Bronze Age Weights from Mesopotamia, Iran & Greater Indus Valley

By Enrico Ascalone

Weight & Value

Edited by Lorenz Rahmstorf
Seminar für Ur- und Frühgeschichte
Georg-August-Universität Göttingen

Volume 3

Publications of the ERC-2014-CoG:

WEIGHTANDVALUE: Weight Metrology and its Economic and Social Impact on Bronze Age Europe, West and South Asia

Göttingen
2022

Bronze Age Weights from Mesopotamia, Iran & Greater Indus Valley

by

Enrico Ascalone

with a contribution from

Jan Tavernier

WACHHOLTZ VERLAG KIEL/HAMBURG

For Barbara, with much love

This publication was funded by the European Research Council [Grant no. 648055]
The present volume has been peer-reviewed.

Redaktion: Sandra Busch-Hellwig, Laura Hermann, Raphael Hermann
Techn. Redaktion: Heinz-Peter Koch

DOI: 10.23797|9783529035425
ISSN: 2702-9336 (Print) / 2748-5528 (Online)
ISBN: 978-3-529-0-3542-5

Cover:
Front cover (bottom): Weight from Telloh (cat.-no. 814; pl. 27).
Back cover (top): weights from Dholavira (cat.-nos. 1417–1434; pl. 53).
Back cover (bottom): Part of the site of Harappan site of Dholavira. Photo taken by Lalit Gajjer.
https://en.wikipedia.org/wiki/Dholavira#/media/File:DHOLAVIRA SITE(24).jpg

Wachholtz Verlag Kiel/Hamburg 2022
Gedruckt auf säurefreiem, chlorfrei gebleichtem Papier

Preface by the editor of the series

Starting with this third volume, the data collected and analysed during the project 'ERC-2014-CoG WEIGHTANDVALUE: Weight metrology and its economic and social impact on Bronze Age Europe, West and South Asia' [Grant no. 648055] will be presented. This volume collects and presents balance weights – most of which previously unpublished – from several Bronze Age sites in Iran (most notably Susa) and Iraq, as well as from Harappan sites in India. Enrico Ascalone has taken on the challenge of investigating Bronze Age weights from countries east of Mesopotamia with much enthusiasm. Thanks to his long-standing contacts with Iranian scholars and institutions, he was granted access to data that are not usually available to researchers worldwide. Only at the very end of his work for the project he received permission to study materials in various museums in India as well as in the Louvre in France (the latter mainly finds from Susa). This book is the first detailed study on such data published ever, especially on Indus-style weights of the third and early second millennium BC. Of particular significance is the enormous amount of weights from Dholavira in Gujarat in India, which can be finally presented in a detailed publication. My specific thanks are due to Ravindra Singh Bisht, the excavator of Dholavira. In addition, I would like to thank all colleagues in India, Iran and France who made it possible for Enrico to study the objects in their museums and excavation storerooms and Jan Tavernier for his appendix on the inscribed weights. The present book is also available in open access: http://10.23797/9783529035425

The layout of the book, including the tables, was again arranged by Heinz-Peter Koch. This book is the last of an immense number of publications he was responsible for as layout editor. I would like to thank him for his always meticulous work I have witnessed during the last five years we have worked together. I wish him all the best for his retirement.

Laura Hermann and Raphael Hermann carefully revised the language, Sandra Busch-Hellwig corrected formal inaccuracies and Nicola Ialongo helped with some graphical problems. Due the fact that Enrico had a limited amount of time to document the over two thousand objects, it was not possible to make drawings of them. The colour photos, however, provide an excellent documentation of these finely crafted weights. The printing and the open access of this publication have been funded again by the ERC Grant.

In the forthcoming volume 4, Nicola Ialongo will present weighing equipment from Bronze Age Europe, mainly from Central, Southern and Western Europe. Finally, in the currently prepared volume 5 of this series, a weight-regulated silver hoard of the Early Bronze Age, the "Khafajah Silver Hoard", and Early Dynastic to Old Babylonian weights from the Diyala sites, all stored in the Oriental Museum in Chicago, will be published in detail. After these volumes the series is open for other prehistoric and early historical data and studies with a focus on weight and value.

Göttingen, October 2022

Lorenz Rahmstorf

Contents

Appendix

Acknowledgments

Ahmadi Masoumeh (National Museum of Iran)
Ajithprasad P. (The Maharaja Sayajirao University of Baroda)
Ambily C.S. (Archaeological Survey of India, Purana Qila)
Amirahmoudi Neda (Deccan College, University of Pune)
Amiri Mosayeb (Director of RICHT)
Arefi Hamed (Director of Jiroft Archaeology Museum)
Biscione Raffaele (Centro Nazionale delle Ricerche)
Bisht Ravindra Singh (Director of Dholavira excavations)
Bosle Rahul (Director of Lothal Museum)
Bridey François (Conservateur, Iran et Asia Centrale, Département des Antiquités orientales, Musée du Louvre)
Chandra Dinesh (Archaeological Survey of India, Purana Qila)
Choubak Hamideh (Director of Iran Center for Archaeological Research)
Conciatori Mauro (Italian Ambassador in Iran)
Costello Laura (Collections Steward, Peabody Museum of Archaeology and Ethnology at Harvard University)
Dimri D.N. (Director of Archaeological Survey of India, Archaeology)
Fonia B.S. (Archaeological Survey of India, Purana Qila)
Ganji Ali Razmi (Second Secretary at The Embassy of the Islamic Republic of Iran)
Gholi Akbar (Cultural Counsellor of the Embassy of the Islamic Republic of Iran)
Giosnami Tanmay (The Maharaja Sayajirao University of Baroda)
Hamidi Hussein (Director of Gorgan Museum)
Kargar Mohammedreza (Director of Directors of Iranian Museums)
Moradi Hossein (Shahr-i Sokhta Archaeological Iranian Expedition)
Kholghi Monir (Manager of International and Legal Affairs of RICHT)
Kiani Samira (Research Institute of Cultural Heritage and Tourism of the Islamic Republic of Iran)
Lamberg-Karlovsky Carl C. (Director of Excavations at Tepe Yahya, 1968-1975)
Mancuso Gianni (President of ENPAV)
Manzi Luciana (Iran Seb Tour Cultural Agency)
Mutin Benjamin (Harvard University)
Moradi Hossein (Iranian Center for Archaeological Research)
Nath Amarendra (Director of Rakhigarhi and Dholavira excavations)
Niakan Lilly (Iranian Center for Archaeological Research)
Nokandeh Jabrael (Director of National Museum of Iran, Tehran)
Omrani Behrooz (Director of Research Center for Cultural Heritage and Tourism Organisation)
Perrone Giuseppe (Italian Ambassador in Iran)
Pic Marielle (Director of Département des Antiquités orientales, Musée du Louvre)
Pittman Holly (University of Pennsylvania, Department of Anthropology)
Poodat Somayeh (Director of Persian Gulf Anthropological Museum, Bander Abbas)
Potts Daniel T. (New York University, Institute for the Study of the Ancient World)
Prabhakar V.N. (Director of Archaeological Survey of India, Exploration and Excavation)
Priya Nayancy (Deccan College Post Graduate and Research Institute of Pune)
Rahmani Media (Iranian Archaeological Expedition at Shahr-i Sokhta)
Rao Shikaripura Ranganatha (Director of Lothal excavations)
Rohi Nargees (Director of Harandy Garden Museum, Kerman)
Romanova Yaroslava (First Secretary at Italian Embassy in Tehran)
Russo Spena Vincenzo (Italian Cultural Counsellor of the Italian Embassy in Iran)
Sajjadi Seyyed Mansur Seyyed i (Director of Shahr-i Sokhta, Dahan-ye Qolaman and Konar Sandal Archaeological project)
Salvatori Sandro (Superintendency for Architectural and Landscape Heritage of Eastern Veneto, Venezia)
Sebt Husseini Ahmad (Sebt Tour Cultural Agency)
Shinde Vasant (Deccan College Post Graduate and Research Institute of Pune)
Shirazi Rouhollah (Director of Iranian Centre for Archaeological Research)
Sorkhe Hamid (Director of Shush Museum)
Steinkeller Piotr (Harvard University)
Sulemanie Nader (Director of Kerman section of ICAR)
Tripathi Anil (Archaeological Survey of India)
Yadav Yogesh (Deccan College Post Graduate and Research Institute of Pune)
Yadhav Nilesh (Deccan College Post Graduate and Research Institute of Pune)
Youdrviv S.R. (Archaeological Survey of India, Purana Qila)

Foreword

This research has been carried out both at the University of Copenhagen (Saxo Institute) and the University of Göttingen (Seminar für Ur- und Frühgeschichte). It has been funded by the European Research Council under the European Union's Horizon 2020 Framework Programme and was carried out within the scope of the ERC-2014-CoG WEIGHTANDVALUE: 'Weight metrology and its economic and social impact on Bronze Age Europe, West and South Asia', Grant no. 648055. The collation of the archaeological material has been possible thanks to numerous agreements with local institutions who kindly granted the study of the material that allowed the collection of 2058 weights, potential weights, possible weights and related finds. The research work which began in August 2016 and ended in April 2020 comprised numerous research trips to Iran, India, USA and France. The aim was to consolidate institutional relations and collect all the data relevant to the subject of my research. In particular, the project supported the following research trips in:

1. Iran, from 19.09.2016 to 01.10.2016
2. Iran, from 11.11.2016 to 15.12.2016
3. Iran, from 27.01.2017 to 07.02.2017
4. Iran, from 28.10.2017 to 17.12.2017
5. India, from 29.04.2018 to 19.05.2018
6. Iran, from 26.11.2018 to 24.12.2018
7. Iran, from 03.03.2019 to 08.03.2019
8. India, from 28.04.2019 to 11.05.2019
9. France, from 12.08.2019 to 31.08.2019
10. USA, from 24.07.2019 to 08.08.2019
11. Iran, from 04.11.2019 to 24.12.2019
12. India, from 17.02.2020 to 17.03.2020

Likewise, the success of the project was possible thanks to the support and delightful help from all the institutions I came into contact with. It is my belief that it would not have been possible to collect this data without such a complete willingness to research on the part of all the institutions involved. Alongside the thanks for the individuals present at the beginning of this volume, I would also like to mention here the institutional bodies that have helped me, also logistically, in carrying out this research:

1. National Museum of Iran, Tehran, Iran
2. Iranian Center for Archaeological Research (ICAR), Tehran, Iran
3. Research Iranian Center for Cultural Heritage and Tourism (RICCHT), Tehran, Iran
4. Susa Museum, Ahwaz, Iran
5. Kerman Archaeological Museum, Kerman, Iran
6. Jiroft Museum, Jiroft, Iran
7. Sistan-va-Baluchistan Museum, Zahedan, Iran
8. Shahr-i Sokhta Museum, Zabol, Iran
9. Archaeological Museum, Gorgan, Iran
10. Archaeological and Ethnological Museum, Bander Abbas, Iran
11. Persepolis Museum, Shiraz, Iran
12. University of Tehran, Iran
13. University of Zabol, Iran
14. University of Zahedan, Iran
15. Archaeological Survey of India, New Delhi, India
16. Archaeological National Museum of India, New Delhi, India
17. The Maharaja Sayajirao University, Baroda, India
18. Deccan College of Pune, Vadodara, India
19. Louvre Museum, Paris, France
20. Peabody Museum, Boston, USA
21. Harvard University, USA
22. Archaeological Survey of India, Purana Qila Branch 2, India
23. Archaeological Survey of India, Jodhpur, Rajasthan, India
24. Archaeological Survey of India, Baroda, Gujarat, India

In addition to the above 2058 weights and related finds, 10,011 photos and 54,470 data-entries were collected originating from the following sites:

1. Susa
2. Choga Zanbil
3. Djaffarabad
4. Larsa
5. Telloh
6. Kish
7. Ur
8. Konar Sandal
9. Jiroft
10. Tepe Yahya
11. Shahr-i Sokhta
12. Gorgan
13. Rakhigarhi
14. Farmana
15. Kuntasi
16. Nageshwar
17. Nagwada
18. Shikarpur
19. Bagasra
20. Dholavira
21. Kalibangan
22. Lothal

I want to thank Lorenz Rahmstorf for his unconditional support in my research. Without his contribution and the funding obtained, this project would not have existed. I would like to thank the entire research team of the 'WEIGHTANDVALUE' project, Bianka Gürntke who facilitated

every single administrative aspect of our research, Heinz-Peter Koch who created the tables in this volume and Nicola Ialongo who provided the computer programme for the Cosine Quantogram Analyses.

Finally, I would like to thank and remember all the people I met during my long stays abroad and with whom I shared my time. Each of them was a source of enrichment and human growth that I will always carry with me.

1 Introduction

This volume presents the results from five years of research carried out in India, Iran, USA and Europe, which allowed me to identify, collect and record unpublished material related to weighing and weight metrology. The collected evidence presents new insights into the weight metrology of the Near East, Central and Southern Asia.

I would like to express my deepest gratitude to the many colleagues who have kindly granted me permission and access to their material. Without them, it would not have been possible to record the presented collection of artefacts. Between 2016 and 2020, I undertook multiple extensive research trips to visit 24 different museums and Directorates of Antiquities, where I recorded 2058 weights from 22 different sites in Iran, southern Mesopotamia and the Greater Indus Valley.

The most 'recent' publications of unpublished weighing material stem from the pioneering period of English research activities in the major sites of the Indus Valley, and French investigations in Mesopotamia and Khuzistan during the 1930s. This volume presents the first modern record of Near Eastern and South Asian weighing materials and fills a large gap in the record.

Of particular importance is the record of 937 Harappan weights from the major cultural sites along the Indus, which complements the list of weights previously published by A. S. Hemmy (1931; 1938a; 1943; see also Vats 1940). The presented record of Indian weights from Haryana (Rakhigari and Farmana) and Gujarat (Kuntasi, Nageshwar, Nagwada, Shikarpur, Bagasra and Dholavira) represents the first systematic collection of weighing material from the areas adjacent to the Indus River – the regions of the so-called Harappa civilisation.

The 869 weights from Dholavira presented in this volume represent the largest collection of weights ever published in the Near Eastern and South Asian literature, immediately ahead of the 746 weights from Susa (also in this volume). This is followed by the 424 specimens from Susa published by N. T. Belaiew (1934), the 525 weights from Ugarit (Courtois 1990), the 354 weights from Ur (Hafford 2012), the 289 weights from Susiana in M. C. Soutzo (1911), the 276 weights from Ebla (Ascalone/Peyronel 2006), the 261 weights from Nippur (Hafford 2005), the 228 weights from Tell el-Ajjul (Petrie 1934), the 220 weights from Mohenjo-daro (Hemmy 1938a), the 168 weights from Kültepe (Özgüç 1986 and recently Kulakoğlu 2017), the 159 weights from Harappa and Mohenjo-daro (Hemmy 1931), the 149 weights from Uluburun (Pulak 1996), the 118 weights from Byblos (Dunand 1958), the 100 weights from Harappa in M. S. Vats (1940), the 67 weights from Larsa (Arnaud 1979), the 58 weights from Chanhu-daro (Hemmy 1943), the 55 weights from the island of Keos (Petruso 1984), the 54 weights from Assur (Unger 1918), and the 34 specimens from Alalakh (Arnaud 1967).

This volume presents my collection of weighing material and its related find, and offers a preliminary metrological interpretation of the objects. More detailed studies on the historical significance of balance weights and their role within a wider historical framework have been (and will be) the focus of further specific publications by the author (Ascalone 2018c; 2019b; 2019e; 2020; Ascalone/Basello 2018; in press). The aim of this book is to provide a catalogue of objective archaeological data, complemented by an initial metrological interpretation of the finds.

The material is presented in seven chapters.

Chapter 2 outlines the typology created to identify and classify balance weights. Based on morphological features, 27 different types could be identified. Chapter 3 discusses in detail the various materials the weights were made of. Chapters 4, 5 and 6 provide detailed information on each individual object, based on geographical area and archaeological site (Fig. 4.1, 5.1 and 6.1). Based on their historical and cultural development, I identified three macro-areas to consider: Lower Mesopotamia (including Khuzistan), the Iranian plateau and the Greater Indus Valley (including Gujarat and the Ghaggar basin) represent the three pillars of my research, each of which has developed their own particular approach to weighing and measuring. Each of these chapters comprises a brief introduction to the archaeological investigations and chronologies of each site, followed by a presentation of each object based on their typology and, where possible, archaeological context. The end of each paragraph includes a preliminary metrological analysis of the presented artefacts – the interpretation is based on general cultural aspects of the site and the region, an evaluation of the shape and material of the objects, their archaeological contexts and, where possible, statistical analysis (see below).

Whilst writing this volume I was met with significant challenges along the way, both logistical during the many field trips undertaken to study objects, and, above all, theoretical. First of all, creating an objective typology of balance weights based on geometric shapes and properties can significantly complicate the interpretation and understanding of the objects. For example, while the so-called perforated ovoid (see Type 1j) typologically falls under the class 'ovoid', it is, metrologically speaking, in no way related to the widespread classical ovoid weights (also known as barrel-shaped) of Type 1.

This apparent inconsistency is explained in the following chapters, which attempt to fully define the role of each individual artefact, identifying them as weights, potential weights, possible weights or associated finds. An objective, non-interpretative typology was therefore the only viable option. Only in two cases, further interpretative steps were added to the typologies proposed in Chapter 2:

- spherical objects, divided into 'pebble' and 'rounded', in order to differentiate between artificially altered (rounded) and naturally occurring (pebble) round artefacts;
- terracotta objects (cuboid and discoid), which represent a very specific subcategory to the main types (Types 17e and 18b, respectively).

A further challenge is the correct identification of the material the balance weights were made out of. Although archaeology is now considered an interdisciplinary subject, specific skills are in many cases still underdeveloped. A geologist has different skills than an archaeologist, and vice versa, thus making it difficult for the latter to easily identify and classify the materials from which the weights were made. For this reason, I have refrained from carrying out my own petrological analysis, and any classification of the balance weights' raw materials is entirely based on information found in publications, excavation diaries or museum catalogues.

Similarly, the chronologies of the sites studied in the following paragraphs are based on the publications by the excavators, with the exception of the chronologies of the Iranian highland sites which are based on my personal experience from the Shahr-i Sokhta and Jiroft fieldwork projects. As most balance weights lack a precise archaeological context or associated finds, their chronological classification is complicated. In those cases, the objects can only be dated through typological/morphological characteristics and a wider consideration of the chronological occupation of the relevant archaeological site. In some cases, chronological information can also be obtained from inscriptions on the objects themselves. The majority of the objects presented in this volume date between the second half of the 3rd and the first centuries of the 2nd millennium BC, but there are sporadic examples from the Late Bronze Age, the Iron Age, from the Achaemenids period and, particularly interesting, from the end of the 4th /beginning of the 3rd millennium BC.

The biggest challenge in this type of study, however, was to understand how the artefacts were actually used, and to securely identify objects as balance weights. Metrological studies have traditionally made use of a variety of methods, each of which has played their part in the gradual establishment of the discipline. Shape, mass, material, diffusion, weight reference systems and epigraphic data, associated finds and archaeological contexts as well as mathematical and statistical analyses are all considerations in weight metrology. Of course, the difficulty of identifying objects as weights does not apply to the so-called canonical forms of balance weights; instead, the challenge arises when identifying different shapes as such. Whilst there are many aspects to be considered when identifying objects as balance weights, I believe that there are a series of basic requirements that should always be fulfilled:

1.1. The consideration of the historical context

Starting from the numismatic research of A. Böckh (1838) in the first half of the 19th century, ancient metrology is characterised by a comparative approach to different units of measurement (the so-called *vergleichende Metrologie*). The studies of F. Hultsch and C. F. Lehmann/Lehmann-Haupt dominated the field of metrology for over fifty years, between the second half of the 19th and the beginning of the 20th century, dealing with both the Greco-Roman world and the first Mesopotamian metrological series (Hultsch 1864; 1882; 1898; Lehmann 1889a; 1889b; 1893; 1895; Lehmann-Haupt 1909; 1912; 1918 see also Berriman 1953; 1955). F. H. Weissbach (1907; 1911) was the first to challenge the traditional approach by Böckh, by initiating the analysis of Mesopotamian weighing materials, with considerations of regional types, which stood in opposition to the previous 'comparative' method. A more general theorisation of the so-called Inductive Metrology was proposed by O. Viedebantt (1917; 1923), who introduced the concept of the so-called *Normzonen*, *i. e.* the margin of variability within which to recognise the ancient standards, with minimum and maximum values within which to verify the concentration and thickening points of the units. Subsequent studies by various scholars, mainly Assyriologists, followed both traditions and were directed towards the construction of a combined method that offered more reliable results and that was applied to both Egyptian and Mesopotamian *corpora* (Thureau-Dangin 1907; 1921; 1927; Belaiew 1929; 1934; Hemmy 1935; 1937). The beginning of a 'modern' phase of weighing research in the Near East must be attributed to a group of Italian scholars: The birth of the so-called Historical Metrology is placed temporally close to the profound 'revolution' operated by the American 'New Archaeology', but happened in fact independent of it, developing a decisively historical-cultural tradition of European origin. This phase did not yet include archaeologists, but instead historians and Assyriologists, with a wide focus from the Aegean to the Levant and to Mesopotamia (see Breglia 1955a; 1955b; 1958; 1958-1959; 1961; 1964). In the Near East, the fundamental studies of N. Parise (1970-1971; 1971; 1981; 1984) were soon complemented by those of C. Zaccagnini (1978; 1979; 1986) and M. Liverani (1972; 1979), who reconsidered the development, relations and evolution of weighing systems within a grid of historical, social and economic references (for the Aegean see Parise 1962-1964; 1964; 1971; also 1999 and, more recently, de Fidio 1998-1999 and Sacconi 2005). The latest, current 'phase' of methodological approaches to Aegean and Near-Eastern weight metrology began during the 1990s. While the research approach of the 'historical school' continued to reveal valuable data, especially for the 'western' and Mesopotamian minas (Zaccagnini 1999; 1999-2001; 2000; 2005; Parise 2001-2003), a different line of investigation, based on archaeological evidence such as contextual and typological matrices, was first established in the Aegean (Petruso 1992, but also 1978 and 1984). This line of investigation is followed by A. Michailidou (1999; 2001; 2003; 2005; 2006), L. Rahmstorf (2003; 2006a; 2006b), M. E. Alberti (1995; 1999; 2003; 2006), C. Pulak (2000; 2001) and others, and was developed for the Levant and Mesopotamia by E. Ascalone and L. Peyronel (Ascalone/Peyronel 1999; 2000a; 2000b; 2001; 2003; 2006a; 2006b; 2006c; 2006d; 2011a; 2011b; Ascalone 2006c; 2013; 2018c; 2019b; 2019e; 2020). The new hypothesis is that weight-regulated objects should be seen as the sum of different actions in a specific historical context. In turn, this means that there is little sense in studying the mass of an object without considering its historical background. This type of approach requires detailed knowledge of the region under consideration, thus imposing pathways of knowledge that must be contextualised. As I argued previously: 'The keyword for modern research on pre-monetary metrology in the Near East is, therefore, 'history: weight evidence must be placed precisely within a chronological phase in order to be evaluated in its various aspects, but also in order to investigate the effects of the historical process on measurement systems. Exchange relations, interferences, and restructuring of weight systems can be investigated in synchronic and diachronic comparisons of archaeological and epigraphic data, if, however, they are correctly substantiated historically and not on the basis of theoretical principles that are assumed to be reflected in numerical relations between values' (Ascalone/Peyronel 2006a, 22).

Despite this dominant historiographical trend that began in the second half of the 1990s, the widespread advent of statistical studies has shifted the focus towards numerical data, once again ignoring the contextual data. In recent years, mathematical and statistical analysis has been increasingly used to determine value systems separated from their cultural context, providing levels of interpretation of the data without any reference to socio-economic and environmental processes, in other words de-historicising metrological evidence. Frequency Distribution Analysis (Peroni 1966; Sommerfeld 1994; Feth 2014) and Cosine Quantogram Analysis (CQA) (Kendall 1974; Petruso 1992; Pakkanen 2011) applied to the archaeological artefacts are two models that are now more commonly used to identify and understand weight systems, but which should always be integrated into a wider system of archaeological data analysis. The increasingly frequent use of statistical studies appears to be an indispensable resource for a new discipline which, however, cannot be based exclusively on the use of numerical data to explain the social, economic and historical processes of a society which must be contextualised in time and space. I think that metrological studies should be the result of a transversal knowledge that must not disregard contextual data: 'We need to locate in a more precise way the weighing evidence within historical phases and, vice versa, understand the effects that the historical process produced on the ancient accounting and measuring systems. It seems now pointless to follow the same standards from one part of the ancient Mediterranean to the other, among archives and weights, to justify correspondences that are centuries apart. We should now take some steps towards a historical metrology focusing on each period, on each diversity; at the same time, in a diachronic perspective, it will help us to outline the complex links between the weighing systems of the ancient Mediterranean" (Alberti *et al.* 2006b, 3), because, as Witold Kula suggests, the transformation of weighing systems follow social dynamics and important changes in the economy, politics and culture. In stable periods, weighing systems also tend to be stable and often spread; during periods of radical transformations and crisis, weighing systems undergo strong mutations (Kula 1987, 122-124).

1.2. The possession of knowledge

In accordance with Point 1, in order to allow a contextualised analysis of archaeological data, one of the major requirements when studying a class of objects, and in particular balance weights, is the possession of detailed knowledge of the historical, geographical, economic and social contexts of a site or a single region. Studying the materials of and manufacturing traces on potential balance weights, and applying mathematical and statistical methods, can only yield viable results if done against the background of this knowledge.

The development of computer-based methods of data processing has revolutionised archaeology. Gathering, sharing and evaluating masses of data, as in the past was only done by W. F. M. Petrie (1926), N. T. Belaiew (1934; 1943) and A. S. Hemmy (1931; 1936; 1937; 1938a; 1938b; 1943), is now standard practice. The abundance of material available nowadays has allowed archaeologists to develop sophisticated models and to verify complex hypotheses (Hodson *et al.* 1971; Doran/Hodson 1975; Hodder 1978; Orton 1980; Sabloff 1981), for example by applying the general theory of systems known from K. V. Flannery

(1968), W. L. Steiger (1971) and D. Berlinksi (1976) and through mathematical approaches to the study of change (see also Thom 1975; Renfrew 1978; Renfrew/Cooke 1979; Saunders 1980). This, however, came at the cost of archaeological data. Historical changes must be studied within a social context, as the changes themselves are the product of specific social contexts, which influence the occurrence of one or the other innovation. Each society is the product of its own history and therefore responds to changes of any kind in its own way. It is therefore impossible to formulate general statements to explain the whole reality of cultural developments, particularly just through mathematical/statistical analysis. The risk of using all-inclusive models from the past seems to derive from the new tendency to ignore the political and social significance of archaeological data, as was also the case in the past with the simple, systematic classification of artefacts, the so-called *goloye veshchevedeniye* ('naked artefactology' or literally 'naked things-knowledge' in Trigger 1996, 241) which deprived them of their historical analysis.

The mathematical formula to explain the reality of a complex society from Mesoamerica to the Far East now appears to be an obsolete activity that takes up old pre-New Archaeology traditions (White 1949; Meggers 1960) and later positions introduced by J. R. Caldwell (1959), then taken up by L. Binford (1962; 1965; later Renfrew 1979; 1984; Johnson 1978; 1981), in which archaeological data were used to explain systemic changes in a world system. The historical decontextualisation of an object was one of the greatest problems in 20th century archaeology; its aim was to aseptically reconstruct human evolution through the recognition of variable constants within a global system, thus forgetting the social and relational processes of complex civilisations through the contextualisation of archaeological data. Thanks to the work of English archaeologists (starting with D. Clarke in 1968, who, although influenced by New Archaeology, criticised its systemic approach through a renewed interest in the social environment and a historical contextualisation of the artefact based on knowledge) this anti-historical approach has now been overcome. The same C. Renfrew (1979), who grew up in the wake of European tradition, realised the unrealistic nature of the dichotomy between history and science traced by American anthropologists, and recognised that Binford's logic-deductive positivism was outdated.

1.3. Handling the artefact

Being able to see, touch and feel an object is also paramount to correctly identifying balance weights. A photograph, drawing or written record is not enough to adequately understand the use of an object. Understanding the material, the processing and manufacturing, as well as possible use and re-use traces, all of which require careful direct analysis, allow us to interpret the function of an object.

1.4. Field presence

Although it can be difficult to visit the place where an object was discovered, experiencing the area and site, and ideally further sites in the same region, can aid our understanding of the object itself. Information gathered from local workers, local colleagues and rudimentary ethnographic analyses can provide a significant insight that would otherwise be impossible to reconstruct. In addition to that, the knowledge of other categories of artefacts from the same site can help to determine the functionality and use of new categories of objects.

1.5. A trans-disciplinary approach

It is crucial to carry out a balanced, trans-disciplinary approach, where one method must support the other, without overriding another. In order to do so, each method must be understood and applied within a body of knowledge about the studied period and region.

Once these five essential theoretical points of archaeological research on metrological studies are fulfilled, we can proceed to apply different methodologies to the study of Near Eastern weights that can be summarised analytically as the following multi-step approach:

1. Definition of the shape and its comparisons
2. Identification of the material from which the object is made
3. Definition of the size of the object
4. Calculation of mass
5. Reconstruction of the archaeological context
6. Identification of associated finds
7. Identification of markings on the object
8. Identification of inscriptions on the object
9. Identification of manufacturing processes
10. Identification of other material classes within the site
11. Identification of other material classes within the region
12. Identification of the site's landscape
13. Reconstruction of the socio-economic complexity of the site
14. Reconstruction of the historical dynamics of the site
15. Study of textual (regional administrative texts) evidence relating to weights, weight systems, administrative procedures, payments, quantities traded or taxes
16. Expanding knowledge through ethnographic studies
17. Mathematical analysis
18. Statistical analysis, including Cosine Quantogram Analysis and Frequency Distribution Analysis

Every step leads towards the analysis and interpretation of a find, thus helping its identification as a balance weight or as an object with different functions. On this basis, I have developed four different categories of objects that will assist the reader in their interpretation of the archaeological data presented in this volume. The entire *corpus* was divided into 'weights', 'potential weights', 'possible weights' and 'associated finds' without a metrological function.

– Weights: most of the objects identified as weights come from Mesopotamia and the Greater Indus Valley, where weighing standards were widely coded and used within one or more weight systems. The standardisation of their shapes and masses, combined with the textual evidence from Mesopotamia, easily allowed their identification as balance weights.

– Potential weights: potential weights include all those objects that can, for various reasons, be considered balance weights, but that do not necessarily conform to the standardised features of official weights. This includes some objects from the Iranian plateau (see the specimens from Shahr-i Sokhta, Konar Sandal and Tepe Yahya), or those finds that have returned little known shapes within very standardised *corpora* (such as the cone-shaped objects from Mesopotamia). This group also includes all of the so-called pebbles, whose possible identification as weights varies according to their archaeological contexts. In Mesopotamia, for example, they seem to have been used as simple accounting annotation tools without a metrological function, whereas in the Greater Indus Valley they could be considered balance weights, thus allowing new historical interpretations of the social nature of weighing and accounting activities. In this case, the aforementioned body of knowledge regarding archaeological context, social and historical background, associated finds *etc.*, combined with mathematical and statistical analyses, help to differentiate between the pebbles from Mesopotamia and those from the Indus Valley. The identification of pebbles as weights must therefore necessarily include the study of the local context, both in social and economic terms.

– Possible weights: this group includes all objects that most likely were not used as balance weights, but that nevertheless cannot be outright rejected. These include, for example, the pebbles from Mesopotamia, the cylinder-shaped weights from Susa which were more likely unfinished seals rather than balance weights, and the irregularly-shaped conical objects with a hole in the top, which were probably used as weights for fishing nets.

– Associated finds: this group includes all objects that cannot be considered weights. However, it was decided to provide the reader with this typology of artefacts to enable independent analysis.

Finally, the catalogue provides the interpretation of the collected objects allowing them to be placed within one of these four groups. For each object, I provide a personal interpretation of its classification as a balance weight, with reference to the appropriate weight system and the number of units. When an object was physically not accessible but its data could be reconstructed from records, I added an 'x' after the mass of the sample and its unit of reference. Statistical data, in particular from Cosine Quantogram Analysis, were included when the evidence showed significant results for specific classes of finds.

All 2058 specimens presented in this work were previously unpublished, with the exception of some weights from Susa published by M.-C. Soutzo (1911) and N. T. Belaiew (1934; 1943; new weights were also published in Connan/Deschesne 1996, 269-272). It was not possible to identify all of these weights in the previous publications, as in many cases the inventory numbers of the museums and excavations did not correspond to the current accession numbers. In total, I recorded 746 weights from Susa, while the total number of weights previously published by N.T. Belaiew and M.-C. Soutzo is only 424. It is therefore plausible that the objects published by Belaiew and Soutzo at least partially overlap with those presented in this volume; however, the presented *corpus* provides not only previously unpublished data, but also includes information about the origins, detailed descriptions, and photographs of each object. Further weights were collected in Lothal and Kalibangan, where I was able to physically examine the material. Whilst I was able to collect all the data, the absence of electricity in one case, and continuous heavy flooding in a second case, prevented me from completing the photographic record. The data from these two important sites will be the subject of planned journal publications.

The collected evidence provides the basis for extensive, far-reaching historical interpretations of weighing and weighing materials in the Near East, however they are not included in this volume which is intended primarily as a data record; all these clues will be discussed in full length in the future:

1. the presence of systems found in non-indigenous contexts
2. the diffusion of imported weights and the presence of previously unknown weight systems (see evidence from Jiroft)
3. the identification of new weights in non-standardised contexts (see Shahr-i Sokhta)
4. the use of terracotta and clay for the production of weights in Gujarat
5. the supposed existence of parallel and diversified weight systems in the Greater Indus Valley (contrary to previous assumptions)
6. the existence of a weight standard used by the central administration and other non-officials in the hands of private merchants (as can be seen from the inscriptions on Mesopotamian specimens)
7. the wide use of copper and bronze in Dholavira for weights

8. the use of pebbles to document a weight economy diversified by social classes in the Greater Indus Valley
9. the role of the Iranian plateau in trade between Mesopotamia and the Indus Valley as seen by new evidence from Shahr-i Sokhta, Tepe Yahya and Konar Sandal
10. the new evidence from Choga Zanbil, Larsa, Telloh and Kish
11. the archaeological and chronological distribution of the Dholavira weights (together with Ebla)
12. the use of copper as evinced by the ingots from Susa, now in the Louvre
13. the existence of a wool mina according to Mesopotamian text
14. the existence of a heavy shekel of 8.9 g in the Bronze Age
15. the diffusion of a 'little mina' in Early Dynastic III and Akkadian periods in Mesopotamia, at the Persian Gulf and in the Iranian highlands.

My future research will focus on the historical contextualisation of these artefacts presented in this volume, in order to provide a deeper, coherent and an as complete as possible overall picture.

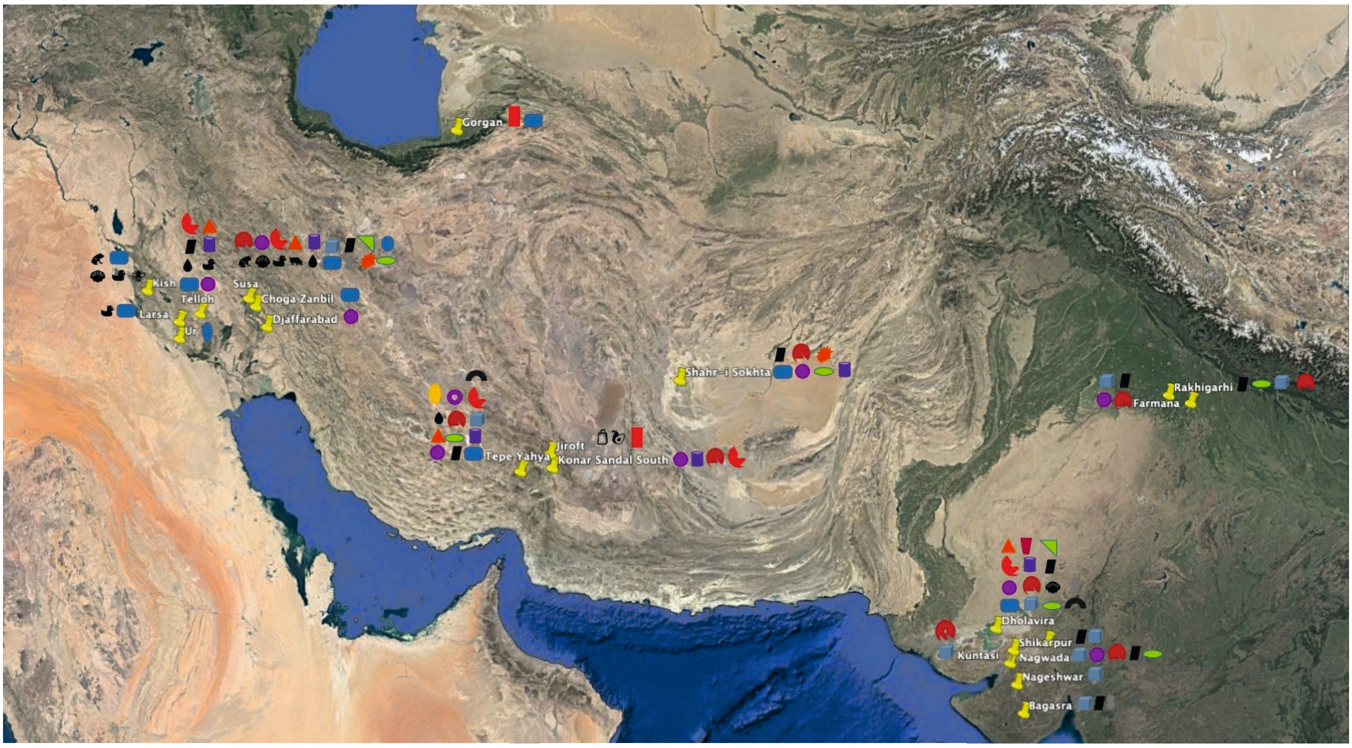
2 Typology

As mentioned in the introduction, a comprehensive typological classification based on morphological features identified amongst the collected *corpus* of artefacts, is proposed. In total, 27 different major shapes could be identified, some of which comprise a number of varying features that necessitate further typological subdivision. The two predominant shapes are 'Type 1: ovoid' in Mesopotamia, and 'Type 18: cuboid' in the Greater Indus Valley. These types are indicative of two equally sophisticated and standardised, yet completely different cultural and metrological 'spheres' (Fig. 2.1). There are 662 known ovoid specimens in Mesopotamia and Khuzistan, and a total of 384 cuboids were found at the major sites of Indus civilisation.

Unfortunately, there is no detailed chronology available for the Mesopotamian specimens, but the majority of them, most likely, date to the period between the end of the 3rd and the middle of the 2nd millennia BC. Based on contextual chronologies and supported by the archaeological contexts of Dholavira, the weights of the Greater Indus Valley date to approximately 2500 BC to 2000/1900 BC.

A preliminary analysis has shown that there is a connection between typological shapes and geographical regions: for example, the duck-shaped weights are exclusively found in the western areas, whereas the cylinder-shaped, biconical, parallelepiped and discoid weights are typical for the Harappan cultural contexts. This shows a distinct morphological difference between the weights of Mesopotamia and those of the Indus.

Based on the geometric shapes of the objects, the weights have been divided into the following main types (Fig. 2.1):



▲*Fig. 2.1. Geographical distribution of types.*

Type 1: ovoid
Type 2: duck-shaped
Type 3: frog-shaped
Type 4: shell-shaped
Type 5: fly-shaped
Type 6: pig head-shaped
Type 7: sphere
Type 8: ellipsoid with base and grooves
Type 9: pebble
Type 10: hand bag-shaped
Type 11: cylinder-shaped
Type 12: biconic
Type 13: small column
Type 14: pear-shaped
Type 15: egg-shaped
Type 16: parallelepiped
Type 17: discoid
Type 18: cuboid
Type 19: '*kudurru*'-shaped
Type 20: hemisphere
Type 21: cone
Type 22: pyramid-shaped
Type 23: irregular shape
Type 24: clay sphendonoid
Type 25: dome-shaped
Type 26: trapezoid-shaped
Type 27: rounded flat with hole

2.1. Ovoid (Type 1)

Total specimens: 662

Cat. no. 1-530, 747-750, 753-757, 760-845, 874-878, 938-941, 1065-1076, 1118-1119, 1189-1202

Ovoid weights represent the most commonly identified type within the *corpus*. Although particularly widespread in Mesopotamia and Susiana, specimens have also sporadically been found on the Iranian plateau (see Tepe Yahya and Shahr-i Sokhta in the Catalogue and Ascalone 2019e; 2020) and in Gujarat (in Dholavira, see Catalogue). The widespread diffusion of this type and its morphological variations have necessitated a further subdivision of this group into at least 11 subtypes. Of these, only types 1j and 1k should not be considered as weights. Based on morphological variations, the following subtypes could be defined:

Type 1a: ovoid
Type 1b: ovoid with base
Type 1c: ovoid with flat ends
Type 1d: ovoid with base and flat ends
Type 1e: ovoid with one flat end
Type 1f: ovoid with two bases
Type 1g: ovoid with two bases and flat ends
Type 1h: ovoid with four bases
Type 1i: ovoid with hole
Type 1j: perforated ovoid of large size
Type 1k: irregular ovoid

Ovoid (Type 1a)

Total specimens: 310

Cat. no. 1-244, 760-814, 938-940, 1065-1072

This subtype is the most common among the ovoid shapes with 310 specimens. Perfectly ovoid weights are known from Shahr-i Sokhta and Tepe Yahya, but they are nearly completely absent from all of Gujarat and the Ghaggar basin; in Lower Mesopotamia, they are so far exclusively known from Susa and Telloh.

Ovoid with base (Type 1b)

Total specimens: 33

Cat. no. 245-263, 747-748, 815-822, 941, 1073-1075

The characteristic flat base of Type 1b ovoids suggests a function related to the action of weighing. Their geographic distribution is almost identical to that of Type 1a, with specimens also known from Shahr-i Sokhta (Cat. no. 1073-1075) and Tepe Yahya (Cat. no. 941) on the Iranian plateau. Chronologically, the 33 Type 1b specimens belong to the period between the beginning of the Sargonid era in Mesopotamia and the end of the 2nd millennium BC, as suggested by the two specimens found at Choga Zanbil (Cat. no. 747-748). The finds from Tepe Yahya and Shahr-i Sokhta must also be dated around the mid of 3rd millennium BC.

Ovoid with flat ends (Type 1c)

Total specimens: 262

Cat. no. 264-482, 749, 753-757, 823-843, 874-878, 1189-1199

Type 1c describes ovoid weights with flat ends, which represent one of the most common types within the *corpus*. Of the 262 specimens, only 11 come from non-Mesopotamian contexts, having instead been found in Dholavira (Cat. no. 1189-1199). Interestingly, and this will be discussed in detail later in the volume, all objects from central Gujarat show signs of indigenous manufacturing and the use of local material. The Type 1c ovoids with flat ends from Dholavira should therefore not be considered as imports from distant Mesopotamia, but instead as locally created objects. In light of this, and bearing in mind the complete absence of this object type throughout the entire Iranian plateau, a new historical and archaeological interpretation of the area should be considered.

Ovoid with base and flat ends (Type 1d)

Total specimens: 31

Cat. no. 483-508, 750, 844, 1076, 1200-1201

The objects of this subtype appear to be specific to the alluvial areas of Mesopotamia and Susiana, at least until the end of the 2nd millennium BC when they are also discovered at Dur-Untash/Choga Zanbil (Cat. no. 750). The single specimen found in Shahr-i Sokhta (Cat. no. 1076) confirms the presence of weighing activities and equivalence between weighing systems in eastern Iran shortly after the middle of the 3rd millennium BC. The presence of two specimens in Dholavira (Cat. no. 1200-1201), which were made locally, in contexts dating to the Late Harappa period (Period VI of the site, dated *c.* 1950-1800 BC), confirms the commercial relations between Lower Mesopotamia, Khuzistan and the coasts of Gujarat.

Ovoid with one flat end (Type 1e)
Total specimens: 7
Cat. no. 509-515
Objects of Type 1e are extremely rare, with only seven specimens (all of which were found in Susa) known. It could be suggested that they are unfinished or that they were in fact faulty and subsequently discarded.

Ovoid with two bases (Type 1f)
Total specimens: 1
Cat. no. 845
With only one specimen known from a Neo-Sumerian archaeological context, a limestone weight from Telloh, ancient Girsu, Type 1f objects are almost non-existent. Instead of a distinct type, the single weight from Telloh could, in fact, be the result of a stone carver's mistake, who had to create a second flat base in order to lower the mass of the weight.

Ovoid with two bases and flat ends (Type 1g)
Total specimens: 2
Cat. no. 516, 1202
Objects of Type 1g are scarce, with only two known specimens coming from Susa and Dholavira (Cat. no. 516 and 1202, respectively). The specimen from Dholavira is made of agate and dates to the IV period of the site, *c.* 2500-2200/2100 BC.

Ovoid with four bases (Type 1h)
Total specimens: 2
Cat. no. 517-518
Objects of Type 1h are equally rare, with only two known specimens from Susa. This subtype must be considered one of the many variables of Type 1.

Ovoid with perforation (Type 1i)
Total specimens: 9
Cat. no. 519-527
Objects of Type 1i feature a perforation that was likely used to suspend a (presumably bronze/copper-alloy) ring, traces of which are often clearly visible within the perforation. This bronze ring could have played a part in using the weight with a single arm scale. All known specimens of this type come from Susa, albeit without archaeological context. Weights of this typology are generally well known from later contexts dating to the Achaemenid period. Perforated specimens, all in hematite, could in fact have been beads rather than balance weights.

Perforated ovoid of large size (Type 1j)
Total specimens: 2
Cat. no. 1118-1119
Objects of Type 1j are not likely to be weights. The two known specimens, both part of the Gorgan Museum collection and found in an undefined area in the Mindasht region, are difficult to interpret. They are large and fully perforated, thus making it unlikely that they were used as balance weights.

Irregular ovoid (Type 1k)
Total specimens: 3
Cat. no. 528-530
Irregular ovoid weights of Type 1k are very rare and only known from Susa. At least one of them (made of hematite, Cat. no. 528) should be considered as unfinished or discarded, while the other two could be considered weights made by a craftsman unfamiliar with stone carving. One of the two specimens in limestone (Cat. no. 530) bears five vertical lines which allow the identification of the local weight unit (38.95 g ÷ 5 = 7.79 g).

2.2. Duck-shaped (Type 2)
Total specimens: 104
Cat. no. 531-617, 758-759, 846-855, 879-883
Duck-shaped balance weights are a typology specific to, and exclusively created in Mesopotamia and Khuzistan during all three millennia of Near Eastern pre-Hellenistic history. Whilst only small amounts of evidence for this type has been found in Ebla (Ascalone/Peyronel 2011b) and Gonur depe (Rossi Osmida 2002, 98-105), the duck shape appears to be the standard morphology for what are considered to be 'official weights'. This applies to both small/light and big/heavy weights. The (mostly palatial) archaeological contexts in which the weights were found (Ascalone/Peyronel 2000a), their inscriptions (Ascalone/Basello 2018, 710-714; 2022) and the iconographic references on some classes of materials (such as royal cylinder-shaped seals from Susa dated between the very end of the 3rd and the middle of the 2nd millennium BC) strongly suggest that their production was closely linked to the king and his administration (Ascalone 2011a, 160-165; 2013, 51-55). In Iron Age northern Mesopotamia (Assur, Nimrud, *etc.*) and Bronze Age Inner Syria (Ebla, Alalakh, Ugarit) on the other hand, the shape of official balance weights seems to have been of the lion. The archaeological evidence suggests that reference weight standards, which were officiated and controlled by the palatine authority of the city-state or kingdom, have been in existence from as early as the Early Dynastic IIIb period, as supported by an ovoid weight with inscription of the *ensi* of Lagash Urukagina (*c.* 2360 BC). Evidence for this regulation of weight standards also exists in the Akkadian and Ur III periods demonstrated by the inscriptions of Naram-Sin (*c.* 2254-2218 BC), Ur-Ningirsu (of the Third Lagash dynasty, *c.* 2150 BC), Shulgi (*c.* 2094-2047 BC) and Shu-Sin (*c.* 2037-2029 BC) (Ascalone/Peyronel 2011b, 67-69). It is certain that during the Akkadian Empire and later dur-

ing the Third Dynasty of Ur (*c.* 2120-2000 BC), an elaboration of canonical weighing norms took place over the entire territory, which allowed the creation of standard codes for the entire region (Bartash 2019, 91-111). Although M. A. Powell (1979, 85-86) has put forward doubts about the presence of a relationship between weight and official standards issued by a royal authority '*in spite of the well-attested evidence of royal standards, there is no evidence whatever of an attempt on the part of the royal government to establish uniform standards and enforce them*', the current archaeological evidence and textual data suggest that the royal government had intervened to establish official weights and measures (see Mari for example in ARMT VII: 132, 145; ARMT VIII: 37, 89, 91; ARMT IX: 127, 176; ARMT XIII: 8; ARMT XVIII: 40; ARMT XXI: 208, 216, 236, 239-240; ARMT XXII: 236; 240, 245, 253-254; ARMT XXIV: 93, 155; ARMT XXV: 155, 158, 162, 169, 170 172, 174, 176-177, 181, 187, 192, 197, 202, 208, 215, 229, 248, 260, 264, 278, 283, 288, 290, 373, 384, 435, 451, 458, 556, 570, 667, 688; see also Chambon 2011), and, with them, the use of the rhetoric of power in conveying messages of righteousness and social justice of the sovereign to the people he governs (Ascalone/Peyronel 2000a, 10-15; Ascalone 2013).

The large-sized duck-shaped weights, more than one mina, are only known from Susa (see Cat. no. 587-617) and range between 424.65+x g and 32,000 g, with their weights ranging in units from the mina to the heavy talent (Ascalone/Basello 2022). Even the diffusion of large-sized duck-shaped weights seems to span all three millennia of Mesopotamian history. Their diffusion is attested to in both southern and northern Mesopotamian contexts, and along the Syrian coast and Inner Syria. Specimens dated to the 3rd/beginning of the 2nd millennium BC were found at Susa (Soutzo 1911; Belaiew 1934; see also the weights in Amiet 1966, 452, no. 346A and Connan/Deschesne 1996, no. 250), Nippur (Hafford 2005, no. B14726, A30564, B12489, B19920), Ur (Hafford 2012, see museum number 128444, 31-43-256, 128443, 31-43-255, 1-12 110), Telloh (Soutzo 1911, no. 10, 24, 27, 29), Lagash (King 1912, pl. 50) Babylon (Soutzo 1911, no. 3), Assur (Unger 1918, no. 152-153, 155, 158-160, 164-166, 168, 177-178) and Byblos (from unknown context; see Dunand 1958, 547, 705). Weights dating to 1st millennium BC contexts are known from Khorsabad (Loud/Altman 1938, 99, pl. 61, no. 178-182), Nimrud (Weissbach 1907, no. 15, 17), Nineveh (Hussein/Suleiman 2000, 288, 390, pl. 81), Ashur (Tadmor/Yamada 2011, 150-151, no. 61), Tell al-Hamidiya with Tukulti-Ninurta II inscription (Wäfler 2003, 158, tab. 83), Ziyaret Tepe (Matney *et al.* 2011, 84, 86-87, fig. 13a; a new weight is published in Reade 2018, 48) and Tell Shiukh Fawqani (two weights; Zaccagnini 1999-2001, 39).

This study includes duck-shaped weights from Larsa (2), Telloh (10), Kish (5) and, mainly, Susa (87), some of which were already published in Belaiew (1934, no. 43-49, 54, 57-64, 105-109, 156-161, 171-173, 184, 188-189, 225, 233, 309, 316, 336, 339-341, 349, 414-416).

2.3. Frog-shaped (Type 3)

Total specimens: 3

Cat. no. 618-619, 884

Type 3 frog-shaped weights are a very uncommon category which, together with Types 5 and 6, seem to be the expression of artistic experimentation rather than the result of serial production. Only three specimens are known, two from Susa and one from Kish, whose masses leave some doubt about their use on scales. The two weights found in Susa are most likely identical to the two specimens published in Belaiew (1934, no. 247-248).

2.4. Shell-shaped (Type 4)

Total specimens: 10

Cat. no. 620-627, 885, 1203

Type 4 shell-shaped weights are relatively rare with only 10 known specimens, nine of which were discovered at Susa. This type was recently discussed in an article which suggested their use as a specific unit of 9.4 g, obtained from a decimal division of the western mina of 470 g (Ascalone in press a). The nine specimens in the Louvre Museum collection (one from Kish, Cat. no. 885) are those published in Belaiew (1934, no. 50, 154-155, 179, 191, 226, 229-230, 298), eight of which can be traced back to oscillation variability in the unit value between 8.81 g and 9.75 g, with a mass average of 9.24 g. The ninth weight in the Louvre is a Mesopotamian shekel with mass 8.30 g. Particularly interesting is the Dholavira specimen (Cat. no. 1203) which was made locally (indicated by the rougher craftsmanship and materials) and could be considered to be a local copy of the widely known balance weights from Susa. In particular, its mass fits both as 1/12 of the Harappan shekel (overestimated at 14.52 g, as known in the Ghaggar basin, see Ascalone 2019b), and as 1/8 of 9.36 g, thus perfectly aligning it with the so-called Levantine shekel (Ascalone/Peyronel 2006a, 23-26).

2.5. Fly-shaped (Type 5)

Total specimens: 1

Cat. no. 886

Type 5 fly-shaped objects are extremely rare, with only one specimen known from Kish (Cat. no. 886 from Trench 6 in Area B2). As with Type 3, its use as a balance weight is uncertain.

2.6. Pig head-shaped (Type 6)

Total specimens: 3

Cat. no. 628-630

Only three specimens of Type 6 pig head-shaped weights are known, all of which come from Susa (two are currently kept in the Louvre Museum, and the third in the National Museum of Tehran). One of the weights (Cat. no. 628) comes from a secure archaeological context dated to Old-Elamite II-III (*c.* 2100-1600 BC).

2.7. Sphere (Type 7)

Total specimens: 41

Cat. no. 631-638, 751-752, 856, 933-934, 942-952, 1077, 1136-1137, 1147-1148, 1204-1215

Type 7 weights are objects that were deliberately carved into a sphere by the manufacturer (rather than naturally formed pebbles for example). The use of spheres as balance weights is particularly uncertain, as it is unclear how they were employed in the weighing process. As there are not enough specimens to carry out meaningful statistical analysis, the functional analyses of these objects vary in relation to the site and the archaeological context (see the methodological introduction of Chapter 1). In light of this, their interpretation is based on the geographical, manufacturing and archaeological contexts, as well as the cultural horizon of the centre and the region. The functional interpretation of these spherical objects is based on an in-depth knowledge of other archaeological *corpora*, ethnographic comparisons and, of course, on the determination of the mass of the object. All but one of the Harappan specimens are spherical with base and correspond with the counted weighing system around 13.65 g. Different evaluations should be made for the specimens from Djaffarabad (for their chronological range) and Telloh (for the almost total absence of spheroidal weights in Mesopotamia and the mass). The specimens with base found in the Iranian plateau should be considered 'potential/possible weights' (Ascalone 2020). In total, 32 spheroidal specimens could be identified, ten of which are without a base. Their geographic distribution is relatively even, although the specimens with bases appear to be more widely used in the Greater Indus Valley, as demonstrated by their presence at the Farmana, Nagwada and Dholavira sites.

Based on morphological variations, Type 7 sphere weights have been divided into the following three subtypes:

Type 7a: sphere

Type 7b: sphere with base

Type 7c: sphere with two bases

Sphere (Type 7a)

Total specimens: 19

Cat. no. 631-636, 751-752, 856, 933, 942-948, 1077, 1204

Type 7a sphere are most common on the Iranian plateau (with five specimens known from Tepe Yahya) and the Khuzistan plain. Only one specimen (from Dholavira, Cat. no. 1204) is known from India.

Sphere with base (Type 7b)

Total specimens: 20

Cat. no. 637-638, 934, 949-951, 1136-1137, 1147-1148, 1205-1214

Type 7b spheres with base are particularly widespread in eastern Iran (Konar Sandal and Tepe Yahya) and in the Greater Indus Valley (Farmana, Nagwada and Dholavira). Two hematite specimens from Susa (Cat. no. 637-638), with mass values of 7.77 g and 8.20 g respectively (equivalent to a western and local shekel unit) suggest their use as balance weights. The same could be suggested for the limestone specimen from Tepe Yahya (Cat. no. 950) which bears a single mark indicating one unit, and has a mass of 13.37 g, equivalent to one Harappan shekel.

Sphere with two bases (Type 7c)

Total specimens: 2

Cat. no. 952, 1215

Type 7c spheres with two bases are very rare, with only two specimens known from Tepe Yahya and Dholavira. The specimen from Tepe Yahya is of particular interest: well-polished on one side only and with a mass of 53.43 g, it corresponds to the Harappan shekel counted at 13.36 g (= 53.43 g ÷ 4).

2.8. Ellipsoid with base and grooves (Type 8)

Total specimens: 20

Cat. no. 639-658

Type 8 ellipsoids with base appear to be heavily standardised in shape, material and size. They bear deep incisions which were likely made to accommodate a rope or string. Archaeologically, they are characteristic objects for the Uruk period, although in Susa they continued to be in use until the Proto-Elamite period. Found in the major centres of the Uruk tradition (Susa in Jequier 1900, fig. 108; de Morgan 1900, fig. 117; Le Brun 1971, 189-196; 231-245, fig. 55,2, 68,12; Sheik Hassan in Foster 2009, 348; Habuba Kabira in Strommenger/Sürenhagen 2014, 250-254, pl. 148,3-12, 149-151, 152,1-3; Tall-e Geser in Alizadeh 2014, fig. 97f, 97h; Hacinebi in Foster 2009, 348; Tepe Sialk in Ghirshman 1938-1939, pl. XXVIII: 1, 95 (S.49); Telloh in de Genouillac 1934, 54, 57, see specimens TG. 4960/14103 and TG. 5451/AO14104; Jemdet Nasr in Mackay 1931, pl. 75,5.9; and in Uruk in Strommenger/Sürenhagen 2014, 251, n. 268) and in slightly later contexts (Tell Asmar in ED I period – L. Rahmstorf pers. comm. – and Kish in Mackay 1925, pl. LXXV,5), they have had various interpretations including balance weights, loom weights, or bullets. The recognition of balance weights in a period that saw the formation of the first urban sites allows a wider consideration on the nature and complexity of the first organised urban systems at the end of the 4th and during the first centuries of the 3rd millennium BC. The total absence of lexical and administrative texts with reference to accounting activities based on weighing procedures, however, makes it difficult to identify objects of Type 8 as balance weights with certainty (the GU_2 term in the Late Uruk texts is equivocal; the sign appears with certainty only from the Early Dynastic I-II texts from Ur; see Bartash 2019, 21-28).

2.9. Pebble (Type 9)

Total specimens: 93

Cat. no. 659-679, 953-954, 962-987, 1078-1110, 1121, 1149-1156, 1216-1217

Type 9 pebbles differ from spherical or ovoid shapes in that there is no apparent trace of manufacturing or deliberate alteration. Instead, they are simple pebbles without any man-made cutting, grinding, polishing or finishing traces. Pebbles are among the most widely discussed metrological objects of all. Can pebbles be considered balance weights? Obviously, there cannot be a single definitive answer to this question, and every object must be considered within its individual geographical, archaeological and cultural context. Specific considerations of individual objects or groups of objects are only possible, if one tries to contextualise the pebble in a wider system of values and knowledge (in the Indus see Mackay 1938, 404; Hall 1943 recently Rahmstorf 2014; 2020, 78-79). The 93 recorded specimens have been divided into the following subtypes:

Type 9a: flat pebble in various shapes

Type 9b: rectangular flat pebble

Type 9c: ovoid/discoid pebble

Type 9d: spheroid pebble

Flat pebble in various shapes (Type 9a)

Total specimens: 25

Cat. no. 1078-1102

Type 9a various shape flat pebbles are particularly prevalent in Shahr-i Sokhta's burial contexts; no evidence could be found in the settlement's occupation levels. Based on the mathematical and statistical analysis applied to the recorded specimens, it is my belief that these objects cannot be considered balance weights.

Rectangular flat pebble (Type 9b)

Total specimens: 2

Cat. no. 953-954

Similar to the previous subtype, rectangular flat pebbles of Type 9b should not be considered as objects related to the quantification of a weight value. There are only two known specimens of this type, both of which were found at Tepe Yahya.

Ovoid/discoid pebble (Type 9c)

Total specimens: 21

Cat. no. 659-679

Several considerations should be made for Type 9c ovoid/discoid pebbles, each of which should be evaluated independently. All known specimens come from Susa, where ovoid is the most common shape for balance weights. This evidence suggests that at least some of the pebbles could actually have been used for weighing activities outside of the canonical and official channels of exchange and hoarding. For this subtype, the mass of each individual object and its contextual provenance becomes fundamental for the understanding of the object itself, albeit not definitively.

Sphere pebble (Type 9d)

Total specimens: 45

Cat. no. 962-987, 1103-1110, 1121, 1149-1156, 1216-1217

Similar considerations can be made for Type 9d spheroid pebbles, which are largely absent from Susa but widespread on the Iranian plateau and in Gujarat. The use of potential balance weights that require no processing and therefore have no manufacturing costs, allows for a potential historical reinterpretation of the understanding of *intra-situ* social dynamics. Similar to the ovoid pebbles in Mesopotamia, the spherical objects from Gujarat co-existed with a heavily standardised and very finely manufactured group of balance weights. This paints a peculiar picture on the possible use of different socio-economic levels of balance weight use. If, in fact, alongside the 'king's weights' and the official weights of the merchant there were also 'non-official' objects that were used to carry out weighing and hoarding activities, one could hypothesise that the pebbles could have been used in a domestic or local economy that existed and functioned parallel to the official (palatial), or the wider commercial economy. Irrespective of metrological analysis of every single pebble, it seems at least plausible to believe that parallel systems to those best known from the archaeological record could have existed, for example accounting systems for small-scale commercial activities or for accounting/budgeting within a family, economic contexts far removed from palatine commercial activities or long-distance trade. In this sense, manufacturing, materials and mass would also allow for a reconstruction of different and more complex levels of socio-economic interaction within the site.

2.10. Hand bag-shaped (Type 10)

Total specimens: 42

Cat. no. 888-929

The hand bag-shaped weights of Type 10 are amongst the most intriguing objects in the *corpus*. Produced by the so-called Jiroft civilisation, these chlorite/steatite objects comprise a handle and at times extremely elaborate decorations on the surface of their main body. Jiroft production of chlorite/steatite objects, particularly vessels, in south-eastern Iran is the subject of intensive discussions (Madjidzadeh 2003a; 2003b; *contra* Muscarella 1994; 2001). Despite the lack of archaeological evidence from the Marhaši region

(= Jiroft; see Steinkeller 1982), the development, timing and diffusion of this production has been discussed intensively (Amiet 1980; 1986a; 1986b). The idea of an 'intercultural' production (Kohl 1971; 1975a; 1975b; 1976; 1977; 1978; 1979; 1982; finally 2001; Lamberg-Karlovsky 1972a; 1972b; 1988; Lamberg-Karlovsky/ Tosi 1988) is now negated by new evidence from the excavations of Konar Sandal (Madjidzadeh 2008), which also allowed the definition of new cultural spheres within the Iranian plateau and their chronological limits. Chlorite/steatite artefacts from Jiroft civilisation formed part of a widespread network of exchange linking Mesopotamia, its borders, the Persian Gulf and the Iranian highlands. The evidence comprising specimens dating to the Early Dynastic II/IIIb period from Adab (with Mesilim inscription; Delougaz 1960, pl. IXa), Khafaja (from level X Sin Temple; Frankfort 1935, 48, fig. 54-55; Delougaz 1960, 94; confer with Amiet 1966, 54, 61, 376), Agrab (Shara Temple; Frankfort 1935, 432-436), Ur (Royal Cemetery, in the Meskalamdug period; Woolley 1976, 51), Nippur (levels VIIB-VIII from Inanna Area; Kohl 1974, 162, 245, 690, pl. XLIII,a; 1979, fig. 5), and Mari (Parrot 1956, 113, pl. XLVI-LI; 1967, 180-182, fig. 226-228, pl. LXXI; 1974, 42-43, fig. 11-12). Contextual evidence from the Iranian plateau is found in Shahdad, from Cemetery Area A (Takab IV.1-III.2 periods; Hakemi 1997a, 609-625; 1997b), and in Tepe Hissar IIIB (in the'Burned Building' on the North Flat, chronologically dated to the first two centuries of the second half of the 3rd millennium BC; Dyson/Remsen 1989, 96). From Yahya we know more than 220 chlorite vessel fragments of the 'Intercultural Style', 79 % of which were found in a IVB layer, with only 21 % from Yahya IVA (Kohl 1975a, 20, fig. 1).

In terms of the typology presented in this volume, most of the handled weights in steatite from Jiroft are featured in Madjidzadeh (2003a, 123-129) and Piran (2012, 16-18, no. 9951, 9978-9979). Additionally, handled weights are widely presented in the archaeological literature broadly spanning a region from Turkmenistan (for Altyn Tepe see Alekshin 1973; Kara Tepe in Masson 1960, fig. 32; Anau in Hiebert 2003, 93-95, fig. 7,15; Sarazm in Isakov 1986, fig. 8,1) and Uzbekistan (for Soch see Brentjes 1971, 155) to Afghanistan (Dashly in Khlopin 1963, 9; Mundigak in Casal 1961, fig. 134-135; and Herat Museum in Franke/Müller-Wiener 2016, no. Pr102-105), and from eastern Iran (Shahdad, in Hakemi 1997a; and Shahr-i Sokhta from the surface) to the Gorgan plain (Tepe Hissar in Schmidt 1937, pl. XVIII, H2095).

As will be demonstrated later, these objects have been considered as potential weights by the author for various reasons outlined in Chapter 5. Although most of them stem from illegal excavations, they all come from the valley of the Halil river that runs through the entire province of Jiroft to the shores of the Persian Gulf. These weights, interpreted differently in the archaeological literature (lastly see Micheli/Vidale 2012; Verstandig 2016), are indicative of contact points between the Indus and Mesopotamian weighing systems, thus making it possible to recognise metrological sequences hitherto unknown. Whilst the presented study does not address the iconographic and stylistic aspects of the individual artefacts, the set of iconographic elements present provides information about the pantheon of Jiroft and its mythological heritage (Winkelmann 2005; Ascalone 2011a, 443-446; Basafa/Rezaei 2014; Vidale 2015). All the weights come from looted burials and, on the basis of extensive chronological considerations (see Chapter 5.1.1), must date back to a period between 2600/2500 and 2300/2200 BC (Ascalone 2006a; 2015).

2.11. Cylinder-shaped (Type 11)

Total specimens: 93

Cat. no. 680-687, 857-861, 935, 988, 1111-1112, 1218-1293

Cylinder-shaped objects of Type 11 should be interpreted based on their context. In Mesopotamia, objects of this shape are most often interpreted as unfinished seals rather than as balance weights. In the Indus, on the other hand, and particularly in Gujarat, cylinders represent some of the most common category of balance weights. Mass and material play an important role in identifying the purpose of individual objects. It seems very likely that the three specimens from Shahr-i Sokhta (Cat. no. 1111-1112) and Konar Sandal (Cat. no. 935) should be considered as weights, following the tradition of the Harappa civilization.

Type 11 is divided into three subtypes:

Type 11a: cylinder-shaped

Type 11b: cylinder-shaped with hole

Type 11c: semi-cylinder-shaped

Cylinder-shaped (Type 11a)

Total specimens: 83

Cat. no. 680-687, 857-861, 935, 1111-1112, 1218-1284

The classic cylinder-shaped weights are present in Dholavira (67 specimens) and in southeast Iran (three potential weights). The 13 specimens from Susa and Telloh should be considered unfinished cylinder-shaped seals. Fifty-six of the 67 cylindrical objects from Dholavira are made of shell, specifically *Turbinella pyrum*, a gastropod particularly widespread along the coast of Gujarat (Hornell 1916, 71), between the west coast of Makran and the Little Rann of Kutch (Kenoyer 2008, 24). Most of the *Turbinella Pyrum* shell blocks in Dholavira were sold as raw material on both the domestic and 'international' market, and were subsequently purchased to be processed into objects (Kenoyer

2008, 21). This seems to explain the wide spatial distribution of shell cylinders, particularly the presence of *Turbinella Pyrum* cylindrical seals in Mesopotamia, the style and themes of which otherwise appear to be rooted in the cultural heritage of Lower Mesopotamia (as known from the seals from the royal cemetery in Ur, dated to the end of the Early Dynastic period) (Woolley 1934; 1955; Gensheimer 1984; lastly see also Zettler/Horne 1998, 80).

Cylinder-shaped with hole (Type 11b)
Total specimens: 1
Cat. no. 988

Only one specimen of Type 11b cylinder-shaped with hole was found at Tepe Yahya. Its particular mass and unusual morphology suggest that it was not used as a balance weight.

Semi-cylinder-shaped (Type 11c)
Total specimens: 9
Cat. no. 1285-1293

Prior to this volume, semi-cylinder-shaped objects from Dholavira of Type 11c were never described in the literature. There are nine known specimens, all found in Dholavira, eight of which consist of shell, with one specimen made from limestone. They show an amazing working standardisation representing a very compact class for material and dimensions. Their use as balance weights remains uncertain, most of the specimens show metrological features connected to western weight systems and a few specimens are reminiscent of the Harappan unit, but are slightly heavier than the standard one calculated at 13.65 g. Due to the lack of metrological certainty, and according to J. M. Kenoyer (2008, 21), objects of this type, should be considered shapes traded to Indus sites for use in the production of beads or inlays. In this case, analysis of their mass values can provide insightful information on whether the raw materials were cut to size and sold based on their mass (see Chapter 3.24), and whether the raw materials were sold in units based on a metrological progression.

2.12. Biconic (Type 12)
Total specimens: 66
Cat. no. 688, 1170-1172, 1294-1355

Biconical weights are exclusively produced in the Harappan civilisation. Their presence in the major centres of the Indus and Gujarat, suggest local production, as demonstrated by evidence from other regions of Indus culture.

In the literature, the weights from Mohenjo-daro (Hemmy 1938a, 604), Harappa (Vats 1940, 362) and Chanhu-daro (Mackay 1943, 239) were described as 'spheres with plane base and tops', but only few specimens were published with their mass and illustrations (Hemmy 1938a, 604-605; 1943, 239). A set of biconical weights, was published by J. M. Kenoyer (1998, 99, fig. 5.29) in his overview on Indus civilisation, albeit without further information. Evidence was collected from Harappa (Vats 1940, pl. CXVIII, 30, J576), and some incomplete documentation comes from Umm al-Nar excavations (Frifelt 1995, 219, fig. 324, no. Px). Only 13 biconic (also called 'truncated hemispherical weights' by L. Rahmstorf 2020, 77-78, fig. 1), all from the Indus Valley, were published with their mass and illustrations: two come from Kotada Badhli (Rujkar *et al.* 2015, 728, no. 16, 159, fig. 7a-b), with masses 31.28 g (x 4 = 7.82 g) and 30.88 g (÷ 4 = 7.72 g) respectively; two from Chanhu-daro (Rujkar *et al.* 2015, no. 921, 1260) with masses 9.13 g and 7.46 g; two from Dholavira (Rujkar *et al.* 2015, no. 19761, 19776) with masses 9.79 g and 9.10 g; one from Harappa with masses 27.34 g (÷ 3 = 9.11 g and ÷ 2 = 13.67 g), and two from Mohenjo-daro with masses 7.90 g and 7.27 g (Rujkar *et al.* 2015, no. DK 10790, VS 1281). To this, should be added a set of heavy weights found at Mohenjo-daro: a group of biconical weights with masses calculated between three and six Mesopotamian minas. Specifically, 1,431.67 g (Hemmy 1938a, pl. CXL,74), 1,445.85 g (Hemmy 1938a, pl. CXL,73), 2,576.31 g (Hemmy 1938a, pl. CV,6) and 2,735.78 g (Hemmy 1938a, pl. CXL,76), respectively counted as three units of 477.22 g, three of 481.95 g, six of 429.30 g and six minas of 455.96 g. The last two weights are quite underestimated and could also be attributed to the local Harappan system or Dilmunite minas of 1,288.15 g and 1,367.89 g. The presence of a specimen in Susa (Cat. no. 688), equating to six Mesopotamian shekels, confirms the relations between the Indus and Mesopotamia. This opens new scenarios on the possible presence of a Harappan enclave in the Khuzistan plain, as already suggested by the presence of hybrid glyptic material.

2.13. Small column (Type 13)
Total specimens: 3
Cat. no. 930-931, 1120

Small columns of Type 13 have been the subject of many discussions in Near Eastern and Central Asian Bronze Age archaeology. Their widespread distribution in Margiana and Bactria contexts has been interpreted as a characteristic production of the Oxus civilisation, between the end of the 3rd and the beginning of the 2nd millennium BC. There have been many interpretations as to their function, including as objects used for weighing. Uncertain archaeological contexts – most of the specimens were found in previously looted graves – and a lack of textual references have made their interpretation difficult. The mass values of the small number of objects collected at the Kerman Museum do not support their use as balance weights, but analysis of a larger sample might provide valuable insights. The currently, most widely accepted hypothesis, suggests that these objects had a ritual function related to funerary practices.

There are at least five morphological subtypes that can be recognised for these objects (Boroffka/Sava 1998). Their distribution appears to be linked to the so-called BMAC; the three presented specimens belong to a shape with slightly tapered ends, in one case (Cat. no. 1120 from Gorgan) with grooves that were probably made to allow suspension with a rope. Whereas the other subtypologies mostly appear in the Balkan areas (north of the Black Sea) and along the steppes of Kazakhstan during the Andronovo culture, the objects from Kerman and the province of Semnan are indicative of the Oxus civilisation; their presence is limited to territories that experienced increasingly intense relations between the Oxus and other contemporary civilisations (*e.g.* Hilmand, Halil and Indus in an integrated cultural system between the end of the 3rd and the beginning of the 2nd millennium BC (Ascalone 2018a).

Similar specimens have been sold on the antique market (Amiet 1977; 1986a; Sarianidi 1977; Pottier 1982), or were found at Anau (Warner 1908, tab. 517-524), Gonur Depe (Sarianidi 1994, 397), Dashly 3 (Sarianidi 1986, 134, pl. 53), Hissar (Deshayes 1977, 99, 101), Kulli (Stein 1931, 124, tab. 23), Quetta (Jarrige/Hassan 1989, tab. 3,14), Shahdad (Hakemi 1997a, no. 0496, 0546, 0696, 0752, 0964, 1385, 2172, 2518, 2555-2556, 2610), Tekkem Depe (Kohl, P. L. 1984, 141, pl. 20a), Togolok 21 (Kohl, P. L. 1984, 150), Altyn Depe (Masson 1988, 53, 65-68), Tureng Depe (Deshayes 1976a, 298, pl. 1), Susa (Amiet 1986a, fig. 97, no. 4), Kara-Depe (Hiebert 1994, 381), Godar-i Shah (Tosi 1970b, 48), Shah Tepe (Arne 1945, 149, pl. 195, no. 146) and Shahr-i Sokhta (not yet published).

2.14. Pear-shaped (Type 14)

Total specimens: 1

Cat. no. 932

There is only one pear-shaped specimen of Type 14, currently in the collection of the Kerman Museum and unfortunately without archaeological context. Pear-shaped balance weights (on their interpretation as weights see Mackay 1938, 402; Hendrickx-Baudot 1972, 25) seem to originate from Baluchistan, as suggested by contextual evidence from the excavations of Sohr Damb/Nal (Hargreaves 1929, 28, 41, pl. XV,b; Franke-Vogt 2005, 110, fig. 34; Franke/Cortesi 2015, no. 631-643), where three of them were found in multiple burials (burials 739/740), dated to around 4000 BC (Franke-Vogt 2005, 67, fig. 6-7 for the grave). Whilst slightly different in shape, it could be suggested that they belonged to a widespread typology present throughout Baluchistan since the most archaic periods, and also known in the Indus Valley, which were contemporaries to the chlorite-handled weights of south-eastern Iran and Margiana during the middle of the 3rd millennium BC. Pear-shaped weights are known from Shahi-Tump (Mille *et al.* 2004), Bampur (Stein 1937, pl. X, XXX), Hussaini (Stein 1937, pl. XXX), Kinneru damb (de Cardi 1983, pl. VI,B), and from the main sites of the Harappan culture, where pear-shaped weights with or without perforation are known at Harappa (Vats 1940, pl. CXVII,4-5.14-15.18-24.33-35, CCXVIII,31), Lothal (Rao 1985, fig. 125,2, pl. CCLVIII,B), Mohenjo-daro (Marshal 1931, pl. CXXX,25-26.34; Mackay 1938, 402, pl. CVI,54) and Nichara (Hargreaves 1929, 41). The same shape is known from Ebla (Syria), where a balance weight bears the inscription 'weight of the city of Shadasu' (= *NA*^{4} *Shadasu*^{KI}), an unidentified city of the ancient Near East (eastern Iran/Baluchistan/Indus?). From the same site, another pear-shaped weight was found on the floor of L.2982, a storage room of the Royal Palace G (*c.* 2400-2300 BC) in association with 24 kg of raw lapis lazuli (a further 9 kg were found in the next room L.2984), 82 beads, worked lapis lazuli and limestone for composite statuettes, one bronze pin, gold and fragments of finished steatite objects (see Biga 2003a for a summary on weighing and measuring at Ebla). Based on the geographical distribution of pear-shaped weights and their associated finds (including lapis lazuli), an eastern origin, possibly the city of Shadasu, could be suggested for the pear-shaped balance weight from Ebla (Ascalone 2020; see Biga 1995 for information on diplomatic relationships between Ebla and its hinterland based on textual evidence).

