-3 and 501 to phase 5b-4. On the whole, the taxonomic variability is very low (only four taxa are attested: *Capparis* sp., Chenopodiaceae, *Populus/Salix*, *Tamarix* sp.), as is typical for such contexts in arid areas in which the arboreal and shrub vegetation is characterised by low variability.

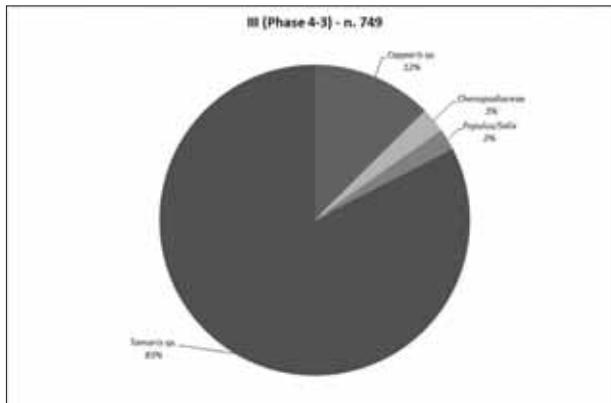
There are no variations between the two phases other than differences in the percentages accounted for by each taxon (Graphs 1-2). Specifically, in the more

Taxon	III (Phase 4-3)	III (Phase 5b/4)
<i>Capparis</i> sp	73	131
Chenopodiaceae	15	4
Populus/Salix	13	1
<i>Tamarix</i> sp.	480	306
Indeterminate	168	59
Total	749	501

Tab. 1: numbers of recovered charcoals by taxon and by phase.



Graph 1: taxonomic composition phase 5b-4.



Graph 2: Taxonomic composition phase 4-3.

recent phase 4-3, there seem to be more plants associated with an environment with greater humidity and increased salinity of the nearby depression (a greater presence of *Tamarix*).

The spatial analysis of the samples reveals taxonomic variability, although the most frequent taxon is always *Tamarix* sp. (Tab. 2).

The taxonomic differences between the loci sampled in the three functional areas previously described indicate lower variability in the area of the kitchens, probably related to the lower number of fragments recovered and analysed: 520 in the staterooms, 516 in the residential area, 122 in the area of the kitchens (Graph 3).

The greatest variability is seen in the staterooms, where there are also open spaces, such as L.19, in which the large number of fragments is probably due to the emptying of numerous combustion structures over time.

Carpological analyses

In total, 231 carpological remains belonging to various categories of seed/fruit and to parts of ears of cereals were analysed (Tab. 3). Most of the remains are from Locus 19, excavated in 2017, and Locus 185, excavated and systematically sampled in 2019, while the other loci yielded very few remains. The taxonomic richness is high, with 21 taxa at varying levels of resolution, from the family (Cyperaceae, Chenopodiaceae, Leguminosae, Poaceae, Polygonaceae) to the

taxa	Staterooms sector		Residential sector				Kitchens sector			
	locus 19	locus 21	locus 4	locus 6	locus 15	locus 16	locus 33	locus 34	locus 36	locus 37
<i>Capparis</i> sp.	29	22	17	1	102	29	2			2
Chenopodiaceae	3			1		4	11			
Populus/Salix	7	1	1		1		4			
<i>Tamarix</i> sp.	145	61	116	10	246	60	56	15	5	83
Indeterminate	68	16	34	3	51	8	31	2		15
Tot	252	100	168	15	400	101	104	17	5	100

Tab. 2: Numbers of recovered charcoals by locus and functional area.

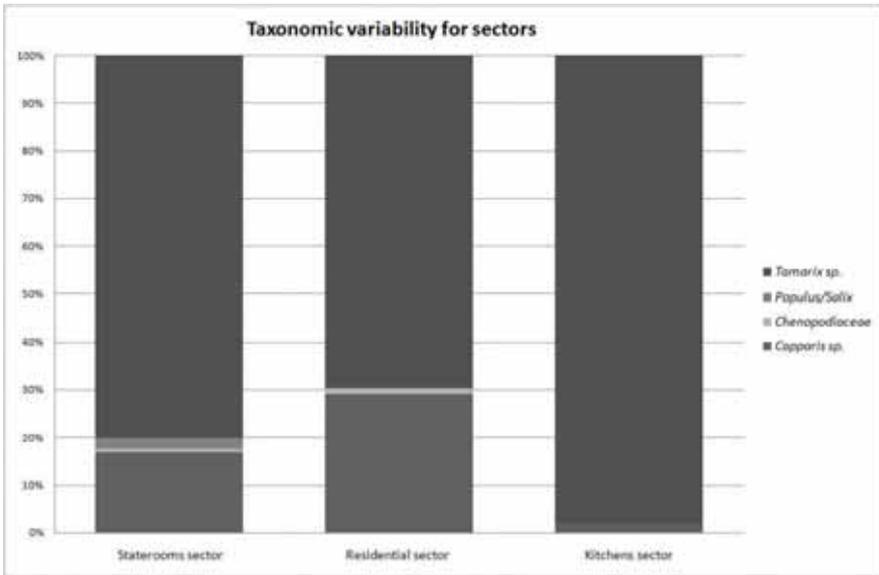
genus (*Avena*, *Bromus*, *Carex*, *Cucumis*, *Galium*, *Hordeum*, *Ranunculus*, *Rubus*, *Salsola*, *Triticum*, *Viburnum*) and – for some remains – the species (*Hordeum vulgare*, *Triticum aestivum/durum*, *Triticum monococcum*, *Vitis vinifera*) (Graph 4).