2.15. Egg-shaped (Type 15)

Total specimens: 9

Cat. no. 689, 862-868, 989

Egg-shaped objects of Type 15 seem to be exclusive to Mesopotamia and Susiana, where eight specimens were found. One specimen was found on the Iranian plateau, at Tepe Yahya (Cat. no. 989).

2.16. Parallelepiped (Type 16)

Total specimens: 168

Cat. no. 690-691, 869-870, 955-956, 990-991, 1113-1114, 1122, 1138-1139, 1157, 1163, 1173-1175, 1356-1505

Parallelepiped objects of Type 16 are common in the *corpus.* They can only occasionally be interpreted as balance weights. Parallelepiped objects are divided into two subtypes:

Type 16a: parallelepiped

Type 16b: parallelepiped with hole

Parallelepiped (Type 16a)

Total specimens: 166

Cat. no. 690-691, 869-870, 983-984, 990-991, 1113-1114, 1122, 1138-1139, 1157, 1163, 1173-1175, 1356-1505

The extensive use of parallelepiped objects in everyday life makes it difficult to understand exactly how, and for what purpose, individual objects were used. This is particularly true for the Mesopotamian cultural centres, which have revealed only very limited archaeological evidence of these objects (two specimens each from Susa and Telloh, see Cat. no. 690-691 and 869-870). The Indus sites, however, have revealed far more information through the archaeological contexts of the parallelepipeds and their associated finds. Particularly the widespread distribution of this type in all of Gujarat (a total of 153 specimens were found here), in Rakhigarhi and Farmana and the apparent metrological coherence suggest that these objects were used as balance weights. The fact that many larger weights and also several copper specimens had the same shape further suggests that these parallelepipeds are actually a previously unknown class of balance weights.

Parallelepiped with hole (Type 16b)

Total specimens: 2

Cat. no. 955-956

Parallelepipeds with hole of Type 16b cannot generally be considered as balance weights. Instead, they could have been used as fishing net weights.

2.17. Discoid (Type 17)

Total specimens: 182

Cat. no. 692-697, 936, 992-1013, 1115-1116, 1123-1126, 1140-1141, 1144, 1158, 1506-1649

Discoidal specimens of Type 17 are some of the most common objects in the Indus, yet almost completely unknown in Susiana and Lower Mesopotamia. A functional interpretation of these objects is difficult, as disc-shaped items could also have been used as stoppers, tokens, for accounting activities/calculations and/or as gaming pieces. It is therefore only possible to interpret the function of individual objects, not of the entire typology. Based on metrological analysis, it is possible to identify individual discoidal balance weights from the Indus, as these objects were usually heavily standardised and often found in association with other items suggesting a metrological function.

This type has been divided into five subtypes:

Type 17a: discoid

Type 17b: discoid with hole

Type 17c: octagonal discoid

Type 17d: irregular discoid

Type 17e: discoid in terracotta

Discoid (Type 17a)

Total specimens: 126

Cat. no. 692-694, 936, 992-1006, 1115-1116, 1140-1141, 1158, 1506-1607

Discoids of Type 17a are the most common variety of this type, in particular in Dholavira where 102 specimens have been found. There is only sporadic evidence of these discoids in Susa (3 specimens) and on the Iranian plateau (although the specimens coming from Shahr-i Sokhta must be considered as potential balance weights, which were perhaps imported from the Indus Valley; Ascalone 2019b, no. 6, 8; 2020, no. 5, 8, fig. 5, 8). The specimens from Dholavira, Rakhighari, Farmana and Nagwada are well-made, well-polished and carefully worked, and consist mostly of limestone and shell.

Discoid with hole (Type 17b)

Total specimens: 1

Cat. no. 695

Only one specimen (from Susa, Cat. no. 695) of Type 17b discoid with hole is known. It appears to be very different to the rest of the objects of this general type, nevertheless it was included in Type 17 due to its overall comparable geometric features. Its manufacture, its size and mass, as well as the central perforation for a string or rope (as suggested by the deep grooves on each on four sides), set this object apart from the other specimens of Type 17 and make it very similar to the ellipsoids with base of Type 8.

Octagonal discoid (Type 17c)

Total specimens: 2

Cat. no. 696, 1608

Two octagonal discoids of Type 17c were found in Susa (Cat. no. 696) and Dholavira (Cat. no. 1608), made of stone and shell respectively. The lack of contextual information, their mass values as well as their morphological anomalies make their interpretation as balance weights difficult.

Irregular discoid (Type 17d)

Total specimens: 1

Cat. no. 697

Only one object (Cat. no. 697) of Type 17d irregular discoid could be identified. Similar to Type 17c, it seems very unlikely that this specimen was used as a balance weight.

Discoid in terracotta (Type 17e)

Total specimens: 52

Cat. no. 1007-1013, 1123-1126, 1144, 1609-1649

Terracotta discoids of Type 17e must be considered as an alternative variation to their stone counterparts. Terracotta was commonly used as an alternative to stone in the entire Gujarat region. In addition to the standard cube-shaped weights, the major cultural centres in Gujarat had a thriving production of clay and terracotta objects which were cheaper and easier to produce than stone. Beads, domestic utensils, seals, bracelets, cooking plates, and agricultural tools were made of clay instead of the more expensive stone equivalents. This demonstrates that an in-depth understanding of the archaeology and material culture of a region, as discussed in the introduction, is imperative to understand the function and use of individual artefacts. The terracotta discoids (and also the cuboids) should therefore be considered as low-quality balance weights. In turn, this allows more in-depth considerations regarding the socio-economic structure within the major centres of Gujarat.

2.18. Cuboid (Type 18)

Total specimens: 386

Cat. no. 698-700, 1014, 1127-1135, 1142-1143, 1145-1146, 1159-1162, 1164-1169, 1176-1188, 1650-1996

Cuboid weights of Type 18 are characteristic for the Indus civilisation, and they are widely known from publications from the first half of the 20th century. Around 700 balance weights in various shapes were published (364 from Mohenjo-daro, 215 from Harappa and 117 from Chanhu-daro) in the respective original excavation reports (Hemmy 1931, 589-598; 1938a, 601-612; 1943, 236-239; Vats 1940). In total, more than 900 weights from over 40 sites, can be identified from the bibliographical references in a recent survey on the weights from the Harappa civilisation (Rahmstorf 2020; see also Ascalone/Peyronel 1999, 352-376; 2003, 321-421). The balance weights from these major sites were usually made of chert or banded chert, with occasional use of limestone, agate or chalcedony. The vast majority are cubic/cuboid objects: undoubtedly the standard shape for balance weights in this region. This type was deliberately called 'cuboid' rather than 'cubic', as not all objects represent a perfect cubic shape. Cuboid instead refers to an approximately cubic shape, which includes objects which could otherwise mistakenly have been classified as Type 16 parallelepiped.

Two different subtypes could be identified:

Type 18a: cuboid

Type 18b: cuboid in terracotta

Cuboid (Type 18a)

Total specimens: 373

Cat. no. 698-700, 1014, 1127-1135, 1142-1143, 1145-1146, 1159-1161, 1164-1167, 1176-1188, 1650-1986

Most of the cuboids are of Subtype 18a. Widespread throughout the Greater Indus Valley, cuboids are known from Rakhigarhi (9), Farmana (2), Kuntasi (1), Nageshwar (1), Shikarpur (5), Nagwada (3), Bagasra (14) and Dholavira (337). Cat. no. 699-700, found at Susa, should be considered as local productions likely made by Harappan merchants *in situ*, while Cat. no. 698 was likely imported from the Indus Valley. The single cuboid from Tepe Yahya (Cat. no. 1014), on the other hand, is ambiguous; its mass (10.58 g), which does not match the Harappan weight system, and its engravings suggest that this object was more likely a gaming piece rather than a balance weight of Harappan origins.

Cuboid in terracotta (Type 18b)

Total specimens: 13

Cat. no. 1162, 1168-1169, 1987-1996

Type 18b terracotta cuboids play an important role in the interpretation of different economic 'cycles'. As with the clay/terracotta discoidal weights, the positive identification of terracotta cuboids as balance weights calls for further in-depth historical considerations, which unfortunately cannot be addressed in this work in detail. It now becomes apparent that there were likely different levels of accounting and multiple economic cycles existing at the same time. So far, archaeological research in the Greater Indus Valley and Mesopotamia has easily recognised 'official' balance weights produced by the palace or ruler. It is now time to recognise a different class of balance weights, mostly cuboids and discoids made of terracotta, which were perhaps produced and used in a different, smaller-scale and less official, economic environment. Whilst a careful contextual analysis of the terracotta weights from Dholavira is still in progress, the data thus far collected and presented in this volume suggest a less monolithic version of weighing practices along the Indus Valley. Not only are balance weights more numerous and diverse in shape than previously recognised, but local weight systems seem to slowly move away from the standard unit of the Harappan system (this also happened along the Ghaggar River Valley; see Ascalone 2019b). Similarly, the binary and decimal progressions reconstructed for the Harappan system seem to show a degree of variation within the standard system, especially for the specimens found in contexts outside the Greater Indus Valley. In summary, these variations and the recognition of an economic system based on 'low-quality' terracotta weights, which were perhaps used for small-scale interpersonal trade or at local markets, change our static, monolithic and homogeneous view of the Indus weight systems and their use.

2.19. '*Kudurru*'-shaped (Type 19)

Total specimens: 1

Cat. no. 887

The Akkadian word '*kudurru*', which appears around the middle of the 2nd millennium BC, indicates a stone stele decorated with reliefs and bearing inscriptions. Objects of this elaborate typology, of which around 150 specimens have been found, were particularly common in Babylon between the 14th and 7th centuries BC. The *kudurru* were placed directly on the fields to delineate property boundaries (Brinkman/Seidl 1982, 267-277). The single diorite specimen from Ur, recorded in the Louvre Museum collection, suggests that *kudurru* weights must have been known by the reign of Shulgi (*c.* 2094-2047 BC) at the end of the 3rd millennium BC. The weight (Cat. no. 887) bears an inscription noting its mass as equivalent to half a Mesopotamian mina.

2.20. Hemisphere (Type 20)

Total specimens: 41

Cat. no. 701-719, 871, 937, 1015, 1997-2015

Type 20 hemispheres combine both balance weights and copper/bronze ingots found in Susa and the Greater Indus Valley. Particularly significant are the ingots from Susa, all dated to the Early Dynastic III of Mesopotamia, as their metrological values fit well into the broader historical context of the relations between Lower Mesopotamia, Oman and the Greater Indus Valley in the middle of the 3rd millennium BC. As both the balance weights and metal ingots share similar geometric and metrological features, the two categories have been combined. Two different subtypes could be identified:

Type 20a: hemisphere

Type 20b: truncated hemisphere

Hemisphere (Type 20a)

Total specimens: 31

Cat. no. 701-719, 871, 937, 1015, 1997-2005

Eleven of the 31 Type 20a specimens should be considered as ingots (Cat. no. 709-719), with mass values to the Mesopotamian wool mina, the traditional mina of *c.* 505 g, and the Dilmunite mina. One hemispherical bitumen weight is related to the Harappan mina (Cat. no. 709). The remaining specimens are balance weights distributed over a large geographical area that also includes Telloh, Konar Sandal and Tepe Yahya; their mass values are compatible with the western systems and, in three cases, with the Harappan weight unit (hemispherical weights are also particularly common in Lothal, whose weights will be the subject of a forthcoming publication by the author; see also Rao 1985, pl. CCLIX,a).

Truncated hemisphere (Type 20b)

Total specimens: 10

Cat. no. 2006-2015

Truncated hemispheres of Type 20b appear to be specific to the Harappan weight system, and were potentially exclusively used in Gujarat (all known specimens come from Dholavira). Some very large specimens which are compatible with the calculation of the Harappan mina counted at *c.* 1,360 g confirm their function as balance weights.

2.21. Cone (Type 21)

Total specimens: 45

Cat. no. 720-731, 872-873, 1018, 2016-2045

Conical objects of Type 21 require careful analysis of individual objects, as this shape was also commonly used for gaming pieces. The material and mass play a decisive role in determining the function of individual objects. Generally speaking, the slightly cone specimens from Lower Mesopotamia appear to have been used as weights, whilst the truncated cone-shaped objects from Dholavira likely had a different function.

This type is divided into two subtypes:

Type 21a: cone

Type 21b: truncated cone

Cone (Type 21a)

Total specimens: 12

Cat. no. 720-728, 872, 1018, 2016

It is difficult to identify the conical objects of Type 20a as balance weights with certainty. If we exclude a porous specimen from Tepe Yahya (Cat. no. 1018), however, the material and mass values, all multiples of the 8.4 g shekel, of the remaining Susa specimens suggest that they were in fact balance weight. Their conical shape was likely created by cutting an ovoid weight, perhaps to obtain a mass lower than the whole weight, or possibly due to an error during its original production.

Truncated cone (Type 21b)

Total specimens: 33

Cat. no. 729-731, 873, 2017-2045

Truncated cones of Type 21b, which are most common in Dholavira where 29 specimens were found, consists of two further subgroups: truncated cone, and truncated cones with a groove that allowed the passage of a rope. Neither display metrological features and were instead most likely gaming pieces, loom weights or fishing net weights. The specimens from Susa and Telloh (Cat. no. 729-731, 873), on the other hand, should be considered balance weights, as suggested by their manufacture, material, and mass values that fit within the known local weight system.

2.22. Pyramid-shaped (Type 22)

Total specimens: 6

Cat. no. 732, 2046-2050

Only six triangular pyramid-shaped specimens of Type 22 are known, five of which were found in Dholavira. Whilst their mass values appear to be closely related to the Harappan unit, the objects could also have been used as gaming pieces (as was the case with some discoid and conical objects). The single specimen from Susa consists of well-polished hematite and was possibly produced simply as an expression of the stone-cutter's creativity or skills.

2.23. Irregular shape (Type 23)

Total specimens: 15

Cat. no. 733-746, 1117

Fifteen irregularly shaped objects were collected, 14 of which come from Susa. Their shape is likely the result of an incomplete manufacturing process and they thus do not bear any metrological significance. These objects, mostly made of hematite, could have been intended as seals, beads, or even balance weights. Many of them bear traces of cutting and volume reduction, which in some cases could be related to the manufacturing process.

2.24. Clay sphendonoid (Type 24)

Total specimens: 45

Cat. no. 1019-1063

Type 24 clay sphendonoids remain somewhat curious. They are widely distributed on the Iranian plateau, in Tepe Hissar (III period), Shahr-i Sokhta (I-IV periods) and Tepe Yahya (IVC and IVB periods), but also in the Indo-Iranian borderland, for example at Deh Morasi Ghundai II (Dupree 1963, 90), Bampur IV (de Cardi 1967b, 40) and Mundigak IV.1 (Casal 1961, 22, fig. 131). Generally considered to be balance weights (Schmidt 1937) or bullets (Tosi 1969, 361-362, fig. 180), in my opinion these objects were used for private accounting activities in a family environment. Usually found in domestic contexts and often in association with other items related to accounting (such as tokens, sealings, seals, *cretulae*) could suggest that they were used in the counting of certain materials, and perhaps formed part of a small-scale hoarding process. Both their material (unfired clay) and their mass values reject their use as balance weights.

2.25. Dome-shaped (Type 25)

Total specimens: 8

Cat. no. 1064, 2051-2057

Dome-shaped weights of Type 25 are related to cylindrical and discoidal weights, but with only one flat and one rounded 'end'. Their presence in contexts of Period IV-V at Dholavira dates them to the Mature Harappan period. All but one specimen comes from Dholavira, with the single object from Tepe Yahya displaying a very different morphology to the Dholavira ones: the above basalt specimen (Cat. no. 1064) shows traces of a string passing just below the upper spherical part. This object, completely different in shape to those of Dholavira, could be considered a weight used with single arm scales, generally used for heavy amounts of material.

2.26. Trapezoid-shaped (Type 26)

Total specimens: 1

Cat. no. 2058

Only one trapezoid specimen of Type 26, without archaeological context, could be identified. Its use as a balance weight, rather than a gaming piece, remains uncertain.

2.27. Rounded flat with hole (Type 27)

Total specimens: 5

Cat. no. 957-961

The five known specimens of Type 27 were all found in Tepe Yahya. Metrological analysis does not support their interpretation as balance weights. Their heavy weight, their often concave shape (see in particular Cat. no. 959) and the presence of traces of wear near the hole, suggest that these objects were instead structural features, perhaps as a sort of hinge washer for temporary structures made of (thin) wooden planks.

3 Material

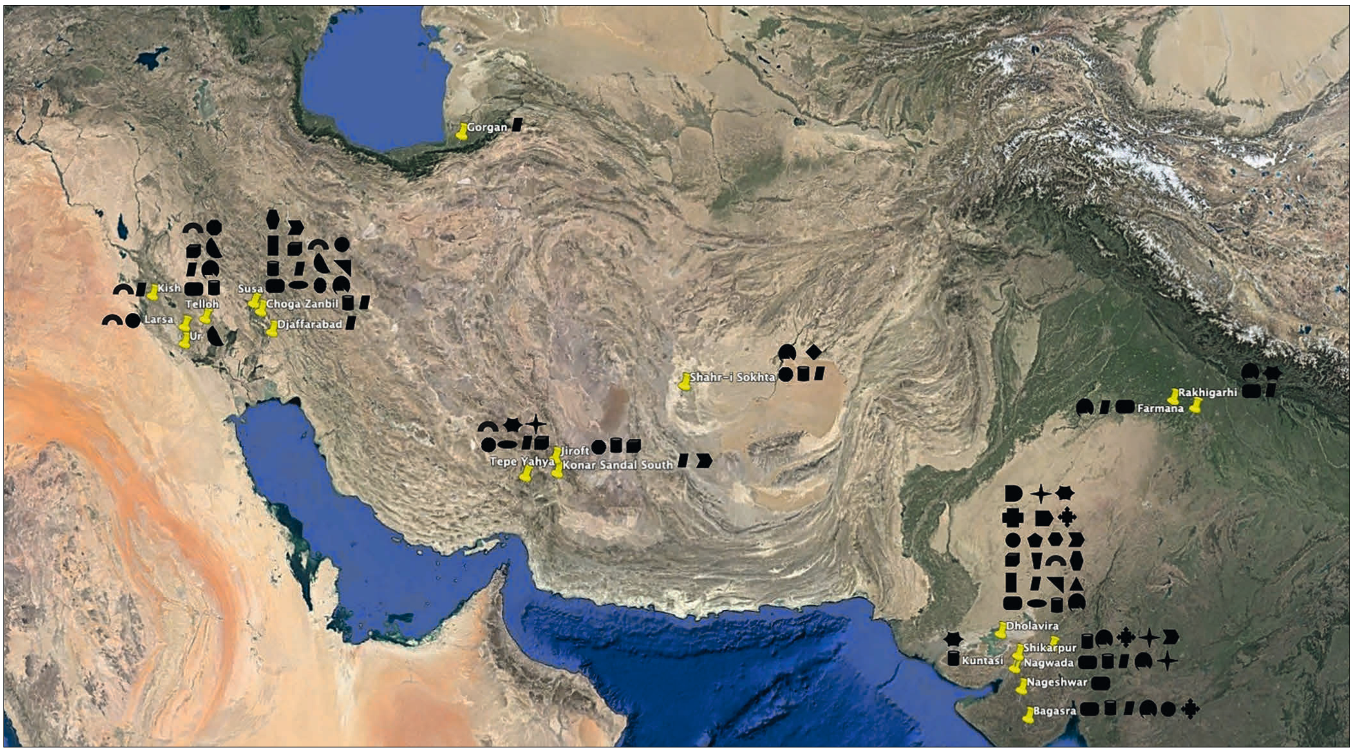
Identifying exactly which materials balance weights or 'potential weights' were made of is extremely difficult without the use of X-ray diffraction analysis (XRD). Whilst some of the suggestions I make in this chapter would likely be met with disapproval by some geologists, I believe it is worth providing more (rudimentary) documentation rather than less. While some materials can (seemingly) be recognised rather simply, others are significantly more difficult to identify. I therefore decided to include whatever materials were identified and recorded in the unpublished excavation reports, diaries and museum catalogues, following conscientiously what was transcribed by those who excavated the site or by those who catalogued the objects.

This approach has resulted in the identification of numerous subjective subcategories. As a general rule I preferred to use the material description given in the excavation diaries over the one recorded in the museum registers. For example, an object from Shahr-i Sokhta, described as limestone in the museum, was actually identified as calcite by the excavator of Ur. The same problem arises with other, very similar stone types, based on their mineral composition such as agate, chalcedony, jasper or carnelian. Despite the many material-based subcategories I identified, it seems that at least three macro-groups can be recognised:

1. agate/carnelian/chalcedony/jasper, a group comprising microcrystalline quartz;
2. limestone/calcite/marble/alabaster, an altered sedimentary rock group (marble and limestone), with their secondary mineral formations (calcite);
3. chlorite/steatite/serpentinite, soft, dark, green-grey secondary minerals occurring in metamorphic rocks.

So-called soapstones/softstones/sandstones, which are general descriptions often used by archaeologists when the material is uncertain or cannot be fully identified, must be added to macro-groups 2 and 3.

On this basis, 27 different categories of materials have been identified (Fig. 3.1). Hematite appears to be the most widespread material in Mesopotamia and Susiana (together with limestone, 416 and 179



Agate/carnelian/chalcedony
Alabaster
Basalt
Bituminous stone
Generic stone
Bronze/copper
Calcite/limestone
Chert
Chlorite/steatite/serpentinite
Diorite
Gabbro
Granite
Gypsium
Hematite
Hornblende
Jasper
Marble
Olivine
Quartz
Schist
Shell
Siltstone
Soapstone/softstone/sandstone
Terracotta
Clay
Vesuvianite
Waagenophyllum

Fig. 3.1. Geographical distribution of materials.

specimens respectively), while the Greater Indus Valley comprises a more balanced distribution, also including weights made of clay, terracotta and shell, the latter of which are totally unknown in Lower Mesopotamia and Susiana. Similarly, in Gujarat and along the Ghaggar River basin, there is a greater use of semi-precious stones, including carnelian, chalcedony, jasper and quartz, while diorite was only used in small quantities in Susa, Telloh and Ur.

Bitumen is a material only used in Susa (see Connan/Deschesne 1996; on its use as a copy of chlorite models originating from Jiroft see Amiet 1986a, 123-124; Ascalone 2019a, 11), while the 'generic stones' (see Chapter 3.5) appear to crop up only in Harappan contexts. Particularly interesting is the use of copper weights in Dholavira; with the exception of the copper and bronze ingots from Susa, some of which were found in the '*vase à la cachette*' (de Mecquenem 1934, 189, fig. 21,16; Le Breton 1957, 118, fig. 40,24; Rao 1963a, pl. XI,b; Amiet 1986a, 125-126, fig. 96,1-9; Tallon 1987, no. 687-692), copper (alloy) balance weights did not exist in the Near East during the 3rd millennium BC.

Chlorite is the most common material used on the Iranian plateau. Due to the above-mentioned difficulties of correctly identifying the precise mineralogical composition of different materials, chlorite, serpentinite and steatite were collected jointly in this study. Numerous areas of ancient chlorite/steatite mining have been recognised mainly along the Halil River Valley in the province of Jiroft (lastly see Pfälzner/Soleimani 2017; Karami *et al.* 2019). Similarly, the large number of alabaster, calcite and limestone objects seems to be mostly due to the natural availability of the material, as suggested by the numerous known sources around Shahr-i Sokhta (Ciarla 1979; 1981; 1985; 1990; Festuccia 2019; 2022a; 2022b; Sefidkhani 2019).

Whilst not the central focus of this research, the identification of primary and secondary sources of raw materials located close to the studied sites provides an insight into the presence and diffusion of certain classes of materials. Considering the chronological context of Dholavira, the presence of a set of copper objects used as balance weights is surprising. Similarly, it seems possible to hypothesise the relationship between the function/meaning of an object and its material. It seems reasonable to suggest that balance weights made of precious or semi-precious materials must be interpreted under consideration of wider concepts of value, not just based on their function related to weighing activities. The symbolic meanings and the historical-social values of the object must also be understood through the archaeological contextualisation of the object itself. Together with the material, this can also provide significant information on the metrological value of a weight. In short, one should consider the possibility that there were, in addition to weight standards, also areas of diffusion of shapes of weights and their materials that had precise ideological and symbolic values (Ascalone/Peyronel 2011b, 71).

3.1. Agate/carnelian/chalcedony

Total specimens: 119

Cat. no. 484, 532, 534-535, 537, 542, 547, 550, 636, 790, 849, 859, 1127, 1129, 1131, 1134, 1139, 1146, 1159-1161, 1178, 1183-1187, 1190-1191, 1193-1198, 1202, 1204, 1295, 1297, 1304-1305, 1308-1309, 1312, 1314, 1316-1326, 1328-1329, 1331, 1333, 1336-1340, 1348-1349, 1373, 1399, 1419, 1422, 1524-1525, 1534-1535, 1556, 1564, 1575-1576, 1655-1657, 1661, 1668, 1682, 1686, 1691-1692, 1697, 1700, 1731, 1733, 1738, 1743, 1751, 1753, 1758, 1767, 1769, 1776-1777, 1784, 1797, 1802, 1812, 1821, 1832, 1853, 1860, 1870, 1881, 1883, 1897, 1909, 1911, 1970, 1997, 2007-2008

In order not to disperse the overall distribution data too much, carnelian, agate and chalcedony have been combined into a single category for analysis (see also jasper in Chapter 3.19).

Chalcedony is a mineral consisting of a cryptocrystalline variety of quartz formed by aggregates of microscopic fibres, which occurs in stalactite, as translucent and ceroid masses. However, it can also be found along river courses, streams, nalas and wadi, thus making it almost impossible to correctly identify a specific source (Vidale 2000, 42). Due to its common appearance, the material is widely used, although objects made of the highest quality agate are relatively rare. Agate/carnelian, and especially its red-orange varieties, is among the most widespread materials, and was often traded between India and the eastern coasts of Africa (Inizan 1993). In the Near East, deposits of agate/carnelian have been identified on the Iranian plateau (in the southern part of the Kavir desert), in the Lut flood plain (Hakemi 1997a, 15), in Shahr-i Sokhta, in the Helmand River delta (Tosi 1969, 374), in Baluchistan (Chagai, Kalat, Laki Trap), and in the Persian Gulf (al-Ghail and Bushire); in India the material is known from the Malwa, Deccan Trap and Sidhi-Mizapur sources located in the central and eastern parts of the Indian subcontinent (Law *et al.* 2013, fig. 1).

Objects made of agate/carnelian and chalcedony are particularly widespread in Gujarat (92 specimens from Dholavira, Bagasra, Nagwada, and Nageshwar), and a small number of specimens have been found in Lower Mesopotamia (eight in Susa and three in Telloh), and in the Haryana region (one in Farmana and four in Rakhigarhi). Based on the literature discussing the distribution of semi-precious stones in India, the Gujarat is widely believed to have been an important source for agate/carnelian during the second half of the 3rd millennium BC. This is due to the frequent occurrence and the high quality of the raw material in the area (Gujarat was also known as an important source during the Greek, Mughal and Early European colonial periods). Hundreds of agate/carnelian mining pits have been identified around the village of Ratanpur (the 'Rajipipla mines') dug into the Miocene conglomerate known as 'Babaguru Formation' in the Bharuch district of Gujarat (see bibliographical references in Law *et al.* 2013, 178). In addition, there are numerous other agate deposits in central and eastern Kutchh (Merh 1995, fig. 17): near the village of Khandek (probably used by the people from Dholavira), a source near Surkotada (5 km from the settlement), and on the island of Mardak (Dagala, Rapar, Adesart, Kherpur, Antarjal, Bhuvad, Khera, Khokari, Veratia, Khakhra, Latipur, Khijaria, Badanpur; see Law 2013, 320, fig. 1). Similarly, many sources are known from the north of Saurashtra province, between Kuntasi and Rangpur, and new sources are regularly identified south-west of Lothal, along the coast of the Gulf of Khambhat (Gogha, Badi, Lakhanka, Chhaya, Khamba, Hemal, Sokhda) and along the Narmada River (Amalijhar, Babaghor, Bhimbor, Dhamlaj, Dholkuva, Ratanpur, Miajipura, Simodra and Vasna; see Law 2006, fig. 1; 2013, 321, fig. 2).

The total lack of sources in Mesopotamia suggests that the specimens from Susa (Cat. no. 484, 532, 534-535, 537, 542, 547, 550, 636) and Telloh (Cat. no. 790, 849, 859) were produced locally (also based on their mass values which match the local weight system, and their morphology) from imported agate/carnelian from the Iranian plateau, the Persian Gulf and Gujarat. Detailed analysis to understand the exact origins of a number of these objects would be desirable. According to textual evidence (lexical lists, royal inscriptions and literary compositions), Sumer was supplied by the eastern sources of carnelian (*na$_4$gug*) or agate/chalcedony (probably Sumerian *na$_4$pír* or Akkadian *khulālu*) in Meluhha (= Indus) (Potts, T. F. 1994, 197, n. 173; *contra* Ratnagar's proposal on Makkan, see Ratnagar 1981, 39). The Mesopotamian lexical texts make particular mention of this type of stone as imported from Dilmun (Bahrain), Meluhha (Greater Indus), Marhaši (south-east Iran, Jiroft valley) and Gutium (Zagros highlands), while the literary texts mention carnelian originating from Meluhha and Aratta at Isin, Uruk and Lagash (Pettinato 1972, 74). The numerous beads imported from the Indus Valley, easily recognised because of the way they were manufactured (etched beads) and their morphology (long-barrel shaped), confirm a Harappan origin of the carnelian/agate found in Mesopotamia. Archaeological evidence confirms the manufacture of etched beads (a possible 'atelier'/workshop and unfinished specimens) in Lothal and Chanhu-daro, and the lack of evidence from Mesopotamia and Iran have further confirmed the Harappan origin of these objects. They are frequently found at Kalibangan (Possehl 1996, 154), Chanhu-daro (Mackay 1943, 199-202, pl. 79), Mohenjo-daro (Marshall 1931, pl. 146; Mackay 1938, pl. 135-138), Harappa (Vats 1940, pl. 128-132; Wheeler 1947, 123, pl. 51.14), Amri (Casal 1964, 155, fig. 122), Lothal (Rao 1962, 23, fig. 27.5) and Rojdi (Nanavati 1961-1962, 424-425). In Iran, five etched carnelian beads are known from Hissar IIIC (funerary context; Schmidt 1937, 229, pl. 35) and III (Schmidt 1933, 438, pl. 144c), one from Shah Tepe IIA (Arne 1945, pl. 76, 92, fig. 612, 615), one from Mundigak IV-3 (Casal 1961, fig. 138), two from VII, Tepe Yahya IVA (During Caspers 1972, 92), and unspecified numbers of specimens from Kalleh Nisar (Vanden Berghe 1970, 73; 1973, 28) and the Akkadian layers at Donjon-Susa (de Mecquenem 1943, fig. 84,7; Amiet 1986a, 144, 147-149, fig. 92, 100). Newer evidence can be found in D. K. Chakrabarti and P. Moghadam (1977, 167, fig. 10), where five new etched carnelian beads, without archaeological and stratigraphic information, are presented: three from Jalalabad (in the Fars region) and two from Marlik (in the north-western corner of the Iranian plateau, in the Elburz area). As stated above, outside of the Indus Valley and the Iranian plateau etched beads are well attested in Mesopotamia, with chronological homogeneity and a widespread distribution. There, the beads were found in contexts dating from Early Dynastic III to the Larsa periods. In Ur, they occur in graves dating from Early Dynastic III to Ur III (Woolley 1934, pl. 133; 1956, pl. 28), and at Asmar the beads belong to Early Dynastic III, the Akkadian and the Larsa periods (Beck 1933, 389; Frankfort 1933, 50; Frankfort *et al.* 1940, fig. 105). The two beads from Nippur stem from Ur III contexts (McCown *et al.* 1967, pl. 150,10), while the specimens from Kish (Langdon 1924, pl. XXIV,2; Mackay 1925, 56-57, 698-701, pl. X; 1929, 184-186) and Al-Hiba (Reade 1979, 8-23) date to Early Dynastic III. Etched beads are so far very rare in the Persian Gulf, with only a small number of specimens known from Umm-an Nar (During Caspers 1972, 92), Hili North Tomb A, and Ajman. The presence of a single etched bead in Ebla indicates their presence in the west, and extends their chronology to the mid-2nd millennium BC (Ascalone 2008a, tab. 4).

Similarly, the agate/carnelian found in Rakhigarhi (Cat. no. 1127, 1129, 1131, 1134) was probably imported from Gujarat *via* the Indus Valley (similar to the Harappan trade network in the Punjab region), the Hakra and the Ghaggar River, to finally reach the largest population centre of the Haryana region. Using this route, the carnelian/agate would have reached the major sites along the Indus Valley, namely Chanhu-daro, Mohenjo-daro and also the more distant Nausharo (Law 2005; 2013, fig. 12). Considering the carnelian/agate objects found in Mesopotamian contexts as imports from the Indus Valley, and Gujarat as the source of origin with subsequent diffusion in Sindh, Punjab and Haryana, one could suggest that carnelian was internationally traded around the mid-3rd millennium BC, with epicentres of activity in Kutchh and Saurashtra. This trade simultaneously satisfied an international market within the Greater Indus Valley, as well as an external market based on the needs of Mesopotamia and Susiana. Gujarat was therefore the driving force behind the diffusion of carnelian, which operated on, at least, three distinct levels: a local regional level, a macro-regional level involving the entire Indus Valley as far as the Haryana region, and an international level towards the maritime trade of the Persian Gulf as far as the coasts of the major ports of southern Mesopotamia, Khuzistan, Ur and Susa.

3.2. Alabaster

Total specimens: 5

Cat. no. 921, 926-927, 996, 1074

As I wrote in the introduction to this chapter, calcite, alabaster, marble and limestone must be considered one larger group, however it has been divided to follow the methodological line explained in Chapter 1.

All five alabaster finds collected for this research come from the Iranian plateau: three from the Jiroft valley (Cat. no. 921, 926-927), one from Tepe Yahya (Cat. no. 996), and one from Shahr-i Sokhta (Cat. no. 1074). The Jiroft specimens come from illegally excavated graves along the Halil valley and are without secure archaeological context. All of the specimens belong to the typology of handbag-shaped weights, which are mostly made of chlorite/steatite; the alabaster specimens therefore represent a typological variation to the 'traditional' one described in Chapter 2. The presence of alabaster objects on the Iranian plateau is easily explained by the large presence of mines in different areas (Ciarla 1979; 1981; 1985; 1990; Festuccia 2019; Sefidkhani 2019); numerous mines have been identified in Sistan and adjacent Afghanistan, including those of Malekh Siah Kuh near Zahedan, which are located about 120 km from Shahr i Sokhta, where deposits of calcite gravel and washed pebbles have been found; Chagai Hills in Afghanistan, approximately 280 km from Shahr-i Sokhta with secondary deposits of alabaster in the form of washed out marble-onyx pebbles appearing in flat terraces; and those of Kuh-i Khan Nashin in the Helmand basin in Pakistan, about 250 km northeast of Shahr-i Sokhta.

Considerable amounts of alabaster have also been recorded in the veins and secondary deposits of the eastern part of Kuh-i Birjand, which delimits the western side of the river-lacustrine and deltaic basin of Sistan, separating it from the Lut depression to the west. Also in that area, many low hills are made up of Tertiary and recent Quaternary sediments, particularly rich in materials with rounded pebbles from 15-25 cm to 50 cm in diameter. Sources of calcite are also relatively common in the basin of the lower Helmand, where the rock emerged due to exogenous agents such as tectonic movements. The constant flow of the river transformed large amounts of the raw material into pebbles. In the geological map of the area, Shahr-i Sokhta is located in a stony alluvial plain, where various types of sedimentary deposits are described, some of which are indicating the presence of washed pebbles. The large number of pebbles distributed across the site as well as the large-scale manufacturing of alabaster vessel is likely due to Shahr-i Sokhta's close proximity to natural alabaster deposits.

In Mesopotamia, alabaster (= *na₄giš-nux-gal* in Sumerian, *gišnugallu* in Akkadian; see Thompson 1981, 129) is mentioned in Gudea's texts, where the raw product is remembered as being imported from Tidānum, the mountain of Uringeraz and an unknown 'country of alabaster' (Pettinato 1972, 77).

3.3. Basalt

Total specimens: 47

Cat. no. 581, 610, 614, 1059, 1175, 1217, 1354-1355, 1376, 1468, 1709, 1712, 1720, 1729, 1734, 1744, 1748-1749, 1761-1762, 1765, 1796, 1825, 1827, 1833, 1840, 1847, 1852, 1868, 1882, 1885-1887, 1898, 1902, 1918, 1956, 1983-1984, 2014, 2025, 2034, 2036, 2038, 2045, 2056-2057

Particularly widespread in the western areas of the Near East, the material appears most common in Upper Mesopotamia, near the Taurus and Amano range, while rather sporadic in southern Mesopotamia and Susiana (only three specimens, Cat. no. 582, 611, 615). Only standard weights were made with basalt (duck-shaped weights in Susa and particularly cuboid weights in Dholavira), suggesting that the material was exclusively used for traditional balance weights, even larger ones, despite the difficulty of working the material (Cat. no. 1175, 1709, 1720, 1734, 1765, 1918, 1983, 1984, 2025, 2036, 2056-2057).

In the Indus Valley, black basalt was present in the Tobra boulder beds of the Salt range, in the Naggar Parker outcrops of southern Sindh, and in the Biwani region of southern Haryana. The presence of 44 basalt weights in Dholavira confirms the connection between Gujarat and Sindh and the Haryana region, with a reverse dispersion direction (from upper to lower Indus) to that of carnelian/agate/calcedony. This also suggests a diffusion of basalt in Gujarat in later periods: 18 of the 25 weights with chronological context were found in Periods V and VI of the Late Harappa phase (2100-2000 BC and 1950-1800 BC, respectively).

3.4. Bitumen

Total specimens: 9

Cat. no. 467, 477, 576, 578, 584, 586, 592, 594, 709

Bitumen occurs naturally between Luristan and Khuzistan, particularly in the Mamatain region, a few kilometres north of Behbehan. Bitumen was also found close to the Persian Gulf coast, near Kangan and Bushire, in southern Iraq, Failaka and in the main course of the Euphrates, at Mari. All eight bitumen weights were found in Susa, providing a historical narrative consistent with the identified sources (Amiet 1986a, 123-124; Connan/Deschesne 1996, 63-85). In Susa, bitumen was used for the local manufacture of various different artefacts, many of which were originally of foreign origin. Examples include bitumen copies of the chlorite vessels from Jiroft, as well as seals and weights (Ascalone 2008b, 355). Bitumen (*esír-a-ba-al* in Mesopotamian texts) was easy to obtain, as it is often found emerging from the subsoil. Without requiring a lot of effort or costs related to obtaining the material, Susa's bitumen seems to have been Gujarat's clay: a cheap, low-quality material used to produce local copies of exotic artefacts, or to make objects controlled by the royal or commercial official elite such as weights. The easy retrieval, extraction and processing, which did not require an expert stone-cutter's labour, suggests individual production by the less wealthy classes of Susian society. Similar to the clay weights of Gujarat, it could be suggest, that a private (family) or commercial circuit of very short range (probably of urban extent) existed alongside the institutional/official system and the international trade. In this historical perspective, the study of bitumen weights can provide a stratified insight into Susian society, shifting the attention from a comparative 'horizontal' metrology to a 'vertical' social model, which allows the investigation of *intra-situ* social aspects rather than (just) the wider external ones.

All the bitumen weights from Susa are reproductions of standard shapes (duck-shaped and ovoid with flat ends) and seem, although mostly damaged, to follow the indigenous weight system. The only exception is Cat. no. 709 which has the same hemispherical shape as the copper ingots from the '*Vase à la cachette*', whose mass might correspond to half a Dilmunita mina or, more likely, to a local wool mina as known from the texts of the Early Dynastic III/Akkadian period (Bartash 2019, 136-137) and the Dudu inscribed weight (see Paragraph 4.1.2.4).

3.5. Generic stone

Total specimens: 261

Cat. no. 3-4, 8, 11-13, 18, 20-22, 25-26, 30-31, 35-36, 38-39, 44, 48-50, 55, 57, 63-64, 67, 70, 76-80, 82, 85-86, 88, 91, 94-95, 98, 100, 103-106, 108-112, 118, 126-127, 130, 135, 140, 144-145, 148, 156, 160, 162, 169, 174, 178, 181, 184, 190, 194, 198-199, 201, 204, 206, 208-209, 211, 213-214, 217, 223, 229, 232, 234-235, 245, 247-248, 252-253, 262, 300, 304, 309, 315, 325-326, 336, 341, 346, 366-367, 379, 386, 398, 402, 431, 437, 445, 455, 458, 461, 465, 468, 470-471, 473, 475, 481, 492, 495, 505-506, 508, 510, 514, 516, 521, 543, 564, 573, 577, 583, 661-663, 665-671, 674-679, 681, 684-685, 687, 690, 692-694, 696-697, 699-700, 720-726, 731, 733-734, 749, 797, 1067-1070, 1072, 1077, 1114, 1117, 1158, 1167, 1173, 1201, 1209, 1212, 1216, 1310, 1313, 1327, 1341, 1343, 1415, 1437, 1453, 1470, 1472, 1478, 1481, 1485, 1492, 1500, 1502, 1537, 1542, 1545-1546, 1558, 1562, 1570-1571, 1574, 1577, 1580, 1583, 1591, 1594-1598, 1715, 1750, 1757, 1818, 1830, 1836, 1839, 1851, 1876-1878, 1889, 1891, 1895, 1924-1925, 1932, 1938-1940, 1943, 1952, 1977, 1999, 2001, 2010-2012, 2017, 2020-2023, 2026, 2029, 2031-2032, 2037, 2046, 2049-2050, 2052-2054

This category includes all specimens that have been identified as 'stone', without any further analysis. Most of the specimens are sedimentary rocks, whose mineralogical origin has not been identified.

3.6. Bronze/copper

Total specimens: 37

Cat. no. 565, 574, 710-719, 1368, 1372, 1374, 1393, 1404, 1420, 1427, 1511, 1527, 1565, 1664, 1666, 1669, 1675-1676, 1679, 1699, 1704-1706, 1745, 1760, 1768, 1829, 1841

Thirty-seven weights and ingots were made of copper or bronze. Of these, unfortunately, only the ingots from the '*Vase à la cachette*' were subject to metallographic analysis, thus confirming their identification as copper objects. Considering the far distance of tin sources, it could be suggested that all metal weights, including the Dholavira specimens (Cat. no. 1368, 1372, 1374, 1393, 1404, 1420, 1427, 1511, 1527, 1565, 1664, 1666, 1669, 1675-1676, 1679, 1699, 1704-1706, 1745, 1760, 1768, 1829, 1841), were likely made of copper extracted from nearby sources.

There is plenty of evidence for tin in Iran and Central Asia, and a large number of mines have also been identified in Afghanistan (Borofka/Parzinger 2003, 7), Uzbekistan, Tajikistan, Kazakhastan (Weisgerber/Cierny 2002; 2003) and on the central Iranian plateau (Cleziou/Berthoud 1982). Similarly, archaeological evidence for copper smelting has been found on the Iranian plateau, which dates back to as early as the 5th millennium BC at Tepe Ghabristan (Madjidzadeh 1979) and Tepe Hissar (Pigott *et al.* 1982, 222-224), and continued until the 3rd millennium BC. Similar evidence is also known from Tepe Hissar, Shahr-i Sokhta, Tepe Yahya, Tal-i Iblis and Tall-i Malyan. Surprisingly, however, the bronze artefacts found in Iran are completely lacking tin, which appears not to have been used by people living close to the source, but was rather traded to Mesopotamia; the lack of tin in the bronze artefacts from central and eastern Iranian highlands at Shahr-i Sokhta (Hauptman 1980), Shahdad (Hakemi 1997a) and Tepe Hissar (Pigott 1989, 32) has been explained as a deliberate technological conservatism

(Pigott/Stech 1986; see also Helwing 2009, 213-214). In Mesopotamian epigraphic sources, tin (*AN.NA* or *annaku*) is first mentioned in Early Dynastic II/III Fara texts, indicating the refined metal was being used for alloying (at a ratio of 6 : 1 copper to tin; Moorey 1985, 18-19). The literary texts from Mesopotamia claim that tin came from and around Aratta (Wilcke 1969, 415; Jacobsen 1987, 17-19), Makkan (Hymn to Ninurta; Cohen 1975, 28 l, 144) and from Hamrin (Muhly 1973, 288, n. 341), while the royal inscriptions explicitly refer to Meluhha (in Cylinder-shaped B of Gudea in Pettinato 1972, 82), Shimashki and Zabšali (in Shu-Sin inscriptions; Kutscher 1989, BT4 v. 9-13). Anshan is also mentioned in the texts of Shulgi (Davidović 1984, 186-200) and Dilmun in NeoSumerian administrative texts (Leemans 1960, 161). Archaeologically, however, there is no evidence suggesting that Harappa controlled the tin trade; instead, the presence of a Harappan colony at Shortugai might actually suggest the destination of the raw materials, rather than indicate control over a wider trade system involving Mesopotamia and the Persian Gulf.

Copper ores are common in the Near East, and many sources were exploited in antiquity. The major sources in the Near East have been identified in the Anarak district (Berthould *et al.* 1982, 41), in the Tepe Sialk region close to Tepe Yahya and Tal-i Iblis (Potts, T. F. 1989; 1994, 145-151), in Sistan, Baluchistan, around Shahdad (in the modern sites of Badamu, Darbinai, Guru, Surkha, Bandar Hanza, Sang-e Esha, Acoros Marghi, Bahresman, Gerdukulu, Daralu, Panegeen, Tal-e Madan), and in the mining complex of Veshnoveh (Piggot 1989, 78-79; Steinkeller 2013, 309, n. 104; 2016, 130). More than 100 native copper mines were also explored in Oman (Ratnagar 2004, 121), particularly during the 3rd millennium BC, to such an extent that it led to intense contact with Lower Mesopotamia, which exported textiles and wool. This import-export activity between the two regions, particularly intense from Early Dynastic II until the Old-Babylonian period, must have determined, and conditioned, the adoption of local weight systems in Oman (= Makkan) that might have been connected to the so-called wool mina, known from archaeological evidence and epigraphic documentation in Mesopotamia (1 Dilmunite mina = 2 Mesopotamian wool minas = 1 Harappan mina). In this historical context, copper ingots from Susa (Cat. no. 710-719) should be considered as evidence for exchange activities based on weighing, where copper ingots were exchanged with wool (and textiles) according to the standards of the wool mina of *c.* 670 g (see Paragraph 4.1.2.4). The cuboid and parallelepiped weights from Dholavira are significant, as together with the two duck-shaped specimens from Susa (Cat. no. 565 and 574) they provide evidence for the specific types of copper weights (other than ingots) that were in use. In the Indus Valley, ancient smelting sites in the rich Kedri belt of northern Rajasthan suggest that this area was one of the major sources of Harappan copper (Agrawala 1984). The copper used to make Dholavira weights, however, may have come from known deposits in Gujarat itself: one near Banejnes in southern Saurashtra (Shekar/Mukul 1969), and another in the Vadodara district (eastern Gujarat) near Khandia (Shah *et al.* 1985), although a recent study has proposed its origin as the deposits of Ambaji-Deri, in the Banaskatha district, on the border to Rajasthan (Law 2013, 334).

In terms of archaeological evidence, there are multiple excavation reports describing copper/bronze artefacts. Data were collected from Mohenjo-daro (440 copper/bronze objects in Marshall 1931, 488-508; Mackay 1938, 441-494), Harappa (Vats 1940, 383-391), Chanhu-daro (Mackay 1943, 174; a further 521 objects are in the possession of the Boston Museum of Fine Arts, published in Miller, H. J. 2000), Lothal (*c.* 1,500 copper/bronze objects in Rao 1979, 520; 1985; due to corrosion and fragmentation, only a few hundred of those objects could be identified), Surkotada (129 objects in Joshi 1990, 266), and Kalibangan (27 objects in Lal *et al.* 2003 and Agrawal *et al.* 1981). Further material from different sites, such as Dholavira, Kuntasi, Farmana, was recently published (Chakrabarti/Lahiri 1996; Agrawal 2000; Hoffman 2018, 252). Compositional analysis via SEM-EDS (scanning electron microscope-energy dispersive spectroscopy) was carried out on 467 samples from Mohenjo-daro, Dholavira, Harappa, Lothal, Chanhu-daro, Kalibangan, Rangpur, Surkotada, Navinal, Kuntasi and Farmana (Hoffman 2018, tab. 1).

Given the thousands of copper/bronze objects from Mohenjo-daro (Marshal 1931, 488-508; Mackay 1938, 441-494) and Harappa (Vats 1940, 383-391), it seems surprising that no objects were classified as weights. The objects identified included axes, spear and lance heads, arrows, knives, daggers, swords, razors, sickles, saws, chisels, awls, drills, needles, fish hooks, hooks, spatulae, bolts, scale pans and beams, plummets, mirrors, various ornaments, beads, bracelets, earrings, finger rings, buttons and vessels – many different typologies, but no weights.

Similar to tin, there is extensive evidence for copper sources in the economic, royal and lexical texts of 3rd millennium BC Mesopotamia. According to these cuneiform sources, the Bronze Age copper mines were located at Dilmun (Englund 1983, 87; Potts 1990, 86, n. 111), Makkan (Pettinato 1972, 152; Heimpel 1987, n. 48) and Meluhha (Leemans 1960, 161). The royal inscriptions further mention the sources of Kimaš (Jacobsen 1987, 408), while the toponomy of Aratta is only cited in lexical texts (see Röllig 1983, 346).

Ancient Near East studies lay a particular focus on copper due to its use as a currency between the end of the fourth and the third quarter of the 3rd millennium BC, before it was replaced with silver, as evident from Early Dynastic IIIb, Sargonid and Neosumerian texts. Alongside barley, which was used as a cheap form of money throughout the 3rd millennium BC (Powell 1990), copper, which was traded between Mesopotamia and Oman as early as the Early and Middle Uruk periods, was used as a medium of exchange in the Early Dynastic period. In the Early Dynastic I-II texts from Ur and Shuruppak, copper (*uruda*) is the earliest metal that bears witness to the use of weight metrology in Lower Mesopotamia. Older evidence from Uruk III, dating to the Jemdet Nasr period, shows that about a quarter of all copper from Sumer came from Oman, suggesting the presence of other sources in Iran and Anatolia. According to these texts, copper was measured in *ma-na* and appears to be the earliest material recorded in weight measures; the signs *URUDA(ZADU602)* appear frequently in administrative and lexical texts describing the counting of animals, personnel and various food products dating to the Late Uruk period. Sale contracts, however, are only known from the Early Dynastic period, when Shuruppak texts unequivocally show the use of copper as money in the second quarter of the 3rd millennium BC (Powell 1979; Bartash 2019, 174). In this period, there are several terms for copper used as money: in particular, Ni_3-UD^{uruda} (a term describing a certain quality of copper) was used as money for the sale of fields, houses and slaves, and, with barley and silver, was one of the monies issued from a central household (Bartash 2019, 175-177). In Early Dynastic IIIb, there is a slow, gradual but irreversible change, during which copper was replaced with silver in Mesopotamia's accounting texts. During Early Dynastic IIIb, the use of silver (Ku_3-*babbar*) as money is also known from the Umma state and attested in the Shuruppak texts; during the subsequent Sargonid period, no examples of copper as money are recorded.

In the absence of epigraphic sources from Meluhha, it is difficult to suggest the use of copper as an exchange currency in the Greater Indus Valley. The discovery of a copper hoard inside a pottery vessel (jar 277) from Harappa (Vats 1940, 89-90), however, together with the numerous copper ingots found in Lothal, open new research perspectives on the causes and modalities of the use, hoarding, exchange and value of copper in the Indus Valley during the second half of the 3rd millennium BC.

3.7. Calcite/limestone

Total specimens: 383

Cat. no. 9-10, 15, 47, 84, 107, 113, 132, 134, 142-143, 146-147, 149, 164, 166-168, 170-173, 175-177, 180, 186, 188-189, 191, 193, 195-197, 202, 210, 212, 218-222, 226-227, 230-231, 233, 236-244, 255-261, 263, 351, 374, 384, 418, 434, 446-447, 457, 466, 469, 474, 476, 478, 482, 499, 502-503, 507, 511, 515, 518, 524-526, 530, 551, 556, 588, 590, 598-599, 601-604, 607-608, 616-617, 633-634, 639-654, 656-660, 664, 672-673, 682, 688, 695, 727, 747-748, 750-752, 768-769, 775, 781, 785, 792, 799-808, 812-813, 819, 821, 823, 836, 838, 843-845, 851-857, 860-861, 863-868, 871, 883, 924-925, 928, 936, 941-942, 944-946, 950, 954-958, 960-961, 963-965, 967-968, 970-976, 978-980, 982, 987-989, 995, 1001, 1066, 1071, 1073, 1075, 1078-1104, 1107-1110, 1112, 1115, 1118-1122, 1136-1138, 1140-1141, 1143, 1147-1156, 1172, 1176, 1211, 1213-1214, 1275, 1278-1279, 1282-1284, 1293, 1306, 1346, 1350, 1352-1353, 1389, 1432, 1445, 1455, 1461-1462, 1465-1466, 1469, 1477, 1480, 1489, 1491, 1493, 1495-1499, 1501, 1504-1505, 1536, 1567, 1578, 1592, 1600-1607, 1688, 1714, 1728, 1739, 1741, 1756, 1764, 1772, 1774, 1811, 1815-1816, 1843, 1894, 1896, 1903, 1914, 1919, 1922-1923, 1928, 1931, 1933-1934, 1936, 1944, 1953-1955, 1957-1958, 1965, 1968-1969, 1971-1973, 1975-1976, 1978-1980, 1985, 2005, 2013, 2015, 2033, 2040-2041, 2051, 2055

The use of calcite, alabaster, marble, gypsum and limestone is a characteristic of the three major regional poles investigated in this study (Lower Mesopotamia, Iranian plateau and Indus Valley). These calcareous sedimentary or altered sedimentary rocks (limestone and marble) and secondary mineral formations (calcite and gypsum) are widespread in Mesopotamia (180 specimens), the Iranian highlands (83) and in the Greater Indus Valley (123), although the calcium-based stones also continue across the Iranian highlands and into Arabia. Unfortunately, scientific analysis of the so-called common stones exploited in the Near East has not yet provided reliable criteria for source provenance identification. Their use is very diverse, from seals to tools, from stelae to loom and balance weights, from statues to sculptures, both in Mesopotamia and the Indus Valley. Only with the beginning of the Akkadian period in Mesopotamia can significant changes be identified: for the first time, hard rock igneous/metamorphic stone (mainly diorite) become the standard for new royal sculptures.

3.8. Vesuvianite

Total specimens: 1

Cat. no. 1920

Vesuvianite or idocrase is a mineral, a sorosilicate that crystallises in metamorphic rocks rich in calcium. Only one specimen (Cat. no. 1920) was identified by R. S. Bisht during his excavations in Dholavira. Some vesuvianite sources have been identified in the Malakand and Mohamand districts (Kazmi/Jan 1997, 286) and in the village of Taleri Mohammed Jan in the southern part of Baluchistan's Zhob area (Law 2005, 184).

3.9. Soapstone/softstone/sandstone

Total specimens: 66

Cat. no. 1207, 1210, 1215, 1268, 1281, 1330, 1342, 1347, 1387, 1396, 1429, 1440, 1444, 1446-1448, 1454, 1459, 1463, 1467, 1475-1476, 1479, 1483-1484, 1486, 1488, 1490, 1494, 1533, 1553, 1559-1560, 1566, 1568, 1572, 1586, 1589, 1593, 1596, 1599, 1742, 1752, 1763, 1775, 1789, 1813, 1831, 1835, 1837-1838, 1850, 1899, 1916-1917, 1926-1927, 1929, 1948, 1951, 1966-1967, 1986, 2004, 2016, 2042

In archaeology, the terms 'soapstone', 'softstone' or 'sandstone', are often used to indicate soft chalky or calcareous materials that can easily be worked. It is evident that the subjective knowledge of the individual archaeologist who studied the material has often been decisive; for this reason, compare the methodological premises made above and the generic terms.

Soapstone specimens are exclusively known from Gujarat, specifically from the sites of Dholavira (67 specimens), Bagasra (2) and Shikarpur (1).

3.10. Chert

Total specimens: 170

Cat. no. 159, 207, 538, 635, 766-767, 770, 773, 777, 782, 791, 794-795, 798, 846, 870, 1065, 1076, 1128, 1130, 1132-1133, 1135, 1142, 1157, 1164-1166, 1170, 1174, 1177, 1180-1182, 1188, 1200, 1280, 1298, 1315, 1332, 1334, 1503, 1538, 1651, 1658, 1665, 1667, 1670-1672, 1674, 1677, 1681, 1683-1684, 1687, 1689-1690, 1698, 1701, 1710-1711, 1716-1719, 1721-1727, 1732, 1735, 1737, 1740, 1746-1747, 1754-1755, 1759, 1766, 1773, 1778-1783, 1785-1786, 1791, 1793, 1795, 1798-1801, 1804-1806, 1808, 1810, 1814, 1817, 1819-1820, 1822, 1824, 1826, 1828, 1834, 1845, 1848-1849, 1854-1859, 1861-1867, 1869, 1871-1873, 1875, 1880, 1888, 1892-1893, 1901, 1904-1908, 1910, 1912-1913, 1921, 1930, 1935, 1941-1947, 1949-1950, 1959-1964, 1974, 1981-1982, 1998, 2018, 2048

In addition to sporadic specimens from Susa (4), Telloh (12) and Sistan (Shahr-i Sokhta, two specimens), chert was widely used throughout the entire Greater Indus Valley, with specimens found in Rakhigarhi (5) and Farmana, in the Ghaggar River basin, Nagwada (1), Shikarpur (3), Bagasra (7) and Dholavira (134) in Gujarat. Out of 165 known chert balance weights, 149 specimens come from the Greater Indus Valley. Along the Indus, chert is a very common material for lithic industries. The material's wide distribution and the strong standardisation of chert objects suggest distribution and trade on a large scale.

Harappa's primary chert sources during Period 3 are the extensive beds of the Rohri Hills of Sindh, the Tochi River in the Barzai region in Waziristan, and the Salt range in Punjab (close to Rahman Dherii, *c.* 150 km from Harappa) (Kenoyer 1995, 218-219, fig. 6). The omnipresence of chert objects in all the excavated areas in Harappa suggests that large quantities of the raw materials were transported to the major settlements to fulfil the needs of densely populated centres such as Dholavira. Other chert sources have been identified in northern Baluchistan, close to the Bolan River near Mehrgarh (Inizan/Lechevallier 1990, 52). Another variety of this material is the so-called black chert, which was in the past used as an indicator of Kot Dijian levels in archaeological excavations in Harappa (Dales/Kenoyer 1991). This variety also occurs in Baluchistan and can be found in the earlier layers of Harappa, during the Ravi phase (Period 1, 3300-2800 BC), thus suggesting an early date for standardised lithics production.

Whilst it was possible to collect chert from riverbeds downstream of source areas, to ensure reliable quantities of good quality stone, it was necessary to travel directly to, or at least close to the source.

3.11. Chlorite/steatite/serpentinite

Total specimens: 103

Cat. no. 19, 52, 138, 179, 192, 200, 215, 265, 433, 497, 504, 512, 631, 725, 761, 787-788, 811, 816, 818, 820, 822, 831, 850, 869, 873, 888-920, 922-923, 938-940, 947-949, 951-953, 981, 983-986, 990, 992-994, 996-1000, 1009, 1012-1013, 1060-1064, 1171, 1189, 1208, 1276, 1344, 1426, 1431, 1516, 1529, 1584, 1771

Due to the long archaeological tradition of studying the production of vessels and handbag-shaped weights from Jiroft, which for a long time have been considered to derive from intercultural relationships between the Iranian plateau, the Arab costs of the Persian Gulf and Lower Mesopotamia, chlorite, steatite and serpentinite have been studied extensively (Kohl 1971; 1975a; 1975b; 1976; 1977; 1978; 1979; 1982; 2001; Lamberg-Karlovsky 1972a; 1972b; 1988; Lamberg-Karlovsky/Tosi 1988). P. de Miroschedji (1973) divided the chlorite vessels from Susa into a '*serie ancienne*' (or 'Intercultural Style' following Kohl's terminology) and a '*serie récente*', without consideration of south-eastern Iranian production. It was only with the recent discoveries made along the Halil valley and the excavations of Konar Sandal that an epicenter of production in the Jiroft valley could be confirmed with certainty (Madjidzadeh 2003a; 2003b; 2008; Piran 2012). Before the discoveries in Jiroft in 2003, numerous chlorite objects were found in the major sites of Mesopotamia (see Chapter 2.10 with bibliography) and also in the more peripheral western areas, thus confirming the commercial value of this production (more than 20 fragments were also found in Mari, during A. Parrot's excavations at the Temple of Ishtar, Ishtarat and Ninni Zaza, and Shamash and the Pre-Sargonid Palace; see Parrot 1956, 113, pl. XLVI-LI; 1967, 180-182, fig. 226-228, pl. LXXI; 1974, 42-43, fig. 11-12).

Most of the chlorite/steatite objects come from the Iranian plateau, in particular from the Jiroft valley, where 66 of the 103 specimens were found. They are less common in Gujarat (only ten specimens were found in Dholavira), despite the extensive documentation from excavations of the major occupation sites along the Indus Valley (for the latest reports see Kenoyer 1997, 269; Vidale/Bianchetti 1997). Steatite disc beads, inscribed tablets and seals are very common in Harappa, where steatite was widely used during all periods; thousands of raw steatite debris fragments and unfinished objects have been discovered throughout the sites of Harappa and Mohenjo-daro. The steatite originating from the main sites of the Indus Valley (including the Rakhigarhi evidence where the residents formed part of the distribution network) was acquired from sources located in what is now northern Pakistan, primarily from the Hazara district (Law 2002; 2011; Nath *et al.* 2014, 76, fig. 1). Other deposits have been identified in Baluchistan (Muslimbagh, near Mehragarh and Nausharo), and in northern and southern Rajasthan.

In Mesopotamia, chlorite/steatite was only present in small numbers (14 specimens from Susa, 12 from Telloh) and was likely imported from the easternmost areas. The large presence in Jiroft (including Tepe Yahya) fits well within a broader historical picture related to the artefacts previously described (see also Paragraph 2.10), and is explained by the recent discoveries of chlorite deposits in two different areas of the region: the Darreh Rud and Bagh Borj deposits in the southern part of the Halil valley, the latter of which is located at an altitude of 2500 m on the rocky massif overlooking the unexplored site of Tom-e Ali Hosseini (Pfälzner/Soleimani 2015, 135-136).

3.12. Diorite

Total specimens: 32

Cat. no. 34, 54, 65, 69, 75, 237, 378, 397, 472, 479-480, 585, 589, 591, 593, 595-597, 600, 605-606, 609, 611-613, 615, 655, 683, 728, 810, 814, 887

Diorite is an intermediate intrusive rock, chemically and mineralogically between granite and gabbro. Diorite was a particularly valuable material that seems to have been widespread in Mesopotamia, but less so in the areas where it was extracted and in the Greater Indus Valley. As the material is difficult to work, requiring specially skilled stoneworkers, and had to be obtained from far distant sources, diorite was considered a luxury good in Mesopotamia, and often used by royalty. Diorite seems to become fashionable with the ride of the Sargonid dynasty, and was particularly popular during the subsequent Gudea period and the Third Dynasty of Ur. Its importance is further confirmed by the royal statues and stelae from Sargon to Ibbi-Sin (*c.* 2335-2004 BC), all of which were made from diorite, and the numerous bowls bearing inscriptions of Mesopotamian kings dated to the end of the 3rd millennium BC (particularly on Rimush's bowl, in which the Akkadian king remembers himself as 'king of Kish and conqueror of Elam and Parakhshum'; see Sollberger 1965, 25). Diorite weights are only known from Lower Mesopotamia, specifically from Susa (29 specimens), Telloh (2) and Ur (1). Their complete absence from the Iranian plateau, the Indus Valley, from Haryana and Gujarat, seems to confirm the focus of the Mesopotamian market on this type of stone.

Diorite (*na$_4$esi* in Sumerian and *ušû* in Akkadian) appears to have played a fundamental role in the rhetoric of royal propaganda. The use of diorite coincides with the formation of the first large scale kingdoms (Akkad-Gudea-Ur III), perhaps unsurprisingly as its hardness guaranteed optimal conservation over the centuries. This would ensure eternal memory of the sovereign and perpetuate their greatness over the years. The relationship between diorite and sovereignty is well documented in Gudea's royal inscriptions. Here, the sovereign celebrates diorite for its brightness, durability and distant origin (Falkenstein 1959). In Mesopotamian texts, references to diorite almost always mention the country of Anshan (also Erikhum) and Makkan (= Oman): Akkadian king Manishtusu is remembered for cutting the diorite from the mountains (= Oman or Marhaši) beyond the Lower Sea (= Persian Gulf), and loading the loot onto the ships that later docked at the port of Akkad to allow the working of a new statue of him (Thureau-Dangin 1907, 166, II,9-10). Towards the end of the dynasty, Naram-Sin celebrated the same feat in Oman, where he took Manium, the lord of Makkan, prisoner, and a large quantity of diorite was used to erect a statue dedicated to the god Enlil (Pettinato 1972, 60).

Alongside the textual evidence, the most recent archaeological investigations have helped to identify the main sources of diorite extraction; in addition to Oman, new deposits have been identified along the lower valley of the Halil River, in southeastern Iran, and at the Band-e Ziyaret mountains where, near the city of Qal'eh Ganj, a black-greyish diorite deposit was identified in the form of several large outcrops.

3.13. Waagenophyllum

Total specimens: 1

Cat. no. 937

Waagenophyllum is a Permian dark grey limestone, rich in white fossil colonial tetracorals. It is named after the German geologist and palaeontologist Wilhelm Heinrich Waagen (1841-1900), who was active in India from 1870 to 1875 (Desset *et al.* 2016, 74-75). This peculiar material was widely used anywhere between the Indus Valley, eastern Iran, the eastern coasts of the Persian Gulf, and inner Oman. Other objects made of this type of limestone with white fossil inclusions include a bead from Shahr-i Sokhta (Piperno/Salvatori 2007, 216, fig. 478, n. 6687), a mace-head from Shahi-Tump (Besenval 2005, 3, fig. 8), a bowl from Jiroft (Piran 2013, 53, n. 9975), and a BMAC/Oxus column, three bowls, one container from Shahdad (Hakemi 1997a, no. 0546, Grave 060; 2475; 3157, Grave 263; 3342, Grave 277; 3855, Grave 319). Outside of Iran the material was used for a Telloh vessel (Desset *et al.* 2016), a weight from Mohenjo-daro (Mackay 1938, pl. CXI,61), three weights from Harappa (Vats 1940, no. 26-28), two from Lothal (Rao 1985, pl. CCCVIII,3.5, 6 and 8, CCLIX,A), a bowl from Failaka (Høilund/Abu-Laban 2016, fig. 773, n. J4-x37) and a vessel from Tarut (Al-Ghabban/Franke-Vogt 2010, 193, n. 42).

A single weight was found in Konar Sandal (Cat. no. 937; Ascalone 2020, fig. 12), which confirms the wide distribution of this material between Lower Mesopotamia, the Iranian plateau and Gujarat. The hemispherical type found in Konar Sandal seems to be specific to the Harappa civilisation; it also appears in the excavation reports of Lothal (Rao 1985, pl. CCCVIII,3.5, 6 and 8, CCLIX,A), Mohenjo-daro (Hemmy 1938a, pl. CXI,61) and Harappa (Vats 1940, no. 26-28).

3.14. Gabbro

Total specimens: 7

Cat. no. 1416, 1473, 1588, 1736, 1788, 1803, 1823

All the gabbro weights collected for this research come from Dholavira. At present it is unclear whether this is due to the expert geological knowledge of the excavator R. S. Bisht, thus allowing him to identify this specific basalt variation with certainty, or whether this material was in fact completely unknown at the other sites in the Indus Valley, Iran and Lower Mesopotamia. Gabbro outcrops have been identified along the lower Halil valley, on the western side of the Band-e Ziyaret mountains close to the Iranian coast of the Persian Gulf (Pfälzner/Soleimani 2015, 135); some studies suggest that sources for igneous rocks such as basalt and gabbro existed in Gujarat during the Harappan period (Law 2013, 337), suggesting that they were used both in an 'international' market and also for a local exchange network.

3.15. Granite

Total specimens: 6

Cat. no. 163, 165, 225, 228, 453, 1474

In the Indus Valley, granite likely came from the Tobra boulder beds of the Salt Range (Shah 1980, 12), the Nagar Parker outcrop in southern Sindh (Jafry/Ahmad 1991), or the Biwani district in Haryana (Eby/Kochhar 1990). Five of the six specimens come from Susa, only one (Cat. no. 1474) was found in Dholavira in Late Harappan contexts.

3.16. Gypsum

Total specimens: 3

Cat. no. 539, 1703, 1915

There are only three known specimens made of gypsum, all of which are heavily damaged, likely due to the softness of the material. Based on the shapes (cubic and duck-shaped), however, the three objects (one from Susa and two from Dholavira) must be considered balance weights.

Gypsum is often cited in Mesopotamian epigraphic sources (*mi-babbar$_x$-ra* in Sumerian and *gassu* in Akkadian) as originating from the unidentified country of *khur-sag-zalag-zalag*, and as imported into Sumer, particularly to Lagash during the Gudea period (Pettinato 1972, 78).

3.17. Hematite

Total specimens: 415

Cat. no. 1-2, 5-7, 14, 16-17, 23-24, 27-29, 32-33, 37, 40-43, 45-46, 51, 53, 56, 58-62, 66, 68, 71-74, 81, 83, 87, 89-90, 92-93, 96-97, 99, 101-102, 114-117, 119-125, 128-129, 131, 133, 136-137, 139, 141, 150-155, 157-158, 161, 182-183, 185, 187, 203, 205, 224, 246, 249-251, 254, 264, 266-299, 301-303, 305-308, 310-314, 316-324, 327-335, 337-340, 342-345, 347-350, 352-365, 368-373, 375-377, 380-383, 385, 387-396, 399, 401, 403-417, 419-430, 432, 435-436, 438-444, 448-452, 454, 456, 459-460, 462-464, 483, 485-491, 493-494, 496, 498, 500-501, 509, 513, 517, 519-520, 522-523, 527-529, 533, 536, 540-541, 544-545, 548-549, 552, 554-555, 557, 562-563, 566-572, 575, 579-580, 582, 587, 618-630, 632, 637-638, 680, 686, 689, 691, 701-708, 721-724, 729-730, 732, 735-746, 753-757, 759-760, 762-765, 771-772, 774, 776, 778-780, 783-784, 786, 789, 793, 796, 809, 815, 817, 824-830, 832-835, 837, 839-840, 842, 847-848, 858, 862, 872, 874-882, 884-886, 943, 1010, 1563, 1884, 2003

In Mesopotamia, hematite was commonly used for the manufacture of balance weights from the mid-3rd millennium BC, and, from the beginning of the 2nd millennium BC, for the production of cylinder-shaped seals (Moorey 1994, 84). Both balance weights and seals were also made of goethite (an iron hydroxide, recognisable by its characteristic yellow-brown smear) and magnetite (a ferric oxide or ferrous-ferric oxide that crystallises in the mono-metric system). Deep black in colour, hematite has a glossy, metallic shine. The distinction between the different materials is usually based on the colour (black for hematite, yellow-brown for goethite and red for magnetite), as usually it is not possible to sample the objects for diffractometric analysis.

Hematite is a material that helps to identify an object as a balance weight; with the exception of cylindrical specimens (Cat. no. 680, 686, 858), which could theoretically be unfinished cylinder-shaped seals, all other hematite objects should be considered balance weights. The source of the hematite imported into Mesopotamia is still uncertain. According to Egyptian Pharaonic texts, these source areas could be Sinai-Negev and the eastern Egyptian desert (Wadi Abu Gercida, Gebel Abu Marwat, Wadi Dib and Wadi Saga), and other sources have been identified in Central Taurus and northern Syria (Lucas 1962, 395; Nicholson/Shaw 2000, 38). Only three hematite weights come from Dholavira (Cat. no. 1563, 1884, 2003), one of which is cuboid-shaped. Two further 'potential weights' were found at Tepe Yahya (Cat. no. 943, 1015), the mass values of which allow the determination of the Mesopotamian shekel counted at 8.40 g and 8.22 g respectively (see Chapter 5). All 410 other specimens come from Lower Mesopotamia (Susa, Larsa, Telloh and Kish), thus confirming the diffusion of this material mainly in western contexts.

3.18. Hornblende

Total specimens: 5

Cat. no. 1413, 1807, 2019, 2028, 2030

This specific material likely originates from the same sources as other volcanic rocks such as basalt and diorite. Only five specimens could be identified, all from the excavations of Dholavira (Cat. no. 1413, 1807, 2019, 2028, 2030).

3.19. Jasper

Total specimens: 21

Cat. no. 546, 558-561, 698, 758, 1179, 1192, 1199, 1300, 1418, 1457, 1509, 1515, 1702, 1844, 2000, 2027, 2043-2044

Due to similar compositions (microcrystalline silicates), the sources of jasper are likely to be found in the same mining areas as agate, chalcedony and carnelian (see above), particularly in Kutchh and Saurashtra (Gujarat). Recent surveys have identified sources of yellow jasper from amygdaloidal basalts in the Jamnagar district in the Saurashtra region, specifically near the village of Khokhari; in microcrystalline silicates in the Khandek agate source; and on Mardak Bet island, where numerous jasper flakes were found (Law 2013, 324-327, fig. 4c-d, 6). Although only one specimen was discovered at Bagasra (Cat. no. 1179), the excavations carried out in the settlement uncovered whole raw blocks in a storage vessel (Bhan *et al.* 2004). The presence of jasper in Susa (six specimens) and Larsa (one specimen), and textual evidence from Mesopotamian texts dating to the 3rd millennium BC, suggests commercial activities along the Persian Gulf which allowed the people of Lower Mesopotamia to come into contact with Dilmun (Bahrain), Meluhha (Greater Indus Valley), and Marhaši (south-east Iran, Jiroft valley), from where agate and jasper were exported.

3.20. Marble

Total specimens: 9

Cat. no. 216, 400, 531, 553, 1105-1106, 1111, 1113, 1116

Marble should be considered as part of the same macro-group as limestone, calcite und alabaster. Similar to the latter materials, marble objects appear to be particularly common in Shahr-i Sokhta (Cat. no. 1105-1106, 1111, 1113, 1116) and Susa (one ovoid, one ovoid with flat ends, and two duck-shaped weights; Cat. no. 216, 400, 531, 553).

3.21. Olivine

Total specimens: 1

Cat. no. 1787

The term olivine derives from the material's distinct olive-green colour. It is also known by the terms chrysolite and, although dated, peridot, both of which refer to a transparent version of the stone. The best source for raw material is on the island of Zebirget in the Red Sea, but to date its diffusion into the Near East and to the Indian subcontinent has not been investigated. There is only one specimen (Cat. no. 1787) from Dholavira, dating to Period IV Period of the site.

3.22. Quartz

Total specimens: 1

Cat. no. 1678

Technically, quartzites also include agate, carnelian, chalcedony and jasper. In archaeological literature, however, 'quartz' generally refers to a transparent, clear, colourless mineral, very similar to rock crystal or hyaline quartz. There is only one (uncertain) known specimen from Dholavira (Cat. no. 1678).

3.23. Schist

Total specimens: 1

Cat. no. 841

In modern petrography, 'schist' refers to a metamorphic rock of medium to large grain size.

A single weight made of schist was found in Telloh (Cat. no. 841), an ovoid with flat ends, which dates to the last two centuries of the 3rd millennium BC.

3.24. Shell

Total specimens: 210

Cat. no. 1011, 1203, 1205, 1218-1265, 1267, 1269-1274, 1277, 1285-1292, 1294, 1296, 1299-1303, 1307, 1311, 1335, 1351, 1356-1367, 1369, 1371, 1375, 1377-1386, 1388, 1390, 1392, 1394-1395, 1398, 1400-1403, 1405-1412, 1414, 1417, 1423-1425, 1428, 1435-1436, 1438, 1441, 1443, 1452, 1456, 1460, 1471, 1506-1508, 1510, 1512-1514, 1517-1523, 1526, 1528, 1530-1532, 1539-1541, 1543-1544, 1547-1548, 1550-1551, 1554-1555, 1561, 1569, 1573, 1579, 1581-1582, 1585, 1587, 1590, 1608, 1650, 1652-1654, 1659-1660, 1662-1663, 1673, 1680, 1685, 1693-1696, 1707-1708, 1713, 1730, 1770, 1790, 1792, 1809, 1842, 1846, 1874, 1879-1890, 1937, 2006, 2009, 2024, 2047, 2058

In Dholavira, shell was commonly used for the production of daily-use objects, including 209 discovered balance weights. The material seems not to have been used for this purpose in other Gujarat settlements, where shell was primarily used to make beads and bracelets. Shell bracelets made from various marine species have been particularly useful in determining the patterns of internal trade networks, as well as the organisation of production and international trade (Kenoyer 1983; 1984). Shell bracelets were predominantly made of *Turbinella pyrum* shell, and only rarely from the spiny Murex (*Chicoreus ramosus*) or the bivalve *Tivela damaoides*. Cylinder-shaped bracelets were most often made from Columella (a variant of the *Turbinella pyrum* group), which has been interpreted as a specific shape traded to the Indus Valley sites for use in the production of beads or inlays (Kenoyer 2008, 21). Evidence for shell working has also been found at a number of other Indus Valley sites: at Rakhigarhi (Nath 2018, 58-60), Lohari-ragho, Mitahthal, Banawali, Bhirrana, Kalibangan, Madina, Farmana, Baror, Dhalewan, Karsola (Nath 2018, tab. 12), Balakot (Dales/Kenoyer 1977), and Nageshwar (Bhan/Kenoyer 1980-1981). Other sites along the coast (Kenoyer 1983; Nath *et al.* 2014) probably used the material for regional exchange amongst other Indus Valley sites (Nath 2018, 62-63), and for external trade to Mesopotamia (this is confirmed by Mesopotamian cylinder-shaped seals made from *Turbinella pyrum* found in the royal tombs of Ur – Zettler/Horne 1998 – and a shell bracelets from Susa in Jarrige 1988, 48, 198, A10). Extensive evidence was found at Shahr-i Sokhta, Balakot and Tepe Yahya (Durante 1979a); in Shahr-i Sokhta, numerous shell bracelets made from *Xancus pyrum* were found, a gastropod particularly widespread along the coasts of the Kathiawar peninsula and near Ceylon (Hornell 1916, 71). The production of bracelets made from *Xancus/turbinella pyrum* is known from the major centres of the Indus Valley, with only a small number also made from *Fasciolaria trapezium* (Durante 1979a, 323; on its diffusion in Mesopotamia in Warka, Kish and Telloh see Gensheimer 1984, 69). The material was also found in Gumla III (Dani 1970-1971, pl. 43, fig. 11), Harappa (Vats 1940, 488), Mohenjo-daro (Marshall 1931, pl. 92) and Rangpur (Rao 1962-1963). The presence of *Xancus pyrum* in Shahr-i Sokhta (20 objects including 14 bracelets, one semi-cylindrical element, three fragments and two seals) and Tepe Yahya (Durante 1979b), probably imported from Gujarat but worked by local craftspeople, allows wider considerations on the intensity and quality of contacts between the hinterland of the Iranian plateau and the coastal regions of the Harappa civilisation (on the role of Southern Arabia in the Persian Gulf trade exchange see Weeks *et al.* 2019). In Dholavira, shell was used for the production of various balance weight types: spherical, cylinder-shaped, semi-cylinder-shaped, biconic, parallelepiped, discoid, cuboid, truncated hemisphere, pyramid and trapezoid-shaped. While for most of these objects the interpretation as balance weights is uncertain, the parallelepiped, cubic, biconical and hemispherical truncated specimens must, through comparison with traditional Harappan specimens, be considered balance weights. The use of shell seems to be specific for the cultural horizon of Gujarat, and particularly evidence from Dholavira provides new insights into the manufacturing processes of weights. As with bitumen (see above), clay and terracotta (see below), the use of easily obtainable, easy-to-process, common materials within a single site supports the notion of multiple social levels of balance weight use, not exclusive to only the elite classes.

Although cylindrical and semi-cylindrical shell objects were likely produced to be sold to a mostly regional market for the production of beads, analysing their mass values provides an interesting picture: it appears as if these blocks were divided and cut on the basis of the Harappan shekel, generally counted at a unit of 13.65 g with its fractions of $\frac{1}{48}$, $\frac{1}{24}$, $\frac{1}{16}$, $\frac{1}{8}$, $\frac{1}{4}$ and $\frac{1}{2}$.

3.25. Siltstone

Total specimens: 3

Cat. no. 1430, 1458, 1487

Siltstone is a clastic sedimentary rock and consists predominantly of silt sized particles.

The only three objects, all from Dholavira (Cat. no. 1430, 1458, 1487), can be included in the group of soapstone/softstone/sandstone described above.

3.26. Terracotta

Total specimens: 69

Cat. no. 1002-1008, 1123-1126, 1145, 1168, 1345, 1391, 1397, 1421, 1433-1434, 1439, 1442, 1449-1451, 1482, 1557, 1610-1626, 1629-1631, 1633, 1635-1646, 1648-1649, 1987, 1990-1996, 2002

Terracotta is a material created from kiln firing clay, the high temperatures of which results in a hard, dry consistency. For most of the terracotta objects from Dholavira (56 of 69 specimens), their use as balance weights remains uncertain, particularly for discoidal and parallelepiped specimens (the same shapes are often used as stoppers, gaming pieces or for counting). As with bitumen, shell and clay, however, the presence of cubic and biconical terracotta specimens suggests that at least some of the objects were used as balance weights. The balance weights in the Indus Valley were not exclusively the expression of a standardised official economy whose weighing operations were controlled by an elite, but instead they were an accounting system whose access was guaranteed to all; a system that consisted of multiple levels (from the international market to the regional, from the urban market to individual households), in which mercantile activities were regulated by the widespread knowledge of a weighing reference system, without centralised control over all the resources exchanged. Whilst the elite present at various sites seem to have developed a more articulated and complex systems of exchange, weighing and accounting were used by every social class, whose knowledge of metrological codes allowed and necessitated the creation of weights from inexpensive material.

3.27. Clay

Total specimens: 65

Cat. no. 959, 962, 966, 969, 977, 1014-1058, 1162, 1169, 1206, 1266, 1549, 1609, 1624, 1627-1628, 1632, 1634, 1647, 1988-1989, 2039

Similar to terracotta, the objects made of sun-baked clay found in Gujarat are particularly significant. Excluding the 50 specimens from Tepe Yahya which were likely used for counting purposes, the objects from Nagwada (one specimen), Shikarpur (one specimen) and Dholavira (13 specimens) seem to confirm this 'democratic' use of weight systems in Gujarat. In this perspective, the four cubic weights found in Nagwada (Cat. no. 1162), Shikarpur (Cat. no. 1169) and Dholavira (Cat. no. 1988-1989) suggest, at least in Gujarat, a wide diffusion of weighing operations; it is still not clear whether this 'horizontal' diffusion of weighing and accounting procedures also corresponded to a 'vertical' system of relationships between the different accounting models. If this was not the case, *i. e.* if the market followed horizontal levels of exchange depriving relationships between social classes, the internal anomalies in the Harappan weighing system could be explained, not only as the result of regional or geographical variations (see data from Haryana in Ascalone 2019b), but also as the expression of weighing actions of one or more specific social groups.

4 Susiana and Lower Mesopotamia

4.1. Susa

The extensive, almost uninterrupted archaeological excavations carried out in Susa began towards the end of the 19th century, when sporadic excavations, with the aim to record the visible remains on the central hills of Susa, helped to kick-start a new interest in Near Eastern studies (Fig. 4.1). This interest was supported by the tales and stories of enthusiastic Western travellers, intermixed with historical anecdotes from the Bible. Despite detailed descriptions of Xerxes's palace by 12th century traveller Benjamin de Tudèle, it was not until the end of the 19th century that the historical site of Susa became subject to systematic investigations.

From 1848 to 1852, William K. Loftus, a geologist and explorer attached to the British Government's Turco-Persian Boundary commission, deployed to establish the territorial boundaries between Persia and the Ottoman Empire, undertook topographical surveys of the regions near the Persian Gulf and Lower Mesopotamia (Loftus 1857). W. K. Loftus proceeded to conduct a comprehensive survey of the ancient site, recording all remains still visible on the northern hill: the perimeter, the poorly preserved remains of Xerxes's palace, fragmented columns, and well-preserved trilingual inscriptions in ancient Persian, Elamite and Babylonian which provide a record of the restoration works carried out by Artaxerxes II (*c.* 404-358 BC) on the great hypostyle hall of the Achaemenian palatine complex (Apadana).

In 1884, following the great interest created by the discoveries made in the palaces of Sennacherib and Assurbanipal in Nineveh, Marcel Dieulafoy, a French engineer, and his wife Jane set out to explore Persia. They succeeded in obtaining permission from the local authorities to carry out the first small-scale excavations in Susa (Dieulafoy, M. 1885; 1886; 1887; 1893; 1913; Dieulafoy, J. 1887; 1893). These pioneering attempts to uncover the archaeological treasures left by Susa's Achaemenid dynasties were followed by first advances to create a historical reconstruction of the site through, admittedly limited, archaeological investigations.

In 1891, during a trip to western Iran, French geologist and prehistorian Jacques de Morgan visited Susa with the (secret) intent to give continuity to the sporadic campaigns initiated by the Dieulafoys. Six years later, de Morgan returned to the city of Khuzistan with 200,000 FF granted by the French Parliament, with the specific aim to

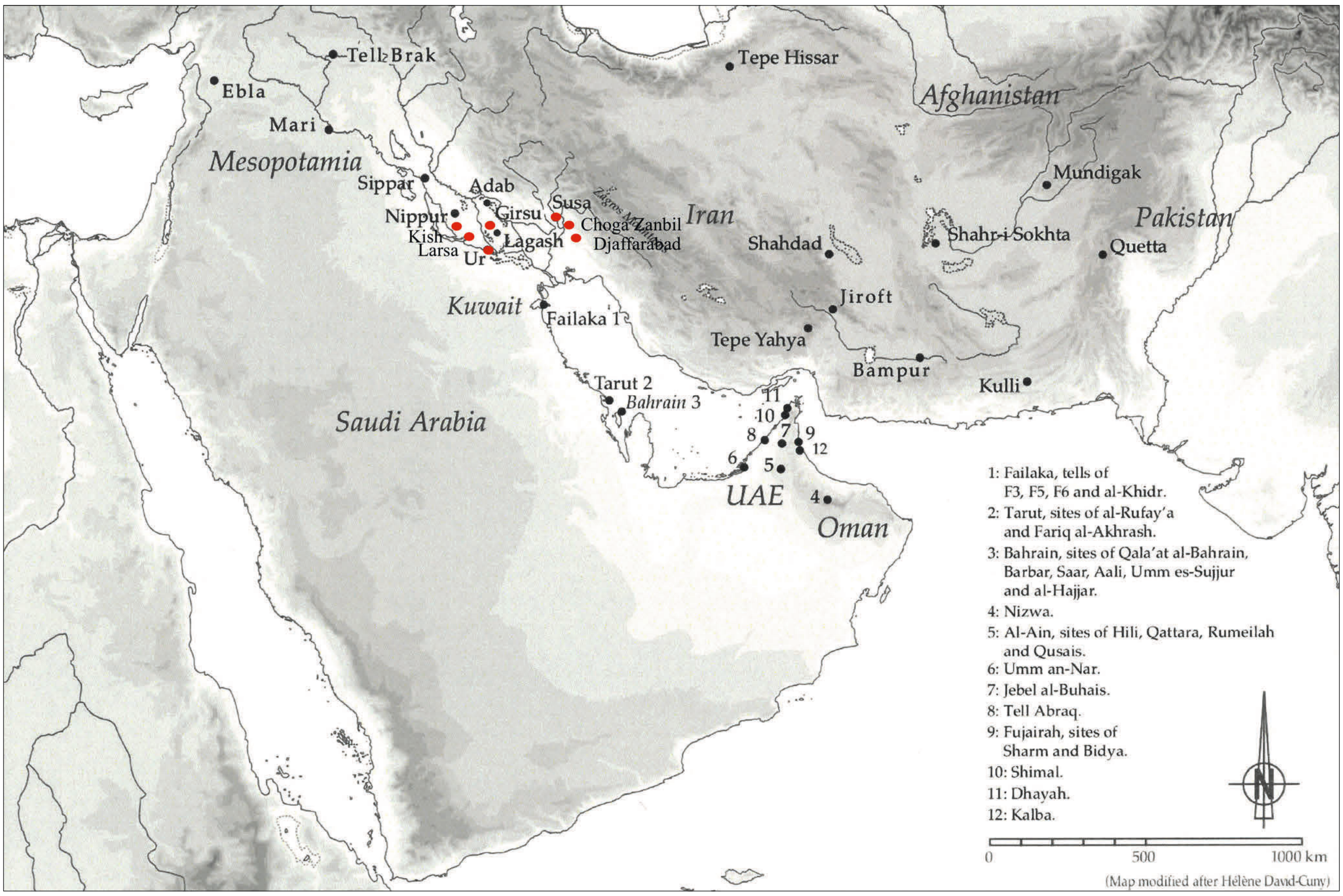


Fig. 4.1. Map of Western Asia in the Bronze Age. Lower Mesopotamian sites with weights which are discussed in this volume are shown in red (modified after Hilton 2014, fig. 3).

Period	de Mecquenem Acr./V.R.	Le Breton	Stève Acr.	Ghirshman V.R.	Carter V.R.	Le Brun Acr.
Susa IIIA	'*XXVIII siècle.*'	Da			18-16	15-13
Susa IIIB		Db			15-13	
Susa IVA	'*XXV siècle*'	Dc/Dd	4-3		12-9	
Susa IVB		De	2-1		8-7	
Susa VA				B VII	6-5	
Susa VB1	'*XXIII siècle*'			B VI	4	
Susa VB2				B V	3	
	'*XX siècle*'			A XV		
				A XIV		

▲*Tab. 4.1. Comparative analysis of stratigraphies from Susa.*

investigate the most archaic and, therefore, formative periods of the settlement.[1]

From 1909, the excavations at Susa were directed by Roland de Mecquenem, who had worked for the campaign in various other roles since 1903. The works carried out from 1909-1913, in collaboration with French architect M. Pillet, concentrated on the Apadana, in an attempt to understand the overall layout of the Achaemenid palace built by Xerxes.

World War I disrupted the work: Susa was occupied by the British Army who built a camp on the *Acropole*. Excavations could not be resumed until 1920, when R. de Mecquenem concentrated his efforts on the other two hills (*Acropole* and *Ville Royale*), previously investigated by J. de Morgan. Between 1933 and 1935, R. de Mecquenem obtained permissions to investigate the nearby settlements of Tappeh, which rose to the east (Jaffarabad, Jowi, Bendebal) and to the southeast (Choga Zanbil) of Susa; these new significant excavations were interrupted only in 1939, with the start of World War II (de Mecquenem 1924; 1929-1930; 1931; 1934; 1943).

With the resumption of archaeological activities after the end of the war, Roman Ghirshman succeeded R. de Mecquenem as the director of the excavations in the centre of Susa. From 1946-1951, his archaeological campaigns excavated a total area of 10,000 m^2 in the northern sector of the *Ville Royale* (*Chantier A* and *B*) (Ghirshman 1951; 1952a; 1952b; 1953; 1954; 1963a; 1963b; 1965; 1966a; 1966b; 1967a; 1967b; 1968a; 1968b; 1970). After 1952, excavations in Susa came to a halt for 12 years, to accommodate new archaeological investigations at the neighbouring site of Choga Zanbil (the Elamite Dur-Untash), which revealed the great religious centre founded by Untash Napirisha around 1350 BC. Excavations in Susa were resumed in 1961, with investigations in the southern sector of the *Ville Royale*, near *Chantier 1* (previously excavated by de Mecquenem), and new excavations carried out by H. Gasche and epigraphist M.-J. Stéve on the *Acropole*, between the *massif funéraire* and the *château* built at the time of de Morgan to house the members of the French archaeological campaign (Stéve/Gasche 1968; 1971; 1990; Stéve 1994).

It was only in 1968 that new excavations directed by J. Perrot allowed a more comprehensive definition of the Susian cultural sequences. The new investigations made it possible to trace the evolutionary and chronological lines of the stratigraphic sequences of Susa, and the most significant aspects of the dynamics of political and cultural growth of the entire region. Later excavations carried out by E. Carter (*Ville Royale*; 1974; 1976; 1978; 1979; 1980), D. Canal (*Acropole 1*; 1978a; 1978b) and A. Le Brun (*Acropole 2*; 1971; 1978a; 1978b; 1978c; 1985; 1990) shed further light on the historical and cultural growth within Susiana, and on the previous, sometimes poorly documented excavations carried out on the hills of the city.[2]

4.1.1. Chronologies

Considering the numerous chronological sequences suggested for Susa at the turn of the 4th/3rd millennia BC, it appears easier to attempt to define the occupational sequences of the later 3rd millennium BC (Ascalone 1997; 2000a; 2000b). The detailed works of E. Carter (1980) on the *Ville Royale* and the common occurrence of Semitic and Elamite inscriptions found in Susa make it possible to track the chronological limits and cultural dynamics of the city between the mid-3rd and the early 2nd millennium BC. A significant lack of textual documentation dating between the end of the Proto-Elamite period and the rise of the Awan dynasties (*c.* 2900/2800-2400 BC) makes it difficult to fully understand the historical developments in the region during this time. After initial work by R. de Mecquenem, R. Ghirshman, E. Carter, M.-J. Stéve and H. Gasche greatly contributed to our understanding of the chronological sequences (Susa IV and V) that would mark the entire 3rd millennium of Susa (Tab. 4.1).[3]

The sequences proposed by R. de Mecquenem (1934, 206, 219, fig. 47, 64) for the *Ville Royale* in 1943, represented the first certain periodic references for the settlement of the 3rd millennium BC (Tab. 4.2); an excavated section totalling 57 m in length and 16 m in depth was used to define the stratigraphic development of the site, based on artefacts and occupation layers. Comparing de Mecquenem's collected and published data (see mainly 1934 and 1943) to Carter's excavation

1 For an exhaustive bibliography on the excavations in Susa by J. de Morgan see Ascalone 2006a, 7-33.

2 Partial and not exhaustive information comes from the other settlements of Susiana dated to the 3rd millennium BC; Tepe Musyan, the largest centre of Deh Luran (Northern Khuzistan), was subject to very limited surveys carried out by J.-E. Gautier and G. Lampre in 1902-1903 (Pézard/Pottier 1926, 17). In Tepe Farukhabad layers dating to ED II (Carter 1987, tab. 1) were found in the two excavated courtyards (A, levels 1-5 and B, levels 19-20) by H. T. Wright (1981, 192).

3 Susa IV and V compare to L. Le Breton's (1957) Susa Dc-De.

Period	de Mecquenem 1934	de Mecquenem 1943-44	de Mecquenem 1956
Susa IIIA (‘*XXVIII siècle*’)	- ‘*vases polychromes*’	- ‘*vases décorés d’une torsade*’ - ‘*bouteilles à profil caréné*’	- ‘*vases polychromes*’
Susa IIIB			
Susa IVA (‘*XXV siècle*’)	- ‘*vases monochromes*’ - ‘*vase à la Cachette*’	- ‘*vases monochromes*’ - ‘*anses-idoles*’ - Puzur-Inshushinak nail foundation	- ‘*vases monochromes*’ - ‘*anses-idoles*’
Susa IVB		- ‘*vases peints très rares*’ - ‘*vases non décorés*’	- ‘*vases peints très rares*’ - ‘*poterie incisée*’
Susa VA	- tablet with the name of Ebarat	- tablet with the name of Ebarat	
Susa VB1 (‘*XXIII siècle*’)	- Shu-Sin inscription on mudbrick - ‘*sarcophages*’ of Ur III period	- ‘*sarcophages*’	- ‘*sarcophages*’
Susa VB2			
	- ‘*sarcophages*’ of Hammurabi period		

Tab. 4.2. Main finds from de Mecquenem’s excavations.

records (1979; 1980) confirms the still embryonic periodic sequences predominantly used by French archaeologist:

XXVIII siècle = Ville Royale I, levels 18-12/11
XXV siècle = Ville Royale I, levels 12/11-5
XXIII siècle = Ville Royale I, levels 4-3

Therefore, including data from the 1970s excavations, two macro-periods have been identified for Bronze Age Susa (*Ville Royale* and the *Acropole*):

1. Susa IV: *c.* 2600-2150 BC (*Ville Royale* levels 12-7; *Acropole* levels 4-1)
   1a. Susa IVA: *c.* 2600-2350 BC (*Ville Royale* levels 12-9; *Acropole* levels 4-3)
   1b. Susa IVB: *c.* 2350-2150 BC (*Ville Royale* levels 8-7; *Acropole* levels 2-1)
2. Susa V: *c.* 2150-1900/1800 BC (*Ville Royale* levels 6-3)

1. Susa IV: *c.* 2600-2150 BC (*Ville Royale* levels 12-7; *Acropole* levels 4-1)
   Sporadic archaeological evidence does not allow a defined and extensive reconstruction of the Susian cultural horizons after the third period of the city (Susa IVA); understanding the historical-archaeological developments of the region is complicated by a large pit dating to the time of Islamic occupation, as well as severely limited documentation from the area, most of which is restricted to a small number of tomb complexes.[4] The most conclusive site, revealing extensive material evidence and a clear stratigraphy that allowed to reconstruct the growth and development of the site over time, was the *Ville Royale* excavated by E. Carter. Whilst the architectural remains are insufficient to determine typological aspects of Susiana architecture, the pottery assemblage[5] as well as the glyptic documentation collected from the *Ville Royale* allow the reconstruction of the complex cultural developments of Susa during ED II-III of Mesopotamia.[6]

1a) Susa IVA: c. *2600-2350 BC (*Ville Royale *levels 12-9;* Acropole *levels 4-3)*
Period IVA at Susa was archaeologically determined through the excavations of the *Ville Royale* by R. de Mecquenem (‘*XXVIII siècle*’ and ‘*XXV siècle*’) and E. Carter (V.R.I: 12-9), the excavations of the *Acropole* by M.-J. Stéve and H. Gasche (levels 4-3), and through the typologies proposed by L. Le Breton (Susa Db -Dc-Dd) (Tab. 4.3).[7]
The two types of ceramic decoration (polychrome and monochrome), that define the pottery styles at Susa between 2700 BC and 2350 BC, find their likenesses in the regions near the plateau and in the provinces of Luristan. The polychrome pottery is also comparable to specimens from Deh Luran, with vast amounts of specimens recovered at Tepe Mussian (Wright 1981, 111-125) and from the centers of Jebel Hamrin (Killik/Roaf 1979, 540). The monochrome vessels

4 An unspecified number of tombs and pottery kilns, assigned to Susa IVA, were found under the floors of Dario’s Achaemenid palace on the Apadana (Stéve/Gasche 1990, 28); only four (out of several hundred) tombs, from Donjon and the *Ville Royale*, can be traced back to the middle of the 3rd millennium BC.

5 The pottery shows strong links with Luristan during Susa IVA (*e. g.* Godin Tepe III, Baba Jan IV and Dar Tanha) (Vanden Berghe 1972a, pl. IX-X,2), while it seems to fit in the Akkadian pottery horizon of Susa IVB; the tombs no. 555 and no. 569 (Susa IVA) also returned a Luranian ‘shaft-hole-axe’ o (see Dar Tanha 1, Takht-i Khan and Bani Surmah) (Vanden Berghe 1968, 58; 1972, pl. XI,2).

6 Period IV at Susa, known from the *Ville Royale* (Carter 1980) and from the *Acropole* (Stéve/Gasche 1968; 1971), was divided into subphase A (*i. e.* ED III; *c.* 2600-2350 BC; levels 12-9 *Ville Royale* and 4-3 (Proto-impérial) *Acropole*), and subphase B (Akkadian period; *c.* 2350-2150 BC; levels 8-7 *Ville Royale I* and 2-1 *Acropole*) (level 2 dated to the ‘*Agadé ancien*’ period, level 1 to the ‘*Agadé récent*’).

7 Susa Db is associated with the scarlet ceramic of ED II (Le Breton 1957, pl. XXVI,8-11).

Chronology	Mesopotamia	Susa Acropole	Susa V.R.	Le Breton 1957
3800-3500	Early Uruk (Susa I)	27 26 25		A
3500-3200	Middle Uruk (Susa transition)	24 23		
		22		Ba
		21		Bb
		20		Bc
		19		Bd
3200-3100	Late Uruk (Susa II)	18		Ca
		17		Cb
3100-2900	JN (Susa IIIA)	16		
		15 14A 14B	18 18/17 17	Cc
2900-2800	ED I (Susa IIIA)	13 ?	16 15	Da
2800-2600	ED II (Susa IIIB)		14 13	Db
2600-2450	ED IIIa (Susa IVA)		12 11 10	Dc-d
2450-2350	ED IIIb (Susa IVA)		9	
2350-2150	Akkad (Susa IVB)		8 7	De
2150-2120	Gudea (Susa VA)		6	
2120-2000	Ur III (Susa VB1)		5 4↓	
2000-1900	Isin and Larsa (Susa VB2)		3	

▲*Tab. 4.3. Typological and stratigraphic sequences at Susa.*

are similar to specimens discovered in the necropolis of western Luristan (specifically the excavation of Qabr Nahi in Vanden Berghe 1973, 28).

A connection between the ceramics of Susa Dc and the polychrome ceramics of Susa IIIB (ED II or the '*XXVIII siècle*' period of R. de Mecquenem), seems plausible. These ceramics are well known from the oldest tombs of Donjon, found at depths between 12 m and 9.75 m (de Mecquenem 1943, fig. 72).[8] Better known are the monochrome ceramics of the '*XXV siècle*', excavated and published by R. de Mecquenem following the excavations carried out between 1929 and 1933, which were discovered in *Chantier 1* of the *Ville Royale*, near the south-west corner of the hill (the French archaeologist assigned the polychrome ceramics to the '*XXVIII siècle*' and the monochrome to the '*XXV siècle*'; de Mecquenem 1934, 211-215).

8 See in de Mecquenem 1943, fig. 72, tombs A 309 (no. 2, 7), A 308 (no. 23), A 319 (no. 23), A 267 (no. 24), A 234 (no. 24), A 267 (no. 27), A 308 (no. 27).

The presence of well-defined pottery styles of the northern neighboring regions (Deh Luran and Luristan) in Susa, as well as the typological links to specimens from Giyan IV, Godin III, Fars (including the necropolis of Jalyan) and Tepe Yahya IVB, seem to suggest that Susa predominantly had cultural ties with the provinces of the Iranian plateau; however, the general adherence to the formal, iconographic, thematic and stylistic canons of the glyptic and sculptural tradition of Mesopotamia (ED II-III), which replaced the Proto-Elamite styles of Susa IIIA, makes it impossible to limit the cultural orbit of Susa to exclusively Elamite circles. At the same time, it is possible to recognise a distinct cultural bipolarity, which was completely replaced in the succeeding period by a process of 'Akkadization', which would affect all fields of artistic, linguistic and cognitive manifestations of the Susian city.

1b) *Susa IVB:* c. *2350-2150 BC (*Ville Royale *levels 8-7;* Acropole *levels 2-1)*

Period Susa IVB is known from levels 8-7 of the *Ville Royale*, excavated by E. Carter, from the two lowest levels discovered by J. Stéve and H. Gasche on the *Acropole* (levels 2-1), and from the typological classes assigned to Susa De by L. Le Breton (Tab. 4.3). While comparative evidence was recently identified in Luristan (Kalleh Nisar A 2) and in the last phases of Yahya IVB, the overall cultural orientation, influenced by the political and military rise of Sargon of Akkad, seems to be directed towards Babylonia. The discontinuation of painted pottery, the presence of plausible Mesopotamian stonecutter workshops that produced new cylinder-shaped seals and sculptures, and the widespread use of Akkadian writing are the result of a presumed political dependence that undermined the artistic originality of Susiana; an almost total assimilation to the Mesopotamian cultural prerogatives that would no longer be reflected in the city of Susa, which had always been conditioned by the duality of its cultural paths. In this apparently homogeneous scenario, some cultural aspects have to be considered in a wider historical context, in which non-tenuous symptoms of a widespread convergence of multiple artistic experiences on a wider alluvial background are attested; this period includes (1) the first cylinder-shaped seals of certain Elamite inspiration, whose stylistic and formal expression, as well as the iconography, technological aspects of production and subject matter (Ascalone 2011; 2018b) seem to derive from the cultural reservoir of Elam; (2) the numerous steatite/chlorite vessels of P. de Miroschedji (1973) from Jiroft (Ascalone 2019a); (3) a small number of Dilmunite seals (Amiet 1972, 221-222, no. 1716-1719; 1974, 109; 1986, fig. 92,1-10); (4) three pseudo-Harappan seals (Amiet 1986a, 143, 148, 177, fig. 94); (5) cubic weights that were clearly imported from the Indus Valley (Cat. no. 698-700); (6) numerous 'etched beads', conceptually and artistically of Harappan production (Amiet 1986a, 144, 148, fig. 92; Ascalone 2008a, 42-45); (7) a bust of an alabaster statue, modeled according to artistic prerogatives known from the clay production of the Zahob valley (Mundigak IV-1 and IV-2; Amiet 1966, fig. 112; *cf.* with Gouin 1969, 47, fig. 2); and (8) a number of vessels of Bactrian origin (Amiet 1977, 98-99, fig. 7.4, 8a-b; 1979, 154, fig. 2).

2. Susa V: *c.* 2150-1900/1800 BC (*Ville Royale* levels 6-3)

   The phases immediately following the collapse of the Sargonid dynasty (Ur III and Simashki dynasty) are represented in levels 6-3 of the *Ville Royale* excavated by E. Carter (1974; 1976; 1978; 1979; 1980), in the sarcophagi dated to '*XXIII*' and '*XX siècle*' (Hammurabi period) recovered by R. de Mecquenem at the Apadana from a depth of 4.5 m below the Achaemenid palace (de Mecquenem 1922, 134-137; 1924, 110-113; 1934; 1943), from *Chantier 1* in the *Ville Royale* (de Mecquenem 1934, 209-211) and *Chantier 2* (de Mecquenem 1934, 221),[9] and in the cemetery area of Donjon (de Mecquenem 1934, 227-234; 1943, in tombs at depths between 5 m and 8 m).[10] Ample evidence of the Simashki phases also comes from the trenches (A and B) excavated by R. Ghirshman (1965; 1966a; 1966b; 1967a; 1967b; 1968a; 1970) at the northern and southern boundaries of the *Ville Royale*: in particular B VII-VI seem to document the phases preceding the rise of Shulgi (VII; Ghirshman 1968b, 7), the subsequent domination over the Susian city of the kings of Ur III (VII-VI) and the periods marked by the rise of the dynasties of Isin (VI). Period V is likely 'linked' to the final phases of the Simashki dynasty, just before the definitive affirmation of the Ebartites (*c.* 1900/1850 BC).[11]

   The overall cultural horizon of Susa V seems to be linked to Mesopotamia during the transition from the 3rd to the 2nd millennium BC, when large numbers of Elamite and Persian Gulf objects (Elam, Jiroft, Turan and Dilmun) became part of Mesopotamian material culture (Ascalone 2006a, 112-151).

   The ceramic tradition of unpainted pottery finds close parallels in Mesopotamian pottery from Akkad to Ur III (compare types 1-3, 5-6, 12, 15-16, 18, 21 and 23 in Stève/Gasche 1971). The clay figurines are an expression of contemporary alluvial production (de Mecquenem 1934, fig. 85,1-10; Spycket 1992, 36-83, no. 127-429) and the glyptics show eloquent and unequivocal references to the themes and styles prevalent in Babylon at the end of the 3rd millennium BC (Amiet 1972, 189-223, no. 1473-1730; Ascalone 2011, 64-76).

   Although the succession of political events (Accad, Ur III and finally Simashki) suggests the existence of historical 'ruptures' or 'leaps' within the Susian cultural sequences, the continuous and uninterrupted coexistence of elements of heterogeneous cultural belonging shows that the real fractures recognised in Susa were mainly of a dynastic and political nature. The affiliation with the Mesopotamian artistic and cognitive spheres continues, albeit with important variables, represented by, for example, the inscriptions in Linear Elamite by Puzur-Inshushinak. It seems quite evident that this does not change the wide and unrestricted confluence of aspects of recognised non-indigenous cultural belonging in the artistic expression of objects produced in Susa (Tab. 4.4).

4.1.2. Weights, potential weights, possible weights and associated finds (Cat. no. 1-746)

Based on their shape, material and metrological features, most of the objects found in Susa contained in this catalogue should be considered as balance weights (Fig. 4.2a-b, 4.3). The extensive evidence for the production and use of weights throughout Mesopotamia (supported by textual documentation) allows detailed comparisons between the objects recovered from Susa and those from the major settlements of Mesopotamia. The early studies carried out as part of the French archaeological campaigns (see Soutzo 1911; Belaiew 1934) as well as the assemblages collected along the Indus Valley (Mohenjo-daro, Chanhu-daro and Harappa; see Hemmy 1931; 1943; Vatts 1940; Hendrickx-Baudot 1972) and in Egypt (see Hemmy 1935; 1937) represent the first pioneering studies on the weight metrology of the ancient Near East. Identifying specific objects from these areas as balance weights therefore appears infinitely easier than in areas without a history of metrological studies, such as Iran.

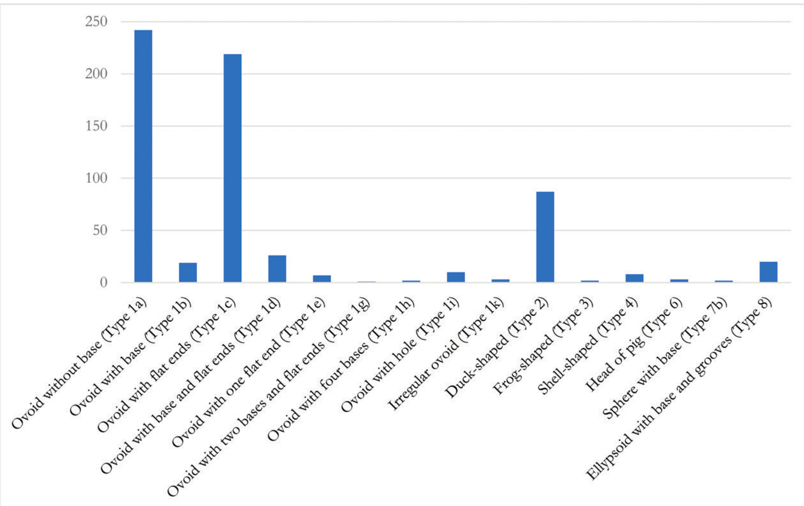
9 At the *Chantier 2* of the *Ville Royale,* de Mecquenem (1934, 221; 1943, 137) also found (in pit tombs intended for infants) tablets bearing the name of Ebarti associated with unpainted ceramics that can be traced back to the previous period.

10 At Donjon bricks with inscriptions of Attahushu (third ruler of the Ebartite dynasty or Sukkalmakh, *c.* 1775-1750 BC) were found at a depth of 8 m (de Mecquenem 1943, 86, A 53).

11 From Period VI of *Chantier B* comes a seal impression bearing the inscription of Queen Mekubi, wife of king Tan-Ruhuratir and daughter of Bilalama of Eshnunna (*c.* 1980 BC) and a tablet with a new sealing of the Simashki king himself (Ghirshman 1968b, 4-7).

OLD-ELAMITE KINGS	SYNCHRONISM
....	
KUL.....	/
PELI	
LUKH-ISHAN	↔ SARGON (2335-2279 BC)
KISHTEP-RATEP II	↔ SARGON
ZIMBA	↔ RIMUSH (2278-2270 BC)
EPIR-MUPI	↔ RIMUSH
ESHPUM	↔ MANISHTUSU (2269-2255 BC)
KHITA	/
KUTIR*-INSHUSHINAK	/
GIRNAMME	↔ VI anno di SHU-SIN (2031 BC)
TAZITTA	↔ VIII anno di AMAR-SIN (2038 BC)
EBARTI I	↔ VI anno di SHU-SIN (2031 BC)
TAZITTA	/
LU...RAK-LUHAN	/
KINDATTU	↔ - IBBI-SIN (2028-2004 BC) - VI anno di ISHBI-ERRA (2011 BC)
IDADU I (1979-1945 BC)	/
TAN-RUHURATER	↔ BILALAMA (ca. 1980 BC)
EBARTI II	/
IDADU II (1925-1900 BC)	/
IDADU-NAPIR	↔ SUMUABUM (1894-1881 BC)
IDADU-TEMTI	/

▲*Tab. 4.4. Awanite and Simashkian kings and their synchronizations with the kings of Mesopotamia.*



▲*Fig. 4.2a. Distribution of shapes at Susa.*

Of the 746 objects recovered from Susa, 659 must be considered balance weights, whereas the remaining 87 require more in-depth analysis. Type 8 (ellipsoid with base and groove; Cat. no. 639-658) is a specific object of the Uruk period, but there is some evidence that it may have existed in Susa III, a period with evidence for a Proto-Elamite influence. This type, however, is more widely spread in settlements linked to the cultural horizon of Uruk IV, dated to the second half of the 4th millennium BC (Habuba Kabira, Tall-e Geser, Godin Tepe, Tepe Sialk; see bibliography in Paragraph 2.8), and in Early Dynastic I contexts (Tell Asmar and Kish). As will be discussed later in Chapter 4.1.2.3, these objects cannot be considered as balance weights with certainty, as their mass values do not appear to adhere to a logical metrological sequence. Their shape, however, as well as the presence of a flat base (to place the objects on a flat surface such as a scale plate) and the clear evidence for a suspension string suggest that these objects could have been used for weighing activities between the end of the 4th and the beginning of the 3rd millennium BC. Although different types of balance weights dating to the earliest periods at the end of the 4th millennium BC have recently been found in Baluchistan (Franke-Vogt 2005, 110, Abb. 34; Franke/Cortesi 2015, no. 631-543), their inconsistent mass values mean they cannot be identified as balance weights with certainty. For the time being, and pending further metrological analyses, these objects are referred to as 'possible weights', rather than 'potential weights'.

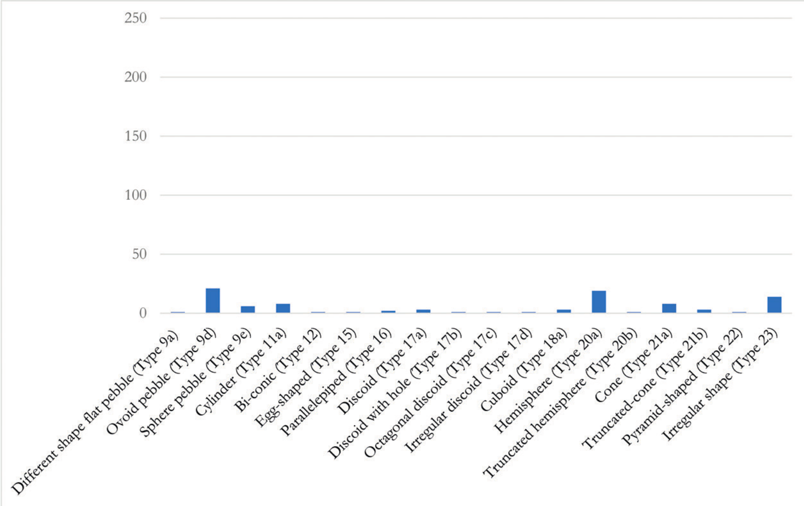
Another object type with uncertain function is the so-called ovoid pebble (Type 9c; Cat. no. 659-679). As these stones appear in their natural state, without any traces of working, their precise function remains unknown. The 21 specimens found in Susa exhibit heavily polished surfaces, suggesting that they were frequently used in daily life. Two pebbles (Cat. no. 669-670) bear engravings that could be interpreted as an indication of weight or, more generically, as a numerical annotation. Each of the specimens bears the sign of an 'X', which on Susa weights generally refers to ½ of the standard unit (in this specific case the two weights have a mass of 3.81 g and 4.15 g, thus suggesting basic shekel values of 7.62 g and 8.30 g). The presence of metrological engravings on the otherwise unprocessed object suggests that even simple pebbles could have been used as balance weights, probably after their mass was determined in reference to manufactured weights. The complete absence of distinct numerical annotations on pebbles, however, makes it impossible to determine their weighing function with certainty; instead, they could have been used as playing pieces. All the recorded pebbles without inscriptions or engravings (Cat. no. 659-668, 671-679) are therefore considered as 'potential weights', as their use as balance weights remains uncertain.

Different considerations must be made for the spherical objects of Type 7a (Cat. no. 631-636) which, unlike Type 9c, are processed and, more often than not, highly polished. In this case, the problem is not a lack of working traces, but rather the determination of their function, since spherical objects were generally used for numerical counting or as gaming pieces. Lacking detailed knowledge of the archaeological context, associated finds and all the analytical categories outlined in Chapter 1, spherical objects should also be considered as 'potential weights'.

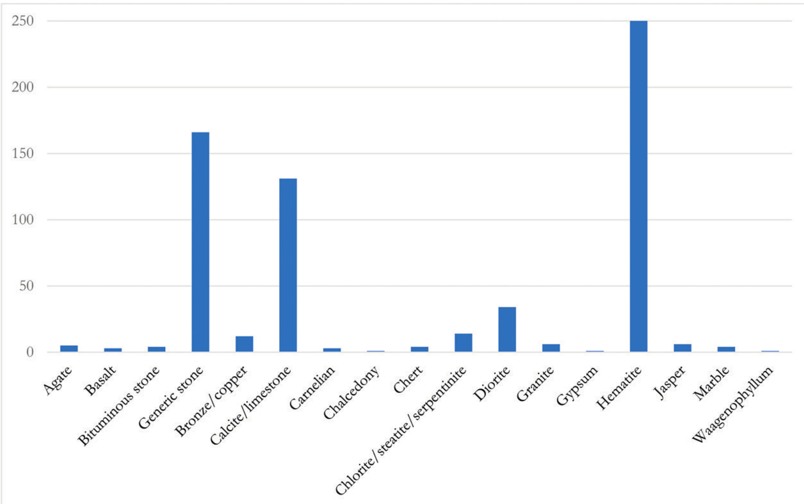
Only some of the cylindrical specimens (Type 11a; Cat. no. 680-687) from Mesopotamia can be interpreted as balance weights; although cylindrical weights are common in the Greater Indus Valley, they appear to be non-existent in Mesopotamia. Most of the objects found in Susa appear to be unfinished seals rather than balance weights. As their use as weights cannot be rejected outright, they should be included in the category of 'possible weights'.

Based on its morphology and material, Cat. no. 695 (with no archaeological context or chronology), may have been a variant of a Type 8 ellipsoid (see above). Irregular shaped objects of Type 23 should be interpreted as unfinished objects which were created to eventually be turned into balance weights. The vaguely defined shapes of Cat. no. 733-746, all made of polished hematite, likely were unfinished or incorrectly processed, and thus discarded, objects, rather than simple waste material.

Different considerations should be made for the copper ingots from Susa (Cat. no. 709-719), which correspond to the local metrological standards. This makes them particularly useful for the reconstruction of the weight systems of Lower Mesopotamia and Susiana (Ascalone 2021a). Ingots were not considered balance weights in the presented analysis, although they are just as important as weights, and in some cases even more so, for the study of Susian weight metrology dating back to the mid-3rd millennium BC.



▲*Fig. 4.2b. Distribution of shapes at Susa.*



▲*Fig. 4.3. Distribution of material at Susa.*

4.1.2.1. Archaeological contexts

Putting Susa's archaeological material into context has been particularly difficult due to the lack of sound archaeological excavations and records from the first excavations carried out in the centre of Khuzistan (the first explorations were carried out in 1852; see Loftus 1852), and apart from the unpublished excavation records by M. A. Kabuli, no recent excavations have been carried out or published. Due to the lack of documentation, the recent attempt of an online catalogue comprising the numerous objects from the excavations of J. de Morgan, R. de Mecquenem and R. Ghirshman appears to be incomplete (for an overview of the excavation reports see Chapter 4.1). The documentary void concerning Susa's balance weights can only partially be filled by the typological study which, however, does not unambiguously discern the objects' chronologies. The previous publications by M.-C. Soutzo (1911), N. T. Belaiew (1934) and the few more recently published bitumen specimens (Connan/Deschesne 1996) provide only a partial reconstruction of the archaeological contexts of the weights. The biggest problem remains the identification of the published objects with those collected at the museums of Susa, Tehran and at the Louvre in Paris as part of this study; in other words, the absence of photos in the previous publications (except for *c.* 30 specimens) makes it difficult to correspond the weights in the Louvre with those already published. Moreover, the introduction of a new accession number system, which replaced the old numbering system and any find numbers allocated during excavation, has made it impossible to identify the weights recently collected with those previously published, with the exclusion of the copper ingots in R. de Mecquenem (1934, fig. 21,16; also in Amiet 1986a, 125-126, fig. 96,1-9; Tallon 1987, 71), the ellipsoids with base and grooves in J. de Morgan (1900, 80, fig. 108 – from Apadana – and 84, fig. 117) and R. de Mecquenem (1923, 473, fig. 9; also de Morgan 1900), 62 weights in M.-C. Soutzo (1911), five weights in N. T. Belaiew (1934), nine weights in J. Connan and O. Deschesne (1996), and 16 weights in E. Ascalone (for bibliographical details see Catalogue). In short, with the exception of 124 specimens, the majority of the Susa weights recorded in this catalogue cannot be traced back to the tables and catalogues published in previous publications. Not being able to correctly correspond the objects to the previous publications has made it even more difficult to conduct a precise contextual analysis. Excluding the few bitumen specimens, only N. T. Belaiew has tried, in a very synthetic way, to provide an archaeological context to the weights he published. He identified six different archaeological contexts:

- '*ensemble provenant des différents sarcophage du XX avant notre ère*' (Belaiew 1934, no. 52-64, 162-226);
- '*collection de poids en pierre trouvés dans un cimitiére Susien*' dated to '*un époque voisine de Hammurabi*', identified at a depth of 14 m in the *Ville Royale* (Belaiew 1934, no. 73-161);
- '*Poids provenant des tombeaux voûtès élamites*' (Belaiew 1934, no. 227-234, 250-252, 339-342);
- '*Poids provenant des tombeaux voûtès élamites du début de l'Elam*' (Belaiew 1934, no. 255-265);
- '*Poids provenant d'un sarcophagi antériore au XX siécle avant notre ère*' (Belaiew 1934, no. 236-248);
- '*Ensemble Our III*' (Belaiew 1934, no. 286-325, 343-424).

No further indication of the stratigraphic sequences, archaeological contexts or associated finds was given. Assuming that the contexts in which the weights were found are dated correctly, the 424 balance weights published by N. T. Belaiew (originally found by R. de Mecquenem between 1921 and 1933), belong to four distinct chronological phases.

3. Awan period, *c.* 2400-2120 BC, 11 weights (Belaiew 1934, no. 255-265)
4. Ur III period, *c.* 2120-2004 BC, 133 weights (Belaiew 1934, no. 236-248, 286-325, 343-424)
5. Old-Babylonian period, *c.* 2000-1800 BC, 166 weights (Belaiew 1934, no. 52-64, 73-161, 162-226)
6. Middle Elamite period, *c.* 1500-1100 BC, 15 weights (Belaiew 1934, no. 227-234, 250-252, 339-342)

Whilst the chronology of the weights excavated by J. de Morgan remains unknown, most of the weights collected during R. de Mecquenem's excavations can be dated to somewhere between the end of the 3rd and the first two centuries of the 2nd millennium BC.

More detailed chronological considerations can be based on the ingots (Cat. no. 710, 713, 715-716, 718) found in the '*vase à la cachette*', a vessel of the so-called second painted style found during J. de Morgan's excavations in 1907 (published years later; de Mecquenem 1934; Le Breton 1957). The vase contained 48 (mostly copper) objects, which have been dated between the Proto-Elamite (*c.* 3100-2750 BC) and Early Dynastic III periods (*c.* 2500-2400 BC; see Amiet 1986a, 125-129, fig. 96,1-9; Tallon 1987, 328-331) based on artistic and typological analogies. The vessel contained the following objects:

- scissors, copper, Sb 2723/15;
- conical silk scissors, arsenic copper, Sb 2723/17;
- shrouded bowl, alabaster and copper oxide, Sb 2723/53;
- four bowls, alabaster, Sb 2723/48; Sb 2723/49; Sb 2723/51; Sb 2723/52;
- vase fragment, blue glazed ceramic, Sb 2723/54;
- four adzes, copper, Sb 2723/3; Sb 2723/4; Sb 2723/5; Sb 2723/6;
- adze fragment, copper, Sb 2723/30;
- three flat axes, copper, Sb 2723/2; Sb 2723/8; Sb 2723/14;
- flat axe with folded flap, copper, Sb 2723/7;
- flat axe, bronze, Sb 2723/1;
- painted jar, terracotta, Sb 2723; Sb 2723 bis [two fragments];
- mirror, arsenic copper, Sb 2723/19;
- strainer, bronze, Sb 2723/22;
- shovel, copper, Sb 2723/21;
- scale pan, copper, Sb 2723/35;
- dagger, copper, Sb 2723/24;
- dagger, arsenic copper, Sb 2723/11;
- dagger, copper, Sb 2723/9;
- chisel, arsenic copper, Sb 2723/16;
- three cylinder-shaped seals, stone, Sb 2723/55; Sb 2723/56; Sb 2723/59;
- cylinder-shaped seal, frit, Sb 2723/57;
- saw, copper, Sb 2723/10;
- tool, arsenic copper, Sb 2723/13;
- rod, copper, Sb 2723/41;
- 13 tokens, stone, Sb 2723/64;
- seven vessels, copper, Sb 2723/26; Sb 2723/29; Sb 2723/34; Sb 2723/36; Sb 2723/37; Sb 2723/38; Sb 2723/39;
- four vessels, arsenic-copper, Sb 2723/20; Sb 2723/23; Sb 2723/31; Sb 2723/32;
- vessel, copper with lead and arsenic, Sb 2723/18;
- vessel, bronze, Sb 2723/33;
- five vessels, alabaster, Sb 2723/43; Sb 2723/44; Sb 2723/45; Sb 2723/46; Sb 2723/50.

Based on its stratigraphy and typology, the painted vessel from Susa must be ascribed to the middle of the 25th century BC. It was found together with other monochrome vases (published in de Mecquenem 1934), just above the layers that contained the Susa IIIB polychrome ceramics dating to Early Dynastic II (Tab. 4.2; de Mecquenem 1943, fig. 72; Le Breton 1957, pl. XXVI,8-11). Objects of the *vase à la cachette* type (de Mecquenem 1934, 211-215; also the Dc-d typologies in Le Breton 1957) commonly occur in levels 4-3 of the *Acropole* (Stéve/Gasche 1971, 91, pl. 16,1), in levels 12-9 of the *Ville Royale* (Carter 1978), and in the regions of Deh Luran and Luristan

(Ascalone 2006a, 21), suggesting a date around *c.* 2450 BC. The rich design of the objects (type, manufacture and material) suggests that the *vase à la cachette* was used to store the physical fortunes of its owner, indicating a potential monetary use of the copper ingots kept within.

Type 8 ellipsoids also allow a broader consideration of the archaeological contexts in which they were found. As written in Chapter 2, the ellipsoids (Cat. no. 639-658) are a distinct archaeological object of the Uruk period (*c.* 3500-3000 BC), with their use possibly extending up to Early Dynastic I (*c.* 2800 BC; for its geographical and chronological diffusion see Paragraph 2.8). Three specimens (Cat. no. 645, 650, 652), found during the latest excavations in Susa directed by A. Perrot between 1970 and 1972, provide the opportunity to study their contexts in more detail.

Cat. no. 652 was found in levels 22-17 of the *Acropole*, which date between the end of the Middle and the Late Uruk period, which is equivalent to the 'transitional period' between Susa II and Susa III (Ascalone 2000b, 15-19), a period identified in the typological classes Bc-d/Ca by L. Le Breton (1957). Cat. no. 645, on the other hand, seems to date to the final phase of the Uruk period (level 17A of the *Acropole*). Finally, Cat. no. 650 draws the chronological boundary for these objects, found in level 16 of the *Acropole* which dates to the first phase of the Proto-Elamite period in Susa (recorded on the first administrative tables of the city, *c.* 3000-2900 BC). The presence of tools used to calculate weight at a time when the first numerical annotations appeared may open new fields of research that cannot be addressed in this volume.

Here, it should simply be noted that the numerical sign system used on Susa III-type tablets seems to be derived from the systems found on proto-cuneiform texts from Uruk and Susa II. According to P. Damerow and R. K. Englund (1989, fig. 3.14), the following numerical systems were used:

- sexagesimal system S (3600 - 600 - 60 - 10 - 1);
- bi-sexagesimal systems B and B# (1200 - 120 - 60 - 10 - 1) (not in the Uruk texts);
- decimal system D (10000 - 1000 - 100 - 10 - 1) (not in the Uruk texts);
- ŠE system (mixed progression between decimal and sexagesimal series);
- variant ŠE system (only in Tepe Yahya);
- GAN_2 system G (10 - 3 - 6).

For now, it is not possible to identify possible connections between the numerical annotations on tablets from Uruk and Susa and weight metrology. Instead, the texts seem to mostly relate to the calculation of quantity, volume or distance. A. Falkenstein (1936, 1 [column 50]) suggested that the Uruk system ('System E'), as evinced by texts, was a representation of the system of weights, but this proposal remains uncertain and has not been fully accepted by the archaeological community (Bartash 2019, 12). As A. A. Vaiman (1974; 1989, 120) states, the so-called System E follows a binary sequence, from the smallest to the largest according to the following scheme:

$1N_7\ (N_1+EN) > 4N_8 > 2N_{24} > 2N_1 > 10N_{14}$

where N_1 indicates the base unit and N_{14} factor 10. This means that N_{24} is ½, N_8 is ¼, and $1N_7$ (N_1+EN) is 1⁄16 of the unit. In other words, the weight annotation in Uruk IV texts (known from 26 texts) comprised the following multiples and fractions of the unit: 10, 1, ½, ¼, 1⁄16 (J. Friberg also suggests a relation between N_1 and N_7, with ratio 1 : 14 as the value of gold in silver, see Friberg 1999, 129-134).

Although the metrological studies on the texts of Uruk IV and Susa II-III, and on some of the archaeological material (see Type 8), are rather controversial, the association between the numerical texts of administrative accounting and a typological class of objects that was potentially used as balance weights seems significant and could open new scenarios in the understanding of the formation of the first forms of weights and measures.

4.1.2.2. Catalogue

4.1.2.2.1. Ovoid (Type 1a): Cat. no. 1-244

1. Susa. - No context - Fragmented ovoid, hematite. L. 0.60 cm, D. 0.78 cm, 0.89+x g - Mus. Louvre (SH 095366).

2. Susa. - No context - Ovoid, good, hematite. L. 11.96 cm, D. 0.68 cm, 10.90 g - Mus. Louvre (Sb 13255).

3. Susa. - No context - Ovoid, good, stone. L. 1.70 cm, D. 0.61 cm, 0.93 g - Mus. Louvre (Sb 13420).

4. Susa. - No context - Ovoid, good, stone. L. 1.81 cm, D. 0.59 cm, 0.93 g - Mus. Louvre (Sb 13258).

5. Susa. - No context - Fragmented ovoid, hematite. L. 1.20 cm, D. 0.49 cm, 0.96+x g - Mus. Louvre (SH 095366).

6. Susa. - No context - Ovoid, perfect, hematite. L. 1.81 cm, D. 0.40 cm, 1.01 g - Mus. Louvre (Sb 13458).

7. Susa. - No context - Ovoid, good, hematite. L. 2.60 cm, D. 0.45 cm, 1.05 g - Mus. Louvre (Sb 13245).

8. Susa. - AS 12889, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 2.00 cm, D. 1.55 cm, 1.10 g - Mus. Louvre (Sb 13192).

9. Susa. - No context - Ovoid, good, calcite. L. 1.60 cm, D. 0.80 cm, 1.15 g - Mus. Louvre (Sb 13216).

10. Susa. - No context - Ovoid, good, calcite. L. 0.55 cm, D. 0.79 cm, 1.19 g - Mus. Louvre (Sb 13294).

11. Susa. - AS 8549, de Morgan 1898-1911 excavations - Fragmented ovoid, stone, with markings ('IIII'). L. 2.80 cm, D. 0.80 cm, 1.40+x g - Mus. Louvre (Sb 1340).

12. Susa. - No context - Ovoid, good, stone. L. 2.20 cm, D. 0.70 cm, 1.60 g - Mus. Louvre (Sb 1354).

13. Susa. - AS 9537, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 2.10 cm, D. 1.32 cm, 1.61 g - Mus. Louvre (Sb 13559).

14. Susa. - No context - Fragmented ovoid, hematite. L. 1.70 cm, D. 0.70 cm, 1.87+x g - Mus. Louvre (Sb 13226).

15. Susa. - AS 9524, de Morgan 1898-1911 excavations - Ovoid, good, calcite. L. 2.90 cm, D. 0.62 cm, 1.96 g - Mus. Louvre (Sb 13563).
16. Susa. - No context - Ovoid, chipped on one end, hematite. L. 2.70 cm, D. 0.51 cm, 2.10+x g - Mus. Louvre (Sb 13175).
17. Susa. - No context - Ovoid, good, hematite. L. 2.34 cm, D. 0.60 cm, 2.12 g - Mus. Louvre (Sb 13210).
18. Susa. - No context - Ovoid, good, stone. L. 3.00 cm, D. 0.60 cm, 2.12 g - Mus. Louvre (Sb 13220).
19. Susa. - AS 8902, de Morgan 1898-1911 excavations - Ovoid, good, steatite. L. 2.30 cm, D. 0.80 cm, 2.24 g - Mus. Louvre (Sb 13217).
20. Susa. - No context - Ovoid, good, with markings ('IIII'), stone. L. 2.60 cm, D. 0.80 cm, 2.26 g - Mus. Louvre (Sb 13472).
21. Susa. - No context - Ovoid, good, with markings ('III'), stone. L. 3.00 cm, D. 0.80 cm, 2.72 g - Mus. Louvre (Sb 13219).
22. Susa. - No context - Ovoid, good, stone. L. 3.13 cm, D. 0.93 cm, 2.76 g - Mus. Louvre (Sb 13300).
23. Susa. - No context - Ovoid, perfect, hematite. L. 3.12 cm, D. 0.55 cm, 2.83 g - Mus. Louvre (Sb 13461).
24. Susa. - No context - Fragmented ovoid, hematite. L. 1.50 cm, D. 0.78 cm, 2.83+x g - Mus. Louvre (SH 095366).
25. Susa. - AS 12855, de Morgan 1898-1911 excavations - Ovoid, good, with marking ('I'), stone. L. 2.93 cm, D. 0.82 cm, 2.90 g - Mus. Louvre (Sb 13556).
26. Susa. - No context - Ovoid, good, with marking ('I'), stone. L. 2.24 cm, D. 1.00 cm, 2.95 g - Mus. Louvre (Sb 13307).
27. Susa. - No context - Fragmented ovoid, hematite. L. 2.10 cm, D. 0.79 cm, 2.93+x g - Mus. Louvre (Sb 13467).
28. Susa. - No context - Fragmented ovoid, hematite. L. 1.70 cm, D. 0.90 cm, 2.98+x g - Mus. Louvre (Sb 13232).
29. Susa. - AS 12004, de Morgan 1898-1911 excavations - Ovoid, good, with inscription, hematite. L. 2.18 cm, D. 0.72 cm, 3.01 g - Mus. Louvre (Sb 13469).
30. Susa. - AS 12828, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 2.60 cm, D. 0.88 cm, 3.01 g - Mus. Louvre (Sb 13536) - Soutzo 1911, 19, n. 12828.
31. Susa. - AS 9523, de Morgan 1898-1911 excavations - Ovoid, good, with marking ('I'), stone. L. 2.90 cm, D. 0.90 cm, 3.07 g - Mus. Louvre (Sb 13542).
32. Susa. - No context - Fragmented ovoid, hematite. L. 1.78 cm, D. 1.10 cm, 3.12+x g - Mus. Louvre (SH 095366).
33. Susa. - No context - Fragmented ovoid, hematite. L. 1.74 cm, D. 1.35 cm, 3.30+x g - Mus. Louvre (SH 095366).
34. Susa. - No context - Ovoid, perfect, diorite. L. 2.45 cm, D. 0.90 cm, 3.31 g - Mus. Louvre (Sb 13263).
35. Susa. - AS 14215, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 2.50 cm, D. 1.89 cm, 3.40 g - Mus. Louvre (Sb 13558).
36. Susa. - AS 12827, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 2.82 cm, D. 1.00 cm, 3.75 g - Mus. Louvre (Sb 13188).
37. Susa. - No context - Fragmented ovoid, incomplete, hematite. L. 2.78 cm, D. 0.78 cm, 3.96+x g - Mus. Louvre (SH 095366).
38. Susa. - AS 9522, de Morgan 1898-1911 excavations - Ovoid, good, with marking ('X'), stone. L. 3.50 cm, D. 0.92 cm, 4.00 g - Mus. Louvre (Sb 13552).
39. Susa. - No context - Ovoid, good, stone. L. 3.10 cm, D. 1.91 cm, 4.05 g - Mus. Louvre (Sb 13185).
40. Susa. - No context - Ovoid, perfect, hematite. L. 3.50 cm, D. 0.65 cm, 4.11 g - Mus. Louvre (Sb 13154).
41. Susa. - No context - Fragmented ovoid, hematite. L. 2.31 cm, D. 0.78 cm, 4.12+x g - Mus. Louvre (Sb 13465).
42. Susa. - No context - Ovoid, good, hematite. L. 2.90 cm, D. 0.91 cm, 4.14 g - Mus. Louvre (Sb 13239).
43. Susa. - No context - Ovoid, perfect, hematite. L. 3.90 cm, D. 0.61 cm, 4.16 g - Mus. Louvre (Sb 13166).
44. Susa. - AS 9520, de Morgan 1898-1911 excavations - Ovoid, good, with marking ('X'), stone. L. 2.39 cm, D. 1.12 cm, 4.17 g - Mus. Louvre (Sb 13561).
45. Susa. - No context - Ovoid, perfect, hematite. L. 2.25 cm, D. 0.79 cm, 4.20 g - Mus. Louvre (Sb 13211).
46. Susa. - No context - Ovoid, good, hematite. L. 2.18 cm, D. 1.00 cm, 4.21 g - Mus. Louvre (Sb 13310).
47. Susa. - AS 952, de Morgan 1898-1911 excavations - Ovoid, good, with marking ('X'), limestone. L. 3.65 cm, D. 1.00 cm, 4.24 g - Mus. Louvre (Sb 13560).
48. Susa. - No context - Ovoid, perfect, stone. L. 1.90 cm, D. 1.01 cm, 4.25 g - Mus. Louvre (Sb 13170).
49. Susa. - No context - Ovoid, good, stone. L. 3.75 cm, D. 2.00 cm, 4.25 g - Mus. Louvre (Sb 13302).
50. Susa. - No context - Ovoid, good, with marking ('X'), stone. L. 3.94 cm, D. 1.00 cm, 4.25 g - Mus. Louvre (Sb 13177) - Soutzo 1911, 11, no. 12295.
51. Susa. - No context - Ovoid, perfect, hematite. L. 2.90 cm, D. 0.70 cm, 4.27 g - Mus. Louvre (Sb 13244).
52. Susa. - AS 9518, de Morgan 1898-1911 excavations - Ovoid, good, steatite. L. 1.85 cm, D. 0.98 cm, 4.34 g - Mus. Louvre (Sb 13550).
53. Susa. - No context - Ovoid, good, hematite. L. 2.59 cm, D. 0.88 cm, 4.39 g - Mus. Louvre (Sb 13492).
54. Susa. - AS 12852, de Morgan 1898-1911 excavations - Ovoid, good, diorite. L. 3.30 cm, D. 1.95 cm, 4.39 g - Mus. Louvre (Sb 13544).
55. Susa. - No context - Ovoid, good, stone. L. 3.10 cm, D. 1.01 cm, 4.41 g - Mus. Louvre (Sb 13311).
56. Susa. - No context - Fragmented ovoid, hematite. L. 1.81 cm, D. 0.95 cm, 4.53 g - Mus. Louvre (Sb 13402).
57. Susa. - No context - Fragmented ovoid, with marking ('I'), stone. L. 3.20 cm, D. 1.20 cm, 4.86+x g - Mus. Louvre (Sb 13303).
58. Susa. - No context - Fragmented ovoid, hematite. L. 2.19 cm, D. 0.98 cm, 5.27+x g - Mus. Louvre (Sb 13496).
59. Susa. - No context - Ovoid, slightly worn, hematite. L. 2.12 cm, D. 0.91 cm, 5.28 g - Mus. Louvre (Sb 13288).
60. Susa. - No context - Ovoid, perfect, hematite. L. 3.32 cm, D. 0.71 cm, 5.34 g - Mus. Louvre (Sb 13149).

61. Susa. - No context - Ovoid, perfect, hematite. L. 4.18 cm, D. 0.70 cm, 5.40 g - Mus. Louvre (Sb 13457).

62. Susa. - No context - Ovoid, perfect, hematite. L. 2.30 cm, D. 1.00 cm, 5.42 g - Mus. Louvre (Sb 13277).

63. Susa. - No context - Ovoid, good, stone. L. 2.60 cm, D. 1.10 cm, 5.42 g - Mus. Louvre (Sb 13410).

64. Susa. - No context - Ovoid, good, with markings ('II'), stone. L. 3.62 cm, D. 1.00 cm, 5.42 g - Mus. Louvre (Sb 13543).

65. Susa. - No context - Ovoid, good, diorite. L. 2.40 cm, D. 0.91 cm, 5.43 g - Mus. Louvre (Sb 13493).

66. Susa. - No context - Ovoid, perfect, hematite. L. 3.31 cm, D. 0.79 cm, 5.45 g - Mus. Louvre (Sb 13473).

67. Susa. - No context - Ovoid, good, stone. L. 3.95 cm, D. 0.95 cm, 5.52 g - Mus. Louvre (Sb 13540).

68. Susa. - No context - Ovoid, perfect, hematite. L. 3.85 cm, D. 1.81 cm, 5.53 g - Mus. Louvre (Sb 13478).

69. Susa. - No context - Ovoid, good, diorite. L. 3.09 cm, D. 0.90 cm, 5.55 g - Mus. Louvre (Sb 13148).

70. Susa. - AS 1282, de Morgan 1898-1911 excavations - Ovoid, good, with markings ('II'), stone. L. 3.23 cm, D. 1.08 cm, 5.55 g - Mus. Louvre (Sb 13537).

71. Susa. - AS 9526, de Morgan 1898-1911 excavations - Ovoid, perfect, hematite. L. 2.70 cm, D. 0.82 cm, 5.57 g - Mus. Louvre (Sb 13503).

72. Susa. - No context - Ovoid, perfect, with bronze traces on surface, hematite. L. 2.22 cm, D. 0.94 cm, 5.57 g - Mus. Louvre (Sb 13199).

73. Susa. - No context - Ovoid, perfect, hematite. L. 4.62 cm, D. 0.63 cm, 5.60 g - Mus. Louvre (Sb 13748).

74. Susa. - No context - Ovoid, perfect, hematite. L. 3.30 cm, D. 1.08 cm, 5.63 g - Mus. Louvre (Sb 13491).

75. Susa. - No context - Ovoid, good, diorite. L. 3.70 cm, D. 1.00 cm, 5.66 g - Mus. Louvre (Sb 13143).

76. Susa. - AS 12823, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 2.70 cm, D. 1.19 cm, 5.68 g - Mus. Louvre (Sb 13406) - Soutzo 1911, 19, no. 12823.

77. Susa. - No context - Ovoid, slightly chipped, stone. L. 2.84 cm, D. 1.20 cm, 5.69+x g - Mus. Louvre (Sb 13293).

78. Susa. - No context - Ovoid, good, stone. L. 3.38 cm, D. 1.28 cm, 5.70 g - Mus. Louvre (Sb 13554).

79. Susa. - AS 12850, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 3.65 cm, D. 0.95 cm, 5.79 g - Mus. Louvre (Sb 1351).

80. Susa. - No context - Ovoid, good, with markings ('II'), stone. L. 3.10 cm, D. 1.08 cm, 5.87 g - Mus. Louvre (Sb 13414).

81. Susa. - No context - Ovoid, good, hematite. L. 1.98 cm, D. 1.12 cm, 6.78 g - Mus. Louvre (Sb 13295).

82. Susa. - No context - Ovoid, perfect, stone. L. 2.70 cm, D. 0.39 cm, 6.85 g - Mus. Louvre (Sb 13577).

83. Susa. - AS 9511, de Morgan 1898-1911 excavations - Ovoid, perfect, hematite. L. 3.90 cm, D. 1.11 cm, 7.48 g - Mus. Louvre (Sb 13140).

84. Susa. - No context - Ovoid, good, limestone. L. 3.22 cm, D. 1.25 cm, 7.85 g - Mus. Louvre (Sb 13562).

85. Susa. - No context - Ovoid, good, stone. L. 2.65 cm, D. 1.50 cm, 8.05 g - Mus. Louvre (Sb 13551).

86. Susa. - No context - Ovoid, good, stone. L. 3.90 cm, D. 1.17 cm, 8.18 g - Mus. Louvre (Sb 13524).

87. Susa. - No context - Ovoid, perfect, hematite. L. 3.70 cm, D. 0.91 cm, 8.23 g - Mus. Louvre (Sb 13156).

88. Susa. - T. 340, de Mecquenem 1936 excavations - Ovoid, good, stone. L. 4.41 cm, D. 1.08 cm, 8.25 g - Mus. Louvre (Sb 13582).

89. Susa. - No context - Ovoid, perfect, hematite. L. 3.80 cm, D. 0.89 cm, 8.26 g - Mus. Louvre (Sb 13475).

90. Susa. - No context - Ovoid, good, with marking ('I'), hematite. L. 3.65 cm, D. 0.98 cm, 8.27 g - Mus. Louvre (Sb 13502).

91. Susa. - AS 3764, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 3.91 cm, D. 1.25 cm, 8.33 g - Mus. Louvre (Sb 13673) - Soutzo 1911, 18, no. 3764.

92. Susa. - AS 14214, de Morgan 1898-1911 excavations - Ovoid, perfect, hematite. L. 3.06 cm, D. 1.00 cm, 8.35 g - Mus. Louvre (Sb 13262) - Soutzo 1911, 18, no. 14214.

93. Susa. - No context - Ovoid, perfect, hematite. L. 3.38 cm, D. 0.90 cm, 8.37 g - Mus. Louvre (Sb 13146).

94. Susa. - AS 1282, de Morgan 1898-1911 excavations - Ovoid, good, with marking ('I'), stone. L. 3.90 cm, D. 1.25 cm, 8.38 g - Mus. Louvre (Sb 13548).

95. Susa. - No context - Ovoid, good, with marking ('I'), stone. L. 4.10 cm, D. 1.18 cm, 8.40 g - Mus. Louvre (Sb 13271).

96. Susa. - AS 11818, de Morgan 1898-1911 excavations - Ovoid, good, hematite. L. 3.60 cm, D. 1.21 cm, 8.42 g - Mus. Louvre (Sb 13518).

97. Susa. - No context - Ovoid, perfect, with marking ('I'), hematite. L. 4.15 cm, D. 1.21 cm, 8.46 g - Mus. Louvre (Sb 13529).

98. Susa. - No context - Ovoid, good, stone. L. 4.20 cm, D. 1.21 cm, 8.46 g - Mus. Louvre (Sb 13574).

99. Susa. - No context - Ovoid, perfect, hematite. L. 2.41 cm, D. 1.18 cm, 8.51 g - Mus. Louvre (Sb 13408).

100. Susa. - AS 6317, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 4.40 cm, D. 1.25 cm, 8.55 g - Mus. Louvre (Sb 13519) - Soutzo 1911, 18, no. 6317.

101. Susa. - AS 14203, de Morgan 1898-1911 excavations - Ovoid, perfect, hematite. L. 3.05 cm, D. 1.44 cm, 8.72 g - Mus. Louvre (Sb 13415) - Soutzo 1911, 19, no. 14203.

102. Susa. - No context - Ovoid, perfect, hematite. L. 2.75 cm, D. 1.09 cm, 8.75 g - Mus. Louvre (Sb 13495).

103. Susa. - AS 9512, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 3.48 cm, D. 1.41 cm, 8.90 g - Mus. Louvre (Sb 13583).

104. Susa. - AS 9517, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 3.41 cm, D. 1.31 cm, 8.95 g - Mus. Louvre (Sb 13286).

105. Susa. - AS 12854, de Morgan 1898-1911 excavations - Ovoid, good, with markings ('II'), stone. L. 4.20 cm, D. 1.31 cm, 10.71 g - Mus. Louvre (Sb 13710).

106. Susa. - AS 14205, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 3.75 cm, D. 1.41 cm, 10.85 g - Mus. Louvre (Sb 13580).

107. Susa. - No context - Ovoid, good, limestone. L. 3.55 cm, D. 1.50 cm, 12.11 g - Mus. Louvre (Sb 13531).

108. Susa. - AS 9513, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 2.70 cm, D. 1.75 cm, 12.21 g - Mus. Louvre (Sb 13576).

109. Susa. - AS 14209, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 3.75 cm, D. 1.55 cm, 12.33 g - Mus. Louvre (Sb 13587) - Soutzo 1911, 20, no. 4209.

110. Susa. - AS 8385, de Morgan 1898-1911 excavations - Ovoid with incision, good, stone. L. 3.35 cm, D. 1.55 cm, 12.38 g - Mus. Louvre (Sb 13568).

111. Susa. - AS 9505, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 3.95 cm, D. 1.45 cm, 12.54 g - Mus. Louvre (Sb 13533).

112. Susa. - AS 14210, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 3.10 cm, D. 1.80 cm, 12.84 g - Mus. Louvre (Sb 13585).

113. Susa. - AS 4173, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 4.89 cm, D. 1.60 cm, 14.44 g - Mus. Louvre (Sb 13589).

114. Susa. - No context - Ovoid, good, slightly worn, hematite. L. 3.6 cm, D. 1.4 cm, 15.93 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Tehran (NMI 4734).

115. Susa. - H. 423, de Mecquenem 1926 excavations - Ovoid, perfect, hematite. L. 4.50 cm, D. 1.18 cm, 16.05 g - Mus. Louvre (Sb 13362).

116. Susa. - No context - Ovoid, perfect, hematite. L. 5.20 cm, D. 1.09 cm, 16.23 g - Mus. Louvre (Sb 13133).

117. Susa. - No context - Ovoid, perfect, hematite. L. 5.10 cm, D. 1.11 cm, 16.30 g - Mus. Louvre (Sb 13505).

118. Susa. - AS 354, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 4.60 cm, D. 1.60 cm, 16.32 g - Mus. Louvre (Sb 13592).

119. Susa. - No context - Ovoid, perfect, with markings ('II'), hematite. L. 4.65 cm, D. 1.11 cm, 16.33 g - Mus. Louvre (Sb 13514).

120. Susa. - No context - Ovoid, perfect, with markings ('II'), hematite. L. 3.95 cm, D. 1.30 cm, 16.44 g - Mus. Louvre (Sb 13747).

121. Susa. - No context - Ovoid, perfect, hematite. L. 3.72 cm, D. 1.28 cm, 16.46 g - Mus. Louvre (Sb 13511).

122. Susa. - No context - Ovoid, perfect, hematite. L. 6.10 cm, D. 1.20 cm, 16.60 g - Mus. Louvre (Sb 13161).

123. Susa. - No context - Ovoid, perfect, hematite. L. 4.50 cm, D. 1.21 cm, 16.61 g - Mus. Louvre (Sb 13134).

124. Susa. - No context - Ovoid, perfect, hematite. L. 4.6 cm, D. 1.2 cm, 16.65 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Tehran (NMI 4733).

125. Susa. - No context - Ovoid, perfect, hematite. L. 2.99 cm, D. 1.52 cm, 16.70 g - Mus. Louvre (Sb 13356).

126. Susa. - No context - Ovoid, perfect, stone. L. 4.89 cm, D. 1.55 cm, 16.73 g - Mus. Louvre (Sb 13523).

127. Susa. - AS 12819, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 4.51 cm, D. 1.20 cm, 16.87 g - Mus. Louvre (Sb 13375) - Soutzo 1911, 18, no. 12819.

128. Susa. - AS 12818, de Morgan 1898-1911 excavations - Ovoid, perfect, with markings ('II'), hematite. L. 5.41 cm, D. 1.40 cm, 16.90 g - Mus. Louvre (Sb 13520) - Soutzo 1911, 10, no. 12818.

129. Susa. - No context - Ovoid, perfect, with markings ('II'), hematite. L. 4.61 cm, D. 1.16 cm, 16.91 g - Mus. Louvre (Sb 13514).

130. Susa. - No context - Ovoid, good, with markings ('II'), stone. L. 4.32 cm, D. 1.83 cm, 17.15 g - Mus. Louvre (Sb 13532).

131. Susa. - AS 14208, de Morgan 1898-1911 excavations - Ovoid, perfect, hematite. L. 4.71 cm, D. 1.30 cm, 17.52 g - Mus. Louvre (Sb 13354) - Soutzo 1911, 18, no. 14208.

132. Susa. - AS 6316, de Morgan 1898-1911 excavations - Ovoid, good, with markings ('II'), limestone. L. 5.72 cm, D. 2.30 cm, 17.65 g - Mus. Louvre (Sb 13557) - Soutzo 1911, 11, no. 6318.

133. Susa. - S. 454, de Mecquenem 1935 excavations - Ovoid, perfect, hematite. L. 3.90 cm, D. 1.38 cm, 19.40 g - Mus. Louvre (Sb 13744).

134. Susa. - AS 9504, de Morgan 1898-1911 excavations - Ovoid, slightly chipped, limestone. L. 4.66 cm, D. 1.61 cm, 19.86+x g - Mus. Louvre (Sb 13588).

135. Susa. - S. 247, de Mecquenem 1935 excavations - Ovoid, good, stone. L. 4.60 cm, D. 1.88 cm, 22.30 g - Old-Elamite I, Susa IVB, '*XXIII siécle*', 2300-2200 BC - Mus. Louvre (Sb 13570).

136. Susa. - No context - Ovoid, perfect, hematite. L. 4.21 cm, D. 1.68 cm, 23.97 g - Mus. Louvre (Sb 13404).

137. Susa. - No context - Ovoid, good, slightly worn, hematite. L. 4.8 cm, D. 1.4 cm, 24.48 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Tehran (NMI 4731).