On the whole, most of the remains are of herbaceous plants, both wild vegetation and weeds typical of fields, especially the Poaceae identified. The plants most directly linked to diet and to cultivation are cereals, which include *Hordeum vulgare* and wheats both naked (*Triticum aestivum/durum*) and hulled (*Triticum monococcum*). The presence of remains of ears of wheat in the assemblage of Locus 19 also marks the area as a space used for processing cereals, probably in the open air. Legumes are not present in large quantities, but there are seeds of *Vitis vinifera* and vegetable crops such as *Cucumis*.

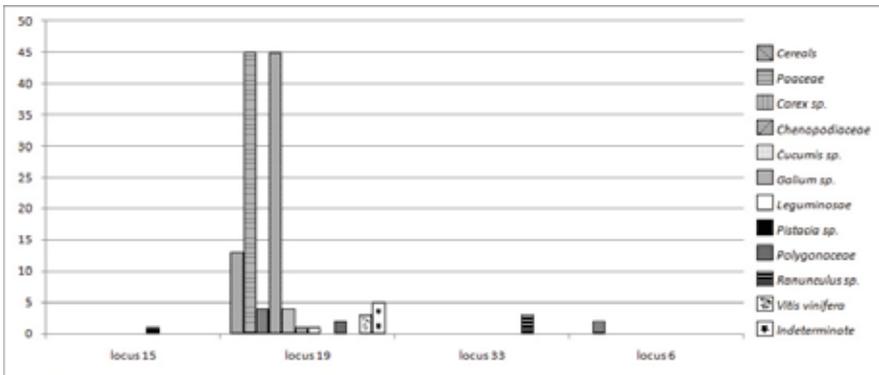
The carpological data seem to indicate a fairly sophisticated management of the plant resources, probably characterised by the cultivation of cereals in open spaces outside the site, while inside the settlement itself, where there was greater availability of water, there were probably allotments and gardens for the cultivation of vegetables and vines.

5. Discussion

The archaeobotanical analyses performed to date have focused on 'Building 33', in which the extensive stratigraphic excavations have enabled more accurate sampling strategies and the systematic recovery of plant macro-remains. Despite being generally characterised by low taxonomic variability, the two phases considered were found to differ in terms of the anthracological remains, probably the result of micro-variations in the palaeohydrology of the nearby depression in the site and in the wider Hirmand river basin. The intensity of these variations is still difficult to measure, although the results of the analyses of the samples taken in the intermediate and off-site areas will no doubt shed some light on this. The carpological data seem to indicate for phase 4-3 a cultivated area next to the site, which clearly benefited from a water supply sufficient for growing cereals, including the more demanding species such as the naked wheats. A



Graph 3: Taxonomic composition by functional area.



Graph 4: taxonomic distribution of carpological remains by locus.

	Cereals	<i>Potaceae</i>	<i>Carex</i> sp.	<i>Chenopodiaceae</i>	<i>Cucumis</i> sp.	<i>Galium</i> sp.	<i>Leguminosae</i>	<i>Pistacia</i> sp.	<i>Polygonaceae</i>	<i>Ranunculus</i> sp.	<i>Vitis vinifera</i>	Indeterminate
locus 15								1				
locus 19	13	45	4	45	4	1	1		2		3	5
locus 33										3		
locus 6		2										

Tab. 3: numbers of carpological remains by taxon and by locus.

further indicator of good management of water resources on the site, or indeed of higher rainfall, is the cultivation of vines and vegetable crops including cucurbits.

The continuation of the archaeobotanical investigations of micro- and macro-remains on the site and the processing of the data from the samplings conducted to date outside it will make it possible to correlate more accurately the internal dynamics of the site during its various phases with variations in the palaeoenvironment and palaeoclimate of the Hirmand river basin as a whole. Indeed, given its geographical location, the area of the site of Shahr-i Sokhta can provide important information for the reconstruction of the complex palaeoclimatic dynamics that affected this part of Sistan in the course of the Bronze Age, as part of the large climate systems characterising the Indian subcontinent and the Mediterranean basin.

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