138. Susa. - AS 9500, de Morgan 1898-1911 excavations - Ovoid, good, with markings ('III'), steatite. L. 5.01 cm, D. 1.81 cm, 24.51 g - Mus. Louvre (Sb 13595).

139. Susa. - No context - Ovoid, perfect, hematite. L. 3.81 cm, D. 1.67 cm, 24.89 g - Mus. Louvre (Sb 13364).

140. Susa. - No context - Ovoid, good, stone. L. 4.60 cm, D. 1.85 cm, 24.94 g - Mus. Louvre (Sb 13598).

141. Susa. - No context - Ovoid, perfect, hematite. L. 4.81 cm, D. 1.84 cm, 25.12 g - Mus. Louvre (Sb 13355).

142. Susa. - AS 12811, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 4.56 cm, D. 1.91 cm, 26.22 g - Mus. Louvre (Sb 13590).

143. Susa. - AS 2499, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 4.60 cm, D. 2.15 cm, 29.10 g - Mus. Louvre (Sb 13593).

144. Susa. - AS 9495, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 5.55 cm, D. 2.00 cm, 32.24 g - Mus. Louvre (Sb 13608).

145. Susa. - AS 14733, de Morgan 1898-1911 excavations - Ovoid, good, with markings ('IIII'), stone (limestone?). L. 5.50 cm, D. 2.10 cm, 32.53 g - Mus. Louvre (Sb 13599).

146. Susa. - AS 6320, de Morgan 1898-1911 excavations - Ovoid, incomplete, limestone. L. 6.90 cm, D. 2.12 cm, 32.54+x g - Mus. Louvre (Sb 13629).

147. Susa. - AS 9534, de Morgan 1898-1911 excavations - Ovoid good, limestone. L. 4.10 cm, D. 2.40 cm, 32.61 g - Mus. Louvre (Sb 13610).

148. Susa. - No context - Ovoid, good, with markings ('IIII'), stone. L. 5.25 cm, D. 2.06 cm, 33.38 g - Mus. Louvre (Sb 13597).

149. Susa. - AS 12819, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 4.71 cm, D. 2.37 cm, 35.40 g - Mus. Louvre (Sb 13591).

150. Susa. - No context - Ovoid, perfect, hematite. L. 5.6 cm, D. 1.6 cm, 40.04 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Tehran (NMI 4730) - Ascalone in press, no. 2.

151. Susa. - No context - Ovoid, good, hematite. L. 4.4 cm, D. 1.8 cm, 40.27 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Tehran (NMI 4694).

152. Susa. - de Morgan 1898-1911 excavations - Ovoid, perfect, with markings ('IIII'), hematite. L. 5.11 cm, D. 1.62 cm, 40.78 g - Mus. Louvre (Sb 13378).

153. Susa. - No context - Ovoid, perfect, hematite. L. 4.05 cm, D. 2.10 cm, 40.83 g - Mus. Louvre (Sb 13139).

154. Susa. - No context - Ovoid, perfect, hematite. L. 5.10 cm, D. 1.68 cm, 40.87 g - Mus. Louvre (Sb 13375).

155. Susa. - No context - Ovoid, fragmented in two different parts and restored, hematite. L. 5.40 cm, D. 1.81 cm, 40.94 g - Mus. Louvre (Sb 13604).

156. Susa. - No context - Ovoid, perfect, stone. L. 5.40 cm, D. 1.79 cm, 40.99 g - Mus. Louvre (Sb 13377).

157. Susa. - No context - Ovoid, perfect, hematite. L. 5.71 cm, D. 1.70 cm, 41.04 g - Mus. Louvre (Sb 13372).

158. Susa. - No context - Ovoid, perfect, hematite. L. 4.80 cm, D. 1.71 cm, 41.08 g - Mus. Louvre (Sb 13376).

159. Susa. - D. 25, de Mecquenem 1914 excavations - Ovoid, good, with markings ('IIII'), chert. L. 5.49 cm, D. 2.11 cm, 41.28 g - Mus. Louvre (Sb 13647).

160. Susa. - No context - Ovoid, good, stone. L. 6.30 cm, D. 2.11 cm, 41.29 g - Mus. Louvre (Sb 13646).

161. Susa. - No context - Ovoid, perfect, hematite. L. 5.40 cm, D. 1.52 cm, 41.37 g - Mus. Louvre (Sb 13379).

162. Susa. - AS 9532, de Morgan 1898-1911 excavations - Ovoid, good, with markings ('IIIII'), stone. L. 6.18 cm, D. 2.22 cm, 41.46 g - Mus. Louvre (Sb 13400).

163. Susa. - No context - Ovoid, good, granite. L. 5.45 cm, D. 2.21 cm, 41.69 g - Mus. Louvre (Sb 13631).

164. Susa. - No context - Ovoid, good, limestone. L. 5.99 cm, D. 2.15 cm, 41.78 g - Mus. Louvre (Sb 13714).

165. Susa. - AS 9496, de Morgan 1898-1911 excavations - Ovoid, good, granite. L. 5.71 cm, D. 2.20 cm, 41.81 g - Mus. Louvre (Sb 13711).

166. Susa. - N. 971, de Mecquenem 1932 excavations - Ovoid, good, limestone. L. 5.36 cm, D. 2.35 cm, 41.93 g - Mus. Louvre (Sb 13596).

167. Susa. - AS 9474, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 5.91 cm, D. 2.18 cm, 42.04 g - Mus. Louvre (Sb 13715).

168. Susa. - AS 12815, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 6.40 cm, D. 2.08 cm, 42.12 g - Mus. Louvre (Sb 13607) - Soutzo 191, 17, no. 12815.

169. Susa. - No context - Ovoid, perfect, stone (limestone?). L. 5.80 cm, D. 2.01 cm, 42.50 g - Mus. Louvre (Sb 13387).

170. Susa. - AS 12812, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 5.45 cm, D. 2.32 cm, 43.87 g - Mus. Louvre (Sb 13712) - Soutzo 1911, 17, no. 12812.

171. Susa. - AS 9498, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 6.10 cm, D. 2.19 cm, 44.18 g - Mus. Louvre (Sb 13641).

172. Susa. - D. 26, de Mecquenem 1914 excavations - Ovoid, good, limestone. L. 5.20 cm, D. 2.55 cm, 45.72 g - Mus. Louvre (Sb 13600).

173. Susa. - AS 9480, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 6.80 cm, D. 2.31 cm, 50.40 g - Mus. Louvre (Sb 13703).

174. Susa. - U. 137, de Mecquenem 1937 excavations - Ovoid, good, stone. L. 5.76 cm, D. 2.50 cm, 56.53 g - Mus. Louvre (Sb 13606).

175. Susa. - AS 9493, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 5.36 cm, D. 2.80 cm, 58.68 g - Mus. Louvre (Sb).

176. Susa. - No context - Ovoid, good, with markings ('IIIIIIIII'), calcite. L. 7.99 cm, D. 2.45 cm, 75.15 g - Mus. Louvre (Sb 13682).

177. Susa. - AS 9489, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 8.10 cm, D. 2.35 cm, 75.18 g - Mus. Louvre (Sb 13667).

178. Susa. - P. 738, de Mecquenem 1933 excavations - Ovoid, good, with marking ('I'), stone. L. 6.92 cm, D. 2.98 cm, 81.42 g - Mus. Louvre (Sb 13643).

179. Susa. - No context - Ovoid, good, slightly worn, steatite. L. 6.20 cm, D. 2.99 cm, 81.68 g - Mus. Louvre (Sb 13697).

180. Susa. - U. 52, de Mecquenem 1937 excavations - Ovoid, good, limestone. L. 5.83 cm, D. 2.98 cm, 82.09 g - Old-Elamite I, Awan dynasty, Susa IVB, 2300-2200 BC - Mus. Louvre (Sb 13649).

181. Susa. - No context - Ovoid, good, stone. L. 7.11 cm, D. 2.75 cm, 82.45 g - Mus. Louvre (Sb 13702).

182. Susa. - No context - Ovoid, perfect, hematite. L. 6.25 cm, D. 2.22 cm, 82.46 g - Mus. Louvre (Sb 13382).

183. Susa. - No context - Ovoid, perfect, hematite. L. 5.48 cm, D. 2.37 cm, 82.59 g - Mus. Louvre (Sb 13389).

184. Susa. - No context - Ovoid, good, stone. L. 7.85 cm, D. 2.76 cm, 83.15 g - Mus. Louvre (Sb 13686).

185. Susa. - No context - Ovoid, perfect, hematite. L. 7.33 cm, D. 2.00 cm, 83.26 g - Mus. Louvre (Sb 13384).

186. Susa. - AS 9491, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 9.35 cm, D. 2.41 cm, 83.67 g - Mus. Louvre (Sb 13707).

187. Susa. - No context - Ovoid, perfect, hematite. L. 6.38 cm, D. 2.13 cm, 83.81 g - Mus. Louvre (Sb 13392).

188. Susa. - E. 1338, de Mecquenem 1923 excavations - Ovoid, good, limestone. L. 5.89 cm, D. 4.00 cm, 83.86 g - Mus. Louvre (Sb 13666) - Belaiew 1934, no. 30.

189. Susa. - AS 9488, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 7.15 cm, D. 2.84 cm, 84.47 g - Mus. Louvre (Sb 13674).

190. Susa. - AS 12810, de Morgan 1898-1911 excavations - Ovoid, perfect, stone. L. 7.00 cm, D. 2.79 cm, 84.60 g - Mus. Louvre (Sb 13602) - Soutzo 1911, 16, n. 12810.

191. Susa. - AS 9475, de Morgan 1898-1911 excavations - Ovoid, good, with markings ('IIIIIIIII'), limestone. L. 8.70 cm, D. 2.49 cm, 84.91 g - Mus. Louvre (Sb 13699).

192. Susa. - AS 12811, de Morgan 1898-1911 excavations - Ovoid, good, steatite. L. 6.03 cm, D. 3.00 cm, 85.93 g - Mus. Louvre (Sb 13708).

193. Susa. - AS 6246, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 8.92 cm, D. 2.60 cm, 95.45 g - Mus. Louvre (Sb 13685).

194. Susa. - AS 3417, de Morgan 1898-1911 excavations - Ovoid, good, slightly worn stone. L. 6.71 cm, D. 3.02 cm, 118.22+x g - Mus. Louvre (Sb 13653).

195. Susa. - AS 14198, de Morgan 1898-1911 excavations - Ovoid, one end slightly chipped, limestone. L. 8.79 cm, D. 3.31 cm, 120.91 g - Mus. Louvre (Sb 13611) - Soutzo 1911, 16, no. 14198.

196. Susa. - AS 14735, de Morgan 1898-1911 excavations - Ovoid, good, with markings ('IIIII' and 'O'), limestone. L. 8.22 cm, D. 4.01 cm, 123.16 g - Mus. Louvre (Sb 13696).

197. Susa. - U. 194, de Mecquenem 1937 excavations - Ovoid, one end slightly chipped, with marking ('O'), limestone. L. 7.98 cm, D. 3.80 cm, 150.48+x g - Old-Elamite II-III/Middle Elamite I-II, 2000-1300 BC - Mus. Louvre (Sb 13690).

198. Susa. - AS 9484, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 8.30 cm, D. 3.59 cm, 157.23 g - Mus. Louvre (Sb 13691).

199. Susa. - No context - Ovoid, chipped, stone. L. 10.81 cm, D. 3.10 cm, 157.97+x g - Mus. Louvre (Sb 13671).

200. Susa. - AS 14734, de Morgan 1898-1911 excavations - Ovoid, good, steatite. L. 8.99 cm, D. 3.65 cm, 158.78 g - Mus. Louvre (Sb 13672).

201. Susa. - AS 9531, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 7.35 cm, D. 3.91 cm, 159.20 g - Mus. Louvre (Sb 13673).

202. Susa. - AS 11819, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 9.50 cm, D. 4.38 cm, 161.18 g - Mus. Louvre (Sb 13689).

203. Susa. - No context - Ovoid, perfect, hematite. L. 7.2 cm, D. 2.8 cm, 161.84 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Tehran (NMI 896).

204. Susa. - AS 9486, de Morgan 1908 excavations - Ovoid, good, stone. L. 8.00 cm, D. 3.89 cm, 162.05 g - Mus. Louvre (Sb 13655).

205. Susa. - AS 14199, de Morgan 1898-1911 excavations - Ovoid, one end chipped, unpolished hematite. L. 9.00 cm, D. 3.61 cm, 164.73+x g - Mus. Louvre (Sb 13709) - Soutzo 1911, 16, no. 14199.

206. Susa. - No context - Ovoid, good, stone. L. 8.00 cm, D. 3.72 cm, 164.89 g - Mus. Louvre (Sb 13828).

207. Susa. - AS 1819, de Morgan 1898-1911 excavations - Ovoid, good, one end slightly chipped, with markings ('II') chert. L. 8.08 cm, D. 3.65 cm, 165.92+x g - Mus. Louvre (Sb 13716).

208. Susa. - AS 12808, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 9.24 cm, D. 3.46 cm, 166.17 g - Mus. Louvre (Sb 13618) - Soutzo 1911, 16, no. 12808.

209. Susa. - AS 9530, de Morgan 1898-1911 excavations - Ovoid, good, with markings ('II'), stone. L. 9.35 cm, D. 3.50 cm, 166.43 g - Mus. Louvre (Sb 13668) - Soutzo 1911, 9, no. 1819.

210. Susa. - AS 9485, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 8.50 cm, D. 3.59 cm, 168.06 g - Mus. Louvre (Sb 13705).

211. Susa. - B. 109, de Mecquenem 1912 excavations - Ovoid, good, stone. L. 8.78 cm, D. 3.75 cm, 168.41 g - Mus. Louvre (Sb 13706).

212. Susa. - D. 21, de Mecquenem 1914 excavations - Ovoid, good, slightly chipped, limestone. L. 8.60 cm, D. 3.70 cm, 174.42+x g - Mus. Louvre (Sb 13626).

213. Susa. - No context - Ovoid, good, stone. L. 9.18 cm, D. 4.38 cm, 216.69 g - Mus. Louvre (Sb 13664).

214. Susa. - No context - Ovoid, good, slightly worn, stone. L. 9.80 cm, D. 4.02 cm, 245.45 g - Mus. Louvre (Sb 13635).

215. Susa. - No context - Ovoid, good, steatite. L. 10.00 cm, D. 3.85 cm, 245.97 g - Mus. Louvre (Sb 13688).

216. Susa. - AS 830, de Morgan 1898-1911 excavations - Ovoid, good, with marking ('X'), marble. L. 10.50 cm, D. 3.98 cm, 256.98 g - Mus. Louvre (Sb 13627).

217. Susa. - AS 14202, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 10.21 cm, D. 4.99 cm, 257.02 g - Mus. Louvre (Sb 13634) - Soutzo 1911, 16, no. 14202.

218. Susa. - AS 1645, de Morgan 1898-1911 excavations - Ovoid, good, slightly chipped, with markings ('III'), limestone. L. 9.31 cm, D. 4.60 cm, 258.13 g - Mus. Louvre (Sb 13658) - Soutzo 1911, 9, no. 1645.

219. Susa. - AS 9483, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 11.50 cm, D. 4.02 cm, 270.27 g - Mus. Louvre (Sb 13620).

220. Susa. - E. 91, de Mecquenem 1921 excavations - Ovoid, good, with markings ('III'), limestone. L. 9.52 cm, D. 5.36 cm, 282.14 g - Mus. Louvre (Sb 13678) - Belaiew 1934, no. 16.

221. Susa. - AS 13856, de Morgan 1898-1911 excavations - Ovoid, good, with markings ('IIII'), limestone. L. 11.51 cm, D. 4.70 cm, 335.46 g - Mus. Louvre (Sb 13736).

222. Susa. - AS 13805, de Morgan 1898-1911 excavations - Ovoid, good, one end slightly chipped, limestone. L. 10.38 cm, D. 4.61 cm, 335.57 g - Mus. Louvre (Sb 13623).

223. Susa. - AS 9482, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 10.00 cm, D. 4.90 cm, 342.86 g - Mus. Louvre (Sb 13724).

224. Susa. - AS 2615, de Morgan 1898-1911 excavations - Ovoid, good, with markings ('OOOO'), unpolished hematite. L. 9.40 cm, D. 3.55 cm, 334.25 g - Mus. Louvre (Sb 13677) - Soutzo 1911, 9, no. 2615.

225. Susa. - No context - Ovoid, good, with hole for bronze ring, granite. L. 13.40 cm, D. 4.60 cm, 462.72 g - Mus. Louvre (Sb 13640).

226. Susa. - P. 5, de Mecquenem 1933 excavations - Ovoid, good, one end slightly chipped, limestone. L. 12.21 cm, D. 5.19 cm, 483.46+x g - Mus. Louvre (Sb 13741).

227. Susa. - F. 858, de Mecquenem 1924 excavations - Ovoid, good, with marking ('I'), limestone. L. 13.00 cm, D. 4.90 cm, 484.50 g - Mus. Louvre (Sb 13660).

228. Susa. - AS 243, de Mecquenem excavations - Ovoid, good, granite. L. 13.35 cm, D. 4.70 cm, 498.16 g - Mus. Louvre (Sb 13614).

229. Susa. - AS 7896, de Morgan excavations - Ovoid, chipped, with markings ('II'), stone. L. 13.72 cm, D. 4.82 cm, 505.49+x g - Mus. Louvre (Sb 13735) - Soutzo 1911, 12, no. 7896.

230. Susa. - No context - Ovoid, good, limestone. L. 12.65 cm, D. 5.25 cm, 510.02 g - Mus. Louvre (Sb 13740).

231. Susa. - E. 90, de Mecquenem 1921 excavations - Ovoid, good, limestone. L. 14.12 cm, D. 5.00 cm, 523.50 g - Mus. Louvre (Sb 13721).

232. Susa. - No context - Ovoid, one end slightly chipped, stone. L. 10.92 cm, D. 5.90 cm, 555.60+x g - Mus. Louvre (Sb 13725).

233. Susa. - AS 11820, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 13.80 cm, D. 5.92 cm, 669.50 g - Mus. Louvre (Sb 13616).

234. Susa. - AS 12805, de Morgan 1898-1911 excavations - Ovoid, good, with markings ('II'), stone. L. 13.50 cm, D. 6.94 cm, 993.00 g - Mus. Louvre (Sb 13734) - Soutzo 1911, 8, no. 12805.

235. Susa. - AS 9533, de Morgan 1898-1911 excavations - Ovoid, good, stone. L. 14.96 cm, D. 7.08 cm, 1,020.50 g - Mus. Louvre (Sb 13679).

236. Susa. - N. 680, de Mecquenem 1932 excavations - Ovoid, one end slightly chipped, limestone. L. 13.74 cm, D. 7.78 cm, 1,157.00+x g - Middle Elamite I, '*XV siécle*', 1500-1400 BC - Mus. Louvre (Sb 13727).

237. Susa. - AS 2668, de Morgan 1898-1911 excavations - Ovoid, good, diorite. L. 19.00 cm, D. 6.55 cm, 1,232.00 g - Mus. Louvre (Sb 13737) - Soutzo 1911, 19, no. 2668.

238. Susa. - P. 673, de Mecquenem 1933 excavations - Ovoid, good, with markings ('III'), limestone. L. 18.50 cm, D. 7.05 cm, 1,469.50 g - Mus. Louvre (Sb 13720).

239. Susa. - A. 7865, de Morgan 1908 excavations - Ovoid, good, limestone. L. 27.00 cm, D. 9.00 cm, 3,495.00 g - Mus. Louvre (Sb 13729).

240. Susa. - No context - Ovoid, good, one end slightly chipped, limestone. L. 25.50 cm, D. 11.50 cm, 4,275.00+x g - Mus. Louvre (Sb 13752).

241. Susa. - No context - Ovoid with one deep incision, good, limestone. L. 31.88 cm, D. 9.71 cm, 4,940.00 g - Mus. Louvre (Sb 24364).

242. Susa. - AS 6087, de Morgan 1898-1911 excavations - Ovoid, good, limestone. L. 26.50 cm, D. 11.80 cm, 4,985.00 g - Mus. Louvre (Sb 13751) - Soutzo 1911, 15, no. 6087.

243. Susa. - A. 7866, de Morgan 1908 excavations - Ovoid, good, limestone. L. 32.43 cm, D. 10.10 cm, 4,995.00 g - Mus. Louvre (Sb 13728) - Soutzo 1911, 15, no. 7866.

244. Susa. - A. 6088, de Morgan 1908 excavations - Ovoid, good, with markings ('II'), limestone. L. 32.80 cm, D. 14.80 cm, 10,045.00 g - Mus. Louvre (Sb 13754) - Soutzo 1911, 8, no. 6088.

4.1.2.2.2. Ovoid with base (Type 1b): Cat. no. 245-263

245. Susa. - AS 12826, de Morgan 1898-1911 excavations - Ovoid with base, good, stone. L. 5.80 cm, H. 2.22 cm, W. 2.42 cm, 17.51 g - Mus. Louvre (Sb 13581).

246. Susa. - No context - Ovoid with base, perfect, hematite. L. 2.20 cm, H. 0.55 cm, W. 0.79 cm, 2.24 g - Mus. Louvre (Sb 13233).

247. Susa. - No context - Ovoid with base, good, stone. L. 1.95 cm, H. 0.76 cm, W. 0.90 cm, 2.79 g - Mus. Louvre (Sb 13284).

248. Susa. - No context - Fragmented ovoid with base, stone. L. 3.72 cm, H. 0.71 cm, W. 1.10 cm, 3.77+x g - Mus. Louvre (Sb 13413).

249. Susa. - No context - Ovoid with base, perfect, hematite. L. 2.60 cm, H. 0.80 cm, W. 1.75 cm, 4.18 g - Mus. Louvre (Sb 13484).

250. Susa. - No context - Ovoid with base, chipped, hematite. L. 2.65 cm, H. 0.72 cm, W. 1.11 cm, 5.05+x g - Mus. Louvre (Sb 13208).

251. Susa. - No context - Fragmented ovoid with base, hematite. L. 2.63 cm, H. 1.20 cm, W. 1.31 cm, 7.42+x g - Mus. Louvre (Sb 13407).

252. Susa. - AS 9510, de Morgan 1898-1911 excavations - Ovoid with base, good, stone. L. 3.45 cm, H. 1.11 cm, W. 1.22 cm, 8.39 g - Mus. Louvre (Sb 13287).

253. Susa. - AS 9056, de Morgan 1898-1911 excavations - Ovoid with base, good, stone. L. 3.90 cm, H. 1.11 cm, W. 1.22 cm, 8.58 g - Mus. Louvre (Sb 13527).

254. Susa. - No context - Ovoid with base, perfect, hematite. L. 4.29 cm, H. 1.45 cm, W. 1.70 cm, 31.04 g - Mus. Louvre (Sb 13380).

255. Susa. - U. 137, de Mecquenem 1937 excavations - Ovoid with base, good, with markings ('IIIIIII'), limestone. L. 6.55 cm, H. 2.10 cm, W. 2.71 cm, 58.07 g - Mus. Louvre (Sb 13652).

256. Susa. - M. 101, de Mecquenem 1930-1931 excavations - Ovoid with base, good, limestone. L. 6.89 cm, H. 2.75 cm, W. 2.81 cm, 81.89 g - Mus. Louvre (Sb 13612).

257. Susa. - AS 4632, de Morgan 1898-1911 excavations - Ovoid with base, good, with markings ('IIIIIIII-IIIIIIIIIII'), limestone. L. 10.90 cm, H. 2.61 cm, W. 3.71 cm, 174.95 g - Mus. Louvre (Sb 13619) - Soutzo 1911, 10, no. 4632.

258. Susa. - No context - Ovoid with base, fragmented, with markings ('III'), limestone. L. 10.88 cm, H. 3.28 cm, W. 4.02 cm, 226.17+x g - Mus. Louvre (Sb 13656).

259. Susa. - D. 22, de Mecquenem 1914 excavations - Ovoid with base, good, slightly worn limestone. L. 10.11 cm, H. 3.81 cm, W. 3.90 cm, 237.80+x g - Mus. Louvre (Sb 13661).

260. Susa. - No context - Ovoid with base, good, with markings ('III'), limestone. L. 10.35 cm, H. 3.40 cm, W. 4.09 cm, 240.58 g - Mus. Louvre (Sb 13722).

261. Susa. - AS 14300, de Morgan 1898-1911 excavations, Acropole - Ovoid with base, limestone. L. 9.50 cm, H. 3.95 cm, W. 4.28 cm, 252.11 g - Mus. Louvre (Sb 13617) - Morgan 1900, 137, fig. 357.

262. Susa. - AS 1820, de Morgan 1898-1911 excavations - Ovoid with base, good, stone. L. 8.91 cm, H. 3.90 cm, W. 4.48 cm, 259.73 g - Mus. Louvre (Sb 13695) - Soutzo 1911, 16, no. 1820.

263. Susa. - AS 13825, de Morgan 1898-1911 excavations - Ovoid with base, good, one end slightly chipped, calcite. L. 31.31 cm, H. 4.85 cm, W. 5.90 cm, 477.70 g - Mus. Louvre (Sb 13739).

4.1.2.2.3. Ovoid with flat ends (Type 1c): Cat. no. 264-482

264. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.60 cm, D. 0.41 cm, 0.55 g - Mus. Louvre (Sb 13259).

265. Susa. - No context - Ovoid with flat ends, perfect, steatite. L. 1.39 cm, D. 0.61 cm, 0.71 g - Mus. Louvre (Sb 13422).

266. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.09 cm, D. 0.40 cm, 0.77 g - Mus. Louvre (Sb 13421).

267. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.68 cm, D. 0.49 cm, 0.83 g - Mus. Louvre (Sb 13460).

268. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.78 cm, D. 0.45 cm, 1.03 g - Mus. Louvre (Sb 13249).

269. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.77 cm, D. 0.45 cm, 1.07 g - Mus. Louvre (Sb 13253).

270. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.22 cm, D. 0.60 cm, 1.09 g - Mus. Louvre (Sb 13423).

271. Susa. - No context -Ovoid with flat ends, perfect, hematite. L. 2.50 cm, D. 0.40 cm, 1.09 g - Mus. Louvre (Sb 13416).

272. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.02 cm, D. 0.49 cm, 1.15 g - Mus. Louvre (Sb 13252).

273. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.69 cm, D. 0.50 cm, 1.18 g - Mus. Louvre (Sb 13251).

274. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 1.35 cm, D. 0.61 cm, 1.28+x g - Mus. Louvre (Sb 13297).

275. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.60 cm, D. 0.61 cm, 1.49 g - Mus. Louvre (Sb 13456).

276. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.68 cm, D. 0.60 cm, 1.57 g - Mus. Louvre (Sb 13237).

277. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 1.70 cm, D. 0.67 cm, 1.57+x g - Mus. Louvre (Sb 13464).

278. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.01 cm, D. 1.60 cm, 1.59 g - Mus. Louvre (Sb 13417).

279. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.71 cm, D. 0.65 cm, 1.63 g - Mus. Louvre (Sb 13419).

280. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.18 cm, D. 0.60 cm, 1.72 g - Mus. Louvre (Sb 13273).

281. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.94 cm, D. 0.70 cm, 1.73 g - Mus. Louvre (Sb 13174).

282. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.26 cm, D. 0.50 cm, 1.75 g - Mus. Louvre (Sb 13272).

283. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 1.69 cm, D. 0.68 cm, 1.79+x g - Mus. Louvre (Sb 13236).

284. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 1.45 cm, D. 0.73 cm, 1.87+x g - Mus. Louvre (Sb 13256).

285. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 1.22 cm, D. 0.85 cm, 1.96+x g - Mus. Louvre (Sb 13409).

286. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.61 cm, D. 0.70 cm, 2.01 g - Mus. Louvre (Sb 13487).

287. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.71 cm, D. 0.75 cm, 2.02 g - Mus. Louvre (Sb 13459).

288. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.73 cm, D. 0.72 cm, 2.08 g - Mus. Louvre (Sb 13222).

289. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.80 cm, D. 0.69 cm, 2.10 g - Mus. Louvre (Sb 13160).

290. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.62 cm, D. 0.75 cm, 2.12 g - Mus. Louvre (Sb 13282).

291. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.45 cm, D. 0.60 cm, 2.13 g - Mus. Louvre (Sb 13468).

292. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.00 cm, D. 1.67 cm, 2.18 g - Mus. Louvre (Sb 13482).

293. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 1.36 cm, D. 0.79 cm, 2.21+x g - Mus. Louvre (Sb 13225).

294. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.82 cm, D. 0.70 cm, 2.22 g - Mus. Louvre (Sb 13159).

295. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.20 cm, D. 0.61 cm, 2.24 g - Mus. Louvre (Sb 13215).

296. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.02 cm, D. 0.65 cm, 2.29 g - Mus. Louvre (Sb 13234).

297. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 1.50 cm, D. 0.75 cm, 2.31+x g - Mus. Louvre (Sb 13241).

298. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.90 cm, D. 0.71 cm, 2.41 g - Mus. Louvre (Sb 13242).

299. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.40 cm, D. 0.69 cm, 2.48 g - Mus. Louvre (Sb 13243).

300. Susa. - AS 12856, de Morgan 1898-1911 excavations - Ovoid with flat ends, good, stone. L. 3.12 cm, D. 0.82 cm, 2.55 g - Mus. Louvre (Sb 13264) - Soutzo 1911, 19, no. 12856.

301. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 1.70 cm, D. 0.71 cm, 2.64+x g - Mus. Louvre (Sb 13250).

302. Susa. - No context - Fragmented ovoid with flat ends. hematite. L. 1.51 cm, D. 0.88 cm, 2.64+x g - Mus. Louvre (Sb 13230).

303. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.70 cm, D. 0.80 cm, 2.69 g - Mus. Louvre (Sb 13191).

304. Susa. - No context - Ovoid with flat ends, good, stone. L. 2.10 cm, D. 0.90 cm, 2.70 g - Mus. Louvre (Sb 13539).

305. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.10 cm, D. 0.75 cm, 2.73 g - Mus. Louvre (Sb 12229).

306. Susa. - AS 12858, de Morgan 1898-1911 excavations - Ovoid with flat ends, perfect, hematite. L. 2.29 cm, D. 0.65 cm, 2.74 g - Mus. Louvre (Sb 13470) - Soutzo 1911, 19, no. 12858.

307. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 1.60 cm, D. 0.81 cm, 2.75+x g - Mus. Louvre (Sb 13497).

308. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.02 cm, D. 0.70 cm, 2.80 g - Mus. Louvre (Sb 13207).

309. Susa. - No context - Ovoid with flat ends, good, stone. L. 2.05 cm, D. 0.95 cm, 2.83 g - Mus. Louvre (Sb 13213).

310. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.80 cm, D. 0.81 cm, 2.84 g - Mus. Louvre (Sb 13193).

311. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.25 cm, D. 0.60 cm, 2.85 g - Mus. Louvre (Sb 13203).

312. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.11 cm, D. 1.80 cm, 2.92 g - Mus. Louvre (Sb 13227).

313. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.11 cm, D. 1.70 cm, 2.93 g - Mus. Louvre (Sb 13158).

314. Susa. - No context - Ovoid with flat ends, perfect, with bronze traces on surface, hematite. L. 2.12 cm, D. 0.74 cm, 2.95 g - Mus. Louvre (Sb 13240).

315. Susa. - No context - Ovoid with flat ends, good, stone. L. 3.15 cm, D. 0.80 cm, 2.95 g - Mus. Louvre (Sb 13485).

316. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.08 cm, D. 0.75 cm, 2.96 g - Mus. Louvre (Sb 13481).

317. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.63 cm, D. 0.61 cm, 2.97 g - Mus. Louvre (Sb 13455).

318. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.75 cm, D. 0.69 cm, 3.01 g - Mus. Louvre (Sb 13418).

319. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.60 cm, D. 0.71 cm, 3.05 g - Mus. Louvre (Sb 13212).

320. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.60 cm, D. 0.70 cm, 3.05 g - Mus. Louvre (Sb 13223).

321. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.10 cm, D. 0.61 cm, 3.08 g - Mus. Louvre (Sb 13480).

322. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.20 cm, D. 0.69 cm, 3.15 g - Mus. Louvre (Sb 13200).

323. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.25 cm, D. 0.68 cm, 3.22 g - Mus. Louvre (Sb 13214).

324. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.10 cm, D. 0.81 cm, 3.31 g - Mus. Louvre (Sb 13466).

325. Susa. - No context - Ovoid with flat ends, good, stone. L. 2.70 cm, D. 1.85 cm, 3.71 g - Mus. Louvre (Sb 13186).

326. Susa. - No context - Ovoid with flat ends, good, stone. L. 1.90 cm, D. 1.00 cm, 3.79 g - Mus. Louvre (Sb 13347).

327. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.25 cm, D. 0.92 cm, 3.85 g - Mus. Louvre (Sb 13206).

328. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.11 cm, D. 0.88 cm, 3.93 g - Mus. Louvre (Sb 13248).

329. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.10 cm, D. 0.86 cm, 4.00 g - Mus. Louvre (Sb 13462).

330. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.59 cm, D. 0.71 cm, 4.01 g - Mus. Louvre (Sb 13231).

331. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.12 cm, D. 0.70 cm, 4.04 g - Mus. Louvre (Sb 13197).

332. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.19 cm, D. 0.88 cm, 4.05 g - Mus. Louvre (Sb 13198).

333. Susa. - AS 12857, de Morgan 1898-1911 excavations - Ovoid with flat ends, perfect, hematite. L. 2.22 cm, D. 0.85 cm, 4.05 g - Mus. Louvre (Sb 13471) - Soutzo 1911, 19, no. 12857.

334. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.50 cm, D. 0.79 cm, 4.10 g - Mus. Louvre (Sb 13152).

335. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.00 cm, D. 1.89 cm, 4.16 g - Mus. Louvre (Sb 13247).

336. Susa. - No context - Ovoid with flat ends, good, stone. L. 2.80 cm, D. 1.00 cm, 4.18 g - Mus. Louvre (Sb 13555).

337. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.75 cm, D. 0.75 cm, 4.20 g - Mus. Louvre (Sb 13477).

338. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.22 cm, D. 0.75 cm, 4.21 g - Mus. Louvre (Sb 13209).

339. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.25 cm, D. 0.65 cm, 4.23 g - Mus. Louvre (Sb 13301).

340. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.00 cm, D. 0.99 cm, 4.33 g - Mus. Louvre (Sb 13182).

341. Susa. - No context - Ovoid with flat ends, good, stone. L. 2.38 cm, D. 0.90 cm, 4.34 g - Mus. Louvre (Sb 13346).

342. Susa. - No context - Ovoid with flat ends, perfect, with bronze traces on surface, hematite. L. 2.35 cm, D. 0.81 cm, 4.40 g - Mus. Louvre (Sb 13157).

343. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.30 cm, D. 0.80 cm, 4.43 g - Mus. Louvre (Sb 13246).

344. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.95 cm, D. 1.71 cm, 4.47 g - Mus. Louvre (Sb 13165).

345. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.30 cm, D. 0.82 cm, 4.54 g - Mus. Louvre (Sb 13187).

346. Susa. - No context - Ovoid with flat ends, good, stone. L. 2.85 cm, D. 1.00 cm, 4.63 g - Mus. Louvre (Sb 13218).

347. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.94 cm, D. 1.00 cm, 4.69 g - Mus. Louvre (Sb 13292).

348. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.12 cm, D. 0.90 cm, 4.88 g - Mus. Louvre (Sb 13150).

349. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 1.55 cm, D. 1.30 cm, 5.23+x g - Mus. Louvre (Sb 13412).

350. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 2.00 cm, D. 0.90 cm, 5.29+x g - Mus. Louvre (Sb 13463)

351. Susa. - No context - Ovoid with flat ends, good, limestone. L. 2.70 cm, D. 1.20 cm, 5.38 g - Mus. Louvre (Sb 13306).

352. Susa. - No context - Ovoid with flat ends, slightly chipped, hematite. L. 2.20 cm, D. 1.12 cm, 5.49 g - Mus. Louvre (Sb 13276).

353. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.25 cm, D. 0.92 cm, 5.49 g - Mus. Louvre (Sb 13238).

354. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.35 cm, D. 0.78 cm, 5.51 g - Mus. Louvre (Sb 13479).

355. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 2.31 cm, D. 0.85 cm, 5.55+x g - Mus. Louvre (Sb 13181).

356. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.70 cm, D. 1.90 cm, 5.58 g - Mus. Louvre (Sb 13155).

357. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 1.78 cm, D. 1.10 cm, 5.59 g - Mus. Louvre (Sb 13183).

358. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.00 cm, D. 0.81 cm, 5.59 g - Mus. Louvre (Sb 13196).

359. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.50 cm, D. 0.75 cm, 5.59 g - Mus. Louvre (Sb 13201).

360. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.30 cm, D. 1.01 cm, 5.62 g - Mus. Louvre (Sb 13190).

361. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.08 cm, D. 0.81 cm, 5.65 g - Mus. Louvre (Sb 13474).

362. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.25 cm, D. 0.75 cm, 5.66 g - Mus. Louvre (Sb 13142).

363. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.80 cm, D. 0.80 cm, 5.70 g - Mus. Louvre (Sb 13145).

364. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.50 cm, D. 0.91 cm, 5.78 g - Mus. Louvre (Sb 13494).

365. Susa. - No context - Ovoid with flat ends, perfect, with bronze traces on surface, hematite. L. 2.90 cm, D. 0.95 cm, 5.82 g - Mus. Louvre (Sb 13202).

366. Susa. - No context - Ovoid with flat ends, good, stone. L. 3.45 cm, D. 1.00 cm, 5.82 g - Mus. Louvre (Sb 13274).

367. Susa. - No context - Ovoid with flat ends, good, stone. L. 3.76 cm, D. 0.75 cm, 5.84 g - Mus. Louvre (Sb 13553).

368. Susa. - No context - Ovoid with flat ends, good, slightly worn, hematite. L. 2.50 cm, D. 1.00 cm, 5.88 g - Mus. Louvre (Sb 13179).

369. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.00 cm, D. 1.15 cm, 5.91 g - Mus. Louvre (Sb 13283).

370. Susa. - No context - Ovoid with flat ends, good, hematite. L. 3.12 cm, D. 1.39 cm, 5.93 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Louvre (Sb 13153).

371. Susa. - No context - Ovoid with flat ends, slightly chipped, hematite. L. 3.00 cm, D. 0.95 cm, 6.02 g - Mus. Louvre (Sb 13204).

372. Susa. - No context - Ovoid with flat ends, good, perfect, hematite. L. 2.55 cm, D. 1.00 cm, 6.37 g - Mus. Louvre (Sb 13224).

373. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 2.30 cm, D. 1.00 cm, 6.93+x g - Mus. Louvre (Sb 13515).

374. Susa. - R. 17, de Mecquenem 1934 excavations - Fragmented ovoid with flat ends, with inscription, limestone. L. 4.16 cm, D. 3.18 cm, 63.96+x g - Old-Elamite I, Susa IVB, '*XXIII siécle*', 2300-2200 BC [according to Mecquenem]; Kassite period, Middle Elamite period, 1500-1000 BC [according to Author] - Mus. Louvre (Sb 13603).

375. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 2.15 cm, D. 1.21 cm, 7.24+x g - Mus. Louvre (Sb 13169).

376. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 2.32 cm, D. 1.01 cm, 7.80+x g - Mus. Louvre (Sb 13180) -

377. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.40 cm, D. 1.00 cm, 7.88 g - Mus. Louvre (Sb 13135).

378. Susa. - No context - Ovoid with flat ends, perfect, diorite. L. 3.60 cm, D. 0.92 cm, 7.90 g - Mus. Louvre (Sb 13144).

379. Susa. - No context - Ovoid with flat ends, good, stone. L. 3.15 cm, D. 1.25 cm, 7.96 g - Mus. Louvre (Sb 13176).

380. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.45 cm, D. 0.90 cm, 8.00 g - Mus. Louvre (Sb 13510).

381. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.31 cm, D. 0.90 cm, 8.03 g - Mus. Louvre (Sb 13194).

382. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.95 cm, D. 1.01 cm, 8.17 g - Mus. Louvre (Sb 13490).

383. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.55 cm, D. 1.00 cm, 8.21 g - Mus. Louvre (Sb 13501).

384. Susa. - No context - Ovoid with flat ends, good, limestone. L. 3.70 cm, D. 1.15 cm, 8.21 g - Mus. Louvre (Sb 13549).

385. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.00 cm, D. 1.00 cm, 8.23 g - Mus. Louvre (Sb 13281).

386. Susa. - No context - Ovoid with flat ends, good, with marking ('I'), stone. L. 2.95 cm, D. 1.40 cm, 8.25 g - Mus. Louvre (Sb 13530).

387. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.85 cm, D. 1.91 cm, 8.27 g - Mus. Louvre (Sb 13164).

388. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.75 cm, D. 1.11 cm, 8.39 g - Mus. Louvre (Sb 13151).

389. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.50 cm, D. 1.15 cm, 8.42 g - Mus. Louvre (Sb 13499).

390. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.00 cm, D. 1.86 cm, 8.44 g - Mus. Louvre (Sb 13189).

391. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.70 cm, D. 1.15 cm, 8.48 g - Mus. Louvre (Sb 13195).

392. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.55 cm, D. 1.20 cm, 8.56 g - Mus. Louvre (Sb 13267).

393. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.60 cm, D. 1.10 cm, 8.59 g - Mus. Louvre (Sb 13500).

394. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.65 cm, D. 1.22 cm, 8.60 g - Mus. Louvre (Sb 13268).

395 Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.62 cm, D. 1.10 cm, 8.64 g - Mus. Louvre (Sb 13260).

396. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 2.44 cm, D. 1.05 cm, 8.69+x g - Mus. Louvre (Sb 13205).

397. Susa. - AS 12853, de Morgan 1898-1911 excavations - Ovoid with flat ends, perfect, diorite. L. 3.50 cm, D. 1.30 cm, 8.77 g - Mus. Louvre (Sb 13521) - Soutzo 1911, 18, no. 12853.

398. Susa. - AS 3507, de Morgan 1898-1911 excavations - Ovoid with flat ends, good, stone. L. 3.82 cm, D. 1.35 cm, 9.06 g - Mus. Louvre (Sb 13565).

399. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 2.90 cm, D. 1.15 cm, 9.28 g - Mus. Louvre (Sb 13509).

400. Susa. - AS 9514, de Morgan 1898-1911 excavations - Ovoid with flat ends, good, marble. L. 3.10 cm, D. 1.38 cm, 9.72 g - Mus. Louvre (Sb 13534).

401. Susa. - No context - Fragmented ovoid with flat ends, hematite. L. 2.99 cm, D. 1.08 cm, 9.97+x g - Mus. Louvre (Sb 13516).

402. Susa. - AS 9515, de Morgan 1898-1911 excavations - Ovoid with flat ends, good, stone. L. 2.71 cm, D. 1.80 cm, 12.39 g - Mus. Louvre (Sb 13568).

403. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.20 cm, D. 1.30 cm, 16.00 g - Mus. Louvre (Sb 13137).

404. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.50 cm, D. 1.30 cm, 16.08 g - Mus. Louvre (Sb 13163).

405. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.35 cm, D. 1.16 cm, 16.10 g - Mus. Louvre (Sb 13513).

406. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.08 cm, D. 1.23 cm, 16.10 g - Mus. Louvre (Sb 13508).

407. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.38 cm, D. 1.11 cm, 16.12 g - Mus. Louvre (Sb 13507).

408. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.81 cm, D. 1.25 cm, 16.25 g - Mus. Louvre (Sb 13275).

409. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.21 cm, D. 1.19 cm, 16.26 g - Mus. Louvre (Sb 13522).

410. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.55 cm, D. 1.30 cm, 16.29 g - Mus. Louvre (Sb 13363).

411. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.11 cm, D. 1.40 cm, 16.68 g - Mus. Louvre (Sb 13141).

412. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.90 cm, D. 1.41 cm, 16.99 g - Mus. Louvre (Sb 13349).

413. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.90 cm, D. 1.15 cm, 17.22 g - Mus. Louvre (Sb 13147).

414. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.31 cm, D. 1.30 cm, 17.26 g - Mus. Louvre (Sb 13350).

415. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.61 cm, D. 1.39 cm, 17.27 g - Mus. Louvre (Sb 13351).

416. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.45 cm, D. 1.60 cm, 17.31 g - Mus. Louvre (Sb 13367).

417. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.88 cm, D. 1.30 cm, 17.76 g - Mus. Louvre (Sb 13512).

418. Susa. - No context - Ovoid with flat ends, burnt and chipped, limestone. L. 4.61 cm, D. 1.93 cm, 21.71+x g - Mus. Louvre (Sb 13713).

419. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.59 cm, D. 1.67 cm, 23.99 g - Mus. Louvre (Sb 13352).

420. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.55 cm, D. 1.31 cm, 24.03 g - Mus. Louvre (Sb 13366).

421. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.51 cm, D. 1.40 cm, 24.38 g - Mus. Louvre (Sb 13353).

422. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 5.19 cm, D. 1.22 cm, 24.47 g - Mus. Louvre (Sb 13132).

423. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.50 cm, D. 1.35 cm, 24.47 g - Mus. Louvre (Sb 13360).

424. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.5 cm, D. 1.5 cm, 24.51 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Tehran (NMI 897).

425. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.48 cm, D. 1.51 cm, 24.66 g - Mus. Louvre (Sb 13746).

426. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 6.00 cm, D. 1.32 cm, 24.90 g - Mus. Louvre (Sb 13506).

427. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.70 cm, D. 1.51 cm, 25.03 g - Mus. Louvre (Sb 13359).

428. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.12 cm, D. 1.45 cm, 25.07 g - Mus. Louvre (Sb 13358).

429. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.72 cm, D. 1.51 cm, 25.18 g - Mus. Louvre (Sb 13357).

430. Susa. - D. 24, de Mecquenem 1914 excavations - Ovoid with flat ends, good, hematite. L. 5.81 cm, D. 1.60 cm, 25.54 g - Mus. Louvre (Sb 13605).

431. Susa. - AS 14212, de Morgan 1898-1911 excavations - Ovoid with flat ends, perfect, stone. L. 3.90 cm, D. 1.81 cm, 29.62 g - Mus. Louvre (Sb 13579) - Soutzo 1911, 20, no. 14212.

432. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.89 cm, D. 1.68 cm, 32.38 g - Mus. Louvre (Sb 13371).

433. Susa. - No context - Ovoid with flat ends, good, steatite. L. 5.97 cm, D. 1.91 cm, 37.88 g - Mus. Louvre (Sb 13642).

434. Susa. - No context - Ovoid with flat ends, good, limestone. L. 6.50 cm, D. 1.96 cm, 39.20 g - Mus. Louvre (Sb 13609).

435. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 5.00 cm, D. 1.68 cm, 40.01 g - Mus. Louvre (Sb 13373).

436. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 5.56 cm, D. 1.60 cm, 40.51 g - Mus. Louvre (Sb 13136).

437. Susa. - M. 142, de Mecquenem 1930-1931 excavations - Ovoid with flat ends, perfect, stone. L. 4.97 cm, D. 1.71 cm, 40.78 g - Old-Elamite II, Susa VB2, 2000-1900 BC - Mus. Louvre (Sb 13381).

438. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 3.82 cm, D. 1.97 cm, 40.98 g - Mus. Louvre (Sb 13546).

439. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.21 cm, D. 1.88 cm, 41.39 g - Mus. Louvre (Sb 13368).

440. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.01 cm, D. 1.90 cm, 41.43 g - Mus. Louvre (Sb 13369).

441. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 5.60 cm, D. 1.60 cm, 41.62 g - Mus. Louvre (Sb 13743a).

442. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.66 cm, D. 1.85 cm, 41.89 g - Mus. Louvre (Sb 13370).

443. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.37 cm, D. 1.85 cm, 42.21 g - Mus. Louvre (Sb 13613).

444. Susa. - D. 88, de Mecquenem 1914 excavations - Ovoid with flat ends, perfect, hematite. L. 4.22 cm, D. 1.81 cm, 43.86 g - Mus. Louvre (Sb 13374).

445. Susa. - AS 9497, de Morgan 1898-1911 excavations - Ovoid with flat ends, good, stone. L. 4.60 cm, D. 2.50 cm, 44.98 g - Mus. Louvre (Sb 13650).

446. Susa. - AS 11832, de Morgan 1898-1911 excavations - Ovoid with flat ends, good, limestone. L. 5.35 cm, D. 2.43 cm, 48.82 g - Mus. Louvre (Sb 13648).

447. Susa. - AS 9479, de Morgan 1898-1911 excavations - Ovoid with flat ends, good, limestone. L. 5.51 cm, D. 3.55 cm, 80.09 g - Mus. Louvre (Sb 13644).

448. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 4.71 cm, D. 2.48 cm, 80.91 g - Mus. Louvre (Sb 13383).

449. Susa. - M. 390, de Mecquenem 1930-1931 excavations - Ovoid with flat ends, perfect, hematite. L. 6.71 cm, D. 2.12 cm, 81.02 g - Mus. Louvre (Sb 13394).

450. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 5.21 cm, D. 2.50 cm, 82.02 g - Mus. Louvre (Sb 13395).

451. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 5.79 cm, D. 2.28 cm, 82.04 g - Mus. Louvre (Sb 13398).

452. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 6.01 cm, D. 2.00 cm, 82.26 g - Mus. Louvre (Sb 13393).

453. Susa. - No context - Ovoid with flat ends, good, granite. L. 7.45 cm, D. 2.60 cm, 82.45 g - Mus. Louvre (Sb 13630).

454. Susa. - M. 144, de Mecquenem 1931 excavations - Ovoid with flat ends, fragmented and restored, hematite. L. 6.61 cm, D. 2.08 cm, 83.89 g - Mus. Louvre (Sb 13390).

455. Susa. - No context - Ovoid with flat ends, perfect, stone. L. 7.12 cm, D. 2.69 cm, 85.78 g - Mus. Louvre (Sb 13399).

456. Susa. - AS 6314, de Morgan 1898-1911 excavations - Ovoid with flat ends, good, with markings ('III-IIIIII'), hematite. L. 7.38 cm, D. 3.60 cm, 123.74 g - Mus. Louvre (Sb 13637) - Soutzo 1911, 16, no. 6314.

457. Susa. - No context - Ovoid with flat ends, good, one end slightly chipped, limestone. L. 7.95 cm, D. 3.50 cm, 152.23+x g - Mus. Louvre (Sb 13687).

458. Susa. - G. 91, de Mecquenem 1925 excavations - Ovoid with flat ends, good, one end slightly chipped, stone. L. 8.44 cm, D. 3.40 cm, 158.97+x g - Mus. Louvre (Sb 13654).

459. Susa. - L.210, de Mecquenem excavations - Ovoid with flat ends, good, hematite. L. 9.15 cm, D. 3.40 cm, 162.34 g - Mus. Louvre (Sb 13621).

460. Susa. - M. 89, de Mecquenem 1930-1931 excavations - Ovoid with flat ends, good, unpolished hematite. L. 9.40 cm, D. 9,40 cm, 163.07 g - Mus. Louvre (Sb 13700).

461. Susa. - R. 17, de Mecquenem 1934 excavations - Ovoid with flat ends, good, stone. L. 9.55 cm, D. 4.20 cm, 241.67 g - Old-Elamite I, Susa IVB, 2300-2200 BC - Mus. Louvre (Sb 13638).

462. Susa. - No context - Ovoid with flat ends, good, hematite. L. 10.73 cm, D. 3.75 cm, 242.45 g - Mus. Louvre (Sb 13615).

463. Susa. - M. 398, de Mecquenem 1930-1931 excavations - Ovoid with flat ends, slightly worn, hematite. L. 7.35 cm, D. 3.48 cm, 244.12 g - Mus. Louvre (Sb 13396).

464. Susa. - No context - Ovoid with flat ends, perfect, hematite. L. 10.30 cm, D. 3.90 cm, 244.58 g - Mus. Susa (SM 4088.1639).

465. Susa. - E. 859, de Mecquenem 1922 excavations - Ovoid with flat ends, one end chipped, stone. L. 11.35 cm, D. 3.61 cm, 253.18+x g - Mus. Louvre (Sb 13659) - Belaiew 1934, no. 24.

466. Susa. - V. 50, de Mecquenem 1938 excavations - Ovoid with flat ends, good, limestone. L. 9.28 cm, D. 4.81 cm, 303.78 g - Mus. Louvre (Sb 13639).

467. Susa. - No context - Ovoid with flat ends, good, bitumen. L. 11.32 cm, D. 5.28 cm, 349.72 g - Mus. Louvre (Sb 17838) - Connan/Deschesne 1996, no. 248.

468. Susa. - AS 6245, de Morgan 1898-1911 excavations - Ovoid with flat ends, one end chipped, bitumen. L. 11.15 cm, D. 5.25 cm, 403.91+x g - Mus. Louvre (Sb 13633) - Soutzo 1911, 9, no. 6245; Connan/Deschesne 1996, no. 256.

469. Susa. - AS 498, de Morgan 1898-1911 excavations - Ovoid with flat ends, good, limestone. L. 12.05 cm, D. 5.42 cm, 461.51 g - Mus. Louvre (Sb 13742).

470. Susa. - No context - Ovoid with flat ends, slightly worn, stone. L. 13.45 cm, D. 4.95 cm, 465.99 g - Mus. Louvre (Sb 13681).

471. Susa. - No context - Ovoid with flat ends, good, stone. L. 14.22 cm, D. 4.60 cm, 476.61 g - Mus. Louvre (Sb 13662).

472. Susa. - AS 2617, de Morgan 1898-1911 excavations - Ovoid with flat ends, good, diorite. L. 13.71 cm, D. 5.32 cm, 497.92 g - Mus. Louvre (Sb 13622) - Connan/Deschesne 1996, no. 2617.

473. Susa. - AS 162, de Morgan 1898-1911 excavations - Ovoid with flat ends, good, stone. L. 11.20 cm, D. 5.50 cm, 506.34 g - Mus. Louvre (Sb 13626).

474. Susa. - AS 898, de Morgan 1898-1911 excavations - Ovoid with flat ends, good, limestone. L. 11.89 cm, D. 5.54 cm, 517.94 g - Mus. Louvre (Sb 13669).

475. Susa. - D. 63, de Mecquenem 1914 excavations - Ovoid with flat ends, chipped in multiple areas, stone. L. 12.82 cm, 539.46+x g - Mus. Louvre (Sb 13738).

476. Susa. - N. 680, de Mecquenem 1932 excavations - Ovoid with flat ends, good, limestone. L. 15.50 cm, D. 4.92 cm, 573.50 g - Middle Elamite I, '*XV siécle*', 1500-1400 BC - Mus. Louvre (Sb 13675).

477. Susa. - No context – Fragmented ovoid with flat ends, incomplete, bitumen. L. 15.00 cm, D. 6.88 cm, 781.00+x g - Mus. Louvre (Sb 20833) - Connan/Deschesne 1996, no. 255.

478. Susa. - No context - Ovoid with flat ends, good, limestone. L. 18.50 cm, D. 5.85 cm, 1,001.50 g - Mus. Louvre (Sb 13726).

479. Susa. - No context - Ovoid with flat ends, good but restored, with inscription ('3 minas'), diorite. L. 18.80 cm, D. 7.25 cm, 1,435.00 g - Mus. Louvre (Sb 13680).

480. Susa. - M. 425, de Mecquenem 1930-1931 excavations - Ovoid with flat ends, good, diorite. L. 18.00 cm, D. 18.00 cm, 1,439.50 g - Mus. Louvre (Sb 13719).

481. Susa. - N. 234, de Mecquenem 1932 excavations - Ovoid with flat ends, good, stone. L. 18.50 cm, D. 7.76 cm, 1,724.50 g - Middle Elamite I, '*XV siécle*', 1500-1400 BC - Mus. Louvre (Sb 13718).

482. Susa. - AS 1163, de Morgan 1898-1911 excavations - Ovoid with flat ends, good, limestone. L. 24.60 cm, D. 11.40 cm, 4,910.00 g - Mus. Louvre (Sb).

4.1.2.2.4. Ovoid with base and flat ends (Type 1d): Cat. no. 483-508

483. Susa. - No context - Ovoid with base and flat ends, perfect, slightly worn, with inscription, hematite. L. 1.81 cm, H. 0.55 cm, W. 0.79 cm, 1.26 g - Mus. Louvre (Sb 13298).

484. Susa. - No context - Ovoid with base and flat ends, slightly chipped, carnelian. L. 1.38 cm, H. 0.59 cm, W. 0.90 cm, 1.28+x g - Mus. Louvre (Sb 13344).

485. Susa. - No context - Ovoid with base and flat ends, good, hematite. L. 1.35 cm, H. 0.55 cm, W. 0.89 cm, 2.00 g - Mus. Louvre (Sb 13257).

486. Susa. - No context - Ovoid with base and flat ends, perfect, hematite. L. 1.70 cm, H. 0.70 cm, W. 0.95 cm, 3.11 g - Mus. Louvre (Sb 13172).

487. Susa. - No context - Ovoid with base and flat ends, perfect, hematite. L. 2.15 cm, H. 0.72 cm, W. 0.81 cm, 3.30 g - Mus. Louvre (Sb 13171).

488. Susa. - No context - Ovoid with base and flat ends, perfect, hematite. L. 2.60 cm, H. 0.70 cm, W. 0.80 cm, 4.13 g - Mus. Louvre (Sb 13228).

489. Susa. - No context - Ovoid with base and flat ends, perfect, hematite. L. 2.31 cm, D. 0.80 cm, 4.22 g - Mus. Louvre (Sb 13476).

490. Susa. - No context - Ovoid with base and flat ends, perfect, hematite. L. 2.30 cm, H. 0.78 cm, W. 0.90 cm, 4.39 g - Mus. Louvre (Sb 13173).

491. Susa. - No context - Ovoid with base and flat ends, perfect, hematite. L. 2.25 cm, H. 0.85 cm, W. 0.95 cm, 4.47 g - Mus. Louvre (Sb 13270).

492. Susa. - AS 12824, de Morgan 1898-1911 excavations - Ovoid with base and flat ends, good, stone. L. 2.88 cm, W. 1.10 cm, D. 1.01 cm, 5.61 g - Mus. Louvre (Sb 13289) - Soutzo 1911, no. 12824.

493. Susa. - No context - Ovoid with base and flat ends, perfect, hematite. L. 2.22 cm, H. 0.95 cm, W. 1.05 cm, 7.75 g - Mus. Louvre (Sb 13278).

494. Susa. - No context - Ovoid with base and flat ends, perfect, hematite. L. 2.35 cm, H. 1.00 cm, W. 1.10 cm, 8.15 g - Mus. Louvre (Sb 13498).

495. Susa. - AS 9508, de Morgan 1898-1911 excavations - Ovoid with base and flat ends, good, stone. L. 3.60 cm, H. 1.16 cm, W. 1.30 cm, 8.42 g - Mus. Louvre (Sb 13569).

496. Susa. - No context - Ovoid with base and flat ends, perfect, hematite. L. 2.60 cm, H. 1.11 cm, W. 1.21 cm, 8.51 g - Mus. Louvre (Sb 13162).

497. Susa. - AS 12829, de Morgan 1898-1911 excavations - Ovoid with base and flat ends, good, steatite. L. 3.15 cm, H. 1.34 cm, W. 1.50 cm, 9.68 g - Mus. Louvre (Sb 13304).

498. Susa. - No context - Ovoid with base and flat ends, perfect, hematite. L. 3.80 cm, H. 1.00 cm, W. 1.12 cm, 9.72 g - Mus. Louvre (Sb 13261).

499. Susa. - AS 14206, de Morgan 1898-1911 excavations - Ovoid with base and flat ends, good, limestone. L. 3.16 cm, H. 2.42 cm, W. 1.69 cm, 13.28 g - Mus. Louvre (Sb 13584) - Soutzo 1911, 20, no. 14206.

500. Susa. - No context - Ovoid with base and flat ends, perfect, hematite. L. 3.21 cm, H. 1.30 cm, D. 1.25 cm, 15.72 g - Mus. Louvre (Sb 13138).

501. Susa. - AS 6315, de Morgan 1898-1911 excavations - Ovoid with base and flat ends, good, with markings ('IIIII'), hematite. L. 5.46 cm, D. 2.30 cm, 41.28 g - Mus. Louvre (Sb 13386) - Soutzo 1911, 10, no. 6315.

502. Susa. - AS 14204, de Morgan 1898-1911 excavations - Ovoid with base and flat ends, good, limestone. L. 7.61 cm, H. 1.72 cm, W. 2.01 cm, 41.54 g - Mus. Louvre (Sb 13651) - Soutzo 1911, 17, no. 14202.

503. Susa. - No context - Ovoid with base and flat ends, chipped, with markings ('IIIIIII'), limestone. L. 5.85 cm, D. 2.60 cm, 61.31+x g - Mus. Louvre (Sb 13398).

504. Susa. - E. 860, de Mecquenem 1922 excavations - Ovoid with base and flat ends, good, slightly worn, steatite. L. 5.25 cm, H. 3.00 cm, W. 4.05 cm, 78.69 g - Mus. Louvre (Sb 13645) - Belaiew 1934, no. 28.

505. Susa. - A. 6242, de Morgan 1908 excavations - Ovoid with base and flat ends, good, slightly chipped, stone. L. 6.95 cm, H. 3.06 cm, W. 3.59 cm, 117.82+x g - Mus. Louvre (Sb 13694).

506. Susa. - AS 126, de Morgan 1898-1911 excavations - Ovoid with base and flat ends, good, stone. L. 7.70 cm, H. 3.55 cm, W. 3.80 cm, 160.77 g - Mus. Louvre (Sb 13670).

507. Susa. - D. 20, de Mecquenem 1914 excavations - Ovoid with base and flat ends, good, slightly worn, limestone. L. 8.49 cm, H. 4.21 cm, W. 4.35 cm, 234.32 g - Mus. Louvre (Sb 13665).

508. Susa. - AS 1821, de Morgan 1898-1911 excavations - Ovoid with base and flat ends, good, stone. L. 9.91 cm, H. 4.22 cm, W. 3.93 cm, 257.25 g - Mus. Louvre (Sb 13723) - Soutzo 1911, 16, no. 1821.

4.1.2.2.5. Ovoid with one flat end (Type 1e): Cat. no. 509-515

509. Susa. - No context - Ovoid with one flat end, perfect, hematite. L. 1.80 cm, D. 0.55 cm, 1.40 g - Mus. Louvre (Sb 13235).

510. Susa. - No context - Ovoid with one flat end, good, stone. L. 2.23 cm, D. 1.35 cm, 4.09 g - Mus. Louvre (Sb 13299).

511. Susa. - No context - Ovoid with one flat end, good, limestone. L. 3.50 cm, D. 0.88 cm, 4.33 g - Mus. Louvre (Sb 13538).

512. Susa. - E. 116, de Mecquenem 1921 excavations - Ovoid with one flat end, good, steatite. L. 3.85 cm, D. 1.41 cm, 11.53 g - Mus. Louvre (Sb 13571).

513. Susa. - No context - Ovoid with one flat end, perfect, hematite. L. 2.81 cm, D. 1.40 cm, 16.35 g - Mus. Louvre (Sb 13167).

514. Susa. - AS 9503, de Morgan 1898-1911 excavations - Ovoid with one flat end, good, with markings ('III'), stone (limestone?). L. 4.92 cm, D. 1.42 cm, 25.41 g - Mus. Louvre (Sb 13312).

515. Susa. - AS 9487, de Morgan 1898-1911 excavations - Ovoid with one flat end, good, limestone. L. 7.50 cm, D. 3.45 cm, 129.17 g - Mus. Louvre (Sb 13704).

4.1.2.2.6. Ovoid with two bases and flat ends (Type 1g): Cat. no. 516

516. Susa. - AS 9516, de Morgan 1898-1911 excavations - Ovoid with two bases and flat ends, good, stone. L. 2.70 cm, H. 1.27 cm, W. 1.38 cm, 8.04 g - Mus. Louvre (Sb 13290).

4.1.2.2.7. Ovoid with four bases (Type 1h): Cat. no. 517-518

517. Susa. - No context - Fragmented ovoid with four bases, hematite. L. 1.60 cm, D. 0.70 cm, 3.28+x g - Mus. Louvre (Sb 13221).

518. Susa. - AS 11817, de Morgan 1898-1911 excavations - Ovoid with four bases, good, limestone. L. 7.57 cm, H. 1.88 cm, W. 2.02 cm, 49.46 g - Mus. Louvre (Sb 13693).

4.1.2.2.8. Ovoid with hole (Type 1i): Cat. no. 519-527

519. Susa. - No context - Ovoid with flat ends, with hole (bead?), perfect, possible weight, hematite. L. 1.31 cm, D. 0.55 cm, 0.82 g - Mus. Louvre (Sb 13254).

520. Susa. - No context - Ovoid with flat ends, with hole (bead?), perfect, possible weight, hematite. L. 1.70 cm, D. 0.79 cm, 2.43 g - Mus. Louvre (Sb 13361).

521. Susa. - No context - Ovoid with hole in one end, good, stone. L. 2.92 cm, D. 1.32 cm, 5.05 g - Mus. Louvre (Sb 13586).

522. Susa. - No context - Fragmented ovoid with flat ends and hole (bead?), possible weight, hematite. L. 2.21 cm, D. 1.00 cm, 4.32+x g - Mus. Louvre (Sb 13265).

523. Susa. - No context - Ovoid with flat ends with hole in one end, perfect, hematite. L. 5.39 cm, D. 2.31 cm, 80.96 g - Mus. Louvre (Sb 13385).

524. Susa. - AS 6282, de Morgan 1898-1911 excavations - Ovoid with hole in one end, good, limestone. L. 6.11 cm, D. 3.72 cm, 115.69 g - Mus. Louvre (Sb 13698) - Soutzo 1911, no. 6282.

525. Susa. - AS 1378, de Morgan 1898-1911 excavations - Ovoid with hole in one end, good, limestone. L. 6.81 cm, D. 4.18 cm, 218.93 g - Mus. Louvre (Sb 13692).

526. Susa. - No context - Ovoid with base and hole, good, limestone. L. 9.00 cm, D. 4.10 cm, 241.85 g - Mus. Louvre (Sb 13632).

527. Susa. - No context - Ovoid with hole in one end, perfect, hematite. L. 7.76 cm, D. 3.50 cm, 250.66 g - Mus. Louvre (Sb 13397).

4.1.2.2.9. Irregular ovoid (Type 1k): Cat. no. 528-530

528. Susa. - No context - Irregular ovoid, chipped, hematite. L. 2.41 cm, H. 0.80 cm, W. 0.81 cm, 4.68+x g - Mus. Louvre (Sb 13184).

529. Susa. - AS 9547, de Morgan 1898-1911 excavations - Irregular ovoid with flat ends, good, hematite. L. 1.38 cm, H. 1.15 cm, W. 1.68 cm, 6.06 g - Mus. Louvre (Sb 13313).

530. Susa. - AS 9502, de Morgan 1898-1911 excavations - Irregular ovoid with flat ends, good, with markings ('IIIII'), limestone. L. 4.02 cm, D. 2.55 cm, 38.95 g - Mus. Louvre (Sb 13594).

4.1.2.2.10. Duck-shaped (Type 2): Cat. no. 531-617

531. Susa. - No context - Duck, good, marble. L. 1.25 cm, H. 0.52 cm, W. 0.70 cm, 0.71 g - Mus. Louvre (Sb 6635).

532. Susa. - No context - Fragmented duck, carnelian. L. 1.35 cm, H. 0.71 cm, W. 0.71 cm, 0.87+x g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Louvre (Sb 13732).

533. Susa. - No context - Duck, perfect, with inscription, hematite. L. 1.00 cm, H. 0.61 cm, W. 0.69 cm, 0.97 g - Mus. Louvre (Sb 9146).

534. Susa. - No context - Duck, good, agate. L. 1.37 cm, H. 1.21 cm, W. 0.72 cm, 1.32 g - Mus. Louvre (Sb 13446).

535. Susa. - No context - Duck, good, agate. L. 1.48 cm, H. 1.01 cm, W. 1.88 cm, 1.38 g - Mus. Louvre (Sb 6636) - Arnaud 1967, 162, n. 2.

536. Susa. - No context - Duck, perfect, hematite. L. 1.30 cm, H. 1.01 cm, W. 0.60 cm, 1.41 g - Mus. Louvre (Sb 13437).

537. Susa. - No context - Duck, good, carnelian. L. 1.78 cm, H. 0.90 cm, W. 1.01 cm, 1.44 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Louvre (Sb 1733).

538. Susa. - No context - Duck, good, chert. L. 1.68 cm, H. 1.40 cm, W. 0.71 cm, 1.65 g - Mus. Louvre (Sb 13450).

539. Susa. - No context - Duck, good, gypsum. L. 1.80 cm, H. 1.08 cm, W. 1.01 cm, 2.07 g - Mus. Louvre (Sb 13447).

540. Susa. - No context - Duck, perfect, hematite. L. 1.11 cm, H. 0.90 cm, W. 0.82 cm, 2.23 g - Mus. Louvre (Sb 13436).

541. Susa. - No context - Fragmented duck, hematite. L. 1.78 cm, H. 0.97 cm, W. 0.70 cm, 2.27+x g - Mus. Louvre (Sb 13433).

542. Susa. - No context - Duck, good, agate. L. 2.11 cm, H. 1.21 cm, W. 0.94 cm, 2.81 g - Mus. Louvre (Sb 2833a).

543. Susa. - No context - Duck, good, stone. L. 1.91 cm, H. 1.00 cm, W. 1.19 cm, 2.85 g - Mus. Louvre (Sb 13434).

544. Susa. - No context - Duck, perfect, hematite. L. 1.79 cm, H. 1.00 cm, W. 0.82 cm, 3.01 g - Mus. Louvre (Sb 13435).

545. Susa. - No context - Duck, chipped, hematite. L. 1.6 cm, H. 1.1 cm, W. 0.7 cm, 3.39+x g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Tehran (NMI 4754).

546. Susa. - No context - Duck, good, jasper. L. 2.02 cm, H. 1.30 cm, W. 1.00 cm, 3.63 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Louvre (Sb 13731).

547. Susa. - No context - Duck, good, agate. L. 2.00 cm, H. 1.18 cm, W. 1.41 cm, 4.08 g - Mus. Louvre (Sb 9360).

548. Susa. - No context - Duck, perfect, hematite. L. 1.71 cm, H. 1.05 cm, W. 1.20 cm, 4.09 g - Mus. Louvre (Sb 6637).

549. Susa. - No context - Duck, perfect, hematite. L. 2.11 cm, H. 1.81 cm, W. 1.90 cm, 4.21 g - Mus. Louvre (Sb 13432).

550. Susa. - No context - Duck, good, agate. L. 2.37 cm, H. 1.55 cm, W. 1.18 cm, 4.58 g - Mus. Louvre (Sb 2833c).

551. Susa. - No context - Duck, good, calcite. L. 2.10 cm, H. 1.38 cm, W. 1.41 cm, 5.29 g - Mus. Louvre (Sb 13449).

552. Susa. - No context - Duck, slightly chipped beak, hematite. L. 1.91 cm, H. 1.32 cm, W. 1.22 cm, 5.50 g - Mus. Louvre (Sb 13431).
553. Susa. - No context - Duck, good, marble. L. 1.30 cm, H. 1.71 cm, W. 1.30 cm, 5.67 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Louvre (Sb 9332).
554. Susa. - No context - Duck, perfect, hematite. L. 2.10 cm, H. 1.22 cm, W. 1.25 cm, 5.73 g - Mus. Louvre (Sb 13429).
555. Susa. - No context - Duck, slightly chipped, hematite. L. 2.54 cm, H. 1.49 cm, W. 1.00 cm, 7.70+x g - Mus. Louvre (Sb 13430).
556. Susa. - No context - Duck, good, slightly worn, limestone. L. 2.61 cm, H. 1.45 cm, W. 1.72 cm, 7.95 g - Mus. Louvre (Sb 13448).
557. Susa. - No context - Duck, perfect, hematite. L. 2.01 cm, H. 1.32 cm, W. 1.40 cm, 8.23 g - Mus. Louvre (Sb 13427).
558. Susa. - No context - Duck, good, jasper. L. 2.30 cm, H. 1.91 cm, W. 1.60 cm, 8.31 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Louvre (Sb 2833B).
559. Susa. - No context - Duck, good, with hole (reused as bead?), jasper. L. 2.45 cm, H. 1.70 cm, W. 0.62 cm, 8.33 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Louvre (Sb 2833D).
560. Susa. - No context - Duck, good, jasper. L. 3.88 cm, H. 1.55 cm, W. 1.45 cm, 8.34 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Louvre (Sb 2833A).
561. Susa. - No context - Duck, good, jasper. L. 3.10 cm, H. 1.19 cm, W. 1.81 cm, 8.37 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Louvre (Sb 13730).
562. Susa. - No context - Duck, perfect, hematite. L. 2.4 cm, H. 1.3 cm, W. 1.2 cm, 8.59 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Tehran (NMI 900).
563. Susa. - No context - Duck, perfect, hematite. L. 3.0 cm, H. 1.3 cm, W. 1.4 cm, 8.88 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Tehran (NMI 5182).
564. Susa. - No context - Duck, unfinished, good, stone. L. 2.35 cm, H. 1.30 cm, W. 1.40 cm, 9.84 g - Mus. Louvre (SH 095366).
565. Susa. - No context - Duck, slightly worn, copper/bronze. L. 2.61 cm, H. 1.40 cm, W. 1.21 cm, 10.71 g - Mus. Louvre (Sb 6631).
566. Susa. - No context - Duck, perfect, with markings ('II'), hematite. L. 3.02 cm, H. 1.55 cm, W. 1.70 cm, 16.07 g - Mus. Louvre (Sb 13428).
567. Susa. - No context - Duck, perfect, hematite. L. 2.80 cm, H. 2.50 cm, W. 1.88 cm, 17.45 g - Mus. Louvre (Sb 13745).
568. Susa. - No context - Duck, perfect, hematite. L. 2.70 cm, H. 2.11 cm, W. 1.80 cm, 24.73 g - Mus. Louvre (Sb 13426).
569. Susa. - No context - Duck (stylised?), good, hematite. L. 3.00 cm, H. 1.77 cm, W. 2.12 cm, 25.01 g - Mus. Louvre (Sb 13425).
570. Susa. - No context - Duck, perfect, hematite. L. 4.6 cm, H. 3.0 cm, W. 2.4 cm, 39.67 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Tehran (NMI 4732).
571. Susa. - D. 249, de Mecquenem 1914 excavation - Duck, slightly worn, with inscription, hematite. L. 5.35 cm, H. 2.40 cm, W. 2.60 cm, 39.95 g - Mus. Louvre (Sb 9359).
572. Susa. - No context - Duck, perfect, hematite. L. 3.9 cm, H. 2.6 cm, W. 2.2 cm, 40.57 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Tehran (NMI 898).
573. Susa. - No context - Duck, perfect, stone. L. 4.71 cm, H. 2.70 cm, W. 2.61 cm, 40.82 g - Mus. Louvre (Sb 9356).
574. Susa. - No context - Duck, worn, bronze. L. 4.28 cm, H. 2.99 cm, W. 2.07 cm, 71.79+x g - Mus. Louvre (Sb 9352).
575. Susa. - No context - Duck, slightly worn beak, chipped, hematite. L. 5.71 cm, H. 3.20 cm, W. 3.19 cm, 75.25+x g - Mus. Louvre (Sb 9355).
576. Susa. - No context - Duck, perfect, bitumen. L. 4.2 cm, H. 2.4 cm, W. 2.8 cm, 81.83 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Tehran (NMI 4729).
577. Susa. - R. 361, de Mecquenem 1934 excavations - Duck, missing the head, stone. L. 6.21 cm, H. 2.49 cm, W. 3.68 cm, 86.55+x g - Mus. Louvre (Sb 9357).
578. Susa. - AS 37, de Morgan 1898-1911 excavation - Duck, good, slightly chipped, bitumen. L. 8.90 cm, H. 4.60 cm, W. 5.30 cm, 135.50 g - Mus. Louvre (Sb 2832) - Soutzo 1911, 15, no. 37; Connan/Deschesne 1996, no. 251.
579. Susa. - U. 51, de Mecquenem 1937 excavations - Duck, good, hematite. L. 5.00 cm, H. 3.61 cm, W. 3.40 cm, 162.44 g - Middle Elamite II, 1300 BC - Mus. Louvre (Sb 9354).
580. Susa. - No context - Duck, perfect, hematite. L. 5.18 cm, H. 3.31 cm, W. 3.71 cm, 163.95 g - Mus. Louvre (Sb 9353).
581. Susa. - AS 166, de Morgan 1898-1911 excavations - Fragmented duck, basalt. L. 6.00 cm, H. 5.40 cm, W. 5.45 cm, 204.50+x g - Mus. Louvre (Sb).
582. Susa. - N. 37, de Mecquenem 1932 excavations, *Ville Royale*, '*XX siécle, À la base du niveau se trouvaient des sarcophages et des vases funéraires de l'époque de Hammourabi, et plus au Sud, des tombes d'Our III*' - Duck, incomplete, with inscription, hematite. L. 9.18 cm, H. 4.31 cm, W. 5.20 cm, 240.64+x g - Old-Elamite II, Susa VB2, 2000-1900 BC - Mus. Louvre (Sb 6339) - de Mecquenem 1922 (Report), pl. XV,3.
583. Susa. - AS 9474, de Morgan 1898-1911 excavations - Duck (stylised?), chipped, stone. L. 11.79 cm, H. 4.78 cm, W. 4.04 cm, 271.13+x g - Mus. Louvre (Sb 9364) - Soutzo 1911, 14, fig. 19, no. 12802.
584. Susa. - de Morgan 1898-1911 excavations - Duck, chipped, bitumen. L. 12.75 cm, H. 5.68 cm, W. 7.38 cm, 424.65+x g - Mus. Louvre (Sb 9348) - Soutzo 1911, 14-15, fig. 18, no. 3625; Pézard/Pottier 1926, 175, 226; Connan/Deschesne 1996, no. 248.
585. Susa. - AS 12802, de Morgan 1898-1911 excavation - Duck, good, slightly chipped, diorite. L. 8.70 cm, H. 7.48 cm, W. 6.88 cm, 427.79+x g - Mus. Louvre (Sb 9365) - Soutzo 1911, 14, no. 12802.

586. Susa. - de Morgan 1898-1911 excavations - Duck, incomplete (restored), bitumen. L. 11.18 cm, H. 7.24 cm, W. 7.70 cm, 445.00+x g - Mus. Louvre (Sb 9347) - Soutzo 1911, 14, fig. 17, no. 3624; Pézard/Pottier 1926, 175, 226; Connan/Deschesne 1996, no. 249.

587. Susa. - AS 12801, de Morgan 1898-1911 excavations - Duck, good, with inscription, hematite. L. 9.10 cm, H. 7.18 cm, W. 6.11 cm, 505.74 g - Middle Elamite, 1400-1000 BC - Mus. Louvre (Sb 9330) - Soutzo 1911, 7, no. 12801.

588. Susa. - N. 497, de Mecquenem 1932 excavations - Duck, good, limestone. L. 11.20 cm, H. 5.80 cm, W. 7.35 cm, 535.02 g - Old-Elamite II, Susa VB2, 2000-1900 BC - Mus. Louvre (Sb 9363).

589. Susa. - A. 7895, de Morgan 1908 excavations - Duck, good, with inscription, diorite. L. 9.75 cm, H. 7.50 cm, W. 6.18 cm, 537.49 g - Mus. Louvre (Sb 9345) - Soutzo 1911, 6, no. 7895.

590. Susa. - E. 857, de Mecquenem 1922 excavations - Duck, good, limestone. L. 10.50 cm, H. 5.25 cm, W. 7.25 cm, 559.25 g - Mus. Louvre (Sb 9366) - Belaiew 1934, no. 64.

591. Susa. - No context - Duck, incomplete (unfinished?), diorite. L. 10.20 cm, H. 6.00 cm, W. 7.20 cm, 619.00+x g - Mus. Louvre (Sb 13743b. SH 095371).

592. Susa. - de Morgan 1898-1911 excavations - Duck, fragmented with inscription, bitumen. L. 10.82 cm, H. 8.56 cm, W. 12.54 cm, 1,165.50+x g - Mus. Louvre (Sb 9346) - Soutzo 1911, 6, no. 1245; Connan/Deschesne 1996, no. 252.

593. Susa. - No context - Duck, good, diorite. L. 13.85 cm, H. 9.60 cm, W. 9.30 cm, 1,245.50+x g (= 180) - Mus. Louvre (Sb 9349).

594. Susa. - de Mecquenem 1913-1914 excavations - Duck, chipped, bitumen. L. 18.00 cm, H. 10.86 cm, W. 10.49 cm, 1,369.50+x g - Mus. Louvre (Sb 9331) - Connan/Deschesne 1996, no. 250.

595. Susa. - AS 6327, de Morgan 1898-1911 excavations - Duck, good, with markings ('III'), diorite. L. 13.65 cm, H. 10.30 cm, W. 9.70 cm, 1,726.50 g - Mus. Louvre (Sb 9341) - Soutzo 1911, 7, no. 6327.

596. Susa. - AS 11414, de Morgan 1898-1911 excavations - Duck, good, with inscription, diorite. L. 15.35 cm, H. 10.90 cm, W. 8.15 cm, 2,020.00 g - Middle Elamite, 1400-1000 BC - Mus. Louvre (Sb 9350) - Soutzo 1911, 6, no. 1144.

597. Susa. - No context - Duck, good, worn, diorite. L. 15.02 cm, H. 11.02 cm, W. 9.55 cm, 2,313.50 g - Mus. Louvre (Sb 9337).

598. Susa. - AS 13821, de Morgan 1898-1911 excavations - Duck, good, with markings ('IIIII'), limestone. L. 16.02 cm, H. 11.50 cm, W. 9.43 cm, 2,459.50 g - Mus. Louvre (Sb 9342) - Soutzo 1911, 13, no. 13821.

599. Susa. - No context - Duck, good, slightly worn, limestone. L.18.00 cm, H. 10.01 cm, W. 12.44 cm, 2,473.00 g - Mus. Louvre (Sb 9336).

600. Susa. - de Morgan 1898-1899 excavations, Acropole - Duck, good, with inscription ('5 minas'), diorite. L. 15.32 cm, H. 12.32 cm, W. 10.20 cm, 2,521.50 g - Mus. Louvre (Sb 13744. SH09372) - de Morgan 1900, 137, fig. 358; Soutzo 1911, 6, no. 6326.

601. Susa. - A. 6086, de Morgan 1908 excavations - Duck, good, limestone. L. 17.80 cm, H. 10.50 cm, W. 11.03 cm, 2,614.00 g - Mus. Louvre (Sb 9329) - Soutzo 1911, 13, no. 6086.

602. Susa. - AS 7871, de Morgan 1898-1911 excavations - Duck, fragmented with inscription, limestone. L. 23.00 cm, H. 15.50 cm, W. 20.00 cm - Kassite period/Middle Elamite period, 1500-1000 BC - Mus. Louvre (Sb 13753).

603. Susa. - AS 13820, de Morgan 1898-1911 excavations - Duck, good, with markings ('IIIIII'), limestone. L. 20.50 cm, H. 11.20 cm, W. 10.50 cm, 3,067.00 g - Mus. Louvre (Sb 9340) - Soutzo 1911, 13, no. 13820.

604. Susa. - A. 6355, de Morgan 1908 excavations - Duck, fragmented with inscription ('10 minas?'), limestone. L. 19.50 cm, H. 9.50 cm, W. 11.80 cm, 3,076.00+x g - Old-Babylonian, Susa VB, 2000-1600 BC - Mus. Louvre (Sb 9344).

605. Susa. - No context - Duck, fragmented, with inscription, diorite. L. 25.80 cm, H. 10.80 cm, W. 12.40 cm, 4,695.00+x g - Old-Babylonian, Susa VB, 2000-1600 BC - Mus. Louvre (Sb 9343).

606. Susa. - AS 6325, de Morgan 1898-1911 excavations - Duck, good, with inscription, diorite. L. 22.50 cm, H. 12.00 cm, W. 15.50 cm, 4,905.00 g - Early 1st millennium BC - Mus. Louvre (Sb 13746) - Soutzo 1911, 8, no. 6325.

607. Susa. - A. 6363, de Morgan 1908 excavations - Duck, slightly chipped, limestone. L. 23.20 cm, H. 14.56 cm, W. 12.78 cm, 4,860.00 g - Mus. Louvre (Sb 13749) - Soutzo 1911, 13, no. 6363.

608. Susa. - No context - Duck, slightly chipped, with markings ('IIIIIIIII'), limestone. L. 20.60 cm, H. 13.59 cm, W. 12.91 cm, 4,940.00 g - Mus. Louvre (Sb 13748. SH 095373).

609. Susa. - A. 6353, de Morgan 1908 excavations - Duck, incomplete, diorite. L. 17.20 cm, H. 11.00 cm, W. 26.50 cm, 5,370.00+x g - Mus. Louvre (Sb 13747).

610. Susa. - A. 6092, de Morgan 1908 excavations - Duck, fragmented, with inscription, basalt. L. 28.00 cm, H. 9.60 cm, W. 16.80 cm, 6,335.00+x g - Mus. Louvre (Sb 9335).

611. Susa. - AS 4855, de Morgan 1898-1911 excavations - Duck, fragmented, with inscription, diorite. L. 20.00 cm, H. 13.40 cm, W. 14.80 cm, 6,365.00+x g - Old-Babylonian, Susa VB, 2000-1600 BC - Mus. Louvre (Sb 13750) - Soutzo 1911, 5, no. 4855.

612. Susa. - A. 6346, de Morgan 1908 excavations - Duck, chipped, diorite. L. 22.23 cm, H. 13.42 cm, W. 15.76 cm, 7,185.00+x g - Mus. Louvre (Sb 9334).

613. Susa. - A. 6435, de Morgan 1908 excavations - Duck, chipped in multiple areas, diorite. L. 27.77 cm, H. 19.30 cm, W. 20.88 cm, 14,220.00+x g - Mus. Louvre.

614. Susa. - No context - Duck, slightly chipped, basalt. L. 32.33 cm, H. 18.10 cm, W. 21.61 cm, 14,245.00 g - Mus. Louvre (Sb 13745).

615. Susa. - A. 6356, de Morgan 1908 excavations - Duck, chipped, with inscription, diorite. L. 29.30 cm, H. 18.78 cm, W. 19.21 cm, 17,665.00+x g - Old-Babylonian, Susa VB, 2000-1600 BC - Mus. Louvre - Soutzo 1911, 5, no. 6356.

616. Susa. - A. 6909, de Morgan 1908 excavations - Duck, chipped, with inscription, limestone. L. 41.24 cm, H. 23.23 cm, W. 10.50 cm, 28,810.00+x g - Mus. Louvre.

617. Susa (Arjan). – No context - Duck, slightly worn, with inscription, limestone. L. 40.0 cm, H. 9.8 cm, W. 10.0 cm, 32,000.00 g - Mus. Susa (SM) - Ascalone/Basello 2022.

4.1.2.2.11. Frog-shaped (Type 3): Cat. no. 618-619

618. Susa. - No context - Frog, perfect, hematite. L. 2.91 cm, H. 1.03 cm, W. 1.31 cm, 5.73 g - Mus. Louvre (Sb 4361).

619. Susa. - No context - Fragmented frog, hematite. L. 2.60 cm, H. 1.15 cm, W. 2.00 cm, 15.31+x g - Mus. Louvre (Sb 13445).

4.1.2.2.12. Shell-shaped (Type 4): Cat. no. 620-627

620. Susa. - No context - Shell-shaped, perfect, hematite. L. 1.38 cm, H. 0.39 cm, W. 0.80 cm, 0.82 g - Mus. Louvre (Sb 13331).

621. Susa. - No context - Shell-shaped, perfect, hematite. L. 2.35 cm, H. 1.70 cm, W. 1.31 cm, 4.51 g - Mus. Louvre (Sb 13441).

622. Susa. - No context - Shell-shaped, perfect, hematite. L. 2.25 cm, H. 1.80 cm, W. 1.59 cm, 5.95 g - Mus. Louvre (Sb 13440).

623. Susa. - No context - Shell-shaped, chipped, hematite. L. 2.38 cm, H. 1.84 cm, W. 1.50 cm, 7.06+x g - Mus. Louvre (Sb 13443).

624. Susa. - No context - Shell-shaped, chipped in a small area, hematite. L. 2.20 cm, H. 1.15 cm, W. 1.75 cm, 8.79+x g - Mus. Louvre (Sb 13442).

625. Susa. - No context - Shell-shaped, chipped in a small area, hematite. L. 3.67 cm, H. 0.90 cm, W. 1.62 cm, 8.87+x g - Mus. Louvre (Sb 13439).

626. Susa. - No context - Shell-shaped, good, hematite. L. 3.28 cm, H. 1.21 cm, W. 2.20 cm, 18.22 g - Mus. Louvre (Sb 13438).

627. Susa. - No context - Shell-shaped, perfect, hematite. L. 3.5 cm, H. 1.2 cm, W. 2.0 cm, 19.12 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Tehran (NMI 899).

4.1.2.2.13. Pig head-shaped (Type 6): Cat. no. 628-630

628. Susa. - No context - Pig head, perfect, hematite. L. 2.11 cm, H. 0.75 cm, W. 1.15 cm, 3.27 g - Mus. Louvre (Sb 13444).

629. Susa. - No context - Pig head, perfect, hematite. L. 2.0 cm, H. 1.5 cm, W. 1.1 cm, 8.28 g - Susa V, Old-Elamite II-III, 2100-1600 BC - Mus. Tehran (NMI 4758).

630. Susa. - No context - Pig head, fragmented, hematite. L. 3.00 cm, H. 1.78 cm, W. 1.70 cm, 17.60+x g - Mus. Louvre (Sb 13424).

4.1.2.2.14. Sphere (Type 7a): Cat. no. 631-636

631. Susa. - No context - Sphere, good, potential weight, steatite. D. 1.65 cm, 8.42 g - Mus. Louvre (Sb 13324).

632. Susa. - No context - Sphere, good, with marking ('I'), potential weight, hematite. D. 1.48 cm, 16.09 g - Mus. Louvre (Sb 13326).

633. Susa. - Acropole 1971, 1247.5. II-III-IV - Sphere, perfect, potential weight, limestone. D. 3.1 cm, 31.69 g - Mus. Susa (SM).

634. Susa. - Acropole 1971, 1247.6. II-III-IV - Sphere, incomplete, potential weight, limestone. D. 3.2 cm, 31.68+x g - Mus. Susa (SM).

635. Susa. - Acropole 1971, 1769.3. II-III-IV - Sphere, perfect, potential weight, chert. D. 3.4 cm, 53.93 g - Mus. Susa (SM).

636. Susa. - Acropole 1971, 1245.1. II-III-IV - Sphere, perfect, potential weight, chalcedony. D. 3.4 cm, 60.07 g - Mus. Susa (SM).

4.1.2.2.15. Sphere with base (Type 7b): Cat. no. 637-638

637. Susa. - No context - Sphere with base, perfect, hematite. H. 1.40 cm. D. 1.59 cm, 7.77 g - Mus. Louvre (Sb 13319).

638. Susa. - No context - Sphere with base, perfect, hematite. H. 1.38 cm, D. 1.70 cm, 8.20 g - Mus. Louvre (Sb 13322).

4.1.2.2.16. Ellipsoid with base and grooves (Type 8): Cat. no. 639-658

639. Susa. - AS 13859, de Morgan 1898-1911 excavations - Ellipsoid with base and grooves, good, possible weight, limestone. H. 9,10 cm, D. 9.42 cm, 1,089.00 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

640. Susa. - AS 14162, de Morgan 1898-1911 excavations - Ellipsoid with base and grooves, good, possible weight, limestone. H. 9.10 cm, D. 10.20 cm, 1,114.00 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

641. Susa. - S. 385, de Mecquenem 1935 excavations - Ellipsoid with base and grooves, good, possible weight, limestone. H. 7.90 cm, D. 11.42 cm, 1,292.50 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

642. Susa. - AS 2620, de Morgan 1898-1911 excavations - Ellipsoid with base and grooves, good, possible weight, limestone. H. 5.85 cm, D. 5.18 cm, 237.55 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

643. Susa. - AS 278, de Morgan 1898-1911 excavations - Ellipsoid with base and grooves, good, slightly chipped, possible weight, limestone. H. 5.68 cm, D. 8.40 cm, 455.77 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

644. Susa. - AS 1159, de Morgan 1898-1911 excavations - Ellipsoid with base and grooves, good, possible weight, limestone. H. 5.40 cm, D. 7.70 cm, 466.54 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

645. Susa. - Perrot excavations, Acropole 1970, 9661, level 17A, square H-5 - Ellipsoid with base and grooves, perfect, possible weight, limestone. H. 6.8 cm, D. 7.8 cm, 568.72 g - Uruk period, Susa II, 3200-3000 BC - Mus. Susa (SM SH571) - Le Brun 1971, 189-196, 231-245, fig. 55,2, 68.

646. Susa. - AS 1809, de Morgan 1898-1911 excavations - Ellipsoid with base and grooves, good, possible weight, limestone. H. 7.52 cm, D. 8.94 cm, 585.33 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

647. Susa. - AS 277, de Morgan 1898-1911 excavations - Ellipsoid with base and grooves, good, with a hole in the upper part, possible weight, limestone. H. 7.20 cm, D. 7.85 cm, 585.63 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

648. Susa. - AS 1160, de Morgan 1898-1911 excavations - Ellipsoid with base and grooves, good, possible weight, limestone. H. 7.05 cm, D. 10.60 cm, 732.00 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

649. Susa. - AS 10428, de Morgan 1898-1911 excavations - Ellipsoid with base and grooves, good, possible weight, limestone. H. 7.54 cm, D. 10.23 cm, 740.50 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

650. Susa. - Perrot excavations, Acropole 1972, 1593, square H-6 711 - Ellipsoid with base and grooves, perfect, possible weight, limestone. H. 6.3 cm, D. 9.3 cm, 740.58 g - Jemdet Nasr period, Susa II (lev. 16), 3000-2800 BC - Mus. Susa (SM 4254) - Le Brun 1971, 189-196, 231-245, fig. 55,2, 68.

651. Susa. - AS 1908, de Morgan 1898-1911 excavations - Ellipsoid with base and grooves, good, possible weight, limestone. H. 7.40 cm, D. 7.40 cm, 753.50 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

652. Susa. - SM 4253, Perrot excavations, Acropole 1972, 16943 - Ellipsoid with base and grooves, perfect, possible weight, limestone. H. 7.0 cm, D. 9.3 cm, 757.46 g - Uruk period, Susa II (lev. 22-17), 3500-3000 BC - Mus. Susa - Le Brun 1971, 189-196, 231-245, fig. 55,2, 68.

653. Susa. - AS 1807, de Morgan 1898-1911 excavations - Ellipsoid with base and grooves, good, possible weight, limestone. H. 7.32 cm, D. 9.10 cm, 769.50 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

654. Susa. - AS 1805, de Morgan 1898-1911 excavations - Ellipsoid with base and grooves, good, possible weight, limestone. H. 8.51 cm, D. 10.43 cm, 775.50 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

655. Susa. - E. 902, de Mecquenem 1922 excavations - Ellipsoid with base and grooves, good, possible weight, diorite. H. 7.85 cm, D. 9.45 cm, 777.50 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

656. Susa. - E. 902, de Mecquenem 1922 excavations - Ellipsoid with base and grooves, good, possible weight, limestone. H. 8.12 cm, D. 9.65 cm, 836.50 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

657. Susa. - R. 373, de Mecquenem 1934 excavations - Ellipsoid with base and grooves, good, possible weight, limestone. H. 8.05 cm, D. 10.38 cm, 851.00 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

658. Susa. - AS 1806, de Morgan 1898-1911 excavations - Ellipsoid with base and grooves, good, possible weight, limestone. H. 8.95 cm, D. 10.70 cm, 926.50 g - Uruk period, Susa II, 3500-3000 BC - Mus. Louvre - Jequier 1900, fig. 108; de Morgan 1900, 80, fig. 108 (Apadana), 84, fig. 117 (Acropole); de Mecquenem 1923, 473, fig. 9.

4.1.2.2.17. Ovoid/discoid pebble (Type 9c): Cat. no. 659-679

659. Susa. - D. 66, de Mecquenem 1914 excavations - Ovoid/discoid pebble, slightly chipped, potential weight, limestone. L. 12.08 cm, H. 3.91 cm, W. 6.39 cm, 471.29+x g - Mus. Louvre (Sb 13663).

660. Susa. - No context - Ovoid/discoid pebble, good, potential weight, limestone. L. 2.31 cm, D. 0.55 cm, 1.59 g - Mus. Louvre (Sb 13483).

661. Susa. - No context - Ovoid/discoid pebble, good, potential weight, stone. L. 2.01 cm, D. 0.91 cm, 2.12 g - Mus. Louvre (Sb 13308).

662. Susa. - No context - Ovoid/discoid pebble, good, potential weight, stone. L. 1.50 cm, H. 0.51 cm, W. 1.08 cm, 2.17 g - Mus. Louvre (Sb 13330).

663. Susa. - No context - Ovoid/discoid pebble, good, potential weight, stone. L. 1.60 cm, H. 0.85 cm, W. 1.01 cm, 2.32 g - Mus. Louvre (Sb 13296).

664. Susa. - No context - Ovoid/discoid pebble, good, potential weight, limestone. L. 1.82 cm, D. 0.93 cm, 2.70 g - Mus. Louvre (Sb 13309).

665. Susa. - No context - Ovoid/discoid pebble, good, potential weight, stone. L. 1.85 cm, H. 0.80 cm, W. 1.35 cm, 2.76 g - Mus. Louvre (Sb 13332).

666. Susa. - No context - Ovoid/discoid pebble, good, potential weight, stone. L. 2.18 cm, H. 0.61 cm, W. 1.30 cm, 2.91 g - Mus. Louvre (Sb 13341).

667. Susa. - AS 8839, de Morgan 1898-1911 excavations - Ovoid/discoid pebble, chipped, potential weight, stone. L. 3.68 cm, H. 0.61 cm, W. 0.95 cm, 2.98+x g - Mus. Louvre (Sb 13403).

668. Susa. - No context - Ovoid/discoid pebble, good, potential weight, stone. L. 2.12 cm, D. 0.99 cm, 3.01 g - Mus. Louvre (Sb 13279).

669. Susa. - No context - Ovoid/discoid pebble, good, with marking ('X'), stone. H. 0.80 cm, D. 1.80 cm, 3.81 g - Mus. Louvre (Sb 13564).

670. Susa. - No context - Ovoid/discoid pebble, good, with marking ('X'), stone. L. 2.50 cm, D. 1.10 cm, 4.15 g - Mus. Louvre (Sb 15535).

671. Susa. - No context - Ovoid/discoid pebble, good, potential weight, stone. L. 2.98 cm, D. 1.89 cm, 4.58 g - Mus. Louvre (Sb 13541).

672. Susa. - No context - Ovoid/discoid pebble, good, potential weight, limestone. L. 2.63 cm, D. 1.25 cm, 5.67 g - Mus. Louvre (Sb 13411).

673. Susa. - No context - Ovoid/discoid pebble, good, potential weight, limestone. L. 3.35 cm, D. 1.20 cm, 7.53 g - Mus. Louvre (Sb 13547).

674. Susa. - No context - Ovoid/discoid pebble, chipped, potential weight, stone. L. 2.40 cm, H. 1.42 cm, W. 1.85 cm, 8.15 g - Mus. Louvre (Sb 13340).

675. Susa. - No context - Ovoid/discoid pebble, good, potential weight, stone. L. 2.80 cm, D. 1.22 cm, 8.31 g - Mus. Louvre (Sb 13525).

676. Susa. - No context - Ovoid/discoid pebble, chipped, potential weight, stone. L. 3.61 cm, D. 1.31 cm, 8.60+x g - Mus. Louvre (Sb 13528).

677. Susa. - AS 9249, de Morgan 1898-1911 excavations - Ovoid/discoid pebble, good, potential weight, stone. L. 3.50 cm, D. 1.29 cm, 8.77 g - Mus. Louvre (Sb 13566).

678. Susa. - No context - Ovoid/discoid pebble, good, potential weight, stone. L. 4.15 cm, D. 1.49 cm, 10.35 g - Mus. Louvre (Sb 13572).

679. Susa. - No context - Ovoid/discoid pebble, good, potential weight, stone. L. 3.11 cm, H. 0.77 cm, W. 2.92 cm, 11.52 g - Mus. Louvre (Sb 13335).

4.1.2.2.18. Cylinder-shaped (Type 11a): Cat. no. 680-687

680. Susa. - No context - Cylinder-shaped, perfect, possible weight, hematite. H. 1.89 cm, D. 0.72 cm, 3.40 g - Mus. Louvre (Sb 13489).

681. Susa. - No context - Cylinder-shaped, good, possible weight, stone. H. 1.80 cm, D. 0.91 cm, 4.44 g - Mus. Louvre (SH 095366).

682. Susa. - AS 9550, de Morgan 1898-1911 excavations - Cylinder-shaped, good, possible weight, calcite. H. 2.90 cm, D. 0.90 cm, 4.62 g - Mus. Louvre (Sb 13305).

683. Susa. - No context - Cylinder-shaped, good, possible weight, diorite. H. 2.70 cm, D. 1.00 cm, 4.79 g - Mus. Louvre (Sb 13168).

684. Susa. - No context - Cylinder-shaped, good, possible weight, stone. H. 2.70 cm, D. 1.20 cm, 8.25 g - Mus. Louvre (Sb 13526).

685. Susa. - No context - Cylinder-shaped, good, possible weight, stone. H. 1.60 cm, D. 1.51 cm, 8.27 g - Mus. Louvre (SH 095366).

686. Susa. - No context - Cylinder-shaped, good, possible weight, hematite. H. 3.00 cm, D. 1.41 cm, 16.27 g - Mus. Louvre (Sb 13131).

687. Susa. - U. 234, de Mecquenem 1937 excavations - Cylinder-shaped, good, slightly chipped, possible weight, stone. H. 6.99 cm, D. 3.18 cm, 125.90 g - Mus. Louvre (Sb 13625).

4.1.2.2.19. Biconic (Type 12): Cat. no. 688

688. Susa. - No context - Biconic, perfect, limestone. H. 2.3 cm, D. 4.1 cm, 48.89 g - Mus. Susa (SM 4192).

4.1.2.2.20. Egg-shaped (Type 15): Cat. no. 689

689. Susa. - No context - Egg-shaped, worn, hematite. H. 1.79 cm, D. 1.25 cm, 5.50 g - Mus. Louvre (Sb 13280).

4.1.2.2.21. Parallelepiped (Type 16a): Cat. no. 690-691

690. Susa. - No context - Parallelepiped, good, stone. L. 2.18 cm, D. 0.60 cm, 1.44 g - Mus. Louvre (Sb 13486).

691. Susa. - No context - Parallelepiped, perfect, hematite. L. 3.00 cm, H. 0.82 cm, W. 0.80 cm, 5.67 g - Mus. Louvre (Sb 13269).

4.1.2.2.22. Discoid (Type 17a): Cat. no. 692-694

692. Susa. - No context - Discoid, good, stone. H. 0.81 cm, D. 0.50 cm, 2.93 g - Mus. Louvre (SH 095366).

693. Susa. - No context - Discoid, good, stone. H. 0.74 cm, D. 1.29 cm, 3.01 g - Mus. Louvre (SH 095366).

694. Susa. - AS 9546, de Morgan 1898-1911 excavations - Discoid, good, stone. H. 1.25 cm, D. 2.41 cm, 13.43 g - Mus. Louvre (Sb 13323).

4.1.2.2.23. Discoid with hole (Type 17b): Cat. no. 695

695. Susa. - B. 36, de Mecquenem 1912 excavations - Discoid with hole, good, potential weight, limestone. L. 3.85 cm, D. 11.12 cm, 588.72 g - Mus. Louvre.

4.1.2.2.24. Octagonal discoid (Type 17c): Cat. no. 696

696. Susa. - No context - Octagonal discoid, good, stone. H. 0.80 cm, D. 1.45 cm, 8.60 g - Mus. Louvre (SH 095366).

4.1.2.2.25. Irregular discoid (Type 17d): Cat. no. 697

697. Susa. - No context - Irregular discoid, chipped, stone. H. 1.10 cm, D. 2.60 cm, 17.04+x g - Mus. Louvre (Sb 13333).

4.1.2.2.26. Cuboid (Type 18a): Cat. no. 698-700

698. Susa. - AS 5724, de Morgan 1898-1911 excavations - Cuboid, good, jasper. L. 2.40 cm, H. 2.39 cm, W. 1.95 cm, 27.25 g - Old-Elamite I, Susa IV-V, 2500-2000 BC - Mus. Louvre (Sb 17774) - Amiet 1986a, 143, fig. 93.

699. Susa. - No context - Cuboid, good, stone (local). L. 7.60 cm, H. 5.95 cm, W. 7.70 cm, 865.50 g - Old-Elamite I, Susa IV-V, 2500-2000 BC - Mus. Louvre (Sb 13817).

700. Susa. - No context - Cuboid, good, stone (local). L. 8.18 cm, H. 5.80 cm, W. 7.85 cm, 870.00 g - Old-Elamite I, Susa IV-V, 2500-2000 BC - Mus. Louvre (Sb 13816).

4.1.2.2.27. Hemisphere (Type 20a): Cat. no. 701-719

701. Susa. - No context - Hemisphere, perfect, hematite. H. 0.80 cm, D. 1.76 cm, 3.96 g - Mus. Louvre (Sb 13320).

702. Susa. - No context - Hemisphere, perfect, hematite. H. 0.70 cm, D. 1.21 cm, 2.34 g - Mus. Louvre (Sb 13453).

703. Susa. - No context - Hemisphere, fragmented in two different areas, hematite. H. 0.95 cm, D. 1.91 cm, 4.07+x g - Mus. Louvre (Sb 13317).

704. Susa. - No context - Hemisphere, perfect, hematite. H. 0.90 cm, D. 1.39 cm, 4.33 g - Mus. Louvre (Sb 13452).

705. Susa. - No context - Hemisphere, good, hematite. H. 0.92 cm, D. 1.61 cm, 5.84 g - Mus. Louvre (Sb 13316).

706. Susa. - No context - Hemisphere, good, hematite. H. 1.32 cm, D. 1.65 cm, 7.89 g - Old-Elamite II-III, Susa V, 2100-1600 BC - Mus. Louvre (Sb 13318).

707. Susa. - No context - Hemisphere, good, hematite. H. 1.98 cm, D. 1.41 cm, 11.09 g - Mus. Louvre (Sb 13325).

708. Susa. - No context - Hemisphere, perfect, hematite. H. 1.85 cm, D. 2.59 cm, 24.59 g - Mus. Louvre (Sb 13321).

709. Susa. - No context - Hemisphere, slightly chipped, ingot, bitumen. H. 4.80 cm, D. 11.62 cm, 650.50 g - Old-Elamite I, Susa IVA-B, 2500-2300 BC - Mus. Louvre (Sb 11551) - Conna/Deschesne 1996, 350, no. 457; Ascalone 2021a, no. 23.

710. Susa. - de Morgan 1907 excavations, Acropole, *Vase à la cachette* - Hemisphere, slightly worn, ingot, copper. H. 4.00 cm, D. 11.85 cm, 1,357.00 g - Old-Elamite I, Susa IVA, 2400-2300 BC - Mus. Louvre (Sb 2723/69) - de Mecquenem 1934, 189, fig. 21,16; Le Breton 1957, 118, fig. 40,24; Amiet 1986a, 125-126, fig. 96,1-9; Tallon 1987, no. 691; Ascalone 2021a, no. 32.

711. Susa. - No context - Hemisphere, slightly worn, ingot, copper/bronze. H. 6.04 cm, D. 13.83 cm, 1,477.00 g - Old-Elamite I, Susa IVA, 2400-2300 BC - Mus. Louvre (Sb 14312) - Tallon 1987, no. 692; Ascalone 2021a, no. 25.

712. Susa. - No context - Hemisphere, slightly worn, ingot, copper/bronze. H. 5.52 cm, D. 13.01 cm, 1,705.00 g - Old-Elamite I, Susa IVA, 2400-2300 BC - Mus. Louvre (SH 104369) - Tallon 1987, 71 (vol. II); Ascalone 2021a, no. 24.

713. Susa. - de Morgan 1907 excavations, Acropole, *Vase à la cachette* - Hemisphere, strongly worn, ingot, copper. H. 3.70 cm, D. 11.00 cm, 1,878.50 g - Old-Elamite I, Susa IVA, 2400-2300 BC - Mus. Louvre (Sb 2723/68) - de Mecquenem 1934, 189, fig. 21,16; Le Breton 1957, 118, fig. 40,24; Amiet 1986a, 125-126, fig. 96,1-9; Tallon 1987, no. 689; Ascalone 2021a, no. 31.

714. Susa. - No context - Hemisphere, slightly worn, ingot, copper/bronze. H. 3.86 cm, D. 14.04 cm, 2,218.00 g - Old-Elamite I, Susa IVA, 2400-2300 BC - Mus. Louvre (SH 095690) - Tallon 1987, 71 (vol. II); Ascalone 2021a, no. 26.

715. Susa. - de Morgan 1907 excavations, Acropole, *Vase à la cachette* - Hemisphere, worn, ingot, copper. H. 3.80 cm, D. 11.00 cm, 2,026.50 g - Old-Elamite I, Susa IVA, 2400-2300 BC - Mus. Louvre (Sb 2723/67) - de Mecquenem 1934, 189, fig. 21,16; Le Breton 1957, 118, fig. 40,24; Amiet 1986a, 125-126, fig. 96,1-9; Tallon 1987, no. 689; Ascalone 2021a, no. 30.

716. Susa. - de Morgan 1907 excavations, Acropole, *Vase à la cachette* - Hemisphere, slightly worn, ingot, copper. H. 3.80 cm, D. 12.70 cm, 2,066.00 g - Old-Elamite I, Susa IVA, 2400-2300 BC - Mus. Louvre (Sb 2723/66) - de Mecquenem 1934, 189, fig. 21,16; Le Breton 1957, 118, fig. 40,24; Amiet 1986a, 125-126, fig. 96,1-9; Tallon 1987, no. 687; Ascalone 2021a, no. 28.

717. Susa. - No context - Hemisphere, slightly worn, ingot, copper/bronze. H. 4.00 cm, D. 12.50 cm, 1,896.00 g - Old-Elamite I, Susa IVA, 2400-2300 BC - Mus. Louvre (SH 095689) - Tallon 1987, 71; Ascalone 2021a, no. 27.

718. Susa. - de Morgan 1907 excavations, Acropole, *Vase à la cachette* - Hemisphere, worn with marking ('I'), ingot, copper. H. 4.50 cm, D. 14.00 cm, 2,921.00 g - Old-Elamite I, Susa IVA, 2400-2300 BC - Mus. Louvre (Sb 2723/65) - de Mecquenem 1934, 189, fig. 21,16; Le Breton 1957, 118, fig. 40,24; Amiet 1986a, 125-126, fig. 96,1-9; Tallon 1987, no. 687; Ascalone 2021a, no. 29.

719. Susa. - No context - Hemisphere, slightly worn, ingot, copper/bronze. H. 6.53 cm, D. 16.55 cm, 7,130.00 g - Old-Elamite I, Susa IVA, 2400-2300 BC - Mus. Louvre (SH 104370) - Tallon 1987, 71 (vol. II).

4.1.2.2.28. Cone (Type 21a): Cat. no. 720-728

720. Susa. - No context - Cone, good, stone. H. 2.95 cm, D. 1.00 cm, 4.42 g - Mus. Louvre (Sb 13178).

721. Susa. - No context - Cone (potentially an ovoid cut in half), perfect, hematite. H. 1.91 cm, D. 0.95 cm, 4.53 g - Mus. Louvre (Sb 13266).

722. Susa. - No context - Cone, good, hematite. H. 1.50 cm, D. 1.25 cm, 5.57 g - Mus. Louvre (Sb 13451).

723. Susa. - No context - Cone (potentially an ovoid cut in half), good, hematite. H. 1.75 cm, D. 1.11 cm, 5.60 g - Mus. Louvre (Sb 13285).

724. Susa. - No context - Cone (potentially an ovoid cut in half), perfect, hematite. H. 3.81 cm, D. 2.05 cm, 16.34 g - Mus. Louvre (Sb 13365).

725. Susa. - No context - Cone, good, steatite. H. 6.00 cm, D. 2.81 cm, 71.81 g - Mus. Louvre (Sb 13657).

726. Susa. - S. 18, de Mecquenem 1935 excavations - Cone, perfect, stone (limestone?). H. 5.08 cm, D. 2.35 cm, 82.91 g - Mus. Louvre (Sb 13391).

727. Susa. - AS 9492, de Morgan 1898-1911 excavations - Cone, good, limestone. H. 6.27 cm, D. 2.80 cm, 84.32 g - Mus. Louvre (Sb 13683).

728. Susa. - No context - Cone, chipped, with markings ('III'), diorite. L. 12.25 cm, D. 7.45 cm, 1,198.00+x g - Mus. Louvre (Sb 13717).

4.1.2.2.29. Truncated cone (Type 21b): Cat. no. 729-731

729. Susa. - No context - Truncated cone, perfect, hematite. H. 0.51 cm, D. 1.00 cm, 1.13 g - Mus. Louvre (Sb 13315).

730. Susa. - No context - Truncated cone, perfect, hematite. H. 0.49 cm, D. 1.00 cm, 1.40 g - Mus. Louvre (Sb 13454).

731. Susa. - No context - Truncated cone, good, stone. H. 1.10 cm, D. 1.89 cm, 8.36 g - Mus. Louvre (SH 095366).

4.1.2.2.30. Pyramid-shaped (Type 22): Cat. no. 732

732. Susa. - No context - Pyramid-shaped, perfect, hematite. L. 0.62 cm, H. 1.01 cm, W. 1.22 cm, 4.13 g - Mus. Louvre (Sb 13327).

4.1.2.2.31. Irregular shape (Type 23): Cat. no. 733-746

733. Susa. - No context - Irregular, good, stone. L. 1.47 cm, H. 0.60 cm, W. 0.71 cm, 1.23 g - Mus. Louvre (Sb 13314).

734. Susa. - No context - Irregular, good, stone. L. 2.00 cm, H. 1.38 cm, W. 1.49 cm, 3.24 g - Mus. Louvre (Sb 13342).

735. Susa. - No context - Irregular, good, hematite. L. 1.98 cm, H. 0.91 cm, W. 1.18 cm, 5.62 g - Mus. Louvre (Sb 13328).

736. Susa. - No context - Irregular, good, hematite. L. 2.21 cm, H. 0.71 cm, W. 1.15 cm, 4.68 g - Mus. Louvre (Sb 13488).

737. Susa. - No context - Irregular, good, with working traces, hematite. L. 2.30 cm, H. 0.85 cm, W. 2.19 cm, 13.28 g - Mus. Louvre (Sb 13334).

738. Susa. - No context - Irregular, good, with working traces, hematite. L. 3.45 cm, H. 1.37 cm, D. 1.78 cm, 33.52 g - Mus. Louvre (Sb 13337).

739. Susa. - No context - Irregular, good, with working traces, hematite. L. 2.02 cm, H. 0.91 cm, W. 1.73 cm, 8.77 g - Mus. Louvre (Sb 13345).

740. Susa. - No context - Irregular (unfinished duck?), good, hematite. L. 2.00 cm, H. 1.29 cm, W. 1.95 cm, 11.93 g - Mus. Louvre (SH 095366).

741. Susa. - No context - Irregular, good, with working traces, hematite. L. 2.50 cm, H. 0.75 cm, W. 2.69 cm, 12.84 g - Mus. Louvre (Sb 13405).

742. Susa. - No context - Irregular, good, with working traces, hematite. L. 2.30 cm, H. 0.85 cm, W. 2.19 cm, 13.28 g - Mus. Louvre (Sb 13334).

743. Susa. - No context - Irregular, good, with working traces, hematite. L. 2.60 cm, H. 1.11 cm, W. 1.85 cm, 13.39 g - Mus. Louvre (Sb 13339).

744. Susa. - No context - Irregular, good, hematite. L. 2.30 cm, H. 2.30 cm, W. 1.50 cm, 15.00 g - Mus. Louvre (Sb 13338).

745. Susa. - No context - Irregular, good, hematite. L. 2.21 cm, H. 0.71 cm, W. 1.15 cm, 4.68 g - Mus. Louvre (Sb 13488).

746. Susa. - No context - Irregular, good, with working traces, hematite. L. 3.60 cm, H. 2.52 cm, W. 2.51 cm, 35.11 g - Mus. Louvre (Sb 13336).

4.1.2.3. Metrological notes

As stated in the introduction, this volume will not include a full metrological analysis of all the objects collected over the years. However, some preliminary insights, which will be the subject of future publications, will be provided. The weight values of objects from Susa are in line with the Mesopotamian metrological tradition widely accepted in the archaeological literature. An overall analysis of the Susian weights ranging between 0 and 10 g returns peaks at 1.49 g, 2.67 g and 4.06 g, which correspond to fractions of the shekel of central-southern (2.67 g x 3 = 8.01 g and 4.06 g x 2 = 8.12 g) and northern Mesopotamia (1.49 g x 6 = 8.94 g). Similarly, the main weight clusters can be recognised in the following weight ranges:

Weights in the range of 0-10 g (Fig. 4.4)

1. 0.83-1.23 g
   From Mesopotamian textual evidence, the local shekel of 8.4 g was divided into fractions of ⅙, ¼, ⅓, ½ and ⅔ (Bartash 2019, 64). For these reasons, the values included in this range can, at least hypothetically, be interpreted as fractions of ⅒ and ⅛ of the Mesopotamian Daric (8.4 g), or ⅛ of the shekel (9.4 g).
2. 1.38-1.61 g
   The weights in this range represent ⅙ of the local base unit of 8.4 g. The objects towards the upper end of the range could represent ⅙ of the so-called Levantine shekel of 9.4 g.
3. 2.00-2.17 g
   Objects falling into this range can be considered as ¼ of the local shekel of 8.4 g, and, at the same time, the possible 'heavy' shekel implemented by the Neo-Assyrian chancelleries during the Iron Age (Ascalone/Basello 2022). This 8.9 g shekel, obtained from the mina of 1,070 g (or 535 g), seems to have

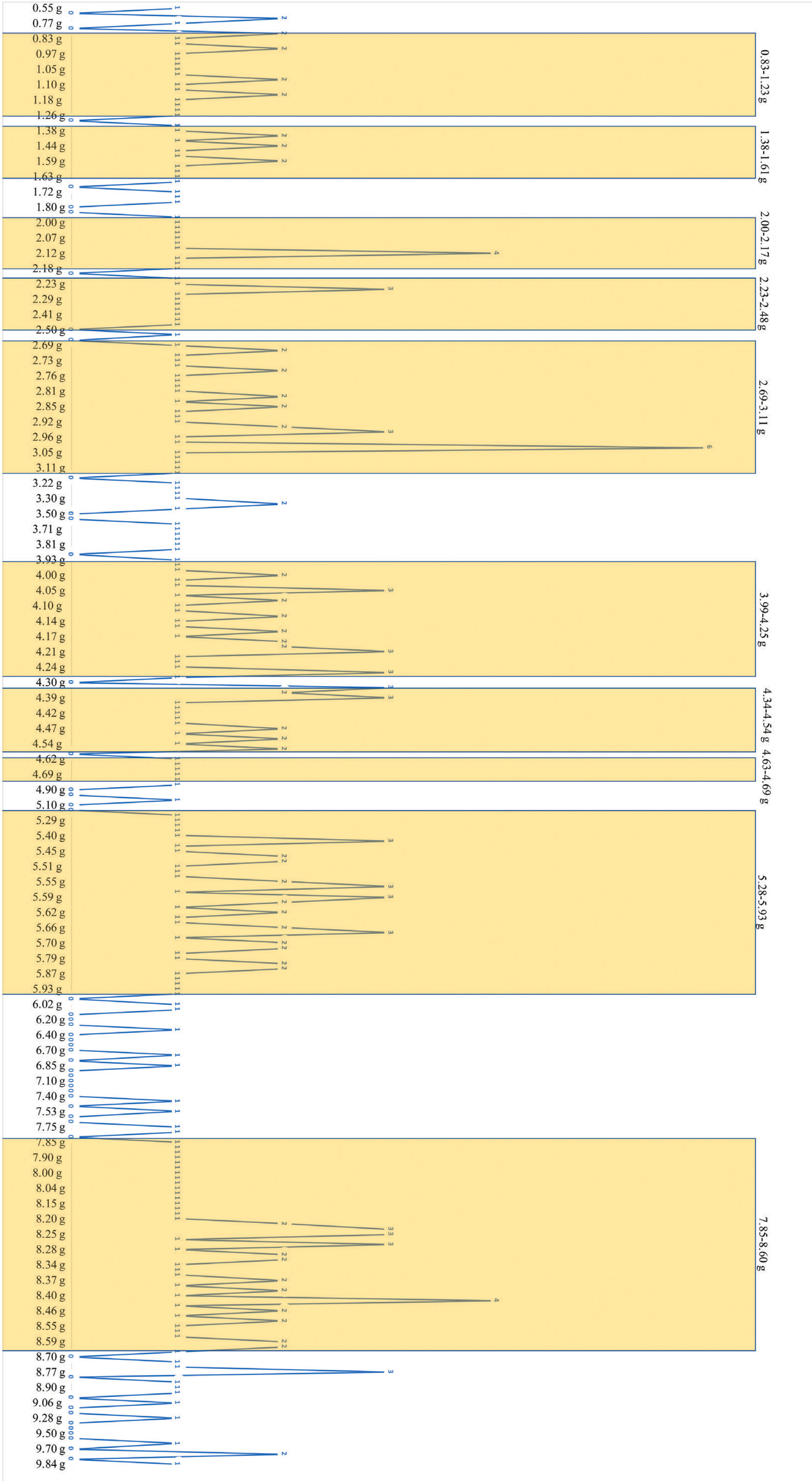
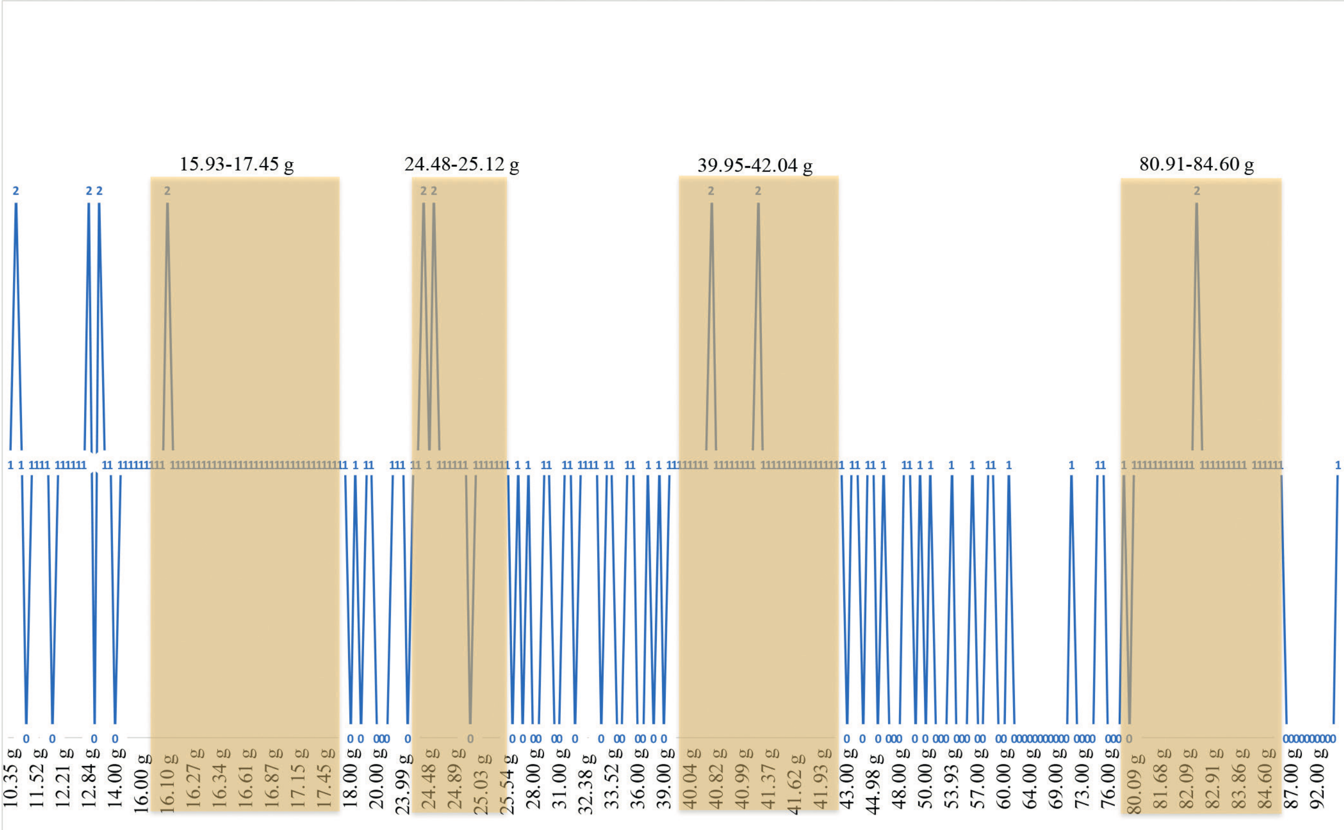


Fig. 4.4. Main clusters of mass values from Susa (0-10 g).



▲*Fig. 4.5. Main clusters of mass values from Susa (10-100 g).*

spread throughout the Near East at the beginning of the 9th century BC, although evidence from Kültepe may date as early as the 20th century BC (Özgüç 1986, 80, no. 76).

4. 2.23-2.48 g
   The objects in this range represent ¼ of the shekel of 9.4 g. Some of the objects slightly overestimate the value, however this could be due to the inclusion of a number of specimens that cannot be identified as balance weights with certainty.
5. 2.69-3.11
   This range represents weights with the value of *c.* ⅓ of both shekels (8.4 g and 9.4 g).
6. 3.99-4.25 g
   This range comprises all weights equivalent to ½ the local shekel of 8.4 g.
7. 4.34-4.54 g
   Weights in this range could represent ½ of an underestimated shekel unit of 9.4 g. More likely, however, they represent ¼ of the heavy double-shekel of about 17.83 g (obtained by division of a mina weighing 1,070 g), which was developed during the 1st millennium BC under Tukulti-Ninurta II. Whilst its existence could thus far not be proven, new evidence (Curtis 2013, no. 547-548) in combinations with the data presented in Fig. 4.4 seem to confirm its appearance alongside the traditional 8.4 g shekel series.
8. 4.63-4.69 g
   This range equals ½ of the 9.4 g shekel.
9. 5.28-5.93 g
   Objects in this range represent ⅔ of the Mesopotamian shekel (8.4 g), ⅔ of an underestimated 9.4 g shekel, or ⅓ of the double shekel (17.8 g).
10. 7.85-8.60 g
   This range, which comprises the largest number of weights, represents the unit of the local shekel in Susa.

Weights in the range of 10-100 g (Fig. 4.5)

1. 15.93-17.45 g
   These objects are equal to two Mesopotamian base shekels, two underestimated shekels of 9.4 g, or, if the double heavy shekel did indeed exist, a single unit of the shekel obtained by dividing a mina (1,070 g) by 60.
2. 24.48-25.12 g
   These objects are equal to three local shekels.
3. 39.95-42.04 g
   Weights in this range are equal to five local shekels.
4. 80.91-84.60 g
   This range represents weights equal to ten shekels of 8.4 g.

Weights in the range of 100-1,000 g (Fig. 4.6)

1. 115.69-129.17 g
   The division of the Mesopotamian mina follows the same sexagesimal system as the shekel. Particularly common fractions, as evident from Mesopotamian texts, are ⅚ (only from

Ur III), ⅓, ½ and ⅔. This range represents ¼ of the local mina and also the western mina of 470 g.

2. 158.78-168.06 g
   This range corresponds to ⅓ of the classic Mesopotamian mina. It is also equal to the so-called light mina which existed from the Early Dynastic period onwards. Textual evidence, for example from the Manishtusu obelisk, reveals that a *ma-na-tur* or 'little mina' was introduced by the royal Akkadian administration, and continued to be used at least until the reign of Naram-Suen. This mina is based on a shekel value of 2.81 g (⅓ of a standard shekel) multiplied by factor 60 in a sexagesimal metrological system (2.81 g × 60 = 168.80 g). According to the textual sources, a specific shekel based on a mina of 168.8 g was used for weighing silver, gold and copper (Bartash 2019, 99-100).
3. 234.32-259.73 g
   The weights in this range are equal to ½ a mina of 470 g and 504 g. They could also represent ¼ of the 1,070 g double heavy mina.
4. 462.72-517.94 g
   These objects represent one western mina of 470 g, or one local mina of 504 g. They could also represent ½ of the 1,070 g mina.

Weights in the range of 1,000-5,000 g (Fig. 4.7)

1. 1,001.50-1,089 g
   Textual evidence from the 3rd millennium BC refers to multiples of 2, 3, 4 and 6 times a mina. The Susa weights follow this numerical progression and provide a consistent picture of weight accounting operations for the heaviest values. Objects in the range of 1,001.5-1089.0 g represent two local minas. While the mina of 504 g was used throughout all three millennia of Mesopotamian and Susa history, it appears that the mina of 1,070 g (see below) was only introduced by the Assyrian chancelleries; a mina of this value was common in the western provinces of the Assyrian empire, as is evident from the specimens from Karkemish, Zincirli, Arslan Tash and Tell Shiukh Fawkani (Zaccagnini 1999-2001; 2005; 2019; on the unit of 1,070 g see Reade 2018, 156-169).
2. 1,232-1,357 g
   This range comprises only three balance weights, which could indicate the existence of the so-called wool weight, which corresponds to ½ of the Dilmunite mina (see below for the Harappan standard in Susa). Based on textual evidence from Nuzi and Alalahk (IV phase), a *c.* 670 g mina equivalent to the weight of a wooly sheep fleece (weighing approximately 600 g to 783.24 g) has been proposed for the Late Bronze Age (Parise 1986, 81-88; 1991, 13-16; Zaccagnini 1999-2001, 51-

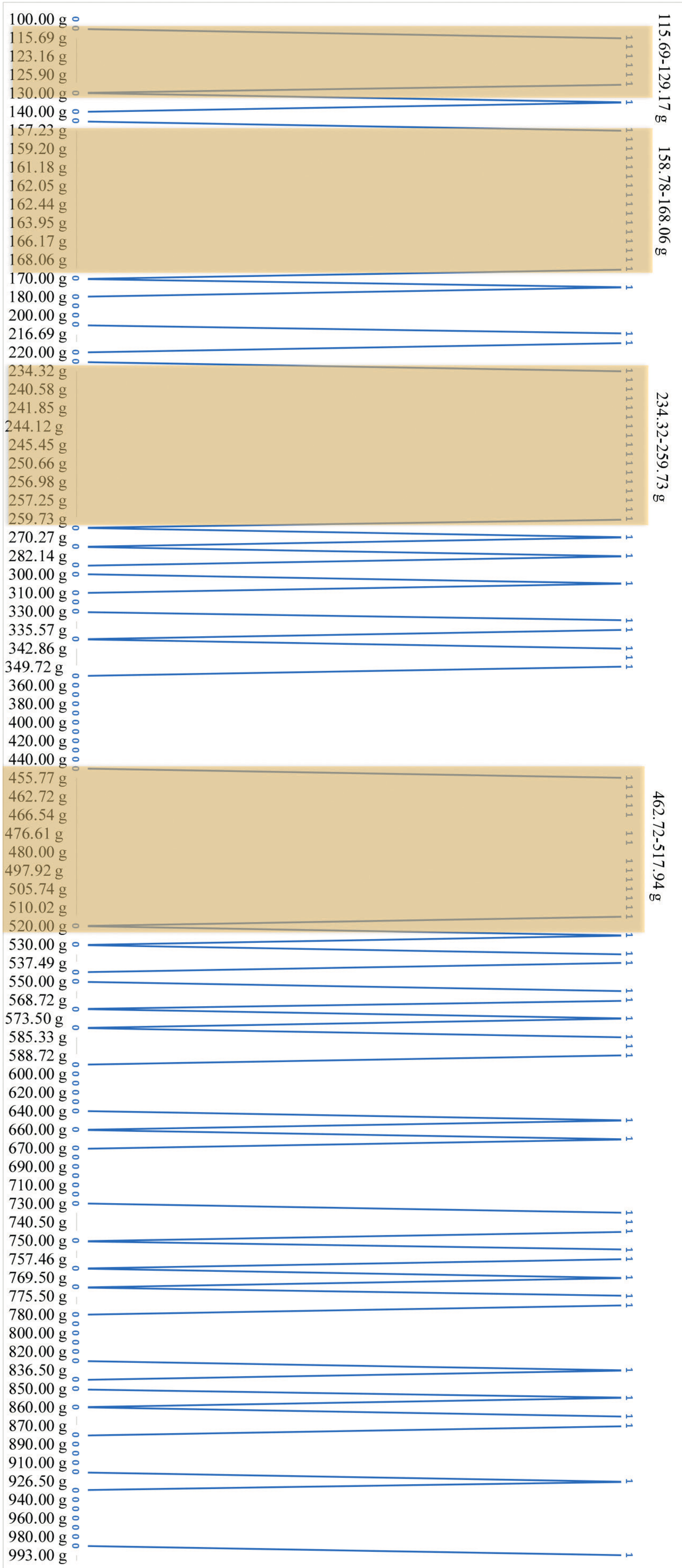
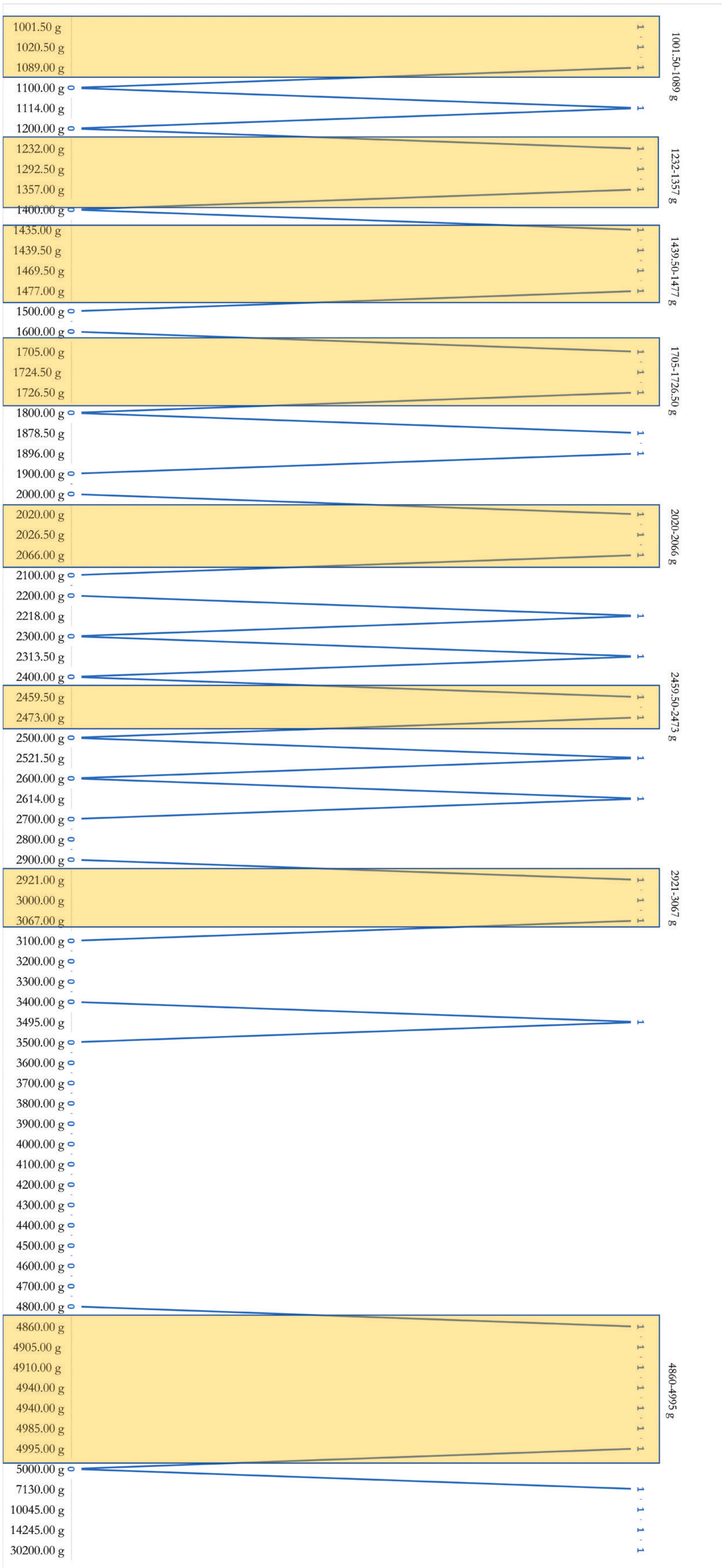


Fig. 4.6. Main clusters of mass values from Susa (100-1,000 g).



▲*Fig. 4.7. Main clusters of mass values from Susa (1,000-5,000 g).*

54). The texts from Alalakh (AT 361), dated to the reign of Niqmêpa (15th century BC), and Nuzi (14th century BC), mention a light value, representing a fully processed fleece minus any waste, calculated as *c.* 660-680 g and *c.* 727.20 g respectively. Evidence for the existence of a wool mina in the 3rd millennium BC can be found in the Early Bronze Eblaite weights (Ascalone/Peyronel 2006a, no. 50, 52; on the monetary aspects in the Syro-Palestinian region see Biga 2003c), and in the approximately contemporary Dudu weight of 676.80 g. Found in Lagash, this weight contains an inscription making specific reference to a 'wool mina' (Parise 1986; 1991). Further evidence has been found at Tell el-Ajjul (641.61 g) in Middle Bronze Age contexts, and at Nimrud in levels dating back to the reign of Salmanassar V, where a bronze lion weighing 1,000 g bears the inscription '⅔ of the village', *i. e.* a value of 666 g which also corresponds to 80 Mesopotamian shekels of 8.32 g and 100 shekels of 6.66 g (Fales 1995, 40-41; Zaccagnini 1999; 1999-2001). The identification of a mina specifically used for the quantification of wool makes it possible to draw parallels between two simultaneously used weight systems, linked to each other through standard exchange ratios. The minas of *c.* 650-680 g appear, therefore, to be a geographically transversal and widely spread system used for wool weighing, which co-existed with the minas used for weighing metals or (semi-)precious stones weighing *c.* 470 g (Inner Syria and Anatolia) and *c.* 500 g (Mesopotamia).

3. 1,439.50-1,477 g
   Objects in this range correspond to three classic Mesopotamian minas.
4. 2,020-2,066 g
   These objects are equal to four minas of 505 g, and to ½ of the 1,070 g mina.
5. 2,459.50-2,473 g
   The seven specimens contained within this range date to the 2nd millennium BC and correspond to five Mesopotamian minas.
6. 2,921-3,067 g
   This range corresponds to six minas of *c.* 505 g.
7. 4,860-4,995 g
   Objects in this range represent ten Mesopotamian minas (on the numerous historical studies on the Mesopotamian weights and values see Ascalone/Peyronel 2006a, 40-49, with bibliographical references).

The most common weight units used in the Mesopotamian system are also visible in Fig. 4.8-10, particularly the units related to the Type 2 duck-shaped weights used as a case study in this analysis. The Type 2 graph returns values associated with the so-called Mesopotamian Daric with a base unit of 8.4 g. Peaks are visible at 0.7 g (÷ 12), 1.4 g (÷ 6), 4.1 g (÷ 2), and 8.2-8.3 g with a peak at 8.2-8.4 g (x 1). Cosine Quantogram Analysis of duck-shaped weights returns values that fit a weight system with base unit 8.4 g.

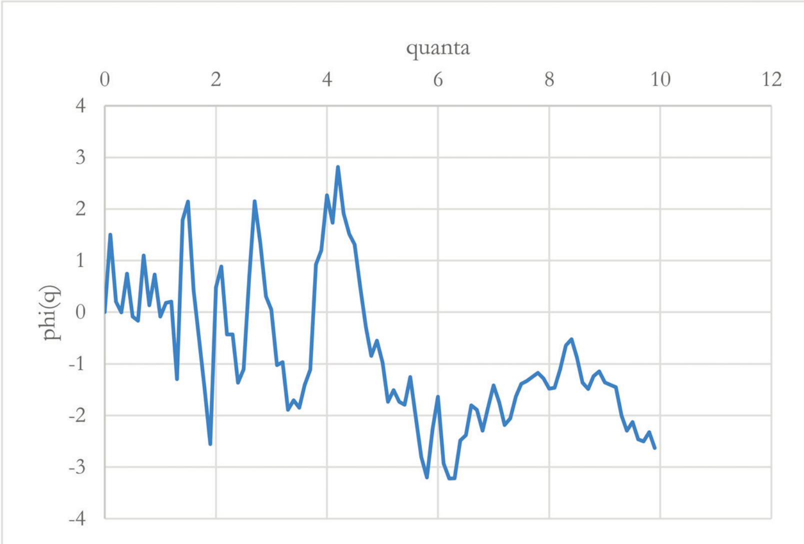
Analysis of Types 8 and 9c, both of which are uncertain in terms of their use as balance weights, returned inconclusive results and their function could not be determined with certainty. CQA of Type 8 ellipsoids does not return statistically relevant values that would indicate their potential use as balance weights (Fig. 4.11). Type 9c pebbles, however, produce slightly more significant results, with a single peak at *c.* 2.7 g which is equal to ⅓ of the Mesopotamian shekel of 8.1 g. Whilst not conclusive evidence, this suggests that unprocessed objects (pebbles) could have been used as balance weights. Their average value fits well into the codified alluvial system of about 8.4 g. Furthermore, some specimens bear engravings which directly express the mass of the objects in relation to the current system (see weights Cat. no. 669-670 indicating half a Mesopotamian shekel).

From a historical perspective, it seems likely that what has been proposed for the Harappan system can also be suggested for Susa, and perhaps other major sites of southern Mesopotamia: different 'levels' of weights were used for different types of weighing operations, by different people of different classes. The notion that pebbles were used as balance weights can provide new information on weight accounting procedures and allows new considerations on *intra-situ* social aspects beyond *extra-situ* commercial activities.

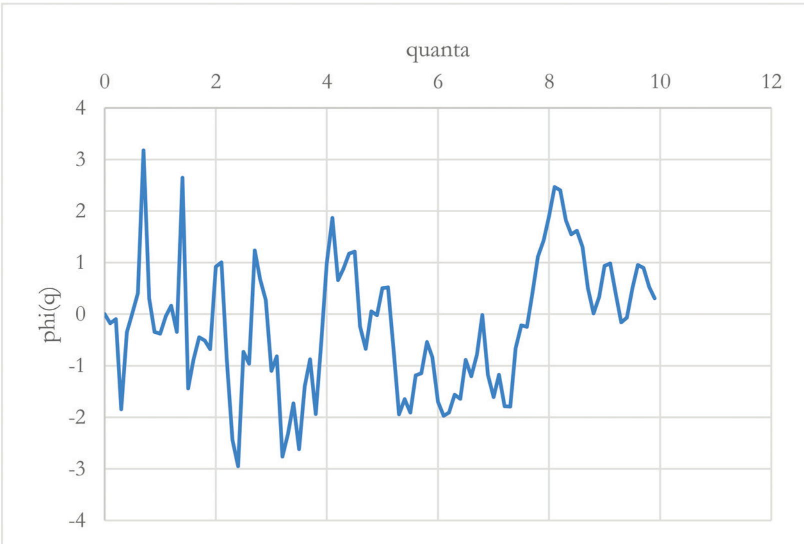
The numerous finds from Susa can, at least partially, be organised into different categories of weights. The following contains some brief considerations of these categories:

The Harappan group (Cat. no. 34-35, 81-82, 224, 233, 324, 487, 499, 504, 601, 628, 680, 694, 698-700)

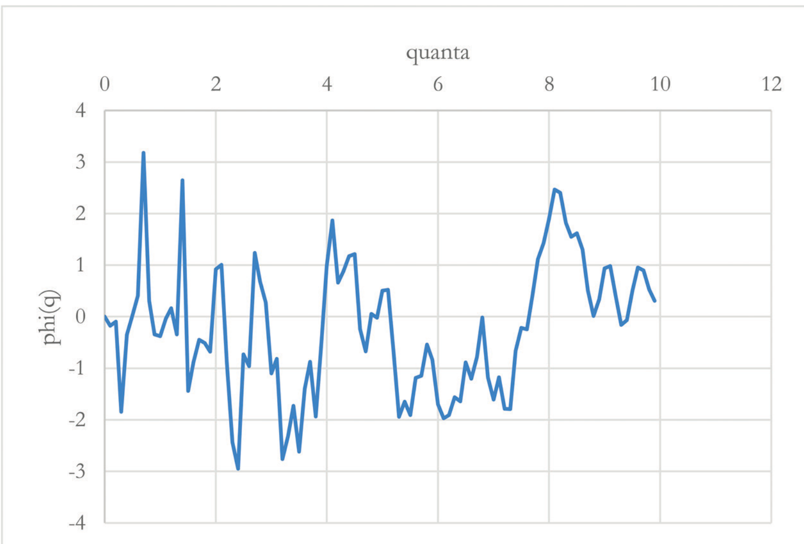
Weights in this group are considered as of Harappan origin (Cat. no. 694, 698), or of Harappan production in the indigenous contexts of Khuzistan (Cat. no. 34-35, 81-82, 224, 233, 324, 487, 499, 504, 601, 628, 680, 699-700). Two of the three cubic weights (Cat. no. 698-700) appear to have been produced locally, as indicated by the use of a type of limestone that was commonly used in Susa during the second half of the 3rd millennium BC. As previously suggested by P. Amiet (1986a, 143, fig. 93), the third cubic weight (Cat. no. 698), made of jasper, was likely imported from the Indus Valley, as was the discoidal weight of 13.43 g (Cat. no. 694). These specimens are complemented by objects with different typologies, all typical for the site, with mass values undoubtedly related to the Indus Valley weight standards. Whilst the cylindrical specimen (Cat. no. 680) could conceiv-



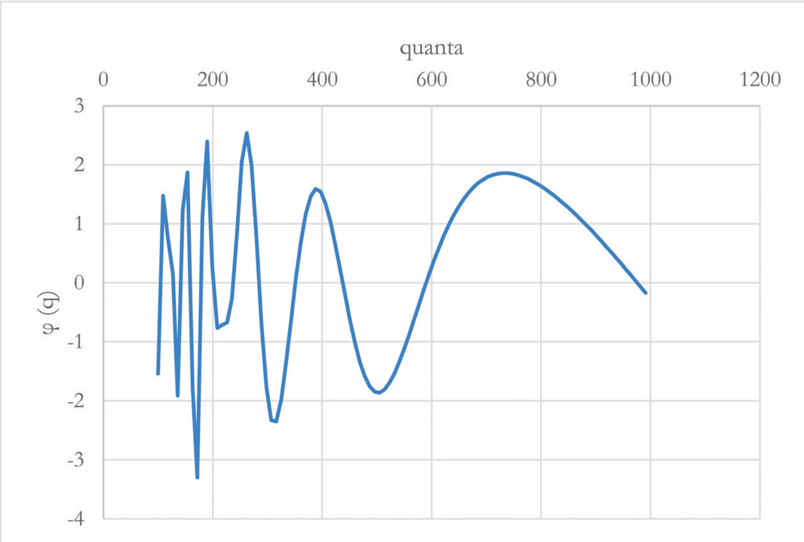
▲*Fig. 4.8. Cosine Quantogram Analysis of Type 1a at Susa.*



▲*Fig. 4.9. Cosine Quantogram Analysis of Type 1c at Susa.*



▲*Fig. 4.10. Cosine Quantogram Analysis of Type 2 at Susa.*



▲*Fig. 4.11. Cosine Quantogram Analysis of Type 8 at Susa.*

ably be interpreted as an unfinished seal, Cat. no. 34-35, 81-82, 224 and 233 (ovoids), Cat. no. 324, 487, 499 and 504 (ovoids with base and flat ends), Cat. no. 628 (pig head-shaped) and Cat. no. 601 (duck-shaped) can be considered weights produced in Susiana which follow the Harappan weight standards (Ascalone 2021a). The mentioned weights can be connected to the Greater Indus Valley metrological values as follows.

Cat. no. 34: 3.31 g x 4 = 13.24 g
Cat. no. 35: 3.40 g x 4 = 13.60 g
Cat. no. 81: 6.78 g x 2 = 13.56 g
Cat. no. 82: 6.85 g x 2 = 13.70 g
Cat. no. 224: 334.25 g x 4 = 1,337 g or 40 x 8.36 g (see above about the 'wool mina')
Cat. no. 233: 669.50 g ÷ 50 = 13.39 g (see above about the 'wool mina')
Cat. no. 324: 3.31 g x 4 = 13.24 g
Cat. no. 487: 3.30 g x 4 = 13.20 g
Cat. no. 499: 13.28 g x 1 = 13.28 g
Cat. no. 504: 78.69 g ÷ 6 = 13.11 g
Cat. no. 601: 2,614 g ÷ 200 = 13.07 g or 2 x 1,307 g (see above about the 'wool mina')
Cat. no. 628: 3.27 g x 4 = 13.08 g
Cat. no. 680: 3.40 g x 4 = 13.60 g
Cat. no. 694: 13.43 g x 1 = 13.43 g
Cat. no. 698: 27.25 g ÷ 2 = 13.62 g
Cat. no. 699: 865.50 g x 3/2 = 1,298.25 g
Cat. no. 700: 870 g x 3/2 = 1,305 g

Of particular interest is an ovoid with four engraved circles (Cat. no. 224), which seem to be an annotation of equivalence between the system of *c.* 13.65 g and the Mesopotamian unit obtained from 40 units of 8.36 g, at a ratio of ¼ with the Dilmunite and ⅔ with the Mesopotamian mina.

The Western group (Cat. no. 20, 70, 80, 220, 530, 669)

A weight standard based on a mina of 470 g (7.83 g, 9.40 g and 11.75 g) in Susa was previously discussed by the author (Ascalone/Peyronel 1999, 363-368; 2003, 366-384), based on previously published data by M.-C. Soutzo (1911) and N. T. Belaiew (1934). The existence of a 470 g mina is generally accepted, on the basis of epigraphic evidence dating back to the Late Bronze Age, as well as a systematic study of the individual weight systems that existed in the Eastern Mediterranean. This enabled the determination of different standard values, and the decoding of parameters of exchange based on weight (first of all Parise 1970-1971; 1981; 1984). It was only in the last 30 years that scientific debate started to acknowledge the coexistence of a number of different, interconnected weighing systems within a single site, applied jointly in a fluid system of accounting knowledge that included indigenous and imported standards of weight. The Ugaritic texts, for example, provide evidence for multiple systems existing around a single base mina of 470 g, which is divided into different shekels, 7.83 g, 9.40 g and 11.75 g, of 60, 50 or 40 units, respectively. An economic text written in Akkadian, bought in Laodicea in 1933 but certainly of Ugarit origin, records 29 consignments for a total amount of 6,600 shekels, equivalent to two talents and 600 shekels; this record shows that one Ugarit talent is equal to 3,000 shekels, and not 3,600 as in Mesopotamia (Parise 1970-1971, 13-14). A text found in Ras Shamra (RS 11.732) provides a record of gifts sent to Khattusha (perhaps by Ammishtamru), which confirms that the 470 g mina was divided into shekels by divisors 40 and 50, thus suggesting that Khatti also used a talent of 60 minas (Parise 1984, 128). The so-called vassalage treaty between Shuppiluliuma and Niqmepa II of Ugarit also provides indirect evidence that the 470 g mina could be divided by 40, by equating 12 minas to 480 shekels (*i. e.* 1 mina = 40 shekels) (Parise 1970-1971, 16-17; 1984, 128). In addition to the above-mentioned reconstructed evidence, the division of the 470 g mina into 60 shekels of 7.83 g, at least in Karkemish, is evident from two further texts: the agreement between Ini-Teshub of Karkemish and Amministhamru II (RS 17.146), and the verdict pronounced by Ini-Teshub on the killing of the merchant of the king of Tardkhudashshi (RS 17.158) (Parise 1981, 158; 1984, 128-129). As early as 1970, based on the evidence from Ugarit and Alalakh (AT.401)[12], N. Parise established fixed ratios between the various individual systems based on the mina of 470 g, and shed light on the adoption of indigenous units within a larger weight system.[13]

12 On the existence of a talent obtained from 3,000 shekels in Alalakh see Zaccagnini 1978, 69; 1979b, 475. In other and earlier works Alalakh's talent was thought of as the product of 1,800 (Wiseman 1953, 105) or 2,400 shekels (Tsevat 1958, 123, 128). For documentation about balance weights from the centre of the Antioch plain see Arnaud 1967.

13 On the presence of an underestimated mina in Kültepe of *c.* 450-455 g see texts CCT 2, 24 and Kt u/k 3, in which the relationship between the Assur mina and the Anatolian mina (*aban mātim*) is explained. See Veenhof 1972, 54-57; Dercksen 1996, 86-88; Zaccagnini 2000, 1209-1210.

Based on the newly collected evidence from Susa, and considering only the specimens bearing numerical markings on their surface, a group comprising six balance weights can be traced back to the western shekels obtained from dividing the 470 g mina by 40, 50 and 60.

Cat. no. 20: 2.26 g x 4 = 9.04 g (four vertical lines)

Cat. no. 70: 5.55 g x 2 = 11.10 g (two vertical lines)

Cat. no. 80: 5.87 g x 2 = 11.74 g (two vertical lines)

Cat. no. 220: 282.14 g ÷ 30 = 9.40 g (three vertical lines)

Cat. no. 530: 38.95 g ÷ 5 = 7.79 g (five vertical lines)

Cat. no. 669: 3.81 g x 2 = 7.62 g (cross, indicating ½ shekel)

The heavy mina of 535/1070 g group and its shekel (Cat. no. 132, 216, 218, 257, 455, 589, 595)

The existence of a double system of Mesopotamian minas during the 1st millennium BC, in which one (*c.* 1,070 g = 535 g x 2) was heavier than the traditional one (*c.* 1,010 g = 505 g x 2), was first proposed by M. A. Powell (1990, 516)[14] and recently confirmed by J. Reade (2018, 156-169).[15] This mina seems to be attested in some specimens, most of which come from well-stratified Neo-Assyrian sites at Nineveh, Nimrud and Khorsabad (for a detailed reference of weights see Ascalone/Basello 2022). Physical evidence for this mina is provided by a duck-shaped stone weight from Tukulti Ninurta II (890-884 BC), found at Nimrud by H. Layard (Curtis/Reade 1995, 194, no. 205): the weight has a mass of 178 g and bears an inscription indicating its value as ⅙ of a mina (178 g x 6 = 1,068 g). The same considerations can be made for other duck-shaped weights from Nimrud: 127.8 g with eight vertical strokes (127.8 g x 8 = 1,022.4 g; Layard 1851, no. 83G); 130 g with eight linear scratched marks (130 g x 8 = 1,040 g; Reade 2018, 3); 189 g with six vertical strokes (189 g x 6 = 1,134 g; Layard 1851, no. 83H); and 170 g with six vertical strokes separated by a slight gap from two more vertical strokes (170 g x 6 = 1,020 g; Al-Rawi 2008, 126, fig. 15i). Similar evidence comes from Karkemish, Zincirli, Arslan Tash and Tell Shiukh Fawkani, previously studied by C. Zaccagnini (1999-2001; 2005; 2019), dated to Iron Age I-III, between the date of the collapse of the Hittite empire (*c.* 1190 BC) and the Battle of Karkemish (*c.* 605 BC).[16] The two different values of the mina are also apparent in the existence of a shekel system with a unit counted of *c.* 8.91 g or 17.83 g (x 60 = 1,070 g), as suggested by two lion-shaped bronze weights from Nimrud, found at the entrance to throne room B in the North-West Palace. With mass values of 52.36 g and 35.90 g respectively, the first bears a double inscription in Aramaic and Akkadian which indicates three shekels as a base unit (52.36 g ÷ 3 = 17.45 g) (Layard 1853, no. 15; Weissbach 1907, no. 74; Curtis 2013, no. 547), the second two lines and an inscription in Aramaic that reads '2 shekels' (35.9 g ÷ 2 = 17.95 g) (Layard 1853, no. 16; Weissbach 1907, no. 75; Curtis 2013, no. 548).

The weights obtained from the sexagesimal division of the double heavy mina of 1,070 g concentrate around 8.9 g, thus necessarily modifying some earlier metrological analyses. In fact, values between 8.5 and 9 g were previously often excluded from metrological studies, either considered as overestimated specimens of the 8.4 g unit, or, more often, as underestimated specimens of the western shekel of 9.4 g.

There are six specimens from Susa that bear inscriptions related to weight metrology:

14 '*The light mina seems to be 500 g range, the big mina twice as heavy, although some Assyrian specimens representing mina fractions imply norms substantially heavier than these*' (Powell 1990, 516).

15 In the past, N. T. Belaiew (1929), examining the weights in the British Museum collection dated to the Third Dynasty of Ur, identified the presence of three 'units' (the third being quite significant), whose correspond to 491.1 g (series D I, between 484.8 g and 498 g, shekel at 8.23 g), 502.2 g (series D II, shekel at 8.36 g), and 511.8 g (series D III, shekel at 8.52 g) (Belaiew 1929, 124-125); furthermore, taking into consideration the agate weights from Uruk published by F. Thureau-Dangin (1927), all carefully worked and complete, A. S. Hemmy (1935, 89-91) identified five shekel 'standards': 7.575 g – 8.225 g – 8.45 g – 8.775 g – 9.25 g. All but one of these units were confirmed by the most recent comparative metrological studies: the series of 7.57 g and 9.25 g are recognized in the western shekel obtained from the mina fractionation of 470 g and the values estimated at 8.22 g and 8.45 g were immediately identified as the values of the so-called Mesopotamian 'load', the last unit of 8.77 g was not understood, considered as an underestimated value of the shekel of 9.4 or as an overestimated unit of the shekel of 8.4 g. Equally, the explanation of the fluctuation of shekel mass values, and the determination of a so-called margin of error, appears completely misleading. The 3 % suggested by M. A. Powell cannot be applied to both underestimated and overestimated weights. It seems evident that the mass of weights produced five millennia ago, undergoes a more significant subtraction variation than those weights that return error margins with overestimated masses. In summary, the percentage of the margin of error cannot be applied to both weights with underestimated and those with overestimated masses: it seems obvious that underestimated weights should have a higher percentage of error. If we identify an error percentage of 3 % on the shekel of 8.4 g (Powell 1979, 87-88), this percentage cannot be applied indiscriminately to the base value by identifying a unit range of 8.15 and 8.65 g; the use of poorly applied statistical data, in this case, has precluded us from recognising a unit which must correspond to the base shekel of 8.9 g (= 17.83 g). Until now, this has been ignored by the archaeological literature. The problem of deviation from the original mass of a weight affects the underestimated specimens: according to an administrative enquiry into the accuracy of the weights (for a total of 13,512 weights) used in 1920s and 1930s in British-ruled Punjab, only 8 % of the weights are heavier than normal standard, with an average overestimation equal to 1.6 % (Ratnagar 2003, 81).

16 Chronological evidence is provided by weights from Kültepe (level II of Kültepe, *c.* 1970-1840 BC) and Ashur (Middle to Late Bronze Age) (see Özgüç 1986, 80, no. 76 and Unger 1918, no. 26 respectively).

Cat no. 132: 17.65 g with two vertical lines (17.65 g ÷ 2 = 8.82 g; 8.82 g x 60 = 529.20 g)

Cat. no. 216: 256.98 g with the sign for 'half mina' (256.98 g x 2 = 513.96 g)

Cat. no. 218: 258.13 g (slightly chipped) with the sign for 30 shekels (258.13 g ÷ 30 = 8.60 g; 8.60 g x 60 = 516.26 g)

Cat. no. 257: 174.95 g with 20 vertical lines (174.95 g ÷ 20 = 8.75 g; 8.75 g x 60 = 524.85 g)

Cat. no. 455: 85.78 g with ten vertical lines (85.78 g ÷ 10 = 8.58 g)

Cat. no. 589: 537.49 g with an inscription and six vertical lines (537.49 g ÷ 60 = 8.96 g)

The last weight (Cat. no. 617) appears to be the most significant of this series, with an inscription recording one talent of 32 kg with one mina of 533.33 g (Ascalone/Basello 2022). It seems that, starting from the Iron Age, a second system with a mina of 1,070 g (= two minas of 535 g) existed simultaneously to the traditional system based on the mina of *c.* 504 g, developed by the Assyrian chancelleries and prevalent throughout the empire. This new system, which also comprised a shekel of *c.* 8.9 g (or a 'double-shekel' of 17.83 g), was based on a 32 kg talent (*not* 30.2 kg) obtained from 30 minas of 1,070 g, used simultaneously to the traditional Babylonian system of 504 g. From a metrological perspective, the closest comparison to Cat. no. 595 is a specimen from the Dardanelles, at Abydos, where a lion-shaped bronze weight with handle weighing 31,808 g (÷ 30 = 1,060.27 g), bearing an Aramaic inscription, was found in the Achaemenid levels (Reade 2018, B. 31).

It is difficult to explain why Assyria began to use a heavier mina, estimated at 1,070 g, in addition to the traditional Mesopotamian double mina of 1,010 g, but there appears to be a connection to the implementation of Assyrian official administration between the first years of the 9th century BC to the Achaemenid period (5th century BC), as confirmed by a weight from Abydos.

This raises the question whether the two Persian coin systems (8.4 g for gold coins, 10.7 g for silver) are directly related to the two contemporary weighing systems used under the Assyrian administration, which were still used during the Achaemenid period (see E. Ascalone in Ascalone/Basello 2022).

The hybrid mina weight (Cat. no. 595)

In addition to standard systems, so-called hybrid minas were used, with 60 shekels of *c.* 9.4 g (= 564 g) and 50 shekels of *c.* 8.4 g (= 420 g). The existence of a 'hybrid' mina obtained by adhering to the sexagesimal system of the Levantine shekel was first proposed by C. Zaccagnini (1999-2001, 39-45; 2000; 2005; but also Parise 2001-2003, 443-445; *contra* Vargyas 1996, 10-13; Ascalone 2011) who demonstrated the existence of a mina of *c.* 564 g based on evidence from the Iron Age (for the spread of hybrid minas in the Early Bronze Age see Ascalone/Peyronel 2006a, 28-30). Considering only clearly marked weights, there appears to be at least one hybrid mina.

Cat. no. 595: 1,726.5 g with three vertical lines (1,726.5 g ÷ 3 = 575.5 g)

The ingots group (Cat. no. 709-719)

The copper ingots from Susa require a different type of analysis, particularly considering their wider role within a trade system (Ascalone 2021a). All of the Louvre specimens are presumed to date to the beginning of the second half of the 3rd millennium BC, a period marked by intensive relations between Mesopotamia, the Iranian highlands, the Persian Gulf (especially Makkan, *i. e.* Oman) and the Indus Valley. Similar bun-shaped or hemispheric ingots were found on the western coast of the Persian Gulf, in Gujarat and the Indus Valley. Two different groups of ingots come from Susa: one without any archaeological context (Cat. no. 711-712, 714, 717), and the other (five ingots) from the *vase à la cachette* (Cat. no. 710, 713, 715-716, 718) dated to Early Dynastic III (*c.* 2500-2400 BC) (Amiet 1986a, 125-129, fig. 96,1-9; Tallon 1987, 328-331).

The ingots from the *vase à la cachette* can be metrologically analysed as follows:

Cat. no. 710: 1,357 g x 1 = 1,357 g = 2 x 678.50 g

Cat. no. 713: 1,878.50+x g ÷ 4 = 469.62+x g

Cat. no. 715: 2,026.50 g ÷ 4 = 506.62 g

Cat. no. 716: 2,066 g ÷ 4 = 516.50 g

Cat. no. 718: 2,921 g ÷ 6 = 486.83 g

Similar results can be obtained from the remaining ingots without archaeological context:

Cat. no. 709: 650.50 g x 2 = 1,310.10 g

Cat. no. 711: 1,477 g ÷ 3 = 492.33 g

Cat. no. 712: 1,705 g ÷ 1 ¼ = 1,364 g (or Harappan/Dilmunite mina); 1,705 g ÷ 10 = 170.50 g (or little mina as mentioned in Early Dynastic and Akkadian sources for weighing silver, gold and copper, Bartash 2019, 99-100) = 1 x 1,705 g (or Jiroft mina, see below)

Cat. no. 714: 1,896 g ÷ 4 = 474 g

Cat. no. 717: 2,218 g = ?

The mass values of the Susa ingots mostly correspond to the system of the Mesopotamian (Cat. no. 711, 713-716, 718) and the Dilmunite mina (Cat. no. 709-710, 712). The latter can be derived from the wool mina mentioned in pre-Sargonic Mesopotamia texts (Bartash 2019, 36-59; a thorough descriptive and metrological analysis of these ingots was previously published by the author in Ascalone 2021a). The ingots serve as a testimony to the relations between Oman and the main sites of Lower Mesopotamia, employed in a sophisticated exchange system involving copper and wool. Based on textual evidence dating to Mesopotamian Early Dynastic III, it can be suggested that the 'mina of Dilmun' can be used as a basis to calculate the values of other contemporary wool minas. The Mesopotamian texts provide testimony to the import of copper from Oman and the export of wool to Makkan, so it seems plausible that copper ingots could have served as currency used in the wool trade. One mina of wool equaled 680 g (x 2 = Dilmunite mina of 1,360 g), as is evident from the inscription ('*ma-na siki-ba Dudu*') on the pre-Sargonic weight from Girsu (Parise 1986; 1991; the same 'mina of wool' is cited in Early Bronze IV Ebla texts – *na4-siki*; see Ascalone/Peyronel 2006a, 114-116; for a chronology of Eblaite texts see Biga/Pomponio 1990; 1993; Biga 1996; 2003b). From a historical perspective, the use of the Dilmun mina in an economic system not controlled by any state power can be explained with its ratio in reference to the Mesopotamian wool mina (½ a Dilmunite mina) and the Indus shekel (100 Harappan units).[17]

4.2. Choga Zanbil/Dûr-Untaš

Towards the end of the 19th century, a geological survey conducted at the modern Choga Zanbil recovered an inscribed brick which revealed the toponym 'Dûr-Untaš', the Middle Elamite capital. Located about 40 km south-east of Susa, the city was founded by Untaš-Napiriša, king of Elam and son of Humban-Numena, and the daughter of Kurigalzu, Kassite king of Babylon (Rutten 1953; Stève 1967). It was until 1936 and 1939 that R. de Mecquenem carried out short surveys of the site (de Mecquenem 1953a; 1953b; Michalon 1953). This was followed by more in-depth investigations by R. Ghirshman who conducted nine excavations (1951-1962) at the site, which brought to light a vast area that included a ziggurat, temple buildings, a palace and a large perimeter wall enclosing about 100 ha (Ghirshman 1966c; 1968c; see also Porada 1970 for seals). Subsequent campaigns revealed the temple of Manzat and NIN.DAR.A (3 km away) (Mousavi 1990; Vallat 1990), while satellite imagery identified the ancient ceremonial access route passing through the 'east-gate'. The epigraphic evidence collected in Choga Zanbil (around 6,000 inscribed bricks) reveals that the city was founded and commissioned by Untaš-Napiriša during the second half of the 14th century BC (1340-1300 BC = Middle Elamite II period), primarily as a centre for ceremonial and religious activities, probably related to a reformation of the prevailing religious system.

4.2.1. Chronologies

A complete lack of inscriptions produced after Untaš-Napiriša death suggests that the religious centre was abandoned after his passing (no inscriptions have been found of the subsequent rulers Kidin-Hutran II, Napiriša-Untaš and Kidin-Hutran III; see also Potts 1999, 231). All major buildings were abandoned and, although sporadic ceramic evidence from later periods has been found (Pons 1994), it is commonly believed that the centre was no longer used for official purposes. The chronologically limited occupation of the site, for the most part restricted to the end of the 14th century BC, makes Choga Zanbil particularly interesting. The short lifetime of the city allows precise dating of the majority of balance weights from Dur-Untaš-Napiriša to the Middle Elamite II period, based on associated ceramics and numerous royal inscriptions found at the site.

4.2.2. Weights, potential weights, possible weights and associated finds (Cat. no. 747-750)

The four objects (Cat. no. 747-750) from Choga Zanbil were clearly used as balance weights on a scale plate. Morphologically (ovoid with base, with flat end, or with both) they belong to a group of objects that first appear towards the end of the 3rd millennium BC. Particularly interesting is Cat. no. 748 which has only very slight traces of processing. It was probably made from an already ovoid pebble and only marginally worked. Two engraved lines indicate the weight unit.

4.2.2.1. Archaeological contexts

The four weights from Choga Zanbil were found during R. de Mecquenem's campaigns between 1936 and 1938 (de Mecquenem 1953a), and there is secure contextual information available. At an educated guess, Cat. no. 747, 749 and 750 probably date to the period when the city was 'alive' (1340-1300 BC), while Cat. no. 748 was, according to the Louvre's excavation register where the object is now kept, dates to the Neo-Elamite I period (*c.* 1000-744 BC), when the settlement had already been abandoned.

4.2.2.2. Catalogue

4.2.2.2.1. Ovoid with base (Type 1b): Cat. no. 747-748

747. Choga Zanbil/Dûr-Untaš. - T.Z. 1b, de Mecquenem 1936 and 1939 excavations - Ovoid with base, good, with markings ('IIIII'), limestone. L. 4.40 cm, D. 2.05 cm, 41.38 g - Mus. Louvre (Sb 13601).

748. Choga Zanbil/Dûr-Untaš. - C.Z.V. 29, de Mecquenem 1937-1938 excavations - Ovoid with base, chipped in multiple areas, with markings ('II'), limestone. L. 9.50 cm, H. 3.09 cm, W. 3.05 cm, 142.95+x g - Neo-Elamite, 1000-744 BC - Mus. Louvre (Sb 13701).

17 The identification of a mina specifically used to weigh wool makes it possible to identify two coexisting weight system linked by standard exchange ratios. The mina of *c.* 650-680 g appears, therefore, to be a geographically transversal and widely spread system used for wool weighing, which was used along the minas used for weighing metals or (semi-) precious stones counted at *c.* 470 g (Levant) and *c.* 500 g (Mesopotamia). For information on the wool mina in Inner Syria in the 3rd millennium BC see Ascalone/Peyronel 2006a, no. 50, 52.

4.2.2.2.2. Ovoid with flat ends (Type 1c): Cat. no. 749

749. Choga Zanbil/Dûr-Untaš. - T.Z. 2, de Mecquenem 1936 and 1939 excavations - Ovoid with flat ends, good, stone. L. 8.80 cm, D. 4.48 cm, 170.53 g - Mus. Louvre (Sb 13684).

4.2.2.2.3. Ovoid with base and flat ends (Type 1d): Cat. no. 750

750. Choga Zanbil/Dûr-Untaš. - C.Z. 12, de Mecquenem 1937-1938 excavations - Ovoid with base and flat ends, incomplete, with markings ('II'), limestone. L. 6.92 cm, H. 3.02 cm, W. 3.41 cm, 131.81+x g - Mus. Louvre (Sb 13676).

4.2.2.3. Metrological notes

Metrological analysis of the four specimens from Choga Zanbil seems easy for Cat. no. 747-749, and more complex for Cat. no. 750. Cat. no. 747 has five vertical lines engraved indicating the value of five shekels with a base unit of 8.28 g (41.38 g ÷ 5). Cat. no. 748, although chipped in multiple areas, has two vertical lines engraved representing 20 Mesopotamian shekels (slightly underestimated due to the chipping; 142.95+x g ÷ 20 = 7.14+x g). Finally, Cat. no. 749 can be interpreted as 20 shekels of 8.52 g (170.53 g ÷ 20). The analysis of Cat. no. 750 is trickier, as only ⅔ of the object are preserved. The two engraved vertical lines could also indicate 20 local shekels (131.81+x g ÷ 20 = 6.50+x g). Interestingly, the numerical indicators on the Choga Zanbil weights are used to indiscriminately indicate both the number of single shekels (Cat. no. 747) and the number of ten shekels (Cat. no. 748, 750).

4.3. Djaffarabad

Tepe Djaffarabad is located 7 km north of Susa, in the Khuzistan plain which represents the south-western alluvial appendix to the Iranian plateau, near the Persian Gulf and just behind the Zagros mountains. The ancient site, roughly circular in shape and covering an approximate area of 40 m x 50 m, is raised 7 m from the surrounding desert plain near the course of the Chaour River, a tributary of the Kerkha, the main river of the region.

Between 1969 and 1974, the *Délégation Archéologique Française en Iran* carried out extensive investigations at Djaffarabad, with the aid of the *Centre National de la Recherche Scientifique*. The excavations provided a more in-depth understanding of the ancient site, which had previously been subject to a number of limited surveys carried out by R. de Mecquenem and L. Le Breton in 1930 and 1934, who proposed uninterrupted period sequences based on strict typological classifications of ceramics (Le Breton 1947). The new research, which commenced on 13 January 1969 under the direction of G. Dollfus, investigated a total area of 650 m² on the north-eastern natural terrace overlooking the Chaour, and a 70 m long, 5 m wide trench running from south-west to north-east (Dollfus 1971; 1975). The new excavations made it possible to place the settlement within the wider archaeological context of the region, thus making it possible to define the material cultural aspects of the centre consisting primarily of fuselages, human and animal figurines, stone tools, sealings and cylinder seals (Perrot 1971).

4.3.1. Chronologies

Djaffarabad was probably founded between the end of the 6th and the beginning of the 5th millennium BC (Period I), when the occupation covered an area of approximately 2,000 m² which suggests a degree of sedentarisation commonly known from other settlements of the province of Ahwaz (Tab. 4.5). The archaeological evidence suggests an economy primarily based on the breeding of rams, deer and cattle, and extensive cultivation of barley, wheat, peas and lentils, which exploited the supposed 300 mm of annual rainfall.

During the subsequent Period II, around the middle of the 5th millennium BC, Djaffarabad's economy drastically changed to the first embryonic forms of diversification and work specialisation, as evident from the appearance of the first specialised workshops for the production of pottery vessel.

The beginning of the 4th millennium BC (Period III) saw a drastic increase in the settlement density of the region. Towards the end of this period, the construction of the *Haute Terrasse* and a new strong demographic growth in Susa seem to speak for a partial process of centralisation of human resources in the Susian settlement. By the middle of the 4th millennium BC, a new type of urban economic organisation developed in Lower Mesopotamia, and Djaffarabad was abandoned.

4.3.2. Weights, potential weights, possible weights and associated finds (Cat. no. 751-752)

The two specimens from Djaffarabad should be considered as possible weights, mostly because their use as weights cannot be disproven. Both specimens are spherical in shape and made of limestone, with evident traces of processing.

4.3.2.1. Archaeological contexts

The first object (Cat. no. 751) was found in 1970, the second specimen (Cat. no. 752) in 1973 during the French excavation campaigns directed by G. Dollfus (1971; 1975). Neither object has a secure archaeological context, but the abandonment of the settlement suggests that they date to a period prior to the beginning of the 3rd millennium BC.

4.3.2.2. Catalogue

4.3.2.2.1. Sphere (Type 7a): Cat. no. 751-752

751. Djaffarabad. - No context - Sphere, perfect, possible weight, limestone. D. 3.6 cm, 61.22 g - Mus. Susa (SM. 1970/1548.1).

Western Susiana	Djaffarabad	Djaffarabad Architectonical phases	Susa (Acr. I)	Bendebal	Djowi
Djaffarabad period	I	6-4	/	30-28	17-13
Transitional Phase	/	/	/	28	12-11
Chogha Mish period	II	3m-n	/	27-11	10-4
Susa A period	III	3d-1	27-24	10	3-1

Tab. 4.5. Comparative stratigraphies in Susiana.

752. Djaffarabad. - No context - Sphere, perfect, possible weight, limestone. D. 3.8 cm, 79.00 g - Mus. Susa (SM. 1973/2036.1).

4.4. Larsa/Tell es-Sinkara

Larsa lies *c.* 20 km east of Uruk, near the village of Tell es-Sinkara. The archaeological site, which covers more than 300 ha, has been the subject to multiple excavation campaigns carried out by English (Loftus in 1849-1852; Loftus 1857), German (Andrae in 1903; Banks 1905) and especially French archaeologists, which identified the 'Ebabbar', the temple of the god Shamash, and its associated ziggurat. French exploration began in 1933 under the direction of A. Parrot (1933; 1935; 1968), whose campaigns momentarily came to a halt when the site of Mari, the modern Tell Hariri, was discovered. The excavations were resumed in 1967 and continued until 1989, first under the direction of J.-C. Margueron (1970; 1971), and later J.-L. Huot (1978; 1983; 1987; 1989). The most recent excavations revealed, amongst other things, the ramparts of the former city wall, at least three entry gates to the city (south-east, south-west and north), the main road and sideroads, workmen's and living quarters (*e. g.* the 2,000 m^2 *Maison B 33* from Early Dynastic III; *Maisons B 27* and *B 59* dating to the Old-Babylonian period), administrative and religious structures, and monumental buildings interpreted as the residences of Sîn-iddinam (*c.* 1849-1843 BC) and Nûr-Adad (*c.* 1865-1850 BC). Based on a large-scale field survey, it was suggested that a temple for the god Nergal was located in the eastern part of the hill. Since 1979, the discovery of copious epigraphic materials, primarily literary texts from the Hammurabi period, has made it possible to reconstruct life in the settlement at the beginning of the 2nd millennium BC. The most significant discoveries include the vessel of a goldsmith which contained 67 balance weights, found in Court 1 of the Ebabbar (Arnaud *et al.* 1979), and two kudurru from the Kassite period bearing the names of Nazi-Maruttaš (*c.* 1323-1248 BC) and Kudur-Enlil (*c.* 1264-1256 BC).

4.4.1. Chronologies

Based on the archaeological stratigraphy and epigraphic evidence found at Larsa, the centre was likely occupied from Early Dynastic III to the mid of the 1st millennium BC. The settlement had a particularly prosperous period under the reign of the Amorites dynasty of Larsa, who assumed power immediately after the death of Ibbi-Sin of Ur, with Naplânum (*c.* 2025-2005 BC) and Yamsium (*c.* 2004-1997 BC) as the first succeeding kings. The dynasty ended abruptly in *c.* 1763 BC with the passing of the last king, Rîm-Sîn (*c.* 1822-1763 BC), and a new dynasty of probably Elamite decent came into power. Despite the dynasty's Elamite name, the new king called himself 'Father of the land of the Amorites' (Tabs. 4.6-4.7).

Chronology (BC)	King of Larsa	Larsa	Umm Al-Jir	Nippur	Ur
2025-2005	Nâplanum		V	IV	Ur III
2004-1977	Yamisium				Isin period
1976-1942	Samium				
1941-1933	Zabaya			III	
1932-1906	Gungunnum				
1905-1895	Abî-sarê	E-Babbar Temple		II	Larsa period
1894-1866	Sûmû-El	Nur-Adad Palace			
1865-1850	Nûr-Adad			I	
1849-1843	Sîn-iddinam		VI		
1842-1841	Sîn-erîbam				
1840-1836	Sîn-iqišam				
1835	Silli-Adad				
1834-1823	Warad-Sîn				Warad-Sîn Fort
1822-1763	Rîm-Sîn			E	
1762-1700				D	
1700-1600				C	
1600-1500					

Tab. 4.6. Archaeological phases of Lower Mesopotamia.

Tab. 4.7. Synchronization among kings of Larsa, Isin and Babylon.

Chronology (BC)	Kings of Larsa	Kings of Isin	Kings of Babylon
2025-2005	Nâplanum	Išbi-Erra (2017-1985)	
2004-1977	Yamisium	Šu-ilišu (1984-1975)	
1976-1942	Samium	Iddin-Dagan (1974-1954)	
1941-1933	Zabaya	Išme-Dagan (1953-1935)	
1932-1906	Gungunnum	Lipit-Ištar (1934-1924)	
1905-1895	Abî-sarê	Ur-Ninurta (1923-1896)	
1894-1866	Sûmû-El	Bur-Sîn (1895-1874) Lipit-Enlil (1873-1869)	Sumu-Abum (1894-1881) Sumu-la-El (1880-1845)
1865-1850	Nûr-Adad	Erra-imitti (1868-1861)	
1849-1843	Sîn-iddinam	Enlil-bâni (1860-1837)	Sabium (1844-1831)
1842-1841	Sîn-erîbam		
1840-1836	Sîn-iqišam	Zambiya (1836-?)	
1835	Silli-Adad	Itêr-pîša (?-?)	
1834-1823	Warad-Sîn	Ur-Dukuga (?-1828) Sîn-mâgir (1827-1817)	Apil-Sin (1830-1813)
1822-1763	Rîm-Sîn	Damiq-ilišu (1816-1794)	Suìin-Muballit (1812-1793) Hammurapi (1792-1750)
1762-1700			Samsu-iluna (1749-1712)
1700-1600			
1600-1500			

4.4.2. Weights, potential weights, possible weights and associated finds (Cat. no. 753-759)

Due to their morphology (ovoids with flat ends; duck-shaped), their material (mostly hematite), their archaeological (burial) contexts, and mass values correlating to well-known weight system, all of the specimens found at Larsa should be considered balance weights.

4.4.2.1. Archaeological contexts

All seven weights from Larsa (Cat. no. 753-759) were recovered during A. Parrot's 1933 excavation (Parrot 1933). While six of the weights were found together in Tomb 101 (Cat. no. 753-758), the context of the seventh weight (Cat. no. 759) remains uncertain, sometimes ascribed to Tomb 113, other times to Tomb 326.

Although the excavation reports from 1933 make otherwise detailed reference to the numerous burials recovered during the campaign, none of the tombs supposedly containing balance weights are mentioned. Those tombs were found underneath the houses in the residential sector which, as was often the case in the Near East, buried the bodies of the deceased below the floor level of the house. Larsa's housing complex dates to between the end of the Ur III period and the Larsa dynasty (*c.* 2100 to 1900 BC). Whilst the reports make no specific reference to the balance weights, a similar date between the end of the 3rd and the beginning of the 2nd millennium BC can be assumed.

Previously found weights (Arnaud *et al.* 1979) were mostly recovered from the sacred complex of the Ebabbar dedicated to the god Shamash, which was completed by the middle of the 19th century BC. The temple remained in use even after the conquest of Hammurabi, who drastically changed the layout of the sanctuary. Restorations and alterations continued until the Neo-Babylonian period, testimony to the great importance of the religious building.

During the ancient and classical Old-Babylonian phases, the sacred area comprised two independent *nuclei*: the ziggurat and the Ebabbar. The ziggurat was equipped with a large courtyard surrounded by rectangular rooms and a latitudinal *cella* at the eastern front of the Templar Tower, with a perimeter also enclosed by rooms connected by a substantial external wall decorated with multiple reliefs and twisted semi-columns. Only the eastern part of the Ebabbar could be recovered, where two courtyards surrounded by rooms (Courts I and III) were used to enter the sanctuary through a vestibule, which was heavily altered during the Kassite period. The metrological evidence of the Old Babylonian period comprises a group of 67 balance weights found inside the 'treasure' of the goldsmith, and two recently published unmarked hematite specimens (an elongated sphendonoid and a stylised duck), discovered in the funeral chamber under compartment 17 of residence B59 (Calvet 2003, fig. 69,59.67 and 59.68, pl. 35 c-d).

The other already published weights were found, as mentioned, during J.-L. Huot's seventh excavation campaign (Arnaud *et al.* 1979; see also Huot 1980; 1995; Bjorkman 1993). The weights were found inside a jar containing a cylindrical hematite seal, 18 *cretulae* with seal impressions, some gold, electro and silver jewellery, precious metal fragments and flakes, beads in semi-precious stones, and bronze tools. The treasure was attributed to Ilshu-Ibinishu, who is mentioned in the legend of the Old-Babylonian hematite seal (L.76.14). Various other names of officials inscribed on *cretulae*, the legend of the inscribed seal L.76.19, and on associated tablets, make this attribution uncertain. D. Arnaud's excavation report provides the shape, material, dimensions and, most importantly, mass values of all the weights (Arnaud *et al.* 1979, 28-30). Metrological analysis provides data (particularly units of 7.8 g, 8.4 g, 8.7 g and 9.4 g) similar to other Mesopotamian sites that used multiple weight systems within a single settlement (Arnaud *et al.* 1979, 31, 33; for a detailed metrological analysis see Ascalone/Peyronel 2006a, 450-464).

The archaeological context, with a secure chronological boundary through Samsu-Iluna's destruction of Larsa in 1738 BC, the epigraphic evidence relating the finds to precisely named individuals, and associated objects (precious metals) for which the balance weights were used to measure, make this an exceptional archaeological discovery.

4.4.2.2. Catalogue

4.4.2.2.1. Ovoid with flat ends (Type 1c): Cat. no. 753-757

753. Tell es-Sinkara/Larsa. - D. L.326, Parrot 1933 excavations, Tomb 101 - Ovoid with flat ends, perfect, hematite. L. 1.00 cm, D. 0.55 cm, 0.79 g - Old-Babylonian period, 2100-1900 BC - Mus. Louvre (AO 28415).

754. Tell es-Sinkara/Larsa. - E. L.326, Parrot 1933 excavations, Tomb 101 - Ovoid with flat ends, perfect, hematite. L. 1.94 cm, D. 0.65 cm, 2.12 g - Old-Babylonian period, 2100-1900 BC - Mus. Louvre (AO 28415).

755. Tell es-Sinkara/Larsa. - L.326, Parrot 1933 excavations, Tomb 101 - Ovoid with flat ends, perfect, hematite. L. 2.10 cm, D. 1.70 cm, 2.84 g - Old-Babylonian period, 2100-1900 BC - Mus. Louvre (AO 28415 C).

756. Tell es-Sinkara/Larsa. - B. L.326, Parrot 1933 excavations, Tomb 101 - Ovoid with flat ends, perfect, hematite. L. 2.91 cm, D. 0.83 cm, 4.24 g - Old-Babylonian period, 2100-1900 BC - Mus. Louvre (AO 28415).

757. Tell es-Sinkara/Larsa. - A. L.326, Parrot 1933 excavations, Tomb 101 - Ovoid with flat ends, perfect, hematite. L. 3.50 cm, D. 0.71 cm, 5.56 g - Old-Babylonian period, 2100-1900 BC - Mus. Louvre (AO 28415).

4.4.2.2.2. Duck-shaped (Type 2): Cat. no. 758-759

758. Tell es-Sinkara/Larsa. - L.326, Parrot 1933 excavations, Tomb 101 - Duck, good, jasper. L. 1.51 cm. H. 0.72 cm, W. 0.90 cm, 1.16 g - Old-Babylonian period, 2000-1800 BC - Mus. Louvre (AO 16995).

759. Tell es-Sinkara/Larsa. - Parrot 1933 excavations, Tomb 113 or 326 - Duck, good, hematite. L. 1.70 cm, H. 1.00 cm, W. 0.90 cm, 3.22 g - Old-Babylonian period, 2000-1800 BC - Mus. Louvre (AO 28414).

4.4.2.3. Metrological notes

The seven weights from Larsa all correlate to the Mesopotamian system with a base unit between 7.90 g and 8.52 g (Cat. no. 753-757). The two duck-shaped weights (Cat. no. 758-759) further correlate to the 9.4 g system. All specimens are fractions of the Mesopotamian shekel with ratios ⅒ (Cat. no. 753), ¼ (Cat. no. 754), ⅓ (Cat. no. 755), ½ (Cat. no. 756), ⅔ (Cat. no. 757), and ⅛ (Cat. no. 758) and ⅓ (Cat. no. 759) of the 9.4 g shekel.

4.5. Girsu/Telloh

The ancient city of Girsu is located near the modern site of Telloh, about 260 km from Baghdad near the Chatt el-Haï, a tributary of the Tigris. Telloh had an oval layout of *c.* 4 km x 3 km. Discovered in 1877 by G. C. E. de Sarzec (Heuzey 1884-1893), the French deputy consul in Basra, it was subject to 20 years of excavation campaigns under the direction of G. Cros (until 1933; Cros 1904; 1910), H. de Genouillac (1930; 1934; 1936) and A. Parrot (1932; 1933; 1948). Similar to Larsa, a large part of the site suffered from extensive clandestine excavation activities, which significantly compromised the official archaeological investigations. However, even the officially authorised excavations could not provide a precise chronological sequence based on stratigraphic layering. The excavations returned copious amounts of epigraphic materials, especially administrative tablets, sporadic and poorly preserved architectural traces of monumental buildings, and numerous archaeological finds.

4.5.1. Chronologies

A survey carried out by H. de Genouillac near the central hill of the settlement revealed that the site must have been occupied since the Late Ubaid or Uruk period (4th millennium BC). The main excavations, and textual documentation, however, place the major occupation period between the Early Dynastic period and the end of Ur III (*c.* 3000-2000 BC). During the Early Dynastic period, Girsu was the capital of the Kingdom of Lagash, which probably extended all the way to the Persian Gulf. After the Akkadian rule (*c.* 2350-2150 BC), the city once again resumed an important role in the political landscape of southern Mesopotamia, and was subsequently put under the control of the kings of the Third Dynasty of Ur.

The only secure archaeological sequence was recorded at 'Tell K', the most important hill of the site, where a temple devoted to Ningirsu with several phases of construction was found. The oldest phase was attributed to Early Dynastic I (*c.* 2900-2800 BC), followed by a reconstructive phase initiated by Ur-Nanshe (*c.* 2500 BC) to enlarge the structure (which nevertheless remained comparatively small, 10.8 m x 7.3 m). To this period can be attributed the 2,000 tablets from the archives of the goddess Bau, as well as the extraordinary silver vase of Entemena and the 'Stele of the vultures' which records the conflict between Umma and Lagash.

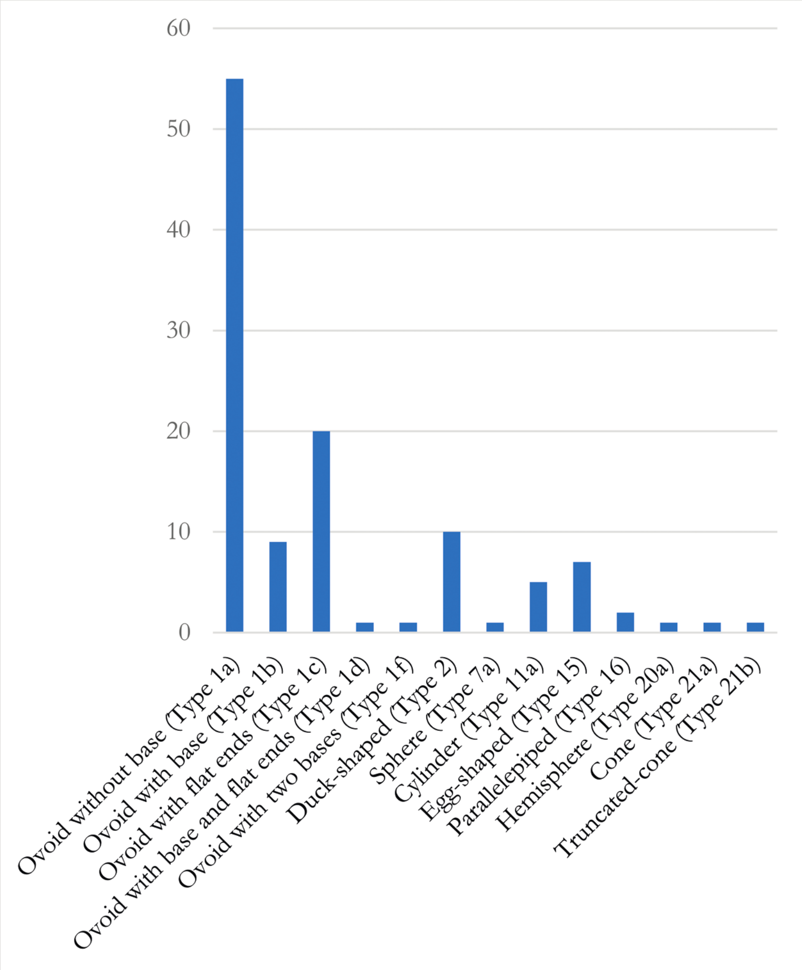


Fig. 4.12. Distribution of weights at Telloh.

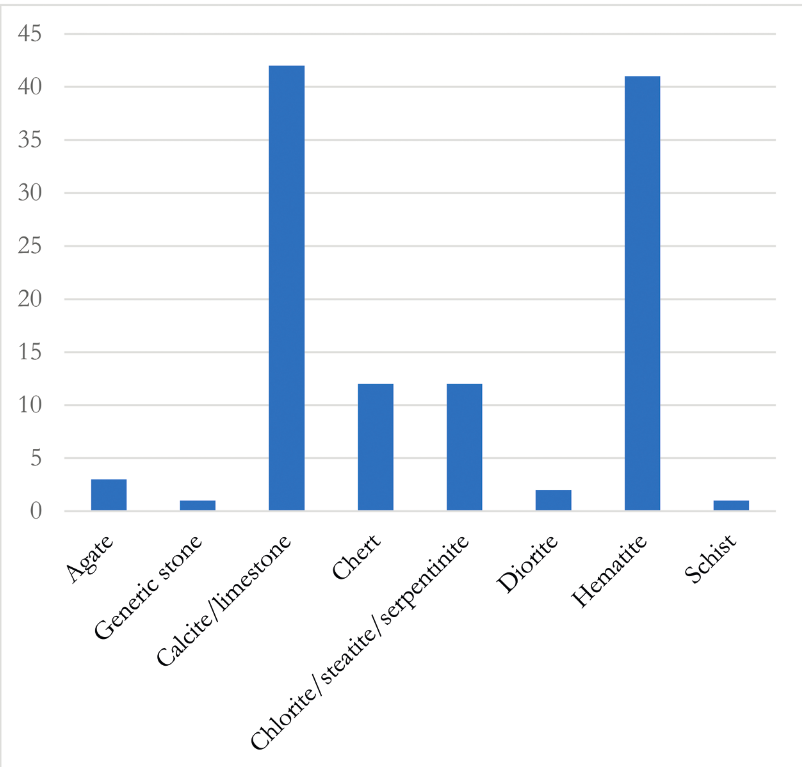


Fig. 4.13. Distribution of materials at Telloh.

There is little archaeological evidence from the Akkadian period, despite a phase of prosperity under Gudea, who initiated substantial building and restoration activities in the city, which were continued by his successor Ur-Ningirsu. Under the administrative control of the kings of Ur, the city lost importance; restoration work was carried out by the kings of Ur III, in particular on the temple to the god Ningirsu. With the destruction of Ur by the Elamite (*c.* 2004 BC) Girsu also fell into disrepair, until it was sparsely populated again by the kingdom of Samsu-iluma during the 17th century BC.

4.5.2. Weights, potential weights, possible weights and associated finds (Cat. no. 760-873)

Almost all of the 114 objects from Telloh/Girsu can be considered as balance weights (Fig. 4.12-13). The exception are a number of cylindrical specimens (unfinished seals?), a spherical specimen, and a potential smoothing stone, which should be considered 'potential weights' (Cat. no. 856-861, 870). Metrologically, all of the objects from Telloh seem to adhere to the systems used in Lower Mesopotamia between the first and second Lagash dynasties (Early Dynastic III to the end of the 3rd millennium BC, *c.* 2500-2000 BC).

4.5.2.1. Archaeological contexts

Similar to the weights from Susa, and in fact the majority of weights recovered during excavations in the 20th century, the Telloh/Girsu weights, which are today stored in the Louvre Museum, are difficult to trace in the excavation reports. The lack of photos, drawings or inventory numbers makes it almost impossible to correlate the physical objects with the balance weights and mass values published in the reports. The only exception to this is weight Cat. no. 814, which was recorded at the Palace of Shu-Sin (Soutzo 1911, 25).

The weights excavated by G. C. E. de Sarzec were published by M.-C. Soutzo (1911) in great detail, and generic references 'to the discovery of weights' can be found in H. de Genouillac's (1934; 1936) and A. Parrot's (1948) excavation reports, who discovered the majority of Girsu's balance weights (see Catalogue). H. de Genouillac (1934, 92) makes specific reference to balance weights found in layers dating to the pre-Sargonid and Sargonid periods (*c.* 2500-2300 BC). The three small weights from Tomb VI and the seven weights from Tomb IV in *Chantier V bis* were more generally attributed to Ur III (de Genouillac 1936, 43, 45). The latter weights were found in association with two copper scale pans. An indeterminate number of hematite weights, was found underneath the temple of Nanshe, inside a vaulted tomb that probably dates to the period of the Larsa dynasty (*c.* 2000-1800 BC) (de Genouillac 1936, 43). A. Parrot (1948, 229, fig. 53a, c) later mentions three inscribed weights, one of which indicating the value of five minas, found in the Shu-Sin archive (*c.* 2037-2029 BC). In reverse, this specimen could be identified as the already mentioned Cat. no. 814, found by G. C. E. de Sarzec on 17 August 1881 and first published by M.-C. Soutzo (1911).

4.5.2.2. Catalogue

4.5.2.2.1. Ovoid (Type 1a): Cat. no. 760-814

760. Telloh/Girsu. - TG 3890, de Genouillac 1930 excavations - Ovoid, perfect, with markings ('IIII<'), hematite. L. 2.31 cm, D. 0.32 cm, 0.77 g - Ur III/Larsa period, 2100-1900 BC - Mus. Louvre (AO 12736 C).

761. Telloh/Girsu. - TG 1417, de Genouillac 1929 excavations - Ovoid, good, steatite. L. 1.65 cm, D. 0.60 cm, 0.88 g - Mus. Louvre (AO 12106.8).

762. Telloh/Girsu. - Parrot 1931-1932 excavations - Ovoid, perfect, hematite. L. 2.21 cm, D. 0.40 cm, 0.92 g - Mus. Louvre (AO 12736 A) - Thomas 2016a, 29.

763. Telloh/Girsu. - TG 2485, de Genouillac 1930 excavations - Ovoid, perfect, hematite. L. 1.80 cm, D. 0.45 cm, 1.02 g - Mus. Louvre (AO 12736 B) - Thomas 2016b, 97.

764. Telloh/Girsu. - TG 2207, de Genouillac 1930 excavations - Ovoid, perfect, hematite. L. 2.10 cm, D. 0.60 cm, 1.47 g - Mus. Louvre (AO 12732.12) - Thomas 2016a, 29.

765. Telloh/Girsu. - TG 4044, de Genouillac 1930 excavations - Ovoid, perfect, hematite. L. 1.90 cm, D. 1.60 cm, 1.55 g - Mus. Louvre (AO 12732.15) - Thomas 2016a, 29.

766. Telloh/Girsu. - No context - Ovoid, perfect, chert. L. 2.38 cm, D. 0.60 cm, 1.61 g - Mus. Louvre (AO 14224 A).

767. Telloh/Girsu. - TG 2333, de Genouillac 1930 excavations - Ovoid, perfect, chert. L. 2.29 cm, D. 0.70 cm, 2.12 g - Mus. Louvre (AO 12734.18) - Thomas 2016a, 29.

768. Telloh/Girsu. - TG 2515, de Genouillac 1930 excavations - Ovoid, perfect, limestone. L. 2.60 cm, D. 1.77 cm, 2.12 g - Mus. Louvre (AO 12732.16) - Thomas 2016a, 29.

769. Telloh/Girsu. - No context - Ovoid, good, limestone. L. 2.72 cm, D. 0.70 cm, 2.17 g - Mus. Louvre (SH 111112) - Thomas 2016a, 29.

770. Telloh/Girsu. - T 1087/7, Parrot 1931-1932 excavations - Ovoid, perfect, with markings ('IIII'), chert. L. 2.68 cm, D. 1.79 cm, 2.19 g - Mus. Louvre (AO 15403) - Thomas 2016a, 29.

771. Telloh/Girsu. - TG 2270, de Genouillac 1930 excavations - Ovoid, perfect, hematite. L. 2.75 cm, D. 0.61 cm, 2.74 g - Mus. Louvre (AO 12732.21) - Thomas 2016a, 29.

772. Telloh/Girsu. - TG 3889, de Genouillac 1930 excavations - Ovoid, perfect, hematite. L. 1.80 cm, D. 0.79 cm, 2.81 g - Mus. Louvre (AO 12732.3) - Thomas 2016a, 29.

773. Telloh/Girsu. - TG 2333, de Genouillac 1930 excavations - Ovoid, perfect, chert. L. 2.40 cm, D. 1.75 cm, 2.85 g - Mus. Louvre (AO 12732.17) - Thomas 2016a, 29.

774. Telloh/Girsu. - Parrot 1931-1932 excavations - Ovoid, perfect, hematite. L. 2.38 cm, D. 0.71 cm, 2.90 g - Mus. Louvre (AO 12736) - Thomas 2016a, 29.

775. Telloh/Girsu. - TG 3672, de Genouillac 1930 excavations - Ovoid, perfect, with markings ('III'), limestone. L. 3.75 cm, D. 1.90 cm, 2.91 g - Mus. Louvre (AO 12732.5).

776. Telloh/Girsu. - de Genouillac 1930 excavations - Ovoid, perfect, hematite. L. 2.10 cm, D. 0.79 cm, 3.05 g - Mus. Louvre (AO 12732.7) - Thomas 2016a, 29.

777. Telloh/Girsu. - de Genouillac 1930-1931 excavations - Ovoid, good, chert. L. 2.50 cm, D. 1.91 cm, 3.47 g - Mus. Louvre (AO 14425 B).

778. Telloh/Girsu. - TG 3819, de Genouillac 1930 excavations - Ovoid, perfect, with marking ('I'), hematite. L. 3.60 cm, D. 1.58 cm, 4.01 g - Mus. Louvre (AO 12732.4) - Thomas 2016a, 29.

779. Telloh/Girsu. - Cros 1904 excavations - Ovoid, good, with markings ('II'), hematite. L. 4.93 cm, D. 1.55 cm, 16.76 g - Mus. Louvre (AO 4374 A) - Thomas 2016b.

780. Telloh/Girsu. - No context - Ovoid, incomplete, hematite. L. 3.95 cm, D. 1.31 cm, 17.00+x g - Mus. Louvre (SH 083396).

781. Telloh/Girsu. - de Genouillac 1930-1931 excavations - Ovoid, slightly worn, limestone. L. 4.30 cm, D. 1.97 cm, 17.16 g - Mus. Louvre (AO 12732.23).

782. Telloh/Girsu. - T 297, de Genouillac excavations - Ovoid, perfect, chert. L. 4.82 cm, D. 1.65 cm, 25.70 g - Mus. Louvre (AO 14224 B).

783. Telloh/Girsu. - Cros 1904 excavations - Ovoid, one half missing, with marking ('I'), hematite. L. 2.27 cm, D. 0.88 cm, 5.05+x g - Mus. Louvre (AO 4374 D).

784. Telloh/Girsu. - TG 3480, de Genouillac 1930 excavations - Ovoid, slightly worn, hematite. L. 3.55 cm, D. 1.08 cm, 7.76 g - Mus. Louvre (AO 12732.8) - Thomas 2016a, 29.

785. Telloh/Girsu. - T 1087/4, Parrot 1931-1932 excavations - Ovoid, perfect, limestone. L. 4.98 cm, D. 1.10 cm, 8.08 g - Mus. Louvre (AO 15397) - Thomas 2016a, 29.

786. Telloh/Girsu. - de Genouillac 1930 excavations - Ovoid, perfect, hematite. L. 3.38 cm, D. 1.02 cm, 8.21 g - Mus. Louvre (AO 12732.27) - Thomas 2016a, 29.

787. Telloh/Girsu. - T 799, Parrot 1931-1932 excavations - Ovoid, good, steatite. L. 3.51 cm, D. 1.15 cm, 8.33 g - Mus. Louvre (AO 15400).

788. Telloh/Girsu. - de Genouillac 1930-1931 excavations - Ovoid, perfect, steatite. L. 3.71 cm, D. 1.21 cm, 8.34 g - Mus. Louvre (AO 14225 A).

789. Telloh/Girsu. - de Genouillac 1930 excavations - Ovoid, perfect, hematite. L. 3.10 cm, D. 1.03 cm, 8.50 g - Mus. Louvre (AO 12732.1) - Thomas 2016a, 29.

790. Telloh/Girsu. - TG 5553, de Genouillac 1930-1931 excavations - Ovoid, good, agate. L. 3.39 cm, D. 1.19 cm, 8.59 g - Mus. Louvre (AO 14228).

791. Telloh/Girsu. - TG 2024, de Genouillac 1930 excavations - Ovoid, perfect, chert. L. 3.70 cm, D. 1.32 cm, 8.68 g - Mus. Louvre (AO 12732.20) - Thomas 2016a, 29.

792. Telloh/Girsu. - TG 1332, de Genouillac 1929 excavations - Ovoid, good, limestone. L. 4.33 cm, D. 1.17 cm, 8.87 g - Mus. Louvre (AO 12106.20).

793. Telloh region. - No context - Ovoid, incomplete, hematite. L. 3.50 cm, D. 1.75 cm, 32.06+x g - Mus. Louvre (SH 083396).

794. Telloh region. - No context - Ovoid, fragmented, chert. L. 2.81 cm, D. 2.78 cm, 34.43+x g - Mus. Louvre (SH 083399).

795. Telloh/Girsu. T 1087/5, Parrot 1931-1932 excavations - Ovoid, perfect, chert. L. 7.95 cm, D. 1.81 cm, 41.35 g - Mus. Louvre (AO 15399) - Thomas 2016a, 29.

796. Ancient Guimet collection (probably Telloh). - No context - Ovoid, perfect, with inscription, hematite. L. 7.35 cm, D. 7.35 cm, 41.40 g - Neo-Sumerian, 2100-2000 BC - Mus. Louvre (AO 22744).

797. Telloh/Girsu. - de Sarzec 1881 excavations - Ovoid, good, with inscription, black stone. L. 4.10 cm, D. 2.45 cm, 41.55 g - Neo-Sumerian, 2100-2000 BC - Mus. Louvre (AO 248) - Soutzo 1911, 25.

798. Telloh/Girsu. - No context - Ovoid, good, chert. L. 5.81 cm, D. 2.43 cm, 43.08 g - Mus. Louvre (SH 083399).

799. Telloh/Girsu. - No context - Ovoid, heavily worn, limestone. L. 2.95 cm, D. 3.31 cm, 43.60+x g - Mus. Louvre (AO 26161).

800. Telloh/Girsu. - No context - Fragmented ovoid, limestone. L. 5.84 cm, D. 2.20 cm, 47.56+x g - Mus. Louvre (SH 083399).

801. Telloh/Girsu. - de Sarzec 1881 excavations - Ovoid, good, limestone. L. 4.75 cm, D. 2.11 cm, 52.00 g - Mus. Louvre (AO 280 B) - Soutzo 1911, 25.

802. Telloh/Girsu. - No context - Ovoid, heavily worn, limestone. L. 4.61 cm, D. 2.98 cm, 52.36 g - Mus. Louvre (AO 26168).

803. Telloh/Girsu. - No context - Ovoid, worn, limestone. L. 4.78 cm, D. 3.10 cm, 53.41 g - Mus. Louvre (SH 083395).

804. Telloh/Girsu. - No context - Ovoid, worn, limestone. L. 4.77 cm, D. 3.15 cm, 58.17 g - Mus. Louvre (AO 26165).

805. Telloh/Girsu. - No context - Ovoid, good, limestone. L. 4.99 cm, D. 3.50 cm, 67.76 g - Mus. Louvre (AO 26162).

806. Telloh/Girsu. - de Sarzec 1881 excavations - Ovoid, slightly chipped, limestone. L. 5.10 cm, D. 3.65 cm, 71.12+x g - Mus. Louvre (AO 2893) - Thomas 2016b.

807. Telloh/Girsu. - No context - Ovoid, worn, limestone. L. 5.90 cm, D. 3.42 cm, 73.92+x g - Mus. Louvre (AO 26163).

808. Telloh/Girsu. - No context - Ovoid, good, limestone. L. 5.51 cm, D. 3.50 cm, 74.32 g - Mus. Louvre (AO 26158).

809. Telloh region. - No context - Ovoid, incomplete, hematite. L. 4.70 cm, D. 3.38 cm, 80.25+x g - Mus. Louvre (SH 083396).

810. Telloh/Girsu. - de Sarzec 1881 excavations - Ovoid, good, with inscription, diorite. L. 5.81 cm, D. 2.81 cm, 82.53 g - Neo-Sumerian, 2100-2000 BC - Mus. Louvre (AO 247) - Soutzo 1911, 25.

811. Telloh/Girsu. - No context - Ovoid, fragmented and restored, steatite. L. 8.38 cm, D. 2.80 cm, 98.45 g - Mus. Louvre (SH 083399).

812. Telloh/Girsu. - No context - Ovoid, good, limestone. L. 6.65 cm, D. 3.78 cm, 129.84 g - Mus. Louvre (AO 26167).

813. Telloh/Girsu. - de Genouillac 1930-1931 excavations - Ovoid, good, limestone. L. 9.98 cm, D. 3.42 cm, 170.81 g - Mus. Louvre (AO 14223).

814. Telloh/Girsu. - de Sarzec 17.08.1881 excavations - Ovoid, one end slightly chipped, with inscription (‘*5 certified minas, Shu-Sin, strong king, king of Ur, king of the four parts of the world*’), diorite. L. 20.21 cm, D. 9.60 cm, 2,520.00 g - Ur III period, 2037-2029 BC - Mus. Louvre (AO 246) - Soutzo 1911, 25; Frayne 1997, 332-333.

4.5.2.2.2. Ovoid with base (Type 1b): Cat. no. 815-822

815. Telloh/Girsu. - TG 3237, de Genouillac 1930 excavations - Ovoid with base, perfect, hematite. L. 3.72 cm, W. 1.85 cm, 5.35 g - Mus. Louvre (AO 1210.7) - Thomas 1916a, 29.

816. Telloh/Girsu. - TG 1281, de Genouillac 1929 excavations - Ovoid with base, good, steatite. L. 3.20 cm, H. 2.10 cm, W. 1.35 cm, 8.17 g - Mus. Louvre (AO 12106.7).

817. Telloh/Girsu. - T 1087, Parrot 1931-1932 excavations - Ovoid with base, perfect, hematite. L. 2.80 cm, W. 0.97 cm, 8.25 g - Mus. Louvre (AO 15394) - Thomas 1916a, 29.

818. Telloh/Girsu. - TG 3302, de Genouillac 1930 excavations - Ovoid with base, perfect, steatite. L. 3.36 cm, W. 1.20 cm, 8.29 g - Mus. Louvre (AO 12732.10) - Thomas 1916a, 29.

819. Telloh/Girsu. - TG 1286, de Genouillac 1929 excavations - Irregular ovoid with base, good, limestone. L. 3.31 cm, H. 1.21 cm, W. 2.18 cm, 8.46 g - Mus. Louvre (AO 12106.2).

820. Telloh/Girsu. - de Genouillac 1929 excavations - Ovoid with base, good, steatite. L. 3.63 cm, H. 1.51 cm, W. 1.61 cm, 15.78 g - Mus. Louvre (AO 12106.22).

821. Telloh/Girsu. - T 95, Parrot 1931-1932 excavations - Ovoid with base, perfect, with markings (‘III’), limestone. L. 5.08 cm, H. 1.72 cm, W. 1.85 cm, 24.65 g - Mus. Louvre (AO 15395).

822. Telloh/Girsu. - TG 1223, de Genouillac 1929 excavations - Ovoid with base and traces of suspension rope, good, steatite. L. 3.98 cm, H. 3.30 cm, W. 2.48 cm, 42.41 g - Mus. Louvre (AO 12106.4).

4.5.2.2.3. Ovoid with flat ends (Type 1c): Cat. no. 823-843

823. Telloh/Girsu. - TG 3573, de Genouillac 1930 excavations - Ovoid with flat ends, perfect, calcite. L. 1.51 cm, D. 0.51 cm, 0.50 g - Mus. Louvre (AO 12732.6) - Thomas 1916a, 29.

824. Telloh/Girsu (eastern tell). - T 1376, Parrot 1932-1933 excavations - Ovoid with flat ends, perfect, hematite. L. 1.31 cm, D. 1.55 cm, 0.99 g - Mus. Louvre (AO 16798 E).

825. Telloh/Girsu. - Parrot 1931-1932 excavations - Ovoid with flat ends, perfect, hematite. L. 1.40 cm, D. 0.69 cm, 1.71 g - Mus. Louvre (AO 12736) - Thomas 1916a, 29.

826. Telloh/Girsu (eastern tell). - T 1376, Parrot 1932-1933 excavations - Ovoid with flat ends, perfect, with marking ('I'), hematite. L. 2.29 cm, D. 1.55 cm, 2.43 g - Mus. Louvre (AO 16798 B).

827. Telloh/Girsu. - TG 2955, de Genouillac 1930 excavations - Ovoid with flat ends, perfect, hematite. L. 2.06 cm, D. 1.54 cm, 2.74 g - Mus. Louvre (AO 12732.13) - Thomas 1916a, 29.

828. Telloh/Girsu. - TG 2045, de Genouillac 1930 excavations - Ovoid with flat ends, perfect, hematite. L. 2.11 cm, D. 1.69 cm, 2.81 g - Mus. Louvre (AO 12732.19) - Thomas 1916a, 29.

829. Telloh/Girsu. - de Genouillac 1930 excavations - Ovoid with flat ends, perfect, hematite. L. 1.81 cm, D. 0.76 cm, 2.81 g - Mus. Louvre (AO 12374.24).

830. Telloh/Girsu (eastern tell). - T 1376, Parrot 1932-1933 excavations - Ovoid with flat ends, perfect, hematite. L. 2.10 cm, D. 1.61 cm, 2.86 g - Mus. Louvre (AO 16798 C) - Thomas 1916a, 29.

831. Telloh/Girsu. - TG 3932, de Genouillac 1930 excavations - Ovoid with flat ends, slightly worn, steatite. L. 2.35 cm, W. 1.02 cm, 3.92 g - Mus. Louvre (AO 12732.2) - Thomas 1916a, 29.

832. Telloh/Girsu. - de Genouillac 1930-1931 excavations - Ovoid with flat ends, good, hematite. L. 1.89 cm, D. 0.95 cm, 4.28 g - Mus. Louvre (AO 14227).

833. Telloh/Girsu (eastern tell). - T 11376, Parrot 1932-1933 excavations - Ovoid with flat ends, perfect, hematite. L. 2.82 cm, D. 1.75 cm, 4.46 g - Mus. Louvre (AO 16798 A).

834. Telloh/Girsu. - TG 2270, de Genouillac 1930 excavations - Ovoid with flat ends, perfect, hematite. L. 4.08 cm, D. 1.68 cm, 6.10 g - Mus. Louvre (AO 12732.28) - Thomas 1916a, 29.

835. Telloh/Girsu. - de Genouillac 1930 excavations - Ovoid with flat ends, perfect, unpolished hematite. L. 2.91 cm, D. 0.91 cm, 8.02 g - Mus. Louvre (AO 12732.26) - Thomas 1916a, 29.

836. Telloh/Girsu. - TG 2827, de Genouillac 1930 excavation - Ovoid with flat ends, perfect, limestone. L. 3.77 cm, D. 0.92 cm, 8.13 g - Mus. Louvre (AO 12732.14) - Thomas 1916a, 29.

837. Telloh/Girsu. - de Genouillac 1930 excavations - Ovoid with flat ends, perfect, hematite. L. 2.50 cm, D. 1.00 cm, 8.33 g - Mus. Louvre (AO 12374.25) - Thomas 1916a, 29.

838. Telloh/Girsu. - TG 1937, de Genouillac 1929 excavations - Ovoid with flat ends, good, limestone. L. 2.46 cm, D. 1.61 cm, 8.66 g - Mus. Louvre (AO 12106.10).

839. Telloh/Girsu. - Cros 1904 excavations - Ovoid with flat ends, perfect, with marking ('C'), hematite. L. 3.18 cm, D. 1.90 cm, 24.16 g - Mus. Louvre (AO 4376) - Thomas 1916b.

840. Telloh/Girsu. - TG 3406, de Genouillac 1930 excavations - Ovoid with flat ends, chipped in multiple areas, hematite. L. 4.31 cm, D. 3.06 cm, 58.84+x g - Mus. Louvre (AO 12732.9).

841. Telloh/Girsu. - TG 3570 - Ovoid with flat ends, perfect, schist. L. 7.21 cm, D. 3.33 cm, 124.51 g - Mus. Louvre (AO 12732).

842. Telloh/Girsu. - de Sarzec 1881 excavations - Ovoid with flat ends, worn and chipped, unpolished hematite. L. 10.71 cm, D. 4.55 cm, 511.11+x g - Mus. Louvre (AO 280 A) - Thomas 1916a, 29.

843. Telloh/Girsu. - No context - Ovoid with flat ends, slightly worn, limestone. L. 12.10 cm, D. 5.18 cm, 528.60 g - Mus. Louvre (AO 26156) - Thomas 1916a, 29.

4.5.2.2.4. Ovoid with base and flat ends (Type 1d): Cat. no. 844

844. Telloh/Girsu. - TG 1224, de Genouillac 1929 excavations - Ovoid with base and flat ends, good, limestone. L. 3.29 cm, H. 1.08 cm, W. 1.05 cm, 9.51 g - Mus. Louvre (AO 12106.1).

4.5.2.2.5. Ovoid with two bases (Type 1f): Cat. no. 845

845. Telloh/Girsu. - No context - Ovoid with two bases, good, limestone. L. 7.51 cm, H. 3.92 cm, W. 4.41 cm, 143.36 g - Mus. Louvre (AO 26166).

4.5.2.2.6. Duck-shaped (Type 2): Cat. no. 846-855

846. Telloh/Girsu. - TG 3171, de Genouillac 1930 excavations - Duck, slightly chipped, chert. L. 1.68 cm, H. 1.11 cm, W. 1.15 cm, 2.70 g - Mus. Louvre (AO 12735) - Thomas 1916b, 97.

847. Telloh/Girsu. - T 152, Parrot 1931-1932 excavations - Duck, perfect, hematite. L. 2.12 cm, H. 1.35 cm, W. 0.88 cm, 4.44 g - Mus. Louvre (AO 15406) - Thomas 1916a, 29.

848. Telloh/Girsu. - Cros 1904 excavations - Duck, good, hematite. L. 1.70 cm, H. 0.95 cm, W. 0.91 cm, 3.21 g - Mus. Louvre (AO 4374 E).

849. Telloh/Girsu. - TG 2313, de Genouillac 1930 excavations - Fragmented duck, agate. L. 2.51 cm, H. 1.50 cm, W. 1.79 cm, 6.89+x g - Mus. Louvre (AO 12734) - Thomas 1916a, 29.

850. Ancient Guimet collection (probably Telloh). - No context - Duck, good, steatite. L. 2.66 cm, H. 1.81 cm, W. 2.06 cm, 16.62 g - Mus. Louvre (AO 15407).

851. Telloh/Girsu. - de Sarzec 1881 excavations - Duck, slightly chipped, limestone. L. 5.52 cm, H. 2.90 cm, W. 3.21 cm, 79.07+x g - Mus. Louvre (AO 230 C) - Soutzo 1911, 25.

852. Telloh/Girsu. - TG 3959, de Genouillac 1930 excavations - Duck, worn, limestone. L. 7.19 cm, H. 3.35 cm, W. 4.68 cm, 165.20 g - Mus. Louvre (AO 12733) - Thomas 1916a, 29.

853. Telloh/Girsu. - No context - Duck, slightly chipped, with inscription, limestone. L. 7.25 cm, H. 3.91 cm, W. 4.88 cm, 174.58+x g - Neo-Sumerian, 2100-2000 BC - Mus. Louvre (AO 21419) - Thomas 1916a, 29.

854. Telloh/Girsu. - de Sarzec 1881 excavations - Duck, chipped and worn, with inscription, limestone. L. 8.50 cm, H. 4.08 cm, W. 5.42 cm, 245.14+x g - Neo-Sumerian, 2100-2000 BC - Mus. Louvre (AO 230 A) - Soutzo 1911, 25.

855. Telloh/Girsu. - de Sarzec 1881 excavations - Duck, good, limestone. L. 6.68 cm, H. 5.00 cm, W. 5.48 cm, 247.95 g - Mus. Louvre (AO 230 B) - Thomas 1916a, 29.

4.5.2.2.7. Sphere (Type 7a): Cat. no. 856

856. Telloh/Girsu. - No context - Sphere, worn, potential weight, limestone. D. 4.50 cm, 90.76+x g - Mus. Louvre (AO 26164).

4.5.2.2.8. Cylinder-shaped (Type 11a): Cat. no. 857-861

857. Telloh/Girsu. - TG 1286, de Genouillac 1929 excavations - Cylinder-shaped, good, potential weight, limestone. H. 2.58 cm, D. 1.40 cm, 8.25 g - Mus. Louvre (AO 12106.12).

858. Telloh/Girsu. - de Genouillac 1929 excavations - Cylinder-shaped, good, potential weight, hematite. H. 2.78 cm, D. 1.08 cm, 8.40 g - Mus. Louvre (AO 12106.25).

859. Telloh/Girsu. - TG 117, de Genouillac 1929 excavations - Cylinder-shaped, good, potential weight, agate. H. 2.62 cm, D. 1.55 cm, 16.12 g - Mus. Louvre (AO 12106.18).

860. Telloh region. - No context - Cylinder-shaped, good, potential weight, limestone. H. 7.08 cm, D. 3.00 cm, 119.03 g - Mus. Louvre (SH 083399).

861. Telloh region. - No context - Cylinder-shaped, chipped, potential weight, limestone. H. 6.41 cm, D. 3.85 cm, 124.73+x g - Mus. Louvre (SH 083503).

4.5.2.2.9. Egg-shaped (Type 15): Cat. no. 862-868

862. Telloh/Girsu (eastern tell). - T 1376, Parrot 1932-1933 excavations - Egg-shaped, perfect, hematite. L. 2.80 cm, D. 1.09 cm, 8.86 g - Mus. Louvre (AO 16798 D).

863. Telloh/Girsu. - de Sarzec 1881 excavations - Egg-shaped, good, limestone. H. 4.75 cm, W. 2.88 cm, 41.79 g - Mus. Louvre (AO 2893 D).

864. Telloh/Girsu. - No context - Egg-shaped, good, limestone. H. 3.90 cm, D. 2.88 cm, 41.83 g - Mus. Louvre (AO 26157).

865. Telloh/Girsu. - de Sarzec excavations - Egg-shaped, good, calcite. H. 4.21 cm, W. 3.01 cm, 53.56 g - Mus. Louvre (AO 2893 A) - Thomas 1916b, 97.

866. Telloh/Girsu. - de Genouillac 1930-1931 excavations - Egg-shaped, good, limestone. H. 4.35 cm, W. 3.48 cm, 69.60 g - Mus. Louvre (AO 14105).

867. Telloh/Girsu. - No context - Egg-shaped, slightly chipped, limestone. H. 5.90 cm, D. 3.72 cm, 87.74+x g - Mus. Louvre (AO 26160).

868. Telloh/Girsu. - No context - Egg-shaped, good, limestone. H. 5.61 cm, D. 3.59 cm, 92.88 g - Mus. Louvre (AO 26159).

4.5.2.2.10. Parallelepiped (Type 16a): Cat. no. 869-870

869. Telloh/Girsu. - TG 1374, de Genouillac 1929 excavations - Irregular parallelepiped, good, steatite. L. 1.95 cm, H. 0.71 cm, W. 1.38 cm, 3.36 g - Mus. Louvre (AO 12106.9).

870. Telloh/Girsu. - TG 1305, de Genouillac 1929 excavations - Parallelepiped, good, potential weight, chert. L. 5.01 cm, H. 1.08 cm, W. 1.71 cm, 18.31 g - Mus. Louvre (AO 12106.26).

4.5.2.2.11. Hemisphere (Type 20a): Cat. no. 871

871. Telloh/Girsu. - No context - Hemisphere, slightly chipped, limestone. H. 4.01 cm. D. 8.00 cm, 387.30+x g - Mus. Louvre (SH 083503).

4.5.2.2.12. Cone (Type 21a): Cat. no. 872

872. Telloh/Girsu. - de Genouillac 1930-1931 excavations - Cone (possibly an ovoid cut in half), good, hematite. H. 3.39 cm, D. 1.50 cm, 16.96 g - Mus. Louvre (AO 14226).

4.5.2.2.13. Truncated cone (Type 21b): Cat. no. 873

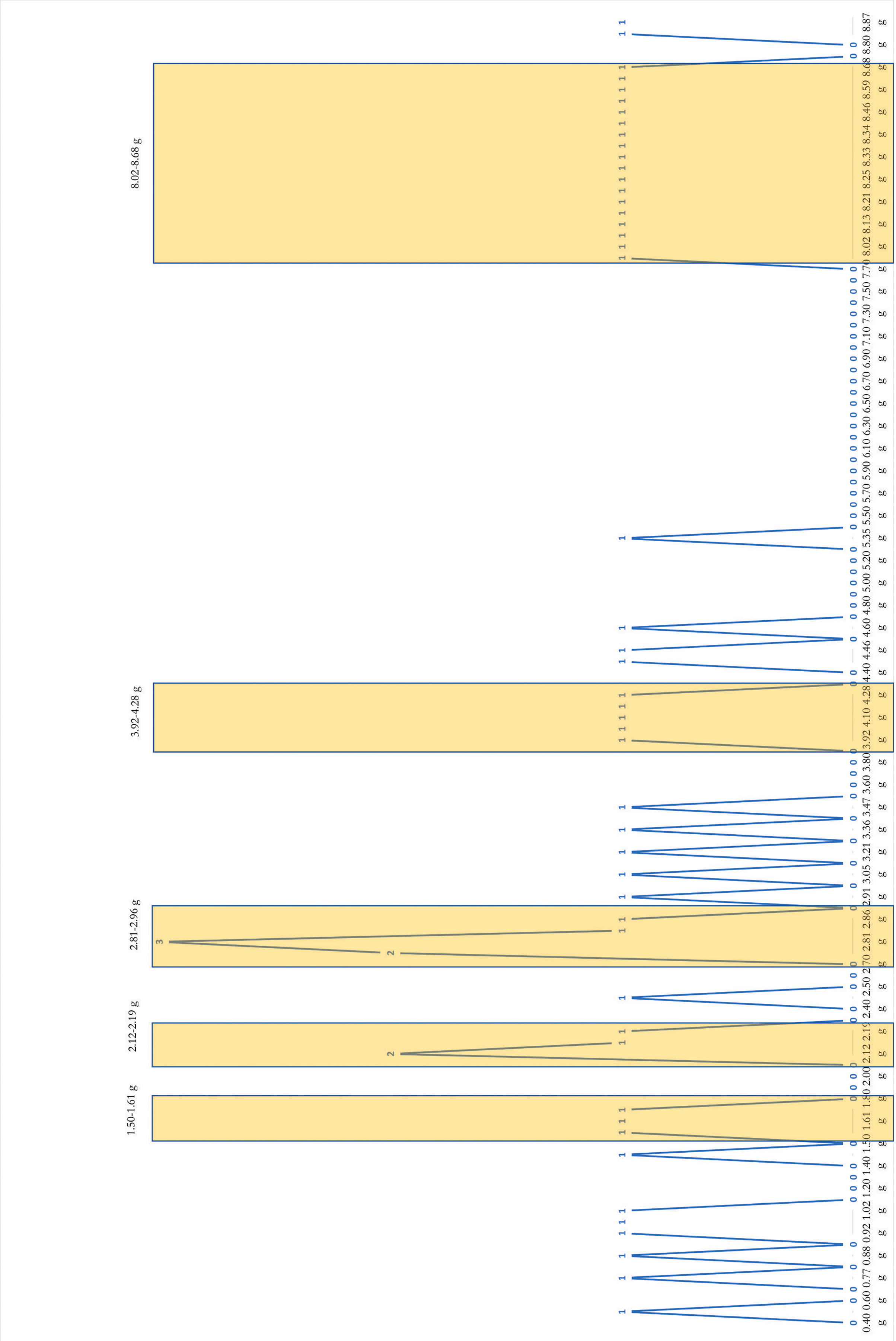
873. Telloh/Girsu. - de Genouillac 1929 excavations - Truncated cone, good, steatite. H. 3.11 cm, D. 2.98 cm, 41.06 g - Mus. Louvre (AO 12106.23).

4.5.2.3. Metrological notes

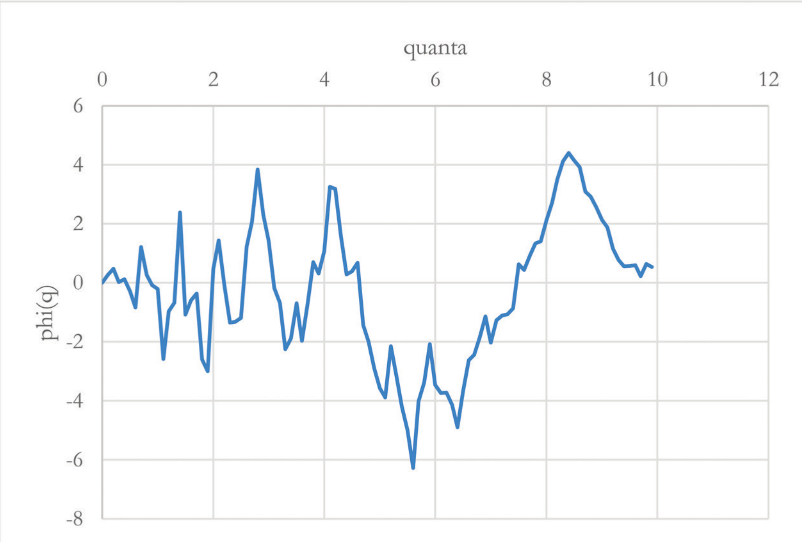
The results of the metrological analysis of Girsu's weights compare to those obtained from Susa. In addition to values associated with western weight systems (based on the mina of 470 g with fractions of 40, 50 and 60) and a small number of specimens imported from Harappa, the Girsu weights also comply with the 8.8/8.9 g heavy shekel discussed earlier in this chapter. Fig. 4.14 shows the concentration of weight values obtained from the Girsu specimens, with the following main units:

Weights in the range of 0-10 g

1. 1.50-1.61 g
   Weights in this range can be considered as ⅙ of the 'Levantine' shekel between 9 g and 9.66 g.
2. 2.12-2.19 g
   This group of weights equals ¼ of the two local shekels (8.48 g to 8.76 g).
3. 2.81-2.96 g
   These weights are the equivalent of ⅓ of the two local shekels (8.43-8.88 g).
4. 3.92-4.28 g
   One half of the traditional Mesopotamian 'Daric'.
5. 8.02-8.68 g
   This group confirms the existence of the 8.7-8.9 g shekel in the 3rd millennium BC. The weights from Telloh show an oscillation of



▲*Fig. 4.14. Main clusters of mass values from Telloh (0-10 g).*



▲Fig. 4.15. Cosine Quantogram Analysis of weights from Telloh.

the unit too high to be considered as an overestimation of the 8.4 g shekel.

Cosine Quantogram Analysis confirms the presence of a shekel of *c.* 8.4 g (Fig. 4.14). CQA applied to weights between 0 and 10 g reveals four different peaks, all of which comply with the traditional Mesopotamian shekel: 1.4 g (= ⅙), 2.8 g (= ⅓), 4.2 g (= ½) and 8.4 g (= 1).

Excluding the weights that follow the 8.4 g traditional shekel (based on the division by 60 of the 504 g mina), other metrological groups can be identified:

The Western group (Cat. no. 760, 762, 765, 776, 799, 784, 820, 831, 834, 844, 848, 856, 867-868, 870-871)

Numerous metrological studies over the last 30 years seem to confirm the coexistence of multiple weight systems within a single site. In Girsu, different local systems were challenged with the appearance of the western shekels (obtained by dividing the 470 g shekel by divisors 40, 50 and 60), originally known from Anatolian, Levantine and Inner Syrian contexts. Excluding all those weights connected to the local Mesopotamian system, the following balance weights related to shekels of 7.83 g, 9.40 g and 11.75 g can be identified:

Cat. no. 760: 0.77 g x 10 = 7.70 g; x 12 = 9.24 g; x 15 = 11.55 g
Cat. no. 762: 0.92 g x 10 = 9.20 g
Cat. no. 765: 1.55 g x 5 = 7.75 g; x 6 = 9.40 g
Cat. no. 776: 3.05 g x 3 = 9.15 g
Cat. no. 784: 7.76 g x 1 = 7.76 g
Cat. no. 799: 43.60+x g ÷ 4 = 10.90+x g; ÷ 5 = 8.72+x g; ÷ 6 = 7.27+x g
Cat. no. 820: 15.78 g ÷ 2 = 7.89 g
Cat. no. 831: 3.92 g x 2 = 7.84 g
Cat. no. 834: 6.10 g x 3⁄2 = 9.15 g
Cat. no. 844: 9.51 g x 1 = 9.51 g
Cat. no. 848: 3.21 g x 3 = 9.63 g
Cat. no. 856: 90.76+x g ÷ 10 = 9.08+x g
Cat. no. 867: 87.74+x g ÷ 8 = 10.96+x g; ÷ 10 = 8.77+x g; ÷ 12 = 7.31+x g
Cat. no. 868: 92.88 g ÷ 8 = 11.61 g; ÷ 10 = 9.29 g; ÷ 12 = 7.74 g
Cat. no. 870: 18.31 g ÷ 2 = 9.16 g
Cat. no. 871: 387.30 g ÷ 50 = 7.75+x g

The heavy shekel group (Cat. no. 761, 764, 769, 770, 774-775, 781, 790-792, 801, 833, 838, 842-843, 847, 853, 862)

Fig. 4.15 shows the existence of a heavy shekel in Telloh as early as the 3rd millennium BC. The mass values of some specimens as well as numerical markings on two of the balance weights seem to confirm this.

Cat. no. 761: 0.88 g x 10 = 8.80 g
Cat. no. 764: 1.47 g x 6 = 8.82 g
Cat. no. 769: 2.17 g x 4 = 8.68 g
Cat. no. 774: 2.90 g x 3 = 8.70 g
Cat. no. 781: 17.16 g ÷ 2 = 8.58 g
Cat. no. 790: 8.59 g x 1 = 8.59 g
Cat. no. 791: 8.68 g x 1 = 8.68 g
Cat. no. 792: 8.87 g x 1 = 8.87 g
Cat. no. 801: 52 g ÷ 6 = 8.67 g
Cat. no. 833: 4.46 g x 2 = 8.92 g
Cat. no. 838: 8.66 g x 1 = 8.66 g
Cat. no. 842: 511.11+x g x 1 = 511.11+x g
Cat. no. 843: 528.6 g x 1 = 528.6 g; ÷ 60 = 8.81 g
Cat. no. 847: 4.44 g x 2 = 8.88 g
Cat. no. 853: 174.58 g ÷ 20 = 8.73 g
Cat. no. 862: 8.86 g x 1 = 8.86 g

Taking only weights with numerical markings into account, two further specimens can be allocated to this class:

Cat. no. 770: 2.19 g x 4 = 8.76 g (four vertical lines)
Cat. no. 775: 2.91 g x 3 = 8.73 g (three vertical lines)

The Harappan group (Cat. no. 777, 802-803, 865, 869)

Similar to the weights from Susa, some specimens from Telloh seem to adhere to the Harappan group most commonly known from the Indus Valley (Ascalone 2021a).

Cat. no. 777: 3.47 g x 4 = 13.88 g
Cat. no. 802: 52.36 g ÷ 4 = 13.09 g
Cat. no. 803: 53.41 g ÷ 4 = 13.35 g
Cat. no. 865: 53.56 g ÷ 4 = 13.39 g
Cat. no. 869: 3.36 g x 4 = 13.44 g

4.6. Tell Ingharra/Kish

The city of Kish was identified amongst a group of hills near the Euphrates. Its ruins cover an area of 4 km², from Tell el-Uhaymir to Tell Ingharra and Tell Bandar. The site was first identified by G. Smith in 1873, and later excavated by H. de Genouillac in 1912 (de Genouillac 1924) and an Anglo-American team from Oxford University and the Field Museum of Natural History of Chicago, directed by S. Langdon, E. Mackay and L. Ch. Watelin (Langdon 1924; Langdon/Watelin 1930; Ross 1930; 1934; MacKay

1931; Langdon/Harden 1934; McGuire Gibson 1972; Moorey 1976; 1978). Recent research under the direction of K. Matsumoto (Matsumoto/Oguchi 2002; 2004) commenced in Tell Ingharra.

4.6.1. Chronologies

Defining the chronology of Kish on the basis of archaeological stratigraphy is almost impossible. An extensive survey (termed 'Y') carried out by the Anglo-American campaign at Tepe Ingharra revealed Neolithic, Ubaid and Uruk period layers. Most importantly, the survey demonstrated a continuous occupation of the settlement during Early Dynastic I and II (*c.* 2900-2600 BC), as evident from architectural features in three layers, as well as a cemetery. Evidence of Early Dynastic III (*c.* 2600-2350 BC) monumental buildings was recorded in the same area, including two major temples (described as ziggurats) located on elevated platforms. The 'Monument Z' and a small number of graves were attributed to the subsequent Akkadian period (*c.* 2350-2200 BC). This was followed by a temporary abandonment of the area until its reoccupation in the Neo-Babylonian period (*c.* 625-539 BC), when two temples were built. New monumental buildings dating to Early Dynastic I and II were excavated in Area A (100 m x 40 m and 56 m x 37 m), which confirm the importance of the site during the first half of the 3rd millennium BC. After the abandonment during the early years of the Akkadian period (*c.* 2300 BC), the entire area was levelled and turned into a cemetery.

Evidence for occupation during the Old-Babylonian period was found in the nearby Tell el-Uhaymir, featuring a ziggurat and a temple dedicated to the god Zababa. Additionally, evidence for the most recent periods was found in Kish as well as in a Parthian fortress located in Tell el-Bender. Tell H also featured evidence of Sasanian occupation.

It appears that the site mostly developed in Tell Ingharra during the 3rd millennium BC, with some previous occupation as early as the first half of the 4th millennium BC. Following its slow, gradual abandonment after the Akkadian period, the centre shifted towards other areas of the settlement. During the first two centuries of the 2nd millennium BC, the main occupation centre moved to Tell al-Uhaymir, and the city once again resumed an important role under the rules of Isin, Larsa and Babylon.

4.6.2. Weights, potential weights, possible weights and associated finds (Cat. no. 874-886)

All of the specimens from Kish can be considered balance weights, although this interpretation remains uncertain for fly-shaped and frog-shaped potential weights (Fig. 4.16).

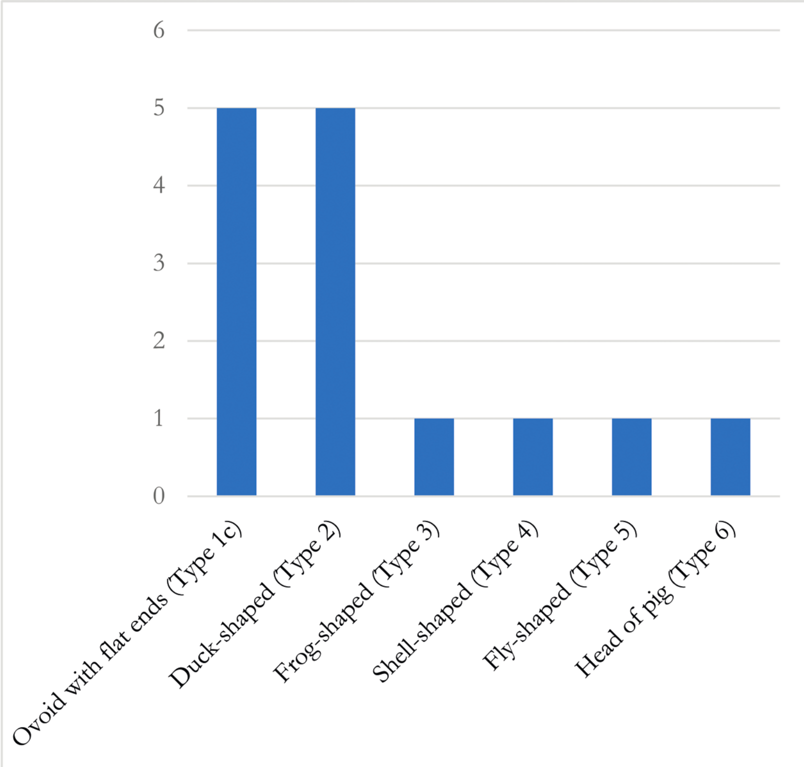


Fig. 4.16. Distribution of shapes at Kish.

4.6.2.1. Archaeological contexts

The archaeological contexts are only known for five specimens (Cat. no. 879, 881, 884-886), all of which were recovered from the same spot (B52) in Trench 6 excavated by H. de Genouillac in 1912. Unfortunately, no further information was provided in the original publication (de Genouillac 1925).

The excavation reports repeatedly make reference to the balance weights found, but without detailed descriptions that would allow unambiguous identification of the specimens collected for this volume. In one case, H. de Genouillac makes explicit reference to a box full of weights from the Hammurabi period (box no. 11) brought to the Louvre, which most likely contained the weights recorded in the catalogue (de Genouillac 1924, 26). In other cases, reference is made to small weights from the Neo-Babylonian period (de Genouillac 1924, 28) and, more frequently, to generic bronze scale weights equivalent to 1 talent and 3, 6, 10, 20 and 30 Mesopotamian minas (de Genouillac 1924, 35, no. 173). Other weights are described as made of grey stone (de Genouillac 1924, 49, no. 92), black stone (de Genouillac 1924, 54, no. 181), white stone (de Genouillac 1924, 54, no. 189), and 'black stone with metallic appearance' (possibly hematite) with mass values between 2.0 g and 8.5 g (de Genouillac 1924, 54, no. 189).

Whilst there is no further information in the French excavation reports, the Anglo-American campaigns recovered a number of weights (not included in this volume) with fascinating contexts. A collection of six weights was found in Chamber 15 of Palace A, with three associated copper ingots in close proximity (Mackay 1929, pl. 38, fig. 2). Mackay (1929, 87) describes the context as follows: '*the chamber measures 7.85 by 3 m and its northern wall shows conspicuous traces of having been much rubbed by people as they passed, doubtless avoiding the fire. It must be remembered that everyone going to the great court had to pass this way. This hearth may, of course, have been used for preparing food, but the presence of the copper ingots and the weights strongly suggests an armorer's shop. A big fortress-palace such as this would quite possibly have had a resident smith provided with the means of repairing weapons and other implements*'.

Unfortunately, no mass values were given for the weights, which were described as '*pebbles marked with lines that were evidently used as weights*' (Mackay 1929, 87, 126-127, pl. 38, fig. 2, pl. 42, fig. 10-15, no. 2598A-F).

The presence of weights in the vicinity of copper ingots suggests that the ingots could have been used as money, as suggested by Early Dynastic II-III and Akkadian texts (Powell 1979; Bartash 2019, 174-177). The discovery of engraved 'pebbles' within a royal context, such as Kish's Palace A, confirms the use of pebbles in weighing procedures, even in an official environment (see Chapters 2 and 3).

The cubic weight no. 2598C is of particular interest, as it appears to be an import from the Indus Valley, similar to specimens found in Susa and Telloh (see earlier in this chapter).

Although complex, the chronologies of Palace A in Kish can be reconstructed to a certain extent (Moorey 1978), based on the stratigraphic relation between the most archaic necropolis and the foundations of the monumental complex, artistic and typological features of the material culture found within the palace, and a 'Fara style' cylinder-shaped seal from Chamber 25 providing a *terminus post quem* for the construction of the palace.

Palace A appears to have been occupied between the end of Early Dynastic II and Early Dynastic III (*c.* 2600-2350 BC). Unfortunately, there is no record as to which floor level the weights were found at. As a result, the balance weights and copper ingots can only be approximately dated to the 25th century BC (*c.* 2500-2350 BC), the last occupation phase of the building. A similar date can be proposed for the cubic weights (excavation no. 2598C). The contemporary '*vase à la cachette*' from Susa contained hemispherical copper ingots that were likely used as currency for trade with sites in modern Oman.

4.6.2.2. Catalogue

4.6.2.2.1. Ovoid with flat ends (Type 1c): Cat. no. 874-878

874. Tell Ingharra/Kish. - de Genouillac 1912 excavations - Ovoid with flat ends, perfect, with marking ('I'), hematite. L. 1.60 cm, D. 0.60 cm, 1.56 g - Mus. Louvre (AO 10565 A) - de Genouillac 1924.

875. Tell Ingharra/Kish. - de Genouillac 1912 excavations - Ovoid with flat ends, perfect, hematite. L. 1.85 cm, D. 0.60 cm, 1.70 g - Mus. Louvre (AO 10564 D) - de Genouillac 1924.

876. Tell Ingharra/Kish. - de Genouillac 1912 excavations - Ovoid with flat ends, perfect, hematite. L. 1.79 cm, D. 0.85 cm, 2.34 g - Mus. Louvre (AO 10564 A) - de Genouillac 1924.

877. Tell Ingharra/Kish. - de Genouillac 1912 excavations - Fragmented ovoid with flat ends, hematite. L. 1.72 cm, D. 0.82 cm, 2.82+x g - Mus. Louvre (AO 10565 B) - de Genouillac 1924.

878. Tell Ingharra/Kish. - de Genouillac 1912 excavations - Ovoid with flat ends, perfect, hematite. L. 2.50 cm, D. 1.49 cm, 16.21 g - Mus. Louvre (AO 10564 C) - de Genouillac 1924.

4.6.2.2.2. Duck-shaped (Type 2): Cat. no. 879-883

879. Tell Ingharra/Kish. - de Genouillac 1912 excavations, Trench 6, B2 - Duck, perfect, hematite. L. 1.82 cm, H. 1.05 cm, W. 0.90 cm, 3.21 g - Mus. Louvre (AO 28414) - de Genouillac 1924; Parrot 1948, fig. 53c.

880. Tell Ingharra /Kish. - 154 A, de Genouillac 1912 excavations – Fragmented duck, incomplete, hematite. L. 2.30 cm, H.1.20 cm, W. 1.31 cm, 3.85+x g - Mus. Louvre (AO 10562. P) - de Genouillac 1924.

881. Tell Ingharra/Kish - P. 154 B, de Genouillac 1912 excavations, Trench 6, B2 - Duck, perfect, hematite. L. 2.18 cm, H. 1.35 cm, D. 1.10 cm, 5.76 g - Mus. Louvre (AO 10563) - de Genouillac 1924; Parrot 1948, fig. 53c.

882. Tell Ingharra/Kish - de Genouillac 1912 excavations- Duck (stylised?), perfect, hematite. L. 2.71 cm, H. 1.60 cm, W. 2.29 cm, 15.37 g - Mus. Louvre (AO 10564 B) - de Genouillac 1924.

883. Tell Ingharra/Kish. - P. 153, de Genouillac 1912 excavations - Duck, worn, limestone. L. 7.20 cm, H. 3.55 cm, W. 4.70 cm, 155.59 g - Mus. Louvre (AO 10561) - de Genouillac 1924.

4.6.2.2.3. Frog-shaped (Type 3): Cat. no. 884

884. Tell Ingharra/Kish. - P.147 A, de Genouillac 1912 excavations, Trench 6, B2 - Frog, perfect, hematite. L. 1.50 cm, H. 0.95 cm, W. 0.81 cm, 2.93 g - Mus. Louvre (AO 10553) - de Genouillac 1924; Parrot 1948, fig. 53a.

4.6.2.2.4. Shell-shaped (Type 4): Cat. no. 885

885. Tell Ingharra/Kish. - P. 145 B, de Genouillac 1912 excavations, Trench 6, B2 - Shell, perfect, hematite. L. 1.60 cm, H. 1.15 cm, W. 1.32 cm, 4.43 g - Mus. Louvre (AO 10554).

4.6.2.2.5. Fly-shaped (Type 5): Cat. no. 886

886. Tell Ingharra/Kish. - P. 150, de Genouillac 1912 excavations, Trench 6, B2 - Fly-shaped, perfect, hematite. L. 1.35 cm, H. 0.60 cm, W. 1.05 cm, 1.19 g - Mus. Louvre (AO 10555) - de Genouillac 1924.

4.6.2.3. Metrological notes

Preliminary metrological analysis of the Kish weights returns somewhat unusual results (Fig. 4.17). At least five of the specimens appear to correlate with the basic shekel of 9.4 g: Cat. no. 874 (= ⅙ of 9.36 g), 876 (= ¼ of 9.36 g), 879 (= ⅓ of 9.63 g), 886 (= ⅛ of 9.52 g), and 883, which is equal to ⅓ of the western mina of 466.70 g (with shekels of 11.67 g, 9.33 g and 7.78 g).

Unusually, only two specimens can be correlated to the traditional Mesopotamian shekel (Cat. no. 878: 16.21 g = 2 x *c.* 8.11 g; Cat. no. 875: 1.7 g = ⅕ x 8.5 g). There is also a large peak around 8.8-8.9 g, a value traditionally associated with the Neo-Assyrian period (from Tukulti-Ninurta II). Recent evidence from Nippur (Hafford 2005, 361, 367, n. 22), Assur (Unger 1918, no. 26), Larsa (Arnaud *et al.* 1979, 31, 33) and Kültepe, which revealed archaeological layers securely dated to 1970-1840 BC (Özgüç 1986, 80, no. 76), however, suggests that the unit may significantly predate the Iron Age. Evidence for this unit comes from three hematite weights: a duck (Cat. no. 881: 5.76 g = ⅔ x 8.64 g), a frog (Cat. no. 884: 2.93 g = ⅓ x 8.79 g) and a shell (Cat. no. 885: 4.43 g = ½ x 8.86 g). Also notable is Cat. no. 882 with a mass of 15.37 g, equal to two Eblaite shekels of 7.68 g. Based on the evidence for this unit, all weights with mass values between 8.5 g and 8.9 g should be carefully reconsidered (Ascalone/Peyronel 2006a).

While the evidence from Kish is still limited in numbers, the specimens and analysis provide an opportunity to trace the large presence of the traditional Levantine shekel (9.4 g) and the use of the 'heavy' shekel (8.7-8.9 g) many centuries prior to their previously assumed inception.

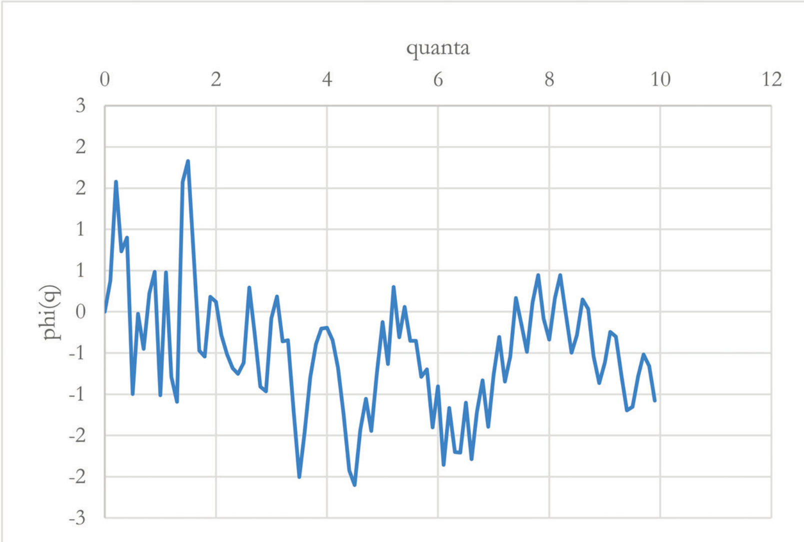


Fig. 4.17. Cosine Quantogram Analysis of weights from Kish.

4.7. Tell Muqayar/Ur

The ancient city of Ur is located near the modern village of Tell Muqayar, close to the city of Nasiriyeh. The entire settlement, which is still surrounded by a rampart built in the first centuries of the 2nd millennium BC, spans an area of 1,300 m x 900 m (see also the new reassessment of the site by E. Hammer (2019)). The actual city would have been significantly larger, however, as the aforementioned rampart would only have enclosed the very centre of the settlement. The site, first noticed by Pietro Della Valle in the mid-1700s, was visited by J. B. Fraser in 1834, who described its ziggurat as '*one of the most interesting relics of antiquary I have seen in this country*' (Fraser 1840, 88). The site was later visited by W. K. Loftus, a member of the Turko-Persian Frontier Commission (1857), Major H. C. Rawlinson, and J. R. Taylor in 1854, the English vice-consul in Basra. Taylor suggested the identification with the 'Ur of the Chaldeans' mentioned in the Bible, based on surface finds such as seals and inscribed bricks. First excavations began in 1918, under the direction of R. Campbell Thompson, an Assyrian scholar funded by the British Museum, but the campaign only lasted a single week. The following year, H. R. Hall, a captain of the British Intelligence Corps who used 70 Turkish prisoners to carry out the excavations, resumed the campaign.

In 1922, a joint project run by the British Museum and the University of Pennsylvania commenced, with 12 consecutive years of excavations under the direction of C. L. Woolley (Woolley 1927a; 1927b; 1927c; 1927d; 1927e; 1934; 1939; 1946; 1955; 1965; 1974; Gadd/Legrain 1928; Burrows 1935; Woolley/Moorey 1982), which identified Ur as the capital of a kingdom that controlled all of Mesopotamia during the end of the 22th and the 21th centuries BC (for the latest research see Hammer 2019, 173-206).

4.7.1. Chronologies

The majority of chronological evidence is derived from the architecture of excavated monuments, rather than archaeological stratigraphy. Evidence for the Late Ubaid (*c.* 4000-3500 BC), Uruk (*c.* 3500-2100 BC) and Jemdet Nasr (*c.* 3100-2900 BC) periods in Ur could only be found in deep trenches close to the city centre, but there is copious evidence for the Early Dynastic period (*c.* 2900-2350 BC), particularly its last phase (Phase III, *c.* 2600-2350 BC), such as around 1,800 tombs. These include the so-called royal graves PG 755 (King Meskalamdug), RT 789, RT 800 (Queen Puabi), RT 1237 (containing the remains of 68 females and six males), RT 1050 (King Akalamdug), RT 1054, and PG 779 (where the 'standard of Ur' was found). The original terrace on which the ziggurat of Ur-Nammu was built also dates to this period.

The majority of monuments, however, can be attributed to the Neo-Sumerian period and the kings of the Third Dynasty of Ur (*c.* 2120-2004 BC): the ziggurat of Ur-Nammu (*c.* 2112-2095 BC), the *giparu* (built by Ur-Nammu and restored by Amar-Sîn (*c.* 2046-2038 BC), later rebuilt by the kings of the First Dynasty of Larsa), the *Ganunmah* (built during the reign of the kings of Ur but restored several times in later periods), the É. HUR.SAG (palace of Ur-Nammu and Shulgi (2094-2047 BC), described as a temple in the inscriptions), the temple of Enki (built by Amar-Sîn), and the mausoleum of Shulgi and Amar-Sin.

The residential area (areas AM, EH, EM, PG, BC) dates primarily to the first centuries of the 2nd millennium BC after the destruction of the city (*c.* 2004 BC). A second group of dwellings (CLW area) was probably inhabited until the middle of the 2nd millennium BC (Kassite period), and a third group of houses may have been in use until the Neo-Babylonian period.

The city of Ur was permanently inhabited from the Ubaid period until the middle of the 2nd millennium BC, albeit with a sharp decline in settlement towards the end of the 3rd millennium BC, when the centre was sacked and destroyed by the Elamites (who later suffered from the rise of Samsu-iluna in southern Babylon, *c.* 1749-1712 BC). The city then prospered once more under Kurigalzu I (?-1375 BC), then suffered during the rise of the Neo-Assyrian kingdom when it became an ally of Assurbanipal (*c.* 668-631 BC) in the conflict with Shamash-Shum-Ukin (*c.* 667-648 BC). The city, however, survived, and regained importance during the Neo-Babylonian period (*c.* 626-539 BC), when a new monument for the great priestess of Sîn and daughter of King Nabonedo (*c.* 556-549 BC) was built near the north gate of the main ramparts. After the arrival of the Persians, the city returned to a rural status, and was recorded by Philip III in some Seleucid era texts as the old 'Caldeans' city.

4.7.2. Weight (Cat. no. 887)

Weight Cat. no. 887 is kudurru-shaped and made of diorite. Originally donated by de Boisgelin to the de Clerq collection, it has been in the possession of the Louvre since 1967. Its inscription identifies King Shulgi, thus placing the weight in the period between *c.* 2094-2047 BC, and its use in the temple of the moon god Nanna, god protector of the city of Ur. The inscription reads: 'for (the god) Nanna. His king, by (the god) Shulgi, the strong leader, King of Ur, King of the Four Corners, (this) one-half mina was verified'. As per the inscription, the weight has a (slightly underestimated due to surface abrasions) mass of 247.42 g, equivalent to half a Mesopotamian mina of 494.84 g.

4.7.2.1. Archaeological contexts

Although the weights discovered during C. L. Woolley's excavations at Ur provide the basis for much of the study of ancient weight metrology in the Near East, only a single specimen was included in this catalogue (a detailed record of the weights from Ur can be accessed at www.ur-online.org, where 586 objects are listed in the category of 'Weights and measures'). The lack of archaeological contexts, however, makes it extremely complicated to reconstruct the use of metrology between the end of the 3rd and the beginning of the 2nd millennium BC.

Ur III contexts

Most of the weights dating to Ur III were recovered from mausoleums: nine specimens (U.16268 A: a-f and three duck weights without catalogue numbers) come from Room 3 of the Shulgi Mausoleum. They were found in a layer of ash and charred wood in association with various metal working stone tool (Woolley 1974, 10). In Room 8, two steatite specimens were found with a pair of copper scale pans with a diameter of about 4 cm, a copper ring, and a gold pearl (Woolley 1974, 13). The weights would have been used with the copper scale pans, suspended from a symmetrical wooden beam. The copper ring could also have been part of the instrument. A hematite weight corresponding to a shekel of 8.5 g was found in Room 6 of the north-west mausoleum (Woolley 1974, 33). Two inscribed duck-shaped weights (U.1190, U.7825) as well as U.808 were found in Room 22 of the Ganunmakh in the sacred area of the ziggurat of Nanna. A number of weights (U.18585: 1-9) were also found in the filling of a cistern located inside the temple of Ningal, dating to the Kassite and Neo-Babylonian periods (see Woolley 1939, 32-35). A cubic weight made of yellowish carnelian (U.17673 in Woolley 1974, 102), found 2.5 m under the buttress of the outer wall of the north-west mausoleum, was likely imported from the Indus Valley. Its mass corresponds to the Harappan system (Ratnagar 1981, 185-186). Although published in a volume discussing the monuments of the local Third Dynasty, it could date back to the Akkadian period.

Old-Babylonian contexts

Most of the weights from this period come from burials connected to private dwellings in sectors AH and EM, which were excavated by C. L. Woolley in the second half of the 1920s. Woolley's chronological interpretation was based on textual evidence found in the house, which dates no later than the eleventh year of Samsu-iluna of Babylon (1738 BC). The sudden termination is probably linked to the destruction of the city following a rebellion in Lower Mesopotamia (Woolley/Mallowan 1976, 13-15). A characteristic feature of many dwellings is the presence of burials underneath the floors, including vaulted underground burial chambers made of fired brick, connected to rooms that C. L. Woolley interpreted as domestic chapels for ancestor worshipping rituals (Woolley/Mallowan 1976, 29-39, pl. 43-48). In addition to vaulted tombs, simple burials with human remains deposited in urns, jars or oval terracotta sarcophagi (larnax) are also attested. The grave goods are generally poor, including some ceramic vases, a cylindrical seal, or a small number of ornaments made of semi-precious stones or bronze. The exception to this are hematite balance weights, a total of 62 of which were found in 12 burials (Woolley/Mallowan 1976, 195-213). The weights and seals can be considered the most precious of the grave good, directly linked to the economic and commercial activities carried out by the deceased during their lifetime. The presence of weights inside houses or other buildings during the Old-Babylonian period is only confirmed by three specimens, briefly mentioned by C. L. Woolley without any record of their mass values: one hematite weight from Giparku (U. 6783) and two duck-shaped diorite weights, one (U.17354) of which was discovered at 11 Paternoster Road, the other in a cell of the sanctuary of Khendur-Sag in 1 Church Lane. It is likely that the number of weights discovered at Ur is significantly larger than mentioned in the excavation reports, which present only a limited selection of 'small finds'. A number of balance weights were found in four burials in Area AH (LG/23, LG/45, LG/55, LG/58, 26 specimens in total), in Area EM+EH (LG/113, LG/124, LG/145, LG/153, 23 specimens), in tomb LG/170 near the fortifications (two specimens), and in three burials located in the area of the Royal Cemetery (LG/193, LG/195, LG/196, 11 specimens). The majority of these weights were found in fire brick vaulted tombs (five tombs containing 23 weights) and sarcophagi (six containing 38 weights), whereas only a single specimen was recovered from a burial pit (LG/55, 5 Niche Lane). No weights were deposited in urns or jars, which are usually associated with infant of sub-adult burials. With the exception of single specimens found in LG/55 and LG/170, weights were always deposited in groups of up to 17 objects in a single burial (LG/45). In LG/23 and LG/45, the weights were found in association with copper scale pans, and the metal discs from burial LG/170 were also likely the remains of a balance scale (Woolley/Mallowan 1976, 210; Peyronel 2000, 181-183).

4.7.2.2. Catalogue

4.7.2.2.1. 'Kudurru'-shaped (Type 19): Cat. no. 887

887. Tell el-Mukayyar/Ur (from de Clercq Collection). - No context - '*Kudurru*'-shaped, slightly worn, with inscription by Shulgi and a crescent moon, '*For {the god} Nanna his king, by {the god} Shulgi, the strong leader, King of Ur, King of the Four Corners, (this) one-half mina, was verified*', diorite. L. 4.88 cm, H. 6.51 cm, W. 3.80 cm, 247.42 g - Ur III period, 2094-2047 BC - Mus. Louvre (AO 22187) - Frayne 1997.

5.1. Jiroft valley

The remarkable discovery of Bronze Age settlements in the Halil River Valley, located south of the city of Jiroft (Fig. 5.1), first through looting and later through excavations led by Youssef Madjidzadeh, has completely changed our understanding of the Iranian plateau in the 3rd millennium BC (Madjidzadeh 2003a; 2008; Piran 2012; Desset/Vidale 2013; Desset *et al.* 2013; for other studies on the Halil valley see Ascalone *et al.* 2012 and Ascalone/Azadi 2019 for the excavations at Qaleh Kutchek; Sajjadi 1987 and Pfälzner/Alidadi Soleimani 2017 for archaeological surveys along the lower Halil).

New research in the area enables fresh perspectives on the historical understanding of south-eastern Iran, and it was possible to identify Kerman province with the historical Marhaši (Akkadian Parakshum) frequently mentioned in contemporary Mesopotamian texts dating to the Akkadian and Old Babylonian periods (during Ur III, textual references to Marhaši are mainly in administrative texts). Marhaši seems to have been the eastern-most target area of military campaigns orchestrated by Akkadian kings, who advanced on the plateau under the lead of Sargon (*c.* 2335-2279 BC) and Rimush (*c.* 2278-2270 BC). Although too distant to be controlled directly by the Akkadian kings or the kings of the Third Dynasty of Ur, Marhaši and the Mesopotamian kingdoms upheld an intensive yet entirely diplomatic relationship. Texts dated to the kingdoms of Amar-Sin (*c.* 2046-2038 BC) and Ibbi-Sin (*c.* 2028-2004 BC) often mention Marhaši messengers, sent to the court of Ur to reside there for a year or more (Scheil/Legrain 1913, 23). Shar-kali-sharri (*c.* 2217-2193 BC), or perhaps his son, moved to Marhaši to marry a native princess of the Iranian region (Westenholz 1987, 97, no. 133, 154). During Ur III, people from Marhaši, probably soldiers (Steinkeller 1982, 261; 1989; *contra* Francfort/Tremblay 2010 who suggest that Marhaši was in fact located in Margiana; see also Guichard 2011, 73-75), were stationed in Mesopotamian outposts near the eastern mountains surrounding the flood plain. In Sumerian literary and lexical texts, Marhaši is associated with distant exotic lands (Magan and Meluhha) (Steinkeller 1982, 261; 1989) and often remembered for the cultivation of specific and alien (Mesopotamian) plants[1] and the presence of unknown animals.[2]

1 Among the plants mentioned was SUM.SIKIL (onions), which are very common in Baluchistan (Vallat 1985, 52).

2 Often remembered are 'the dogs and goats of Marhaši'; the 'Curse of Accad's' notion of monkeys, elephants and zebu seems very doubtful (Steinkeller 1982, 252).

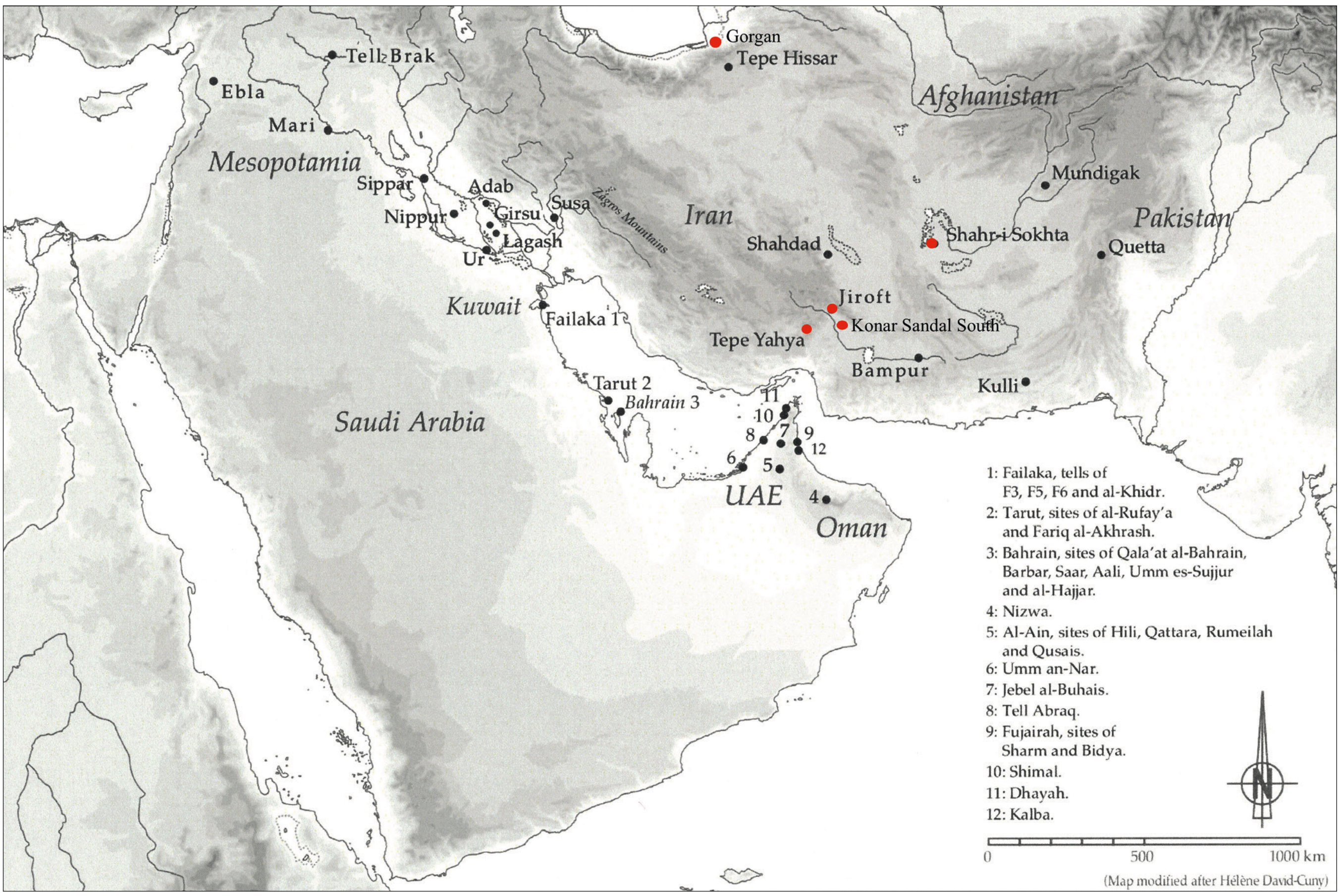


Fig. 5.1. Map of Western Asia in the Bronze Age. Iranian high¬lands sites with weights which are discussed in this volume are shown in red (modified after Hilton 2014, fig. 3).

The surrounding region was mainly remembered as a source of supply of agate (Vallat 1985, 52; Heimpel 1988, 199), chlorite/steatite (Potts, T. F. 1994, 28, n. 168), a local variation of carnelian with characteristic yellow spots (Horowitz 1992, 114), lapis lazuli (Steinkeller 1982, 250), and other precious stones. Inscriptions dating from the reign of Rimush reveal information about the presumed Akkadian victories in the remote eastern regions, and mention the names of some Parakshum kings (such as Abalgamash and Sidgau) who were active in the defence of their own territories and of the Elamite confederation when Marhaši formed an allegiance with Elam to counter the first Akkadian conquests of the region (Potts, T. F. 1994, 28, n. 179). Nevertheless, the Mesopotamian sovereign killed 16,212 and captured 4,216 men (including the Elamite sovereign Emahsini) as exemplary punishment (Potts, T. F. 1989, 128, no. 20). A small number of very specific descriptions of military campaigns during the reign of Naram-Sin make it possible to determine the topography of the land of Marhaši. The Akkadian sovereign, who claimed to have conquered the 'totality of the land of Elam up to Marhaši', provides detailed geographic information of the 'highlands' he conquered.[3] The expression used by the Mesopotamian sovereign suggests that Elam was a territory/state bordering the land of Marhaši, which was likely located in the remote eastern regions of Fars or in the province of Kerman, close to the desert of Lut (see in general Potts 2002; 2008; Francfort/Tremblay 2010; Steinkeller 2014).

Although fieldwork remains extremely limited in the Jiroft region, the entire Halil River Valley represents a great opportunity for archaeological research: future studies will make it possible to gain knowledge of one of the most important civilisations of the 3rd millennium BC, an urban melting pot located between the Greater Indus Valley and Lower Mesopotamia, with intense relations in all directions.

5.1.1. Chronologies

New, yet unpublished evidence from Jiroft, particularly from Konar Sandal (see Chapter 5.2), will make it possible to reconstruct the development of the region during the 3rd millennium BC (Tab. 5.1). The thus far published catalogue of finds seized by the Iranian government (Madjidzadeh 2003a), and limited publications in the journals *Dossiers d'Archéologie* (Madjidzadeh 2003b; 2004) and *Iran* (Madjidzadeh 2008) are important but not exhaustive. However, the better published major sites of the Kerman province (including Shahdad; see Chapters 5.2 and 5.3 for Konar Sandal and Tepe Yahya) could be used to determine a broad overview of the chronology of the '*trans-élamite culture*' (Amiet 1986a), *i. e.* south-eastern Iran culture.

On this knowledge base, we can assume that around the middle of the 3rd millennium BC an Integrated Cultural System (= ICS) developed; a period defined by extensive import and exports of materials between the major sites of the Iranian highlands, Central and Southern Asia. At the same time, a new syncretic form of art linking the different cultural heritages of the main river civilisations (Helmand, Oxus, Halil and Indus) developed. A trans-regional period in southern and eastern Iran, characterised by intercultural relations was born, with two main chronological sequences and cultural developments; a period during which Jiroft sites played an important role in the Early Bronze Age landscape (Ascalone 2018a):

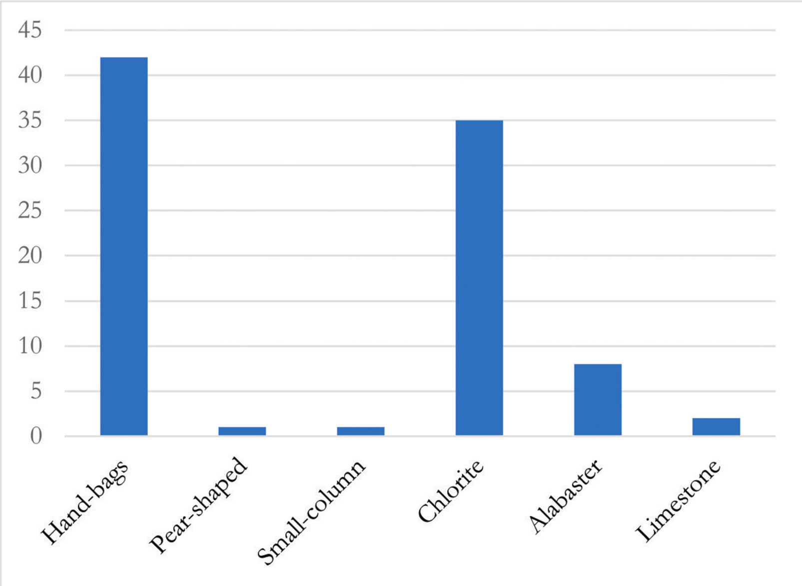
*Early ICS (*c. *2600/2500-2200 BC)*: Mature Indus and a full urban phase in the Kopet Dag (Altyn Depe, Namazga V) were born, and the first palatial compounds in Margiana were built during the Kelleli phase. In the Jiroft valley an intensive settlement development occurred: the main site of Konar Sandal South assumed control of northern Halil. Cultural developments which had previously only happened on a regional scale were now replaced by an integrated cultural system, with wide evidence for imported and exported materials. The development of artistic syncretism led to a sudden increase in material culture, with Jiroft and Margiana playing major roles in its diffusion and elaboration. At the end of this period Shahr-i Sokhta was abandoned around 2300/2200 BC. Under the Akkadian reign, military relations with Mesopotamia were established.

*Late ICS (*c. *2200-1800/1700 BC):* the widespread system of communication and exchange continued during the rise of the Oxus/BMAC civilisation. The city and palace of Gonur North were established. There is evidence for a new cultural phase in Elam (Kaftari period). Iconographic depictions on Anshanite seals and the Oxus silver vessels share distinct common feature. New colonies were established at Shortugai, Sotkha-koh and Sutkagen-dor, whereas a strong Harappan influence is visible at Miri Qalat (Period IV) and Balakot. The 'Gonur Depe phase' first developed in Margiana and at Konar Sandal settlement shifts from the southern (Konar Sandal South) to northern mound (Konar Sandal North). There is evidence for new contacts with the western entities of the Persian Gulf, and diplomatic relations were developed with Ur III and Isin Mesopotamian kings. Significant commercial activities undertaken by mercantile organisations from the Indus Valley are attested at the western coast of the Persian Gulf. In the 18th century BC this period

3 The region's large number of Elamite place names still used today (Potts, T. F. 1994, 30, n. 188) and an inscription dated to the reign of Ishbi-Erra, in which Marhaši is mentioned on the borders of Elam (van Dijk 1978; Steinkeller 1982, 240), seem to confirm a more eastern location, probably the Kerman region (Steinkeller 1982, 255; 1989, 381; *contra* van Dijk 1978, 197).

Absolute chronology (BC)	ICS period Ascalone 2018a	Elam Miller/Sumner 2003 and 2004	Jiroft Madjidzaedh 2008 Eskanderi 2021	Kerman Hakemi 1997a	Sistan Ascalone 2022b	Greater Indus Meadow/Kenoyer 1993	Central Asia Kohl, P. L. 1984	Baluchistan Görsdof 2005 Jarrige *et al.* 2011 de Cardi 1968	Susiana Ascalone 2006a	Mesopotamia Ehrich 1992
3550-3350		Middle Banesh	Mahtoutabad II Varamin III		Early Chalcolithic Sistan IA SiS I.10-9	Ravi culture Harappa 1	Late Aeneolithic Namazga III Kara depe	Sohr Damb I Miri Qalat IIIA	Susa transition	Early Uruk
3350-3100		Late Banesh	Mohtoutabad III Varamin IV		Late Chalcolithic Sistan IB SiS I.8				Susa II	Late Uruk
3100-3000					Early Bronze I Sistan IC SiS II.7			Sohr Samb II Nausharo IB-D	Susa IIIA	Jemdet Nasr
3000-2850	**Pre-ICS**	Transitional phase		Takab IV.2	Early Bronze IIA Sistan IIA SiS II.6		Early Bronze Namazga IV			ED I
2850-2650			Konar Sandal South Lower Town	Takab IV.1	Early Bronze IIB Sistan IIB SiS II.5	Early Harappa Harappa 2		Sohr Damb III Miri Qalat IIIB Bampur I-IV	Susa IIIB	ED II
2650-2600					Early Bronze IIC Sistan IIC SiS II.4		Shortugai I	Nausharo II		
2600-2450	**Proto-ICS**		Konar Sandal South Citadel		Middle Bronze I Sistan IIIA SiS III.3	Mature Harappa Harappa 3A	Middle Bronze Namazga V	Miri Qalat IIIC	Susa IVA	ED IIIa
2450-2400	**Early ICS**	?	Mohutatabad IV Varamin V	Takab III.2	Middle Bronze II Sistan IIIB SiS III.2	Mature Harappa Harappa 3B	Shortugai II	Sohr Damb IV		ED IIIb
2400-2300					Middle Bronze III Sistan IV SiS IV.1			Nausharo III		
2300/2200-2000	**Late ICS**	Kaftari	Konar Sandal North	Takab III.1	Late Bronze I Sistan VA SiS GAP (2300-2100) SiS V.0 (2100-2000)	Mature Harappa Harappa 3C	Late Bronze Namazga VI Gonur depe phase	Nausharo IV Miri Qalat IV Bampur V-VI	Susa IVB Susa VA Susa VB1	Akkad Lagash II Ur III
2000-1800/1700					Late Bronze II Sistan VB	Late Harappa Harappa 4-5	Shortugai III		Susa VB2	Isin/Larsa

▲ *Tab. 5.1. Comparative stratigraphies on the Iranian highlands.*



▲*Fig. 5.2. Distribution of shapes and materials in Jiroft.*

came to a sudden halt, with regional crises developing in the major settlements and the wider regional landscape. At the end of this period the Oxus, Indus and Jiroft civilisations collapsed, the Kaftari period in Fars was followed by a new regional cultural phase, Miri Qalat, Shortugai and Tepe Yahya were abandoned and the Shahdad settlement drastically reduced in size.

The chronologies of Jiroft sites during this phase can be defined on the basis of archaeological stratigraphies, the typology of cylinder-shaped seals (Ascalone 2011a, 331-360, 443-446; 2012, 4; 2018b, 627, 630), and isotope analysis from Mahtoutabad cemetery and the site of Konar Sandal South.

*1. Yahya IVC/Takab IV2/KSS Lower Town/Mahtoutabad III (*c*. 3300-2700 BC)*

Artefacts associated with Proto-Elamite culture (seals and tablets) appeared in Tepe Yahya and the first structured settlements in the Halil River Valley were founded. There is also some Proto-Elamite evidence from the necropolis of Mahtoutabad. Tender relations with Elam and Susiana in the west developed.

*2. Takab IV1/KSS Lower Town/Proto-ICS (*c*. 2700-2600/2500 BC)*

During this period, the settlement of Yahya was abandoned, and a number of settlements sites along the Halil River as well as the first necropolis of Shahdad were developed. Specialist stoneworkers from the Jiroft valley lay foundations for the tradition of manufacturing steatite/chlorite vessels.

*3. Yahya IVB/Takab III2/KSS Citadel/Mahtoutabad IV/Early ICS (*c*. 2600/2500-2200/2150 BC)*

Around 2500/2400 BC the centre of Tepe Yahya was reoccupied, and a significant development of the Halil River Valley sites assigned them a hegemonic role within territorial disputes of eastern Iran. At Konar Sandal South, the production of early and late cylinder-shaped seals became prominent, and the production and diffusion of '*série ancienne*' (or 'Intercultural Style') steatite/chlorite vessels continued and intensified. Diplomatic and forced contacts with Mesopotamia and Elam proceeded.

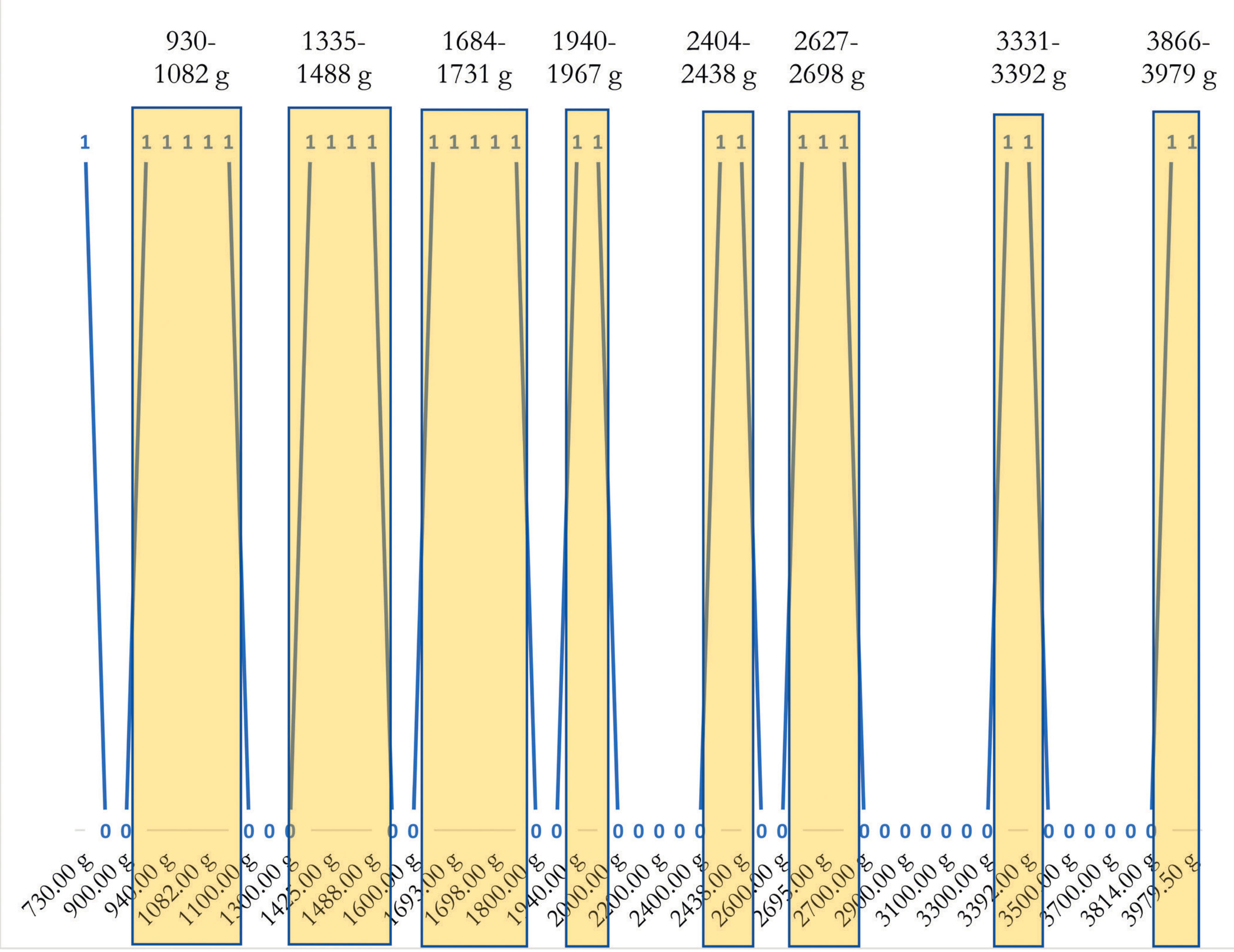
*4. Yahya IVA/Takab III1/Late ICS (*c*. 2200/2150-1900 BC)*

The settlement of Konar Sandal South was abandoned during this period. New types of chlorite vessels ('*série récente*') and local glyptic spread throughout the region. New relations with the Persian Gulf and Bactria were formed, pre-existing contacts were intensified, and closer diplomatic relations to the rulers of Ur, Isin and Eshnunna were established. BMAC evidence in eastern Iran, Jazmurian and Baluchistan is attested.

The historical events of the Jiroft valley fit well into the broader picture painted by the BMAC and the Indus Valley. The most recent excavations carried out along the valley provide the first stratigraphic sequences, and allow the reconstruction of settlement development in the whole region. The sporadic Proto-Elamite evidence from Mahtoutabad III and Yahya IVC was followed by a very specific local production of chlorite/steatite objects, previously incorrectly considered as the result of 'intercultural' production. These artefacts likely represent the most compelling group of objects collected for this volume, and will be the subject of metrological analysis later in this chapter.

5.1.2. Weights, potential weights, possible weights and associated finds (Cat. no. 888-932)

A total of 45 artefacts come from the Jiroft valley and the province of Kerman (Fig. 5.2). While Type 13 or 'small columns' (Cat. no. 930-931) most likely were not used as balance weights (see also Borofka/Sava 1998), ascertaining the function of hand bag-shaped (Cat. no. 888-929) and pear-shaped specimens (Cat. no. 932) proves far more complex (see also Hori 1986, 16-36). The latter were likely used as balance weights during the end of the 4th (particularly from western Central Asia to Baluchistan; Franke/Cortesi 2015, no. 631-643) and the 3rd millennium BC (see also the Eblaite specimens in Ascalone 2020). Equally, the hand bag-shaped specimens can be considered as balance weights, used to weigh large quantities of material. Their morphology, ethnographic comparisons throughout the entire Jiroft valley, and their metrologically significant mass values suggest that these objects were used for weighing purposes between the second and the third quarter of the 3rd millennium BC (*c*. 2700/2600-2300/2200 BC) in south-eastern Iran, as part of a sophisticated economic trade system comprising the main Iranian

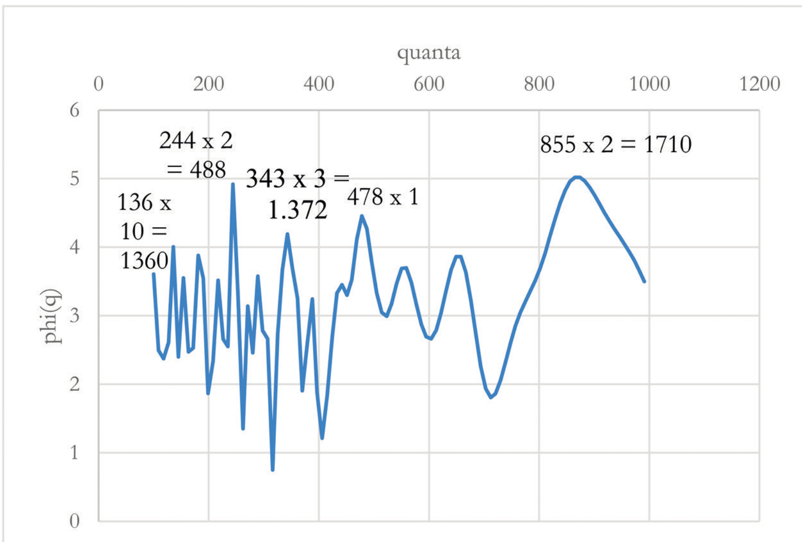


▲*Fig. 5.3. Main clusters of mass values from Jiroft - handled weights (700-4,000 g).*

sites (Shahr-i Sokhta, Shahdad, the entire Jiroft valley), the Greater Indus Valley and Mesopotamia.[4]

Hand bag-shaped weights have been investigated extensively as part of wider studies on the use and production of chlorite/steatite objects (for bibliography see Chapter 2), particularly in terms of the artistic value lying in the elaborate surface decorations of many specimens (Perrot 2003; Perrot/Madjidzadeh 2003; Winkelmann 2005; Basafa/Rezaei 2014; Vidale 2015). Interpretations of hand bag-shaped weights include counterweights for ritual or funerary purposes (Micheli/Vidale 2012), and training equipment for physical exercise (Reade 2012). However, there is evidence that these objects were at least partially used for accounting and weighing, perhaps for the quantification of tin, lapis lazuli, copper or wool, the most frequently traded materials between the Indus Valley, the Persian Gulf and southern Mesopotamia (Steinkeller 2013; for historical evaluations see Chapter 2.10). Based on their morphology, ethnographic comparisons, their mass values, and metrological and statistical analyses, Type 10 hand bag-shaped objects can be considered as balance weights used on an equal-arm balance scale (see Fig. 5.3-4).

▼*Fig. 5.4. Cosine Quantogram Analysis of hand-bag potential weights.*



4 The specimen found in Tepe Hissar IIB (*c.* 3300-3000 BC) was likely an early prototype (Schmidt 1937a, pl. XVIII,H. 2095).

The various and intensive relations between south-eastern Iran (in particular the Halil valley), Mesopotamia and the Indus Valley (see recent studies Pittman 2013; Vidale/Frenez 2015; Wright, R. P. 2016; Ascalone 2020) suggest that Jiroft played a significant role within Bronze Age commercial dynamics in the region. It seems unlikely that such a commercially active region would trade with the Indus Valley and Lower Mesopotamia without the adoption or development of accounting and administrative tools for regulating goods.

5.1.2.1. Archaeological contexts

Still awaiting the final publication of the excavations, the archaeological contexts of the Jiroft weights remain yet unknown, with the exception of the notes by Y. Madjidzadeh (2003a; 2003b; *contra* Muscarella 2001) who attributed all the hand bag-shaped weights to the plundering of the cemetery of Konar Sandal South and the other necropolises located in the Halil valley. Lacking further information, the presence of weights in burial contexts, a practice that was widespread throughout Lower Mesopotamia and Susa during the 3rd and the early 2nd millennium BC, appears particularly significant.

5.1.2.2. Catalogue

5.1.2.2.1. Hand bag-shaped (Type 10): Cat. no. 888-929

888. Jiroft valley. - No context - Hand bag, incomplete, potential weight, steatite. L. 10.2 cm, H. 10.0 cm, W. 1.3 cm, 306.02+x g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8474).

889. Jiroft valley. - No context - Hand bag, good, slightly chipped, potential weight, steatite. L. 14.0 cm, H. 13.5 cm, W. 2.2 cm, 679.50 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Louvre (AO 29138).

890. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 12.7 cm, H. 14.6 cm, W. 2.0 cm, 730.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Jiroft (JM 123).

891. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 18.5 cm, H. 16.3 cm, W. 1.8 cm, 930.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8697).

892. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 15.7 cm, H. 12.6 cm, W. 3.2 cm, 940.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8696).

893. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 13.2 cm, H. 13.5 cm, W. 2.4 cm, 996.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Jiroft (JM 8473).

894. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 15.0 cm, H. 13.8 cm, W. 2.2 cm, 1,082.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Jiroft (JM 47).

895. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 23.0 cm, H. 17.8 cm, W. 2.1 cm, 1,082.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 10856).

896. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 19.1 cm, H. 19.4 cm, W. 2.0 cm, 1,335.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 10855).

897. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 21.1 cm, H. 16.0 cm, W. 2.8 cm, 1,425.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8472).

898. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 19.4 cm, H. 16.1 cm, W. 2.4 cm, 1,457.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 11496).

899. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 15.3 cm, H. 20.0 cm, W. 2.4 cm, 1,488.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8469).

900. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 20.8 cm, H. 20.2 cm, W. 1.9 cm, 1,684.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8801).

901. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 17.5 cm, H. 29.8 cm, W. 2.8 cm, 1,698.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 11699).

902. Jiroft valley. - No context - Hand bag, unfinished, undecorated, potential weight, steatite. L. 18.8 cm, H. 17.3 cm, W. 3.2 cm, 1,731.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8466).

903. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 19.0 cm, H. 17.8 cm, W. 2.7 cm, 1,693.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8807).

904. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 21.5 cm, H. 21.0 cm, W. 1.4 cm, 1,693.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8806).

905. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 18.5 cm, H. 19.2 cm, W. 2.0 cm, 1,940.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 11653).

906. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 17.8 cm, H. 17.4 cm, W. 4.0 cm, 1,967.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8698).

907. Jiroft valley. - No context - Hand bag, slightly chipped, worn, potential weight, steatite. L. 18.0 cm, H. 19.5 cm, W. 2.7 cm, 2,123.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8470).

908. Jiroft valley. - No context - Hand bag, incomplete, potential weight, steatite. L. 20.8 cm, H. 13.3 cm, W. 3.7 cm, 2,145.00+x g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8781).

909. Jiroft valley. - No context - Hand bag, perfect, worn, potential weight, steatite. L. 22.5 cm, H. 17.8 cm, W. 3.1 cm, 2,404.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8471).

910. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 19.8 cm, H. 18.7 cm, W.

3.7 cm, 2,438.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (JM 78).

911. Jiroft valley. - No context - Hand bag, perfect, worn, potential weight, steatite. L. 19.5 cm, H. 18.6 cm, W. 4.1 cm, 2,627.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8476).

912. Jiroft valley. - No context - Hand bag, perfect, worn, potential weight, steatite. L. 23.2 cm, H. 17.3 cm, W. 3.2 cm, 2,695.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8468).

913. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 22.0 cm, H. 19.9 cm, W. 3.8 cm, 2,698.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8479).

914. Jiroft valley. - No context - Hand bag, good, worn, potential weight, steatite. L. 22.7 cm, H. 20.3 cm, W. 3.5 cm, 3,331.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8467).

915. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 31.1 cm, H. 26.0 cm, W. 2.2 cm, 3,392.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Jiroft (JM 126).

916. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 23.8 cm, H. 20.5 cm, W. 3.9 cm, 3,814.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Jiroft (JM 122).

917. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 26.1 cm, H. 24.0 cm, W. 3.0 cm, 3,866.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Jiroft (JM 125).

918. Jiroft valley. - No context - Hand bag, good, slightly chipped, with markings (‘OO’) on each side, seven dots and a zig-zag line, potential weight, steatite. L. 19.0 cm, H. 8.8 cm, W. 17.0 cm, 3,979.50 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Louvre (AO 29388).

919. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 38.0 cm, H. 23.1 cm, W. 3.3 cm, 4,318.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Jiroft (JM 147).

920. Jiroft valley. - No context - Hand bag, perfect, worn, potential weight, steatite. L. 27.8 cm, H. 24.1 cm, W. 4.3 cm, 4,615.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8478).

921. Jiroft valley. - No context - Hand bag, perfect, potential weight, alabaster. L. 26.3 cm, H. 26.0 cm, W. 4.5 cm, 5,753.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8607).

922. Jiroft valley. - No context - Hand bag, perfect, potential weight, steatite. L. 27.8 cm, H. 27.5 cm, W. 3.7 cm, 5,846.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Jiroft (JM 8464).

923. Jiroft valley. - No context - Hand bag, perfect, worn, potential weight, steatite. L. 27.4 cm, H. 28.4 cm, W. 2.9 cm, 6,112.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8480).

924. Jiroft valley. - No context - Hand bag, worn, potential weight, limestone. L. 27.7 cm, H. 21.6 cm, W. 6.1 cm, 6,224.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8608).

925. Jiroft valley. - No context - Hand bag, perfect, potential weight, limestone. L. 25.3 cm, H. 27.0 cm, W. 5.5 cm, 6,581.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8605).

926. Jiroft valley. - No context - Hand bag, perfect, potential weight, alabaster. L. 36.0 cm, H. 29.8 cm, W. 5.9 cm, 8,075.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8604).

927. Jiroft valley. - No context - Hand bag, perfect, potential weight, alabaster. L. 43.2 cm, H. 30.5 cm, W. 4.5 cm, 10,662.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Jiroft (JM 343).

928. Jiroft valley. - No context - Hand bag, perfect, potential weight, limestone. L. 24.5 cm, H. 29.6 cm, W. 11.0 cm, 12,700.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8602).

929. Jiroft valley. - No context - Hand bag, fragmented, potential weight, limestone. L. 29.1 cm, H. 39.8 cm, W. 12.6 cm, 21,109.00 g - Early ICS (= Yahya IVB), 2500-2200 BC - Mus. Kerman (KM 8601).

5.1.2.2.2. Small column (Type 13): Cat. no. 930-931

930. Jiroft valley. - No context - Column, perfect, limestone. L. 32.7 cm, D. 12.3 cm, 15.0 cm, 6,021.00 g - Shahdad III.2-III.1, Late ICS, 2200-1900 BC - Mus. Kerman (KM 8609).

931. Jiroft valley. - No context - Column, perfect, limestone. L. 32.9 cm, D. 13.0 cm, 16.5 cm, 11,533.00 g - Shahdad III.2-III.1, Late ICS, 2200-1900 BC - Mus. Kerman (KM 8605).

5.1.2.2.3. Pear-shaped (Type 14): Cat. no. 932

932. Baluchistan. - No context - Pear-shaped, perfect, potential weight, limestone. L. 15.6 cm, H. 26.4 cm, 10,253.00 g - Shahdad III.2-III.1, ICS, 2500-1900 BC - Mus. Kerman (KM 11190).

5.1.2.3. Metrological notes

Whilst a full metrological study of weight systems will be the subject of further publications, preliminary considerations on the use of the mina throughout the Halil River Valley, as suggested by the hand bag-shaped weights, can be made.

The 36 hand bag-shaped weights appear to belong to three different metrological series (Tab. 5.2), which are connected to the ‘hybrid’, ‘light’ and ‘wool’ minas used in Mesopotamia between Early Dynastic III and the Akkadian period (*c.* 2600-2200 BC), and mentioned in the legal and lexical texts of Shurrupak and Abu Salabikh (Early Dynastic IIIa, *c.* 2600-2450 BC), in the temple archives of Umma and Girsu (Early Dynastic IIIb, *c.* 2600-2450 BC), in the texts of the palatine archives of Adab, Girsu, Umma and Sagub (Sargonid period, *c.* 2350-2200 BC), in the administrative texts of Girsu from the Second Dynasty of Lagash (*c.* 2200-2100 BC) (for 3rd millennium BC texts see Bartash 2019), and evident from the balance weights recovered from the main settlements of Mesopotamia (for

Tab. 5.2. Unit value of potential handled-weights.

Catalogue number	Mass (g)	Ratio (primary system)	Unit (primary system) (g)	Ratio (equivalences with Harappan/ Mesopotamian system)	Unit (g)
890	730.00	1+½ (= 90)	486.66	½ (= 50)	1,460.00
891	930.00	2 (= 120)	465.00	⅔ (= 66)	1,395.00
892	940.00	2 (= 120)	470.00	⅔ (= 66)	1,410.00
893	996.00	2 (= 120)	498.00	⅔ (= 66)	1,494.00
894	1,082.00	2+⅙ (= 130)	499.20	⅘ (= 80)	1,352.00
895	1,082.00	2+⅙ (= 130)	499.20	⅘ (= 80)	1,352.00
896	1,335.00	2+⅔ (= 160) 1 (= 100)	501.88 1,335.00	2+⅔ (= 160) 1 (= 100)	501.88 1,335.00
897	1,425.00	3 (= 180) 1 (=100)	475.00 1,425.00	3 (= 180) 1 (=100)	475.00 1,425.00
898	1,457.00	3 (= 180)	485.66	/	/
899	1,488.00	3 (= 180)	496.00	/	/
900	1,684.00	1	1,684.00		
903	1,693.00	1	1,684.00		
904	1,693.00	1	1,693.00		
901	1,698.00	1	1,698.00		
902	1,731.00	1	1,731.00		
905	1,940.00	4 (= 240)	485.00	1+½ (= 150)	1,293.33
906	1,967.00	4 (= 240)	491.75	1+½ (= 150)	1,311.00
909	2,404.00	5 (= 300)	480.80	/	/
910	2,438.00	5 (= 300)	487.60	/	/
911	2,627.00	5+½ (= 330) 2 (= 200)	477.63 1,313.00	5+½ (= 330) 2 (= 200)	477.63 1,313.00
912	2,695.00	5+½ (= 330) 2 (= 200)	490.00 1,347.50	5+1/2 (= 330) 2 (= 200)	490.00 1,347.50
913	2,698.00	5+½ (= 330) 2 (= 200)	490.54 1,349.00	5+½ (= 330) 2 (= 200)	490.54 1,349.00
914	3,331.00	2	1,665.50		
915	3,392.00	2	1,696.00		
916	3,814.00	8 (= 480)	476.75	3 (= 300)	1,271.33
917	3,866.00	8 (= 480)	483.25	/	/
918	3,979.50	8 (= 480)	497.37	3	1,326.50
919	4,318.00	9 (= 540)	479.77	/	/
920	4,615.00	10 (= 600)	461.50	3+½ (= 350)	1,318.57
921	5,753.00	12 (= 720)	479.41	/	/
922	5,846.00	12 (= 720)	487.16	/	/
924	6,224.00	4	1,556.00	/	/
925	6,581.00	4	1,645.00		
926	8,075.00	16 (= 960)	504.00	6 (= 600)	1,345.00
927	10,662.00	6	1,777.00		
928	12,700.00	10 (= 100)	1,270.00	/	/

the wool mina see Parise 1986; 1991; Zaccagnini 1999-2001, 51-54; Ascalone/Peyronel 2006a, 26-30; for the 564 g hybrid mina see Zaccagnini 1999-2001, 39-45; Parise 2001-2003, 443-445; most recently Ascalone 2011b).

1. The most common series relates to the Mesopotamian mina of *c.* 504 g, with Cat. no. 890-899, 905-906, 909-913, 916-922, 926 representing multiples of the unit. In particular, their metrological sequence follows the values known in the contemporary administrative texts, with series of ½, ⅓, ⅔, ⅚ (and ⅙) giving a coherent picture of the whole corpus. The objects give mina values between 461.50 g (Cat. no. 920) and 504 g (Cat. no. 925).
2. The second series comprising Cat. no. 896-897, 911-913, 928, relates to the Dilmunite/ Harappan mina first suggested by A. S. Hemmy (1938a, 606), who identified a unit of *c.* 13.65 g with multiples of 20, 40, 100, 200, 400, 500, and 800.
3. The third series comprises a group of weights (Cat. no. 900-904, 914-915, 924-925, 927) which interestingly does not seem to fit with the traditional Mesopotamian and Dilmunite weighing systems. They have an average mass of around 1,680/1,700 g, with a fairly clear

binary mathematical progression: x 1, x 2, x 4 (specimen Cat. no. 927 is uncertain). The value could represent a local mina, with a basic unit developed to facilitate conversion to the two main mina systems used along the Halil valley.

Cosine Quantogram Analysis (= CQA) of the 36 complete specimens returns the same three systems: the peaks in Fig. 5.4 confirm the results of the simple mathematical calculation in Tab. 5.2. Analysing a range between 0 and 1,000 returns five peaks at 136 g (1⁄10 of the Harappan mina; 136 g x 10 = 1,360 g), 244 g (½ of a slightly underestimated Mesopotamian mina; 244 g x 2 = 488 g), 343 g (⅓ of the Dilmunite mina; 343 g x 3 = 1,372 g), 478 g (one traditional Mesopotamian mina), and 855 g (½ of the local mina of *c.* 1,680/1,700 g).

Average values and concentration ranges were calculated based on the mass values recorded in the catalogue (Fig. 5.3). The first range (930-1,082 g) corresponds to the mina of 504 g, the second range (1,335-1,488 g) to the Harappan unit, the third (1,684-1,731 g) to the proposed local unit. A fourth range between 1,940-1,967 g equates to two Mesopotamian minas (between 485 g and 491.75 g), the fifth (2,404-2,438 g) represents five minas (between 480.80 g and 487.60 g). The range 2,627-2,698 g represents two Dilmunite minas (1,313.50-1,349 g), the next range (3,331-3,392 g) two local minas between 1,665.50 g and 1,696 g. The final range is equal to eight Mesopotamian minas with a unit between 483.25 g and 497.37 g.

The mathematical and statistical analyses, the archaeological contexts, the morphology, ethnographic comparisons, surface traces from suspension of the objects and a historical depiction from the 3rd millennium BC identify hand bag-shaped objects as balance weights, to be used on equal-arm balance scales as known from the most archaic periods in Baluchistan and contemporary contexts in the Indus Valley (see Paragraphs 2.10 and 2.14).[5] Their mass values adhere to three major mina systems, two of which were also used in Mesopotamia and the Greater Indus Valley. In addition to this tripartite metrological division, it is also possible to recognise weights that have equivalences with different systems; in particular, the Mesopotamian mina of Cat. no. 890-897, 905-906, 911-913, 916, 918, 920, 926 is also easily related to the Dilmunite mina with standardised ratios that, however, return a numerical progression unknown to the Harappan mina system (1/2, 2/3, 4/5, 1, 1 ½, 2, 3, 6). However, as assumed in the past (Ascalone 2019b, 41; 2020, 6), it seems very likely that the standardisation of weighing systems that regulated fractions and multiples of the Harappan series was in use for internal and/or official transactions, and less so when different metrological experiences were encountered, imposing the necessary decoding of weight values in one's own weighing reference system.

Lacking data from archaeological excavations and textual documentation, it is difficult to ascribe historical meaning to a codified and calibrated local mina of 1,680/1,700 g, particularly without knowledge of its divisors (*e. g.* shekel) and multiples (*e. g*. talent). On the basis of the Mesopotamian metrology (most recently Bartash 2019, 36-43), one wonders whether early metrological forms in Iran also involved the use of the mina alone, without its fractions (shekel) or multiples (talent). While there was in Mesopotamia a decided transition between 'fluid' and standardised weighing systems during the Sargonid dynasty (with the 'Sargon reform'), which saw the invention of mathematic ratios between shekel, talent and mina, it appears that the political and social crises around 2300/2200 BC prevented this historical development in south-eastern and eastern Iran. The Jiroft mina was therefore used in a similar way as the Early Dynastic II and III Mesopotamian minas prior to the weighing reformation by Sargon (*c.* 2335-2279 BC), *i. e.* mostly used to quantify large quantities of copper, wool and silver. The south-east Iranian mina would be used like the wool mina of 680 g which did not come in fractions of multiples during the entire 3rd millennium BC.

This proposed local mina of 1,680/1,700 g correlates to the light Mesopotamian shekel (one local mina equals 200 shekels; 200 x 8.45 g = 1,690 g), and to the heavy shekel of 17 g mentioned in Ur III texts (Bibby 1970; Roaf 1982; Zaccagnini 1986). It also correlates to an anomaly in the Harappan series, for which A. S. Hemmy (1931, 590, tab. I) first identified a sequence of 1⁄16, ⅛, ¼, ½, 1, 2, 4, 12.5, 20, 40, 100, 200, 400, 500, and 800. The unusual multiple 12.5 of the 13.60 g Harappan shekel has been identified from the Harappan weights, but its presence has never been explained: 12.5 x 13.60 g = 170 g, which is equal to 20 light (or ten heavy) Mesopotamian shekels and, perhaps more importantly, 1⁄10 of the local Jiroft mina. It can therefore be suggested that this series of multiples identified at Mohenjo-daro and Harappa could represent a parallel system used in addition to the regional one, which could easily be converted to the Mesopotamian shekel and the south-east Iranian mina.

In addition to these interrelated weighing system, Early Dynastic IIIa and Sargonid period texts mentioned a 'light mina', referred to as *ma-na-tur* ('little mina') on the Manishtusu obelisk. The little mina, which was commonly used in later times under Naram-Sin (*c.* 2254-2218 BC), is obtained by dividing the traditional mina of *c.* 504 g by three, thus obtaining a value of *c.* 168 g. This little mina was used for weighing silver, gold and copper traded from the Iranian plateau (Bartash 2019, 99-100).

5 Each weight shows clear traces of wear on the surface of the handle, suggesting that the objects were suspended (see also Micheli/Vidale 2012, 6).

Finally, the value of 1,680/1,700 g also correlated to three hybrid minas (60 shekels of 9.40 g). It remains unclear whether the 1,680/1,700 g Jiroft mina was the result of adapting the already existing Mesopotamian weight system, or whether it was a new unit defined and implemented by the Mesopotamian administration. Finally, future research may also reveal whether the Mesopotamian 564 g mina was simply adopted to convert the decimal system of the 9.40 g unit to the sexagesimal system of Mesopotamian tradition (as proposed by Zaccagnini 1999-2001, 39-45; Parise 2001-2003, 443-445), or to connect it to the Jiroft system.

The ratios mentioned in the text are summarised as follows:

C. 1,680/1,700 g (mina of Jiroft) = *c.* 10 x 170 g (Harappan weighing sequence of 12.5) = *c.* 10 x 170 g (little mina of ED IIIa/Sargonid period in Mesopotamia) = 100 Mesopotamian heavy shekels as mentioned in Ur III texts of 16.90 g (100 x 16.90 g = 1,690 g) = 200 traditional Mesopotamian shekels of 8.45 g (200 x 8.45 g = 1,690 g) = three hybrid minas of 564 g (564 x 3 g = 1,692 g) = 180 Karkemish shekels of 9.40 g (180 x 9.40 g = 1692 g).

5.2. Konar Sandal

In 2000, thousands of ancient artefacts from the province of Jiroft, particularly from the necropolises, were found for the antiquity market (Madjidzadeh 2003a; 2003b; Piran 2012). This led to the initiation of multiple excavation campaigns at Qaleh Kutchek (Ascalone *et al.* 2012) and other major sites in the Halil valley, including Mahtoutabad (Desset/Vidale 2013; Desset *et al.* 2013), Konar Sandal North, and Konar Sandal South (Fouache *et al.* 2005; Madjidzadeh 2008; Mashkour *et al.* 2013). Previous campaigns in the valley were carried out by A. Stein (1937) and S. M. S. Sajjadi (1987; 1989), by B. de Cardi (1967a; 1967b; 1968; 1970) in Bampur east of Jazmurian, by J. R. Caldwell (1967a; 1967b) in Tall-i Iblis west of Jiroft, and Tepe Yahya (see bibliography in 5.3). The site of Konar Sandal is located at the upper course of the Halil River, 250 km from Kerman, at an altitude of 650 m. a. s. l. The site consists of two major hills, Konar Sandal North and Konar Sandal South, which stand at a distance of 1,400 m from each other, both of which feature distinct occupational phases.

The archaeological campaigns in Konar Sandal South (KSS) began in January 2003 with the excavation of five trenches, located at the foot of the main hill (Trenches II and III, east and west of the main hill) and in the Lower Town (Trenches I, IV and V). The following years saw the opening of further trenches in other areas of the settlement (13 trenches in total). In the nearby Konar Sandal North (KSN), 26 trenches covering an area of 7,000 m^2 were excavated near the northern, north-eastern and north-western sides of the large 300 m x 300 m platform.

The investigations carried out in the valley over the last 20 years have revealed the great archaeological potential of the region, and identified the area as the Marhaši/Parakshum landscape mentioned in late 3rd millennium BC Mesopotamian texts (Steinkeller 2012). The excavations have revealed monumental buildings, the layout of the settlement (Acropolis, Lower Town, Outer Town and dwellings just outside the outer walls) (Madjidzadeh 2008, 74-75), the settlement organisation of the valley which seems to be characterised by several levels (Sajjadi 1987; 1989), information about the environment of the Halil region (Fouache *et al.* 2005; Mashkour *et al.* 2013), three inscribed tablets (Desset 2012; 2014; for Tepe Yahya epigraphic evidence see Damerow/Englund 1989), and evidence for official and household administrations (hundreds of cretulae and seals were found throughout the KSS settlement, very similar to those used in contemporary Lower Mesopotamia; Ascalone 2006b; 2008c; 2011a; 2012; 2018b; Pittman 2008; 2013).

5.2.1. Chronologies

Precise dating of Konar Sandal North remains problematic, and no distinct chronological timelines could be identified. The ceramics from KSN are typologically different to the Bronze and Iron Age assemblages found in the surrounding regions (Madjidzadeh 2008, 88). The general notion is that KSS was abandoned around 2200/2100 BC, after which the settlement moved to the nearby KSN hill, but due to the lack of material culture or isotope analysis the subsequent chronology of KSN remains entirely hypothetical (for comparisons see also Tepe Yahya in Magee 2004).

For KSS, however, the chronology of occupation could be reconstructed in great detail, based on stratigraphic layers, radiocarbon dating, and typological chronologies of ceramics and iconography depicted on seals and impressions. Radiocarbon dating shows a main occupational phase between *c.* 2500 BC and 2300 BC, with sporadic samples dating as late as 2150 BC. A comparison of the KSS ceramics with specimens found at nearby Varamin (Eskanderi *et. al.* 2021), in the neighbouring areas in Baluchistan (in Bampur; de Cardi 1968; 1970), Kerman (in Shahdad; Hakemi 1997a), and in the Soghun valley (Tepe Yahya; mainly in Lamberg-Karlovksy 1970; Beale 1986; Potts 2001) has returned a slightly longer occupational phase of the site. The ceramics suggest that the Lower Town was occupied as early as 2900-2600 BC (Takab IV1, end of Varamin IV), followed by a major occupation phase of the Citadel between 2500-2200 BC (Varamin V, Mahtoutabad IV and Bampur I-IV). Occupation of the Citadel during this period is confirmed by numerous seals and impressions, with specific KSS iconographies loosely related to the glyptic traditions of late Early Dynastic III Mesopotamia. Analysis of the iconography reveals two distinct classes: an early class frequently found in Trench III produced between *c.* 2500-2300 BC, succeeded by a later class produced after 2300 BC common in Trench V.

In summary, the evidence from isotope analysis, ceramic and iconographic typologies, and archaeological stratigraphy provide an absolute date range between *c.* 2500-2200 BC for the major occupation phase of KSS. The settlement then collapsed and likely moved to KSN on the northern hill.

5.2.2. Weights, potential weights, possible weights and associated finds (Cat. no. 933-937)

Only five objects are known from KSS (Cat. no. 933-937), all of which are stored in the Kerman Museum. Lacking detailed knowledge of the region's weight metrology, some of the objects (Cat. no. 933-934, 937; published in Ascalone 2019b; 2020), have been considered as potential weights, *i. e.* their morphology supports an interpretation which cannot be confirmed due to a lack of contextual information. Cat. no. 935 should also be considered a potential weight, as its morphology is similar to balance weights found in the Greater Indus Valley, at Shahr-i Sokhta (later 3rd millennium BC; Ascalone 2019b, fig. 7; 2020, no. 6), and Sohr Damb/Nal (2300-2000 BC; Franke/Cortesi 2015, no. 642-643). The morphology of Cat. no. 936, however, is uncertain; it was thus labelled a possible weight in accordance with the protocol in Chapter 1.

5.2.2.1. Archaeological contexts

Unfortunately, none of the specimens come from a secure archaeological context, thus making a precise dating impossible. Cat. no. 935 and 937 can be compared to common balance weights found in the major Harappan centres dated to Harappa 3C (end of the 3rd millennium BC). The morphology of Cat. no. 937 is specific for the end of the 3rd millennium BC, with comparable examples found at Bampur (Stein 1937, pl. XXX,Bam. A. 29), Harappa (Vats 1940, no. 26-28), Mohenjo-daro (Mackay 1938, pl. CXI,61), and Lothal (Rao 1985, pl. CCLIX,A, CCCVIII, 3-6.8). Cat. no. 934 likely dates to the same period, with similar shapes known from Gujarat, especially at Kotada Bhadli (Ruikar *et al.* 2015, fig. 8). The fifth objects, Cat. no. 935, dates slightly earlier, with a morphology widespread throughout Baluchistan and Central Asia between 2500-2300 BC (Franke/Cortesi 2015, no. 642-643).

5.2.2.2. Catalogue

5.2.2.2.1. Sphere (Type 7a): Cat. no. 933

933. Konar Sandal South. - KSS 0101309 - Sphere, perfect, potential weight, limestone. D. 5.8 cm, 244.02 g - Early ICS (= Yahya IVB), 2500-2300 BC - Mus. Kerman (KM 10876) - Ascalone 2020, no. 13.

5.2.2.2.2. Sphere with base (Type 7b): Cat. no. 934

934. Konar Sandal South. - No context - Sphere with base, perfect, potential weight, limestone. D. 4.9 cm, 179.13 g - Early ICS (= Yahya IVB), 2500-2300 BC - Mus. Kerman (KM 10875) - Ascalone 2020, no. 11.

5.2.2.2.3. Cylinder-shaped (Type 11a): Cat. no. 935

935. Konar Sandal South. - KSS 703 - Cylinder-shaped, slightly chipped, potential weight, limestone. H. 8.5 cm, D. 5.8 cm, 493.74 g - Early ICS (= Yahya IVB), 2500-2300 BC - Mus. Kerman (KM 10933).

5.2.2.2.4. Discoid (Type 17a): Cat. no. 936

936. Konar Sandal South. - KSS - Discoid, perfect, possible weight, limestone. H. 3.0 cm, D. 6.4 cm, 184.31 g - Early ICS (= Yahya IVB), 2500-2300 BC - Mus. Kerman (KM 10874).

5.2.2.2.5. Hemisphere (Type 20a): Cat. no. 937

937. Konar Sandal South. - No context - Hemisphere, perfect, potential weight, waagenophyllum. H. 3.3 cm, D. 5.4 cm, 140.68 g - Early ICS (= Yahya IVB), 2500-2300 BC - Mus. Kerman (KM 10878) - Ascalone 2020, no. 12.

5.2.2.3. Metrological notes

While statistical analysis would yield no viable results due to the small numbers of specimens, some basic considerations of the potential weights can be made. Cat. no. 935 with a mass of 493.74 g likely represented one Mesopotamian mina (slightly underestimated due to chipping), and Cat. no. 934 with a mass of 179.13 g ⅓ of a hybrid mina (537.39 g; ÷ 60 = 8.96 g). Hypothetically, it could also represent 13 Harappan shekels of 179.13 g, although factor 13 of a unit is otherwise completely unknown. The presence of the hybrid mina on the Iranian plateau was confirmed by the hand bag-shaped weights found at Jiroft, as discussed in Chapter 5.1. Cat. no. 939 was undoubtedly used as a balance weight, with its mass of 140.68 g representing 12 (= 11.72 g), 15 (= 9.37 g) and 18 western shekels (7.81 g) based on the western mina of 470 g. The presence of a weight of Harappan morphology, widely used in Syria, Anatolia and Palestine since the middle of the 3rd millennium BC, raises new questions regarding contacts between the Iranian plateau, Upper Mesopotamia and Inner Syria, which were partially addressed by the author in the past (Ascalone 2008a).

5.3. Tepe Yahya

Tepe Yahya is located in the valley of Soghun, near the village of Beghin, about 250 km from the city of Kerman, 150 km from the Iranian coast overlooking the Persian Gulf, 350 km from Bampur, and 180 km from Tall-i Iblis. The site was first identified on August 17, 1967, following the extensive landscape surveys carried out by C.

Tab. 5.3. Different chronological proposals for Tepe Yahya chronologies.

Periods	LK 1970	Kohl 1971	LK 1973	Amiet 1986a	Potts 1981a	Beale 1986
IVC	3400-3000	3400-3100	3400-3300	3000-2800	3000-2800	2850-2750
GAP	/	/	/	2800-2500	2800-2700	2750-2400
IVB	3000-2500	3100-2700	3000-2500	2500-2200	2700-2200	2400-1800
GAP	/	?	2500-2100	/	/	1800-1600
IVA	2500-2200	?	2100-1800	2200-1800	2200-1800	1600-1200

C. Lamberg-Karlovsky across the entire Kerman province. Tepe Yahya was then excavated continuously until 1975 under the patronage of Harvard University (Lamberg-Karlovsky 1970; 1971; 1972a; Beale 1973; 1986; Potts 2001). The new interest in an area so far almost completely unreferenced, bar J. R. Caldwell's excavations at Tall-i Iblis (Caldwell 1967a; 1967b) and B. de Cardi's work at remote Bampur (de Cardi 1967a; 1967b, 1968; 1970), commenced with a brief survey carried out at the base of the *tappeh*, which revealed enough convincing material for the American archaeologists to begin a systematic investigation of the site in the following year (Lamberg-Karlovsky 1968). Although too few in number to propose a detailed occupational chronology of the site, the ceramic fragments found near the surface of Yahya hill suggest a first occupation as early as the 6th millennium BC.

5.3.1. Chronologies

The Yahya *tappeh* was split into two by a vast south-west/north-east trench, consisting of 10 m x 10 m squares excavated during the subsequent archaeological campaigns. The excavated layers show a more intensive occupation during the 3rd and early 2nd millennium BC, but particularly Period IV remains poorly understood and subject to multiple, varied interpretations.

The difficulties in defining the chronology of Period IV became apparent in 1973 during the Baghin centre excavation (Lamberg-Karlovsky 1973; 1976a; *contra* Lamberg-Karlovsky 1970; 1971; 1972a; Beale 1973; 1986; see Tab. 5.3); the current interpretation of Tepe Yahya's development is mostly based on ceramics dating to subphases of Period IVB. The currently accepted chronologies are based on the propositions by those who worked directly on the site (see Kohl 2001, 209-228; Lamberg-Karlovsky 2001, 271-280; Potts 2001, 195-206), and on P. Amiet's study of seals in south-eastern Iran (Amiet 1986a, 163-169) (Tab. 5.4). On this basis, Period IVC, primarily known from a building excavated near the South Trench which has returned material with clear western influence mostly dating to the Proto-Elamite phases of the plateau, was succeeded by Period IVB, dating to the second and third quarters of the 3rd millennium BC.[6] A slightly later final date for Period IVB was proposed by D. T. Potts (2001, 200-201) and P. C. Kohl (2001, 221), based on the existence of an occupational abandonment of the site between Periods IVC and IVB.

D. T. Potts bases this late final date on a circular stamp seal, iconography comparable to Akkadian glyptics (see also Amiet 1976, 1-3, fig. 1; 1986a, 133, fig. 138; Pittman 2001, no. 59), square alabaster vessels frequently found in Bactria, Iran and at the Persian Gulf coast around 2000 BC, organic material radiocarbon dated to Shahr-i Sokhta Period IV (*c.* 2200-1800 BC), a Persian Gulf seal (see also Kohl 1971, fig. 2,I; Lamberg-Karlovsky 1971, fig. 2D; 1973, 34-35, pl. XXVI,a; Potts 1980, 403, 528-529, 536, fig. 66C; 2001, no. 57; Collon 1996, fig. 15n), and truncated pot fragments frequently found in BMAC towards the end of the 3rd, beginning of the 2nd millennium BC.

P. C. Kohl's chronology, on the other hand, is based on iconographic and technological comparisons between Tepe Yahya's chlorite/steatite finds and objects from Mesopotamian contexts dating to Early Dynastic II and III, comprising steatite/chlorite imported from the Iranian plateau. This evidence cannot be ignored in the overall chronological evaluation of Period IVB.

C. C. Lamberg-Karlovsky (2001, 273) openly doubts P. Amiet's proposed chronology, who assigns most of the seals from Tepe Yahya's Period IVB to the Akkadian period: '*…this is a classic example in which an art historian takes an unprovenienced object and uses it to date one with an archaeological context*'.

The chronology for Period IVB at Tepe Yahya proposed in this publication is primarily based on various seals found at the site, and is similar to the data proposed by P. C. Kohl (2001). Comparisons of the styles and iconographic depictions of seals found in contexts dated to Period IVB suggest that the period should be ascribed to a phase between *c.* 2500/2400 BC to 2200/2150 BC, finishing slightly earlier than the proposed final date of 2000 BC suggested by D. T. Potts (Ascalone 2011). Due

6 Bevelled-rim bowls and conical cups dating to Period IVC were found, similar to objects from Malyan's Middle Banesh (Nicholas 1980; Potts 1980, 426). Ceramics comparable to finds from Susa VR I, lev. 18-17 or Susa IIIB (Potts 1980, 429; see also Carter 1980) were also recovered, as well as Proto-Elamite tablets similar to those found at the *Acropole*, lev. 16 in Susa, dating to Susa IIIA (see Lamberg-Karlovsky 1976b, 73, fig. 3, pl. 7; Le Brun/Vallat 1978, 39-40); Potts 1980, 381-382, 425-426, fig. 67 with Vallat 1971, 243. A number of Proto-Elamite cylinder-shaped seals and impressions place Yahya's Period IVC approximately between the 4th and 3rd millennium BC, and no later than 2800 BC.

to the occupational 'gap' after the Proto-Elamite Period IVC, the seals from Tepe Yahya provide no information on the development of glyptic art in the Soghun valley. There seems to be no relation to the development from Proto-Elamite glyptic art to the later sphragistic of south-eastern Iran, which evolves around figurative expressions based on indigenous mythical and theological conceptions from south-eastern Iran in the second half of the 3rd millennium BC. Considering that the Proto-Elamite probably did not extend past *c.* 2900/2800 BC, and that the cylinder-shaped seals and impressions from south-eastern Iran date to a period between 2400-2200 BC, Tepe Yahya seems to have been abandoned at a time contemporary to Mesopotamian Periods ED II and III. The centre of the Soghun valley was likely not directly involved in the steatite/chlorite 'market' during the second quarter of the 3rd millennium BC, when numerous steatite/chlorite vessels were exported to the settlements in Diyala and Mesopotamia, thus providing the most significant evidence for a wide and articulated exchange system involving the remote eastern regions of Iran. This exchange could have been encouraged and developed by nomadic merchants of the region, and by the Halil River Valley, where recent discoveries have revolutionised our understanding of ancient south-eastern Iran (Majidzadeh 2003a; 2003b; 2008). In February 2001, the Iranian government confiscated around 900 archaeological objects obtained from illegal excavations in Jiroft, including at least 300 'intercultural'/'*séries anciennes*' vessels made of chlorite/steatite. The recovery of the objects has encouraged new research activities in the area, which revealed at least 90 settlements along a 20 km x 40 km stretch in the Halil River Valley, mostly dating to the 3rd millennium BC. The most significant discovery of south-eastern Pre-Achaemenid Iran is the so-called Jiroft civilisation, which shed light on the existence of early urban settlement structures in the Kerman province (Lamberg-Karlovsky 2003, 76-77; Majidzadeh 2003b, 18-63; 2003c, 64-75; Perrot 2003, 96-113; Pittman 2003, 78-87; Ascalone 2011, 331-345).

Summing up, the seals of Period IVB date no later than 2400 BC, and the Proto-Elamite seals of Period IVC ceased around 2900/2800 BC at the latest. This suggests that Yahya IVB began around the third quarter of the 3rd millennium BC, although comparisons with Mesopotamian chlorite vessels from Early Dynastic III (Adab, Khafaja, Agrab, Ur, Nippur and Mari) could push this date slightly backwards to *c.* 2500 BC (Ascalone 2003; 2006a).

Contrary to D. T. Potts (2001, 195-206), the final appearance on cylinder-shaped seals and Intercultural Style vessels place the end of Period IVB around 2200 BC.[7] D. T. Potts' (2001, 200-201)

Periods	Lamberg-Karlovsky 2001	Potts 2001	Kohl 2001
IVC	3000-2700	3000-2800	3000-2800
GAP	?	2800-2300/2200	2800-2500
IVB	2400-2100	2300/2200-2000	2500-2200
IVA	2100-1800	2000-1700	2200-1800

▲*Tab. 5.4. More recent proposals on Tepe Yahya's stratigraphies.*

analysis of the archaeological material, which led him to propose the termination of Period IVB as late as the beginning of the 2nd millennium BC, has been 'reinterpreted' and widely contested by C. C. Lamberg-Karlovsky (2001, 273-274):

1) D. T. Potts' chronological proposal is based on presumed alabaster vessels with alleged typological counterparts from Bactria, the Persian Gulf coast and Iran around 2000 BC. In fact, the Period IVB vessels are made of undecorated steatite/chlorite instead of alabaster, and the comparisons D. T. Potts refers to are typologically more similar to decorated square-based vessels from Period IVA.

2) The engraved grey ceramic fragment is the only object that connects Tepe Yahya to Shahr-i Sokhta, being similar in style to vessels from Shahr-i Sokhta IV. Any chronological dating of Tepe Yahya IVB based on comparisons to the Helmand Valley is therefore at best purely speculative.

3) The Persian Gulf type seal is an early prototype of an object type that only became common during the last two centuries of the 3rd millennium BC. It most likely dates to the final phase of Period IVB, between 2300/2250 BC and 2200/2150 BC, rather than to the final years of the 3rd millennium BC.

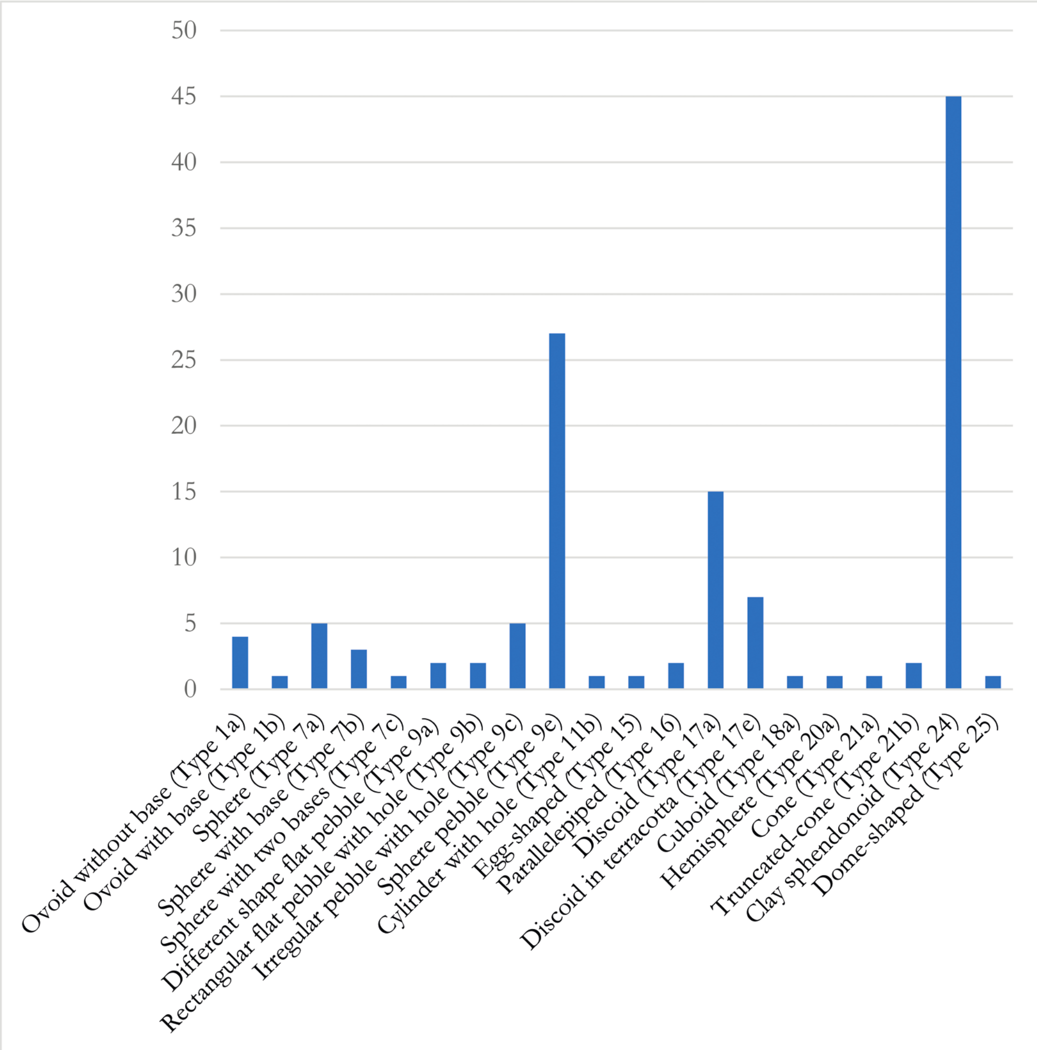
4) The truncated pots are not specific to the turn of the 3rd to 2nd millennium BC, but were used for an extended period of time and have been described in numerous ways such as buff ware at Gonur, grey burnished ware at Hissar, or red slipped ware.

Tepe Yahya's Period IVB should be dated to between 2500/2400 BC and 2200 BC. The period witnessed the development of a new style of seals, the continued and developed production of ancient steatite/chlorite vessels (see the archaeological contexts of Mesopotamian discoveries, and the recent discoveries in the Halil River Valley), and the import of stamp seals from the Persian Gulf.

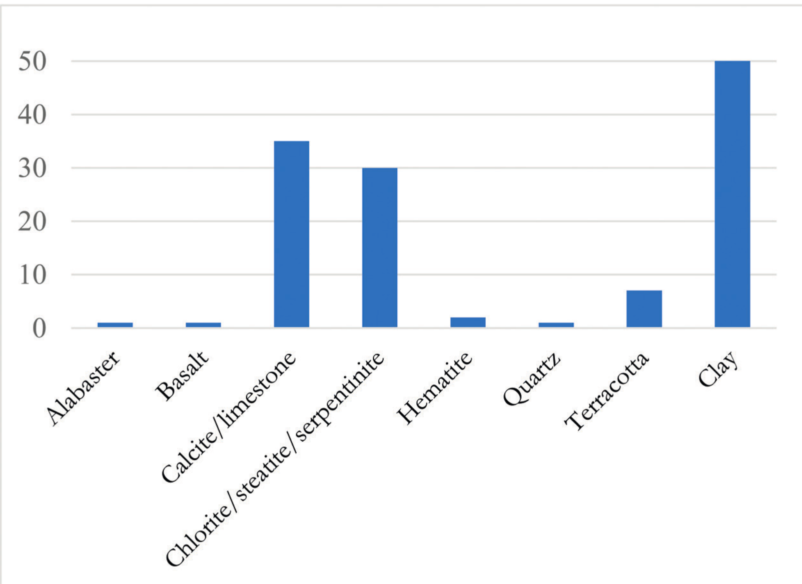
At Tepe Yahya, evidence for Period IVA has been found in areas A, B and BW of the South Trench (Potts 1980, 575). Typological parallels can be found in the painted buff ware from Malyan (Sumner 1974, 173, fig. 7, 9; Potts 1980, 570-571). Steatite/chlorite vessels with concentric pattern decorations (or '*série récente*') are similar to objects from Susa VB (de Miroschedji 1973) dated to the Neo-Sumerian period (Potts 1980, 581).

7 The Jiroft vessels found in Shahdad, Hissar and Mari come from certain Akkadian contexts (Ascalone 2003; 2006a), a chlorite vase fragment bears a significant inscription by Rimush (Meissner 1920, tab. 125; Kohl 1974, 247; 1975a, 30; Potts, T. F. 1994, 258) and two further fragments found at the Inshushinak temple in Susa built by Shulgi (de Mecquenem 1911, 67 for the discovery contexts and Amiet 1966, fig. 149 for the iconography) might date the end of Jiroft production to the post-Akkadian period.

▶ *Fig. 5.5. Distribution of shapes from Tepe Yahya.*



▼ *Fig. 5.6. Distribution of materials from Tepe Yahya.*



5.3.2. Weights, potential weights, possible weights and associated finds (Cat. no. 938-1064)

As with all sites from the Iranian plateau, the identification of balance weights remains challenging, beginning with the total lack of secure specimens from other Iranian Bronze Age settlements (Fig. 5.5-6). Based on the method described in Chapter 1, the objects can be divided into eight potential and 35 possible weights. The morphologies, materials and mass values of the potential weights suggest that the objects were indeed likely used as balance weights, whereas the mostly pebble-shaped possible weights remain significantly more uncertain.

The remaining objects presented in the catalogue cannot be considered balance weights, although some objects could be subject to further studies (particularly flat, rounded, perforated objects, Cat. no. 957-961). Similar to the objects from Shahr-i Sokhta's, the clay sphendonoids should be considered as accounting objects rather than balance weights, as confirmed by the most recent excavations in the major centre of Sistan (Cat. no. 1019-1063) (Ascalone 2019g; Rivoltella 2022).

5.3.2.1. Archaeological contexts

The objects from Tepe Yahya were mostly found in contexts dating to the second half of the 3rd millennium BC (*c.* 2500-2200/2100 BC), with only a third of the objects coming from earlier Period

IVC contexts (see Tab. 5.3 and 5.4). The latter were found in association with Proto-Elamite tablets, seals, sealings and ceramics, commonly used from Susiana to Makran between the end of the 4th and the beginning of the 3rd millennium BC. Of the eight potential weights, only Cat. no. 943 (IVB1) and 1016 (IVC1) come from secure archaeological contexts, dated to 2400-2200 BC and 2500-2400 BC, respectively. During this period, commercial relations between the Indus Valley, Mesopotamia and the Persian Gulf coasts intensified.

5.3.2.2. Catalogue

5.3.2.2.1. Ovoid (Type 1a): Cat. no. 938-940

938. Tepe Yahya. - Z.236 (23/6/70), Area AW, TT-1, 4-6 - Fragmented ovoid, chipped, steatite. L. 5.91 cm, H. 1.91 cm, W. 1.90 cm, 21.17+x g - Mus. Peabody.

939. Tepe Yahya. - SF.11 (1968), Area C, TT-2, 1 - Fragmented ovoid, steatite. L. 4.01 cm, H. 2.22 cm, W. 4.38 cm, 82.79+x g - Mus. Peabody.

940. Tepe Yahya. - Z.158 (20/7/69), Area BW, TT-6, 3 - Ovoid, chipped, steatite. H. 4.00 cm, D. 5.75 cm, 118.01+x g - Mus. Peabody.

5.3.2.2.2. Ovoid with base (Type 1b): Cat. no. 941

941. Tepe Yahya. - Z.537 (1970), Area CW, TT-1 - Ovoid with base, good, limestone. L. 4.48 cm, H. 3.20 cm, W. 2.70 cm, 57.79 g - Early ICS, Yahya IVC1, 2500-2400 BC - Mus. Peabody.

5.3.2.2.3. Sphere (Type 7a): Cat. no. 942-948

942. Tepe Yahya. - Z.2309 (1970), Area C, TT-7, 3 - Sphere, good, worn, limestone. D. 1.01 cm, 1.40 g - Mus. Peabody.

943. Tepe Yahya. - Z.362 (1970), Area XD, TT-3 - Sphere, perfect, potential weight, hematite. D. 2.10 cm, 2.80 g - Early ICS, Yahya IVB1, 2400-2200 BC - Mus. Peabody.

944. Tepe Yahya. - Z.244 (1970), Area XD, TT-2-3 - Sphere, good, slightly worn, possible weight, limestone. D. 2.73 cm, 8.84 g - Mus. Peabody.

945. Tepe Yahya. - Z.743 (1969), Area D, 5b - Sphere, good, worn, possible weight, limestone. D. 2.30 cm, 16.93 g - Mus. Peabody.

946. Tepe Yahya. - Z.384 (8/8/70), Area B, I - Sphere, good, limestone. H. 5.33 cm, D. 5.90 cm, 306.52 g - Early ICS, Yahya IVB1, 2400-2200 BC - Mus. Peabody.

947. Tepe Yahya. - Z.379 (4/8/70), Area B, TT-6, 14 - Sphere, slightly worn, possible weight, steatite. D. 3.18 cm, 49.90 g - Early ICS, Yahya IVB5, 2400-2200 BC - Mus. Peabody.

948. Tepe Yahya. - Z.139 (28/7/69), Area B, 4A, Room B - Sphere, good, possible weight, steatite. D. 4.60 cm, 143.51 g - Mus. Peabody.

5.3.2.2.4. Sphere with base (Type 7b): Cat. no. 949-951

949. Tepe Yahya. - Z.63 (21/6/73), Area XBE, TT-1 - Sphere with base, good, potential weight, steatite. H. 1.02 cm, D. 1.21 cm, 2.39 g - Mus. Peabody.

950. Tepe Yahya. - Z.82 (16/7/69), Area C, 7, 3 - Sphere with base and marking ('I'), good, slightly worn, limestone. H. 2.77 cm, D. 3.25 cm, 13.37 g - Yahya VIB.1-VC (context C.69.7), 4500-4000 BC - Mus. Peabody.

951. Tepe Yahya. - 6/8/70, Area B, 8,1 - Sphere with base, traces of suspension rope, good, slightly worn, possible weight, steatite. H. 7.19 cm, D. 5.41 cm, 520.90 g - Mus. Peabody.

5.3.2.2.5. Sphere with two bases (Type 7c): Cat. no. 952

952. Tepe Yahya. - Z.264, Area ANW, 3, 4 - Sphere with two bases, slightly worn, polished sides, potential weight, steatite. H. 2.80 cm, D. 3.33 cm, 53.43 g - Iron Age - Mus. Peabody.

5.3.2.2.6. Rectangular flat pebble (Type 9b): Cat. no. 953-954

953. Tepe Yahya. - Z.390 (17/8/70), Area CW, TT-4, 2-3 - Rectangular flat pebble, good, steatite. L. 6.20 cm, H. 4.85 cm, W. 1.00 cm, 56.07 g - Yahya IVB5, Early ICS, 2400-2200 BC - Mus. Peabody.

954. Tepe Yahya. - Z.585 (23/6/71), Area XB, TT-1, 1 - Flat pebble, good, limestone. L. 11.55 cm, H. 7.38 cm, W. 1.98 cm, 254.70 g - Mus. Peabody.

5.3.2.2.7. Parallelepiped with hole (Type 16b): Cat. no. 955-956

955. Tepe Yahya. - Z.142, Area A, 2, 3 - Parallelepiped with hole, fragmented and chipped, steatite. H. 6.05 cm, W. 1.45 cm, 34.75+x g - Mus. Peabody.

956. Tepe Yahya. - Z.2378 (1/8/71), Area AN - Parallelepiped with hole, good, steatite. H. 6.80 cm, W. 1.50 cm, 45.69 g - Mus. Peabody.

5.3.2.2.8. Rounded flat with hole (Type 27): Cat. no. 957-961

957. Tepe Yahya. - SF.689 (3/7/71), Area X-BE, TT-2, 1, 3B - Rounded flat with hole, fragmented?, steatite. L. 2.77 cm, H. 0.48 cm, 3.94 g - Mus. Peabody.

958. Tepe Yahya. - SF.3871 (1970), Area XB, TT-1, 2A - Rounded flat with hole, chipped?, steatite. L. 5.66 cm, H. 1.85 cm, 101.32 g - Mus. Peabody.

959. Tepe Yahya. - SF.690 (3/7/71), Area X-BE, TT-2, 3B, a - Rounded flat with hole, worn, steatite. L. 8.80 cm, H. 2.45 cm, 194.05 g - Mus. Peabody.

960. Tepe Yahya. - Z.771 (8/7/73), Area A. 58 - Rounded flat with hole, good, steatite. L. 8.88 cm, H. 3.35 cm, 327.39 g - Mus. Peabody.

961. Tepe Yahya. - 7/2/73, Area X-BE, TT-2, 2 - Rounded flat with hole, chipped?, steatite. L. 9.30 cm, H. 2.60 cm, 375.70 g - Mus. Peabody.

5.3.2.2.9. Sphere pebble (Type 9d): Cat. no. 962-987

962. Tepe Yahya. - 7/7/70, Area B-BW, TT-3, Surface - Sphere pebble, good, worn, possible weight, limestone. D. 0.91 cm, 0.90 g - Mus. Peabody.

963. Tepe Yahya. - Z.631 (20/6/73), Area C/DE, S-2-3 - Sphere pebble, good, possible weight, limestone. D. 1.05 cm, 0.99 g - Mus. Peabody.

964. Tepe Yahya. - 11/8/71, Area B, A-9 - Sphere pebble, good, worn, possible weight, limestone. D. 2.00 cm, 1.75 g - Mus. Peabody.
965. Tepe Yahya. - Z.2214 (2/8/70), Area AN1, 5 - Sphere pebble, good, worn, possible weight, limestone. D. 1.58 cm, 3.73 g - Mus. Peabody.
966. Tepe Yahya. - Z.266 (30/6/70), Area AW, 7, 5 - Sphere pebble, chipped, possible weight, terracotta. D. 1.65 cm, 3.83+x g - Mus. Peabody.
967. Tepe Yahya. - Z.715 (28/6/70), Area ANW1, 1 - Sphere pebble, good, worn, possible weight, limestone. D. 2.78 cm, 5.71 g - Mus. Peabody.
968. Tepe Yahya. - Z.2213 (2/8/70), Area AN1, 5 - Sphere pebble, chipped, possible weight, limestone. D. 1.80 cm, 5.78 g - Mus. Peabody.
969. Tepe Yahya. - Z.1233 (26/7/71), Area XCE, TT-2, 14, 35 - Sphere pebble, chipped, possible weight, terracotta. D. 1.99 cm, 5.86+x g - Mus. Peabody.
970. Tepe Yahya. - Z.707 (19/6/73), Area S - Sphere pebble, good, possible weight, limestone. D. 2.10 cm, 8.45 g - Mus. Peabody.
971. Tepe Yahya. - Z.1142 (6/8/71), Area AN4, TT-1, 3 - Sphere pebble, slightly chipped, possible weight, limestone. D. 2.10 cm, 9.52 g - Mus. Peabody.
972. Tepe Yahya. - Z.251 (8/15/70), Area B-BW, TT-4, 8 - Sphere pebble, good, slightly worn, possible weight, limestone. D. 3.76 cm, 63.84 g - Early ICS, Yahya IVB6, 2400-2200 BC - Mus. Peabody.
973. Tepe Yahya. - Z.1168 (5/7/71), Area C, TT-3, 1, 3 - Sphere pebble, worn, possible weight, terracotta. D. 2.38 cm, 14.29 g - Mus. Peabody.
974. Tepe Yahya. - Z.386 (11/8/70), Area B, TT-1, 2 - Sphere pebble, good, possible weight, limestone. D. 2.75 cm, 7.18 g - Mus. Peabody.
975. Tepe Yahya. - Z.170 (13/7/69), Area B, TT-4, 2 - Sphere pebble, good, worn, possible weight, limestone. D. 2.30 cm, 15.13 g - Mus. Peabody.
976. Tepe Yahya. - Z.77 (6/7/69), Area BW, Surface - Sphere pebble, chipped, possible weight, terracotta. D. 3.50 cm, 15.99+x g - Early ICS, Yahya IVB1, 2400-2200 BC - Mus. Peabody.
977. Tepe Yahya. - Z.1170 (6/7/71), Area C, TT-3, 1, 4 - Sphere pebble, good, worn, possible weight, limestone. D. 2.31 cm, 16.15 g - Mus. Peabody.
978. Tepe Yahya. - Z.49 (27/7/69), Area C, 7, 17 - Sphere pebble, good, worn, possible weight, limestone. D. 2.68 cm, 16.95 g - Mus. Peabody.
979. Tepe Yahya. - Z.172 (16/7/69), Area B, T-4A, 2 - Sphere pebble, good, worn, possible weight, limestone. D. 2.89 cm, 17.76 g - Mus. Peabody.
980. Tepe Yahya. - Z.755 (1969), Area D, 5b - Sphere pebble, good, worn, possible weight, limestone. D. 2.78 cm, 18.58 g - Mus. Peabody.
981. Tepe Yahya. - SF.1107 (30/6/69), Area D, 4A, 1 - Sphere pebble, good, worn, possible weight, limestone. D. 2.49 cm, 18.98 g - Mus. Peabody.
982. Tepe Yahya. - Z.1094 (26/7/69), Area C, 7, Room 8 - Sphere pebble, good, worn, possible weight, limestone. D. 3.61 cm, 20.66 g - Mus. Peabody.
983. Tepe Yahya. - Z.173 (13/7/69), Area E, TT-2, 5 - Sphere pebble, good, worn, possible weight, limestone. D. 2.55 cm, 23.39 g - Mus. Peabody.
984. Tepe Yahya. - Z.250 (30/6/70), Area AW, 7, 5 - Sphere pebble, worn and chipped, possible weight, terracotta. D. 3.08 cm, 23.64+x g - Mus. Peabody.
985. Tepe Yahya. - Z.2403 (30/7/71), Area B, 14 - Sphere pebble, good, slightly worn, possible weight, calcite. D. 3.81 cm, 26.34 g - Yahya IVC, 3100-2800 BC - Mus. Peabody.
986. Tepe Yahya. - Z.133 (27/7/69), Area C, 7, Room 17 - Sphere pebble, good, worn, possible weight, limestone. D. 2.70 cm, 26.69 g - Mus. Peabody.
987. Tepe Yahya. - Z.138 (29/7/69), Area C, 7 - Sphere pebble, *c.* one half is missing, possible weight, limestone. D. 2.81 cm, 187.82+x g - Mus. Peabody.

5.3.2.2.10. Cylinder-shaped with hole (Type 11b): Cat. no. 988

988. Tepe Yahya. - Z.541 (13/6/71), Area A, 2 - Cylinder-shaped with hole, good, steatite. H. 6.00 cm, W. 0.98 cm, 10.31 g - Early ICS, Yahya IVC1, 2500-2400 BC - Mus. Peabody.

5.3.2.2.11. Egg-shaped (Type 15): Cat. no. 989

989. Tepe Yahya. - Z.51, Area XB, 6 - Egg-shaped, perfect, potential weight, limestone. H. 1.70 cm, D. 1.32 cm, 3.65 g - Mus. Peabody.

5.3.2.2.12. Parallelepiped (Type 16a): Cat. no. 990-991

990. Tepe Yahya. - Z.2088, Area BW, TT-5, 4 - Parallelepiped, good, potential weight, steatite. L. 1.55 cm, H. 0.95 cm, W. 1.20 cm, 3.41 g - Yahya IVC, 3100-2800 BC - Mus. Peabody.
991. Tepe Yahya. - 8/2/70, Area AN1. S - Parallelepiped, good, steatite. L. 3.58 cm, H. 3.61 cm, W. 0.85 cm, 22.11 g - Mus. Peabody.

5.3.2.2.13. Discoid (Type 17a): Cat. no. 992-1006

992. Tepe Yahya. - Z.681 (24/6/73), Area XBE, I-5 - Discoid, good, worn, potential weight, limestone. H. 1.81 cm, D. 1.85 cm, 6.35 g - Mus. Peabody.
993. Tepe Yahya. - Z.2118, Area C, Surface - Discoid, good, limestone. H. 0.55 cm, D. 2.25 cm, 6.86 g - Proto-Elamite, Yahya IVC2, 3000-2700 BC - Mus. Peabody.
994. Tepe Yahya. - Z.243 (1970), Area XD, TT-2, 3 - Discoid, chipped, limestone. H. 2.40 cm, D. 2.08 cm, 6.89 g - Mus. Peabody.
995. Tepe Yahya. - SF.329 (4/7/70), Area B, TT-4, 2, 4A - Discoid, worn, surface incisions, steatite. H. 0.88 cm, D. 2.11 cm, 7.29 g - Mus. Peabody.
996. Tepe Yahya. - Z.356 (1970), Area B, TT-1, 2 - Discoid, good, alabaster. H. 0.71 cm, D. 2.81 cm, 10.15 g - Mus. Peabody.
997. Tepe Yahya. - SF.357 (30/6/70), Area BBW, TT-2, 14 - Discoid, good, steatite. H. 0.85 cm, D. 3.71 cm, 12.17 g - Mus. Peabody.
998. Tepe Yahya. - 1970, Area C, I, 18 - Discoid, incomplete, steatite. H. 0.66 cm, D. 4.44 cm, 19.15+x g - Mus. Peabody.

999. Tepe Yahya. - SF.123 (1969), Area BW, TT-5, 2, 4A - Discoid, chipped in multiple areas, steatite. H. 1.08 cm, D. 3.45 cm, 20.12 g - Mus. Peabody.

1000. Tepe Yahya. - Z.363 (1970), Area XD, TT-2, Surface - Discoid, worn, limestone. H. 1.73 cm, D. 2.10 cm, 22.58 g - Early ICS, Yahya IVB1, 2400-2200 BC - Mus. Peabody.

1001. Tepe Yahya. - 21/07/73, Area XCE, TT-5 – Discoid, traces of suspension rope, chipped, steatite. H. 1.35 cm, D. 3.48 cm, 32.81 g - Mus. Peabody.

1002. Tepe Yahya. - Z.744 (1969), Area D, 6 - Discoid, chipped, steatite. H. 1.15 cm, D. 3.99 cm, 33.35 g - Mus. Peabody.

1003. Tepe Yahya. - Z.91, Area B, TT-5 - Discoid, chipped, steatite. H. 1.30 cm, D. 3.90 cm, 35.42 g - Mus. Peabody.

1004. Tepe Yahya. - Area B, TT-1 - Discoid, chipped, steatite. H. 2.45 cm, D. 4.20 cm, 47.79 g - Mus. Peabody.

1005. Tepe Yahya. - Z.2334 (8/7/71), Area A, 23 - Discoid, good, steatite. H. 9.11 cm, D. 3.20 cm, 480.99 g - Mus. Peabody.

1006. Tepe Yahya. - SF.1878 (1968), Area D, 5a - Discoid, good, slightly worn, two concentric circles engraved, limestone. L. 11.41 cm, H. 9.39 cm, W. 1.25 cm, 657.50 g - Mus. Peabody.

5.3.2.2.14. Terracotta discoid (Type 17e): Cat. no. 1007-1013

1007. Tepe Yahya. - Z.595, Area A, 29 - Discoid, good, terracotta. H. 0.48 cm, D. 2.92 cm, 4.66 g - Mus. Peabody.

1008. Tepe Yahya. - Z.2954 (1970), Area C, TT-6, 5 - Discoid, incomplete, terracotta. H. 1.75 cm, D. 2.38 cm, 6.52+x g - Mus. Peabody.

1009. Tepe Yahya. - Z.1092 (14/7/69), Area C, 3, Room 7 - Discoid, good, terracotta. H. 1.58 cm, D. 3.31 cm, 8.53 g - Mus. Peabody.

1010. Tepe Yahya. - Z.223 (23/7/73), Area XCE, TT-6 - Discoid, good, worn, terracotta. H. 0.85 cm, D. 3.50 cm, 11.10 g - Mus. Peabody.

1011. Tepe Yahya. - Z.75 (29/7/69), Area BW, TT-5, 6 - Discoid, good, terracotta. H. 1.40 cm, D. 2.82 cm, 13.55 g - Early ICS, Yahya IVB1, 2400-2200 BC - Mus. Peabody.

1012. Tepe Yahya. - Z.131 (16/8/69), Area C, TT-3, 1, 6 - Discoid, good, terracotta. H. 1.16 cm, D. 3.32 cm, 17.22 g - Mus. Peabody.

1013. Tepe Yahya. - Z.1097 (21/7/69), Area C, 7, Room 10 - Discoid, good, terracotta. H. 1.10 cm, D. 5.45 cm, 22.30 g - Mus. Peabody.

5.3.2.2.15. Cuboid (Type 18a): Cat. no. 1014

1014. Tepe Yahya. - Z.2266 (7/7/70), Area B, 1, 4 - Cuboid, with dots engraved on three sides (1 – 4 – 1), good, steatite. L. 2.40 cm, H. 1.95 cm, W. 0.96 cm, 10.58 g - Mus. Peabody.

5.3.2.2.16. Hemisphere (Type 20a): Cat. no. 1015

1015. Tepe Yahya. - Z.9, Area E, Surface - Hemisphere, perfect, potential weight, hematite. H. 1.15 cm, D. 1.48 cm, 4.11 g - Mus. Peabody.

5.3.2.2.17. Truncated cone (Type 21b): Cat. no. 1016-1017

1016. Tepe Yahya. - Z.542 (3/7/71), Area A-AN - Truncated cone, good, potential weight. H. 2.01 cm, D. 1.55 cm, 8.66 g - Early ICS, Yahya IVC1, 2500-2400 BC - Mus. Peabody.

1017. Tepe Yahya. - Z.399 (1970), Area XBE, 7 - Truncated cone, good, steatite. L. 3.25 cm, D. 3.20 cm, 48.02 g - Mus. Peabody.

5.3.2.2.18. Cone (Type 21a): Cat. no. 1018

1018. Tepe Yahya. - Z.644 (14/8/73), Area XBE, TT-13 - Cone, slightly chipped, possible weight, limestone (?), highly porous. H. 6.60 cm, D. 4.65 cm, 69.47 g - Mus. Peabody.

5.3.2.2.19. Clay sphendonoid (Type 24): Cat. no. 1019-1063

1019. Tepe Yahya. - Z.291 (30/7/70), Area B, 8 - Sphendonoid, one side chipped, clay. L. 3.91 cm, W. 2.65 cm, 21.87+x g - Early ICS, Yahya IVB5, 2400-2200 BC - Mus. Peabody.

1020. Tepe Yahya. - Z.281 (6/8/70), Area B, 8, 1 - Sphendonoid, strongly worn, clay. L. 4.51 cm, W. 2.75 cm, 21.99+x g - Early ICS, Yahya IVB5, 2400-2200 BC - Mus. Peabody.

1021. Tepe Yahya. - Z.591 (15/6/71), Area BW/CW, 2A - Sphendonoid, slightly chipped, clay. L. 4.35 cm, W. 2.59 cm, 22.70+x g - Early ICS, Yahya IVB, 2400-2200 BC - Mus. Peabody.

1022. Tepe Yahya. - Z.285b (28/6/70), Area B-BW, TT-2, 12 (with no. 295-297) - Fragmented sphendonoid, clay. L. 3.53 cm, W. 1.98 cm, 19.98+x g - Early ICS, Yahya IVB3, 2400-2200 BC - Mus. Peabody.

1023. Tepe Yahya. - Z.285a (28/6/70), Area B-BW, TT-2, 12 (with no. 296-297) - Sphendonoid, good, slightly chipped, clay. L. 4.32 cm, W. 2.55 cm, 20.32+x g - Early ICS, Yahya IVB3, 2400-2200 BC - Mus. Peabody.

1024. Tepe Yahya. - Z.278f (1970), Area B, TT-1, 2 (with no. 302-306, 308) - Fragmented sphendonoid, clay. L. 4.10 cm, W. 2.70 cm, 20.34+x g - Early ICS, Yahya IVB2, 2400-2200 BC - Mus. Peabody.

1025. Tepe Yahya. - Z.242 (10/8/70), Area B-BW - Sphendonoid, chipped, clay. L. 4.25 cm, W. 2.55 cm, 20.38+x g - Mus. Peabody.

1026. Tepe Yahya. - Z.88 (31/7/69), Area C, 7, Room 15 (with no. 298-300) - Sphendonoid, good, clay. L. 5.15 cm, W. 3.83 cm, 21.55 g - Early ICS, Yahya IVB, 2400-2200 BC - Mus. Peabody.

1027. Tepe Yahya. - Z.278D (1970), Area B, TT-1, 2 (with no. 302-304, 306-308) - Sphendonoid, good, with markings (‘II’), clay. L. 4.38 cm, W. 3.60 cm, 21.60 g - Early ICS, Yahya IVB2, 2400-2200 BC - Mus. Peabody.

1028. Tepe Yahya. - Z.291 (30/7/70), Area B, 8 - Sphendonoid, one side chipped, clay. L. 3.91 cm, W. 2.65 cm, 21.87+x g - Early ICS, Yahya IVB5, 2400-2200 BC - Mus. Peabody.

1029. Tepe Yahya. - Z.281 (6/8/70), Area B, 8, 1 - Sphendonoid, heavily worn, clay. L. 4.51 cm, W. 2.75 cm, 21.99+x g - Early ICS, 2400-2200 BC - Mus. Peabody.

1030. Tepe Yahya. - Z.591 (15/6/71), Area BW/CW, 2A - Sphendonoid, slightly chipped, clay. L. 4.35 cm, W. 2.59 cm, 22.70+x g - Early ICS, Yahya IVB, 2400-2200 BC - Mus. Peabody.

1031. Tepe Yahya. - Z.279b (20/7/70), Area B-BW, TT-4, 7 (with no. 285) - Sphendonoid, good, clay. L. 4.76 cm, W. 2.75 cm, 23.41 g - Early ICS, Yahya IVB5, 2400-2200 BC - Mus. Peabody.

1032. Tepe Yahya. - Z.278a (1970), Area B, TT-1, 2 (with no. 303-308) - Fragmented sphendonoid, clay. L. 4.51 cm, W. 3.78 cm, 23.43+x g - Early ICS, Yahya IVB, 2400-2200 BC - Mus. Peabody.

1033. Tepe Yahya. - Z.85 (31/7/69), Area C, 7, Room 15 (with no. 299-301) - Fragmented sphendonoid, clay. L. 4.22 cm, W. 2.75 cm, 23.65+x g - Early ICS, Yahya IVB, 2400-2200 BC - Mus. Peabody.

1034. Tepe Yahya. - Z.278c (1970), Area B, TT-1, 2 (with no. 302-303, 305-308) - Sphendonoid, good, clay. L. 4.75 cm, W. 3.70 cm, 24.03 g - Early ICS, Yahya IVB2, 2400-2200 BC - Mus. Peabody.

1035. Tepe Yahya. - Z.278b (1970), Area B, TT-1, 2 (with no. 302, 304-308) - Fragmented sphendonoid, with sign ('I'), clay. L. 4.80 cm, W. 3.85 cm, 24.58+x g - Early ICS, Yahya IVB, 2400-2200 BC - Mus. Peabody.

1036. Tepe Yahya. - Z.255 (8/8/70) - Area B, 20 - Sphendonoid, chipped, perforated, clay. L. 3.08 cm, W. 2.95 cm, 25.49+x g - Early ICS, Yahya IVC1, 2500-2400 BC - Mus. Peabody.

1037. Tepe Yahya. - SF.8627 (20/8/72), Area A, 6 - Sphendonoid, slightly chipped, clay. L. 5.25 cm, W. 2.85 cm, 25.60+x g - Early ICS, Yahya IVB, 2400-2200 BC - Mus. Peabody.

1038. Tepe Yahya. - Z.87 (31/7/69), Area C, 7, Room 15 (with no. 298-299, 301) - Sphendonoid, good, slightly chipped, clay. L. 4.88 cm, W. 2.70 cm, 25.83+x g - Early ICS, Yahya IVB, 2400-2200 BC - Mus. Peabody.

1039. Tepe Yahya. - Z.286g (2/7/70), Area B-BW, TT-2, 12 (with no. 308-314) - Fragmented sphendonoid, clay. L. 4.49 cm, W. 2.45 cm, 26.05+x g - Early ICS, Yahya IVB3, 2400-2200 BC - Mus. Peabody.

1040. Tepe Yahya. - Z.263 (3/8/70), Area B, 20, 10 (with no. 291) - Sphendonoid, good, clay. L. 3.60 cm, W. 3.01 cm, 26.37 g - Early ICS, Yahya IVC1, 2500-2400 BC - Mus. Peabody.

1041. Tepe Yahya. - Z.286D (2/7/70), Area B-BW, TT-2, 12 (with no. 308-310, 312-315) - Fragmented sphendonoid, clay. L. 4.59 cm, W. 3.07 cm, 26.55+x g - Early ICS, Yahya IVB3, 2400-2200 BC - Mus. Peabody.

1042. Tepe Yahya. - Z.277b (11/7/70), Area B-BW, TT-4, 1 (with no. 289) - Sphendonoid, good, clay. L. 4.51 cm, W. 2.78 cm, 26.84 g - Early ICS, Yahya IVB1, 2400-2200 BC - Mus. Peabody.

1043. Tepe Yahya. - Z.268 (17/7/70), Area B-BW, TT-4, 6, 1 - Sphendonoid, worn, clay. L. 4.61 cm, W. 3.86 cm, 27.04 g - Early ICS, Yahya IVB5, 2400-2200 BC - Mus. Peabody.

1044. Tepe Yahya. - Z.277a (11/7/70), Area B-BW, TT-4, 1 (with no. 290) - Fragmented sphendonoid, clay. L. 5.15 cm, W. 3.08 cm, 28.62+x g - Early ICS, Yahya IVB1, 2400-2200 BC - Mus. Peabody.

1045. Tepe Yahya. - Z.278e (1970), Area B, TT-1, 2 (with no. 302-305, 307-308) - Sphendonoid, good, clay. L. 5.10 cm, W. 3.08 cm, 28.72 g - Early ICS, Yahya IVB2, 2400-2200 BC - Mus. Peabody.

1046. Tepe Yahya. - Z.86 (31/7/69), Area C, 7, Room 15 (with no. 298, 300-301) - Sphendonoid, good, with traces of burning, clay. L. 5.31 cm, W. 2.98 cm, 28.89 g - Early ICS, Yahya IVB, 2400-2200 BC - Mus. Peabody.

1047. Tepe Yahya. - Z.260 (1970), Area XC, TT-2, 2A - Sphendonoid, slightly chipped, heavily worn, with traces of burning, clay. L. 4.65 cm, W. 3.21 cm, 30.25+x g - Mus. Peabody.

1048. Tepe Yahya. - Z.283 (6/8/70), Area B-BW, TT-2, 13 - Sphendonoid, chipped, incomplete, clay. L. 3.75 cm, W. 2.99 cm, 30.41+x g - Early ICS, Yahya IVB2, 2400-2200 BC - Mus. Peabody.

1049. Tepe Yahya. - Z.269 (27/6/70), Area B-BW, TT-2, 10, 1 (with no. 287) - Sphendonoid, worn, clay. L. 4.60 cm, W. 2.75 cm, 31.17 g - Early ICS, Yahya IVB2, 2400-2200 BC - Mus. Peabody.

1050. Tepe Yahya. - Z.285c (28/6/70), Area B-BW, TT-2, 12 (with no. 295-296) - Fragmented sphendonoid, clay. L. 4.05 cm, W. 3.10 cm, 31.56+x g - Early ICS, Yahya IVB3, 2400-2200 BC - Mus. Peabody.

1051. Tepe Yahya. - Z.286c (2/7/70), Area B-BW, TT-2, 12 (with no. 308-309, 311-315) - Sphendonoid, chipped, clay. L. 5.00 cm, W. 3.08 cm, 32.82+x g - Early ICS, Yahya IVB3, 2400-2200 BC - Mus. Peabody.

1052. Tepe Yahya. - Z.286e (2/7/70), Area B-BW, TT-2, 12 (with no. 308-311, 313-315) - Fragmented sphendonoid, clay. L. 4.69 cm, W. 3.88 cm, 33.92+x g - Early ICS, Yahya IVB3, 2400-2200 BC - Mus. Peabody.

1053. Tepe Yahya. - Z.286b (2/7/70), Area B-BW, TT-2, 12 (with no. 308, 310-315) - Sphendonoid, chipped, clay. L. 5.06 cm, W. 3.06 cm, 35.60+x g - Early ICS, Yahya IVB3, 2400-2200 BC - Mus. Peabody.

1054. Tepe Yahya. - Z.286a (2/7/70), Area B-BW, TT-2, 12 (with no. 309-315) - Sphendonoid, good, clay. L. 4.40 cm, W. 3.29 cm, 35.81 g - Early ICS, Yahya IVB3, 2400-2200 BC - Mus. Peabody.

1055. Tepe Yahya. - Z.249 (7/7/70), Area B-BW, TT-3, 1B - Sphendonoid, chipped, incomplete, clay. L. 5.00 cm, W. 3.08 cm, 36.28+x g - Early ICS, Yahya IVB, 2400-2200 BC - Mus. Peabody.

1056. Tepe Yahya. - Z.286f (2/7/70), Area B-BW, TT-2, 12 (with no. 308-312, 314-315) - Sphendonoid, good, clay. L. 6.86 cm, W. 3.25 cm, 37.42 g - Early ICS, Yahya IVB3, 2400-2200 BC - Mus. Peabody.

1057. Tepe Yahya. - Z.269 (27/6/70), Area B-BW, TT-2, 10, 1 (with no. 288) - Sphendonoid, chipped, incomplete, clay. L. 5.19 cm, W. 3.11 cm, 37.90+x g - Early ICS, Yahya IVB2, 2400-2200 BC - Mus. Peabody.

1058. Tepe Yahya. - Z.265 (1970), Area B, TT-1, 3 - Sphendonoid, chipped, clay. L. 4.90 cm, W. 2.99 cm, 37.97+x g - Mus. Peabody.

1059. Tepe Yahya. - Z.78 (17/7/69), Area BW, TT-5, 5 - Sphendonoid, chipped, incomplete, clay. L. 3.81 cm, W. 3.78 cm, 39.46+x g - Early ICS, Yahya IVB, 2400-2200 BC - Mus. Peabody.

1060. Tepe Yahya. - Z.248 (1970), Area XCE, TT-2, 1, 3A, 1 - Sphendonoid, good, clay. L. 4.25 cm, W. 3.50 cm, 39.58 g - Mus. Peabody.

1061. Tepe Yahya. - Z.280 (16/7/70), Area B-BW, TT-4, 3 - Sphendonoid, good, clay. L. 5.35 cm, W. 3.31 cm, 40.10 g - Early ICS, Yahya IVB2, 2400-2200 BC - Mus. Peabody.

1062. Tepe Yahya. - SF.1318 (1973), Area XBE, TT-1, 10 (with no. 294) - Fragmented sphendonoid, incomplete, clay. L. 5.10 cm, W. 3.12 cm, 45.94+x g - Early ICS, Yahya IVB, 2400-2200 BC - Mus. Peabody.

1063. Tepe Yahya. - SF.1318 (1973), Area XBE, TT-1, 7 (with no. 286) - Sphendonoid, good, clay. L. 4.50 cm, W. 3.25 cm, 46.81 g - Early ICS, Yahya IVB, 2400-2200 BC - Mus. Peabody.

5.3.2.2.20. Dome-shaped (Type 25): Cat. no. 1064

1064. Tepe Yahya. - Z.2382 (15/6/71), Area AN-ANW. 1 - Dome-shaped, good, potential weight, basalt. H. 6.61 cm, D. 6.30 cm, 328.63 g - Mus. Peabody.

5.3.2.3. Metrological notes

Preliminary statistical analysis could not confirm a possible metrological function for Type 7 spherical objects and Type 9 pebbles. The results of CQA applied to these objects types are inconclusive. Statistical analysis of Type 24 clay sphendonoids shows that they were most likely not used as balance weights.

The most significant metrological results come from those objects considered as potential weights, Cat. no. 943, 949-950, 989-990, 992, 1015 and 1064. Cat. no. 943, a hematite sphere that was most likely imported from Susiana or Lower Mesopotamia, has a mass of 2.80 g, which equates to exactly ⅓ of the Mesopotamian 8.40 g shekel. The spherical Cat. no. 949-950 can be connected to the Harappan unit of 14.34 g (= 2.39 g x 6) and 13.37 g (= x 1). Cat. no. 950 bears a deep incision which could indicate the mass value of the object. Particularly interesting are Cat. no. 989 and 990: Cat. no. 989 is of clearly Mesopotamian morphology (compare Cat. no. 689, 862-868 from Susa and Telloh), with a mass representing ¼ of 14.60 g. Cat. no. 990 is a parallelepiped, widely used in Dholavira (Cat. no. 1356-1505), Farmana (Cat. no. 1138-1139), Nagwada (Cat. no. 1157), Shikarpur (Cat. no. 1163), Bagasra (Cat. no. 1173-1175) and Rakhigari (Cat. no. 1122; see also Ascalone 2019b), and has a mass of 3.41 g corresponding to ¼ of a 13.64 g base unit.

It seems unlikely that Cat. no. 992 was used as a balance weight. Cat. no. 1015, however, was most likely imported from Mesopotamia, where similar hemispherical objects made of hematite were commonly used as weights. With a mass of 4.11 g, the object equates to half a Mesopotamian shekel.

Dome-shaped objects, such as Cat. no. 1064, have been commonly used with equal armed balance scales, particularly in eastern Iran, Baluchistan and the Indus Valley, since the formative periods (first half of the 3rd millennium BC), as evident from the many perforated pear-shaped weights. Whilst the specimen from Tepe Yahya was not perforated, there are clear surface traces which suggest that a suspension rope was wrapped around the object, probably to hang it off a balance scale. With a mass of 328.63 g, the dome-shaped weight represents 1/4 of the Dilmunite mina of 1,314.52 g, 1/5 of the so-called Jiroft mina (see above) of 1,643.15 g, and 2/3 of the Mesopotamian mina of 492.94 g. Its mass is compatible with the major weight systems used in the Greater Indus Valley, Mesopotamia and Marhaši during the second half of the 3rd millennium BC, thus confirming the important role major Jiroft settlements played in the 'international trade'.

5.4. Shahr-i Sokhta

Shahr-i Sokhta is located in the Helmand River Basin in Iranian Sistan, between Kandahar, Zahedan and Zabol. The archaeological site spans an area of 151 ha on a 20 m high plateau, formed over centuries by continuously overlapping debris from the river. The 162 ha plateau is trapezoidal in shape and aligned along a north-south axis. Located at the region's most important river section, directly next to the major trading route between the Iranian highlands, the Indus Valley, Afghanistan and Turkmenistan, Shahr-i Sokhta built its economy based on its geographical location perfectly suited for long-distance trade between the Iranian hinterland and Central Asia. While the ceramic material from the first settlement period finds typological analogies in Baluchistan (*e. g.* Biscione 1984), Shahr-i Sokhta quickly developed its own, distinctive styles. From the very first occupation period, Shahr-i Sokhta formed part of a complex evolutionary framework, oriented towards the socio-economic fervour of Turkmenistan and Baluchistan.

Due to its location, anybody travelling from the north and landing on the coasts of Geodrosia, as well as those travelling from the south to reach Central Asia would have passed through Shahr-i Sokhta. The city became a polyfunctional settlement and final destination for the Iranian routes, and at the same time a fundamental starting point for the eastern routes towards the areas of supply of precious and/or semi-precious stones, feverishly sought after in Elam and Mesopotamia (Ascalone 2003, tab. 1-4).

Chronology BC	Period	Excavation areas	Main buildings
2200-1900/1700	IV (2-0)	R/R-R/S-R/W-R/X	*Burnt Building*
2500-2200	III (4-2)	- X/I-X/H (ERA)* - X/I (ERA)* - X/H; X/C (ERA)*	*- House of Foundations* *- House of the Stairs* *- Large House*
2800-2500	II (7-5)	- X/I-X/H (ERA)* - X/I (ERA)* - X/I (ERA)*	*- House of Foundations* *- House of the Stairs* *- House of the Pit*
3150-2800	I (10-8)	X/I-X/H (ERA)*	

▲*Tab. 5.5. M. Tosi excavation's areas.*

Shahr-i Sokhta is located close to the Helmand River Delta. The river originates in the south-western side of the high Afghan peaks and becomes one of the widest bodies of water in Central Asia. With a basin covering a total of 350,000 km², the river is divided into three main watercourses: Rud-i Sistan, Rud-i Helmand and Rud-i Parian. Due to the vast and easily navigable river, the province of Zahedan has been particularly important for the study of proto-urban and Bronze Age settlements located along the Helmand River. Its study has made it possible to reconstruct the autonomous cultural complex involving Shahr-i Sokhta and Mundigak, an archaeological site in Afghanistan similar to settlements in Iranian Sistan which has been investigated by French archaeologists since the early 1960s.

Prior to a series of Italian campaigns starting in late 1967, little was known of the prehistoric people in eastern Iran. Despite the only partial mapping of the region, Sir A. Stein (1928; 1931; 1937) began a preliminary survey of the entire Helmand catchment area from 1916. A few years later, H. Herzfeld's study of the entire region contributed significantly to the understanding of Iran's pre-Islamic religious history. However, his research was not expanded to the still poorly understood topography and archaeology between Rud-i Biyaban and Rud-i Sistan (Herzfeld 1916; 1931-1932).

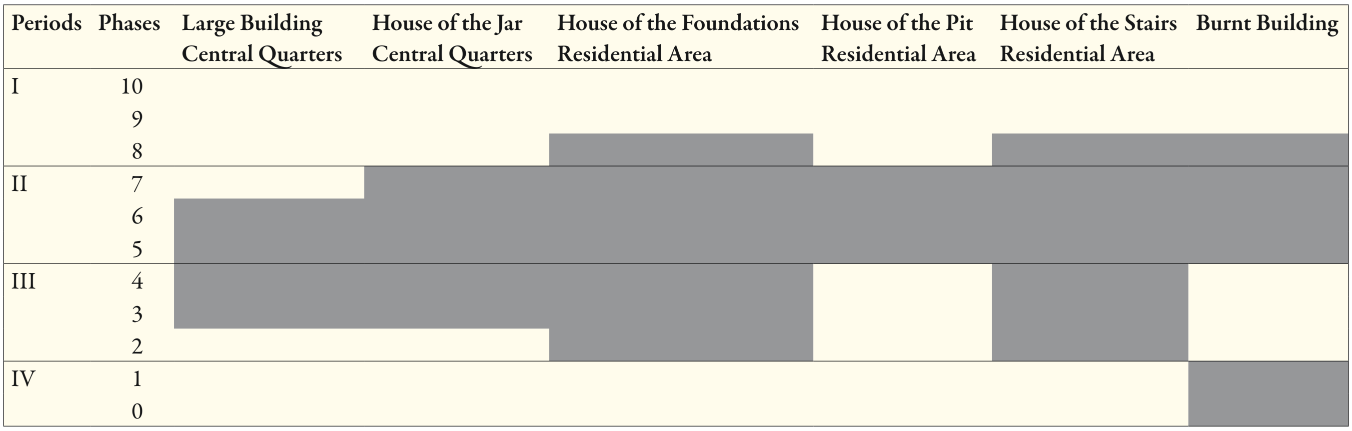
The first, very limited archaeological investigations were conducted at Nād'Alī, a site 20 km south-east of Chakansur, Afghanistan, by a French team in the 1930s, under the guidance of R. Girshman (Ghirshman 1939; Ghirshman *et al.* 1959). The limited results and a sudden change of interest of the French archaeologist, who would continue to focus on Tepe Siyalk instead, meant that the work was never fully completed, and almost no new information about the Helmand Basin cultures could be obtained. In 1951, a new, brief survey of the entire region was carried out by W. A. Fairservis (1961) discovering numerous settlements from the 3rd and 2nd millennium BC.

From 1967 to 1978, archaeological campaigns conducted by the Italian Archaeological Mission under the lead of M. Tosi, aimed at understanding Iranian Sistan during the Bronze Age, were carried out in the centre of Shahr-i Sokhta (Tosi 1968; 1969a; 1969b; 1970a; 1971; 1972a; 1972b; 1972c; 1976a; 1976b; 1983; Lamberg-Karlovsky/Tosi 1973; Piperno/Tosi 1975a; 1975b; Piperno 1976; 1977; 1978; 1979; Amiet/Tosi 1978; Salvatori 1979; Piperno/Salvatori 1982; 1983; 2007). The excavations carried out in the 'Burnt City' (= Shahr-i Sokhta) and the subsequent investigation of the Rud-e Biyaban site (Tosi 1972b) made it possible to reconstruct the cultural and historical sequences of the entire Helmand River Basin. Concentrated on the southern and eastern sectors of the settlement (Tab. 5.5), the Italian excavations returned architectural sequences that represent the clearest evidence for settlement development of Iranian settlements from the 3rd millennium BC (Tab. 5.6). The excavations allowed an almost complete reconstruction of the monumental complexes and housing units in the eastern Residential Area,[8] and discovered the Burnt Building,[9] dating to Period IV of the site (end of 3rd, early 2nd millennium BC). The new data have drastically changed the understanding of growth and development within Sistan settlements during the Bronze Age.

Since 1997, Iranian campaigns led S. M. S. Sajjadi have conducted excavations with the aim to better understand the occupation of the site, concentrating on the necropolis and the central and northern ridges of the settlement. New historical evaluations of Period IV suggest that the settlement significantly decreased in size during the final stages of the occupational period, but unlike initially assumed by M. Tosi the settlement did not collapse entirely (Salvatori/Tosi 2005, 290, fig. 13). The extensive Iranian campaigns represent one of the most significant archaeological activities in eastern Iran. Combined with evidence from Shahdad (K. M. Kaboli) and Konar Sandal (Y. Majidzadeh), the work at Shahr-i Sokhta keep the debate on the cultures of eastern Iran during the Early and Middle Bronze Age active and fertile. A holistic approach comprising these three major settlements and numerous regional contexts is an essential step towards a more detailed understanding of 3rd millennium Iran, and the autonomous cultures that inhabited the Iranian plateau between the urbanisation process of Lower Mesopotamia (4th millennium BC) and the collapse of the Harappan political/economic system (first centuries of the 2nd millennium BC).

8 The settlement structures of the eastern sector, found during the excavation activities carried out by the Italian Archaeological Mission, date to a long phase comprising the first three periods of the settlement (Shahr-i Sokhta I-III, from the 4th millennium to the end of the third quarter of the 3rd millennium BC, *c.* 3100-2200 BC); the 'House of Foundations' (170 m², Period I-III), the 'Large House' (Period III), the 'House of the Pit' (110 m², Period II) and the 'House of the Stairs' (189 m², Period II-III); for a wider description of the individual structures found in the eastern Residential Area see Tosi 1983, 102-122, fig. 8-19.

9 Although the original size of the Burnt Building was probably about 800 m², the excavations revealed only 25 rooms covering a total of 560 m² (for an evaluation of the building and comparisons to similar structures at Tepe Hissar and Altyn Tepe see Tosi 1983, 76-102, fig. 1-59).



▲*Tab. 5.6. Stratigraphic relationships between the main sectors excavated in Shahr-i Sokhta by M. Tosi.*

New research and excavations commenced in 2017 under the direction of the author and M. Sajjadi (Ascalone/Sajjadi 2019; 2022a; 2022b). The multidisciplinary project (= MAIPS) investigated Area 33, a sector between the 'Central Quarters' (Salvatori/Vidale 1997) and the 'Monumental Area', and between the great central depression and Building 1 (Ascalone 2019c; 2019f; 2019i; 2021; 2022a; 2022b). Covering an area of 600 m^2, Sector 33 has thus far revealed at least four different occupational phases corresponding to Phases 6-3 of the settlement as proposed by M. Tosi (1968; 1969a).

The new excavations have prompted new topographical and chronological interpretations of Shahr-i Sokhta, based on archaeological stratigraphy and calibrated radiocarbon dating.

5.4.1. Chronologies

The settlement comprises an area mostly used as a cemetery located in the southern part of the occupational terrace, a craftsmen's quarter near the north-western corner of the site, a monumental area with high hills near the northern sector of the settlement, and an isolated central area defined by deep depressions at its western, eastern and southern borders separating it from the remaining occupational area.

M. Tosi identified four major occupational periods and ten architectural phases, forming the basis for in-depth studies on the dynamics of urban and cultural development of the site. Shahr-i Sokhta seems to have undergone an urban crisis at the end of the 3rd millennium BC, with strong similarities to the settlement regressions in Turkmenistan and the Indus Valley. The four main occupational periods proposed by M. Tosi are as follows (Salvatori/Tosi 2005):

Period I (Phases 10-8): c. *3200/3100-2800 BC*

The mostly light-coloured, often decorated ceramics recovered from the oldest contexts of of Shahr-i Sokhta find parallels in Mundigak III (Casal 1961, fig. 53-59) and throughout Baluchistan (Quetta ware) (Lamberg-Karlovsky/Tosi 1973, 26, fig. 6, 14; Amiet/Tosi 1978, 22, fig. 12-14). The numerous pottery styles related to ceramics of the bordering regions confirm the dynamic, complex role the site played within the regional and international economy, trade and exchange. The most common typological links are with the cultures in Turkmenistan during Namazga III (Biscione 1973; Lamberg-Karlovsky/Tosi 1973, 24, fig. 4-13; Amiet/Tosi 1978, 10-11; Sarianidi 1983, fig. 1-7). A number of Proto-Elamite seals limit this first occupational period to the end of the 4th millennium BC. The presence of a Proto-Elamite tablet, found in the earliest contexts of the settlement, confirms the important role the Helmand valley settlement played for the social, economic and cultural developments during the first two/three centuries of the 3rd millennium BC (Tosi 1976a, 168; Amiet/Tosi 1978, 24, fig. 16).

Period II (Phases 7-5): c. *2800-2500 BC*

Period II of Shahr-i Sokhta has returned the largest amounts of archaeological remains (Biscione *et al.* 1977; Tosi 1983, 103-119, fig. 8-10, 14-16). Ceramic typology is a continuous development of Period I ceramics, with an increase in typological variations and decorative standardisation (Lamberg-Karlovsky/Tosi 1973, 54, fig. 21-27). The 'gray streaky-burnished ware' (known from Period IVC-IVB6 at Tepe Yahya; Lamberg-Karlovsky/Tosi 1973, fig. 10; Amiet/Tosi 1978, fig. 3) and polychrome fragments of the typical 'Nal pottery' (Amiet/Tosi 1978, 22-23, fig. 4a-c) are direct evidence for areas of commercial interaction and cultural integration. The typological similarities between the ceramics from Shahr-i Sokhta, Bampur III-IV and Mundigak IV1-2, led M. Tosi to consider the entire area between Baluchistan and Sistan as a homogeneous cultural area of 'one culture' (Tosi 1974a, 32; see also de Cardi 1968, 144; Lamberg-Karlovsky/Tosi 1973). The large number of bronze stamp seals, found throughout the site, however, links Shahr-i Sokhta to the provinces of southern Turkmenistan and Afghanistan (for Mundigak see Casal 1961, pl. XLV; for pottery see Biscione 1973) and to

Periods	Phases	Area 33	Area 1	Area 20	Area 26	Area 28
I	10					
	9					
	8					
II	7					
	6					
	5					
III	4					
	3					
	2					
IV	1					
	0					

▲*Tab. 5.7. Stratigraphic relationships between the main sectors excavated in Shahr-i Sokhta by S. M. S. Sajjadi and E. Ascalone.*

the geographical and cultural contexts of Iranian Baluchistan (Amiet/Tosi 1978, 22-28, fig. 24; Biscione 1984).

Period III (Phases 4-2): c. *2500-2200 BC*

The evidence for Period III is supplemented by archaeological records from the settlement of Rud-e Biyaban, which revealed a chronology contemporary to phases 4-2 of Shahr-i Sokhta (Tosi 1970a, 189; 1972b, 175). The fine grey ceramics with black painted decorations (sporadically present also in the earliest Phases of the settlement) became very widespread during Periods II-III of the settlement, with morphologies similar to those developed in Bampur IV2-3 and Tepe Yahya IVB (Lamberg-Karlovsky/Tosi 1973, 39-41, fig. 107, 143-146). The iconographic depictions and some specific technological aspects of a small number of bronze stamp seals find analogies in specimens from Tepe Hissar III, Namazga IV (Lamberg-Karlovsky/Tosi 1973, fig. 41-49), Baluchistan and the Greater Indus Valley regions. Interestingly, Shahr-i Sokhta almost completely refused the adoption of cylinder-shaped seals, otherwise used extensively from Mesopotamia to the province of Kerman.

Period IV (Phases 1-0): c. *2200-1900/1700 BC*

During Period IV, burnished grey ceramics with engraved decorations (Lamberg-Karlovsky/Tosi 1973, fig. 147-150) and black-on-red ware (Lamberg-Karlovsky/Tosi 1973, 28, 43, fig. 65) became dominant and widespread. The ceramics find close parallels in Shahdad (Lamberg-Karlovsky/Tosi 1973, 43-44, no. 100) and Yahya IVA. There is very little evidence for Central Asian artefacts from Namazga V-VI (= BMAC), otherwise commonly found in the southern regions of the Iranian plateau (Hiebert 1994, fig. 10.8). BMAC artefacts were found in Susa (Amiet 1989), Shahdad (Hakemi/Sajjadi 1989), Khinaman (Curtis 1988; Maxwell-Hyslop 1988), Shahr-i Sokhta (Tosi 1983), Tepe Hissar III (Schmidt 1937a; Dyson/Howard 1989; Hiebert/Dyson 2002, 122), Khurab (Stein 1937), Tepe Yahya (Hiebert/Lamberg-Karlovsky 1992), and recently in the Sistan region, as well as Pakistani Baluchistan, Mehi (Stein 1931), Sibri (Santoni 1997; 1998), Quetta (Jarrige/Hassan 1989), Mehrgarh (Jarrige 1985), and Nausharo (Jarrige 1989). New radiocarbon analysis explains the absence of BMAC material from Shahr-i Sokhta, as the settlement was abandoned by 2300 BC (see below).

Between 1997 and 2000, Sajjadi excavated an area of 880 m², which revealed 137 distinct funerary contexts (Sajjadi 2003, 24).[10] The burial tombs comprise at least nine major types: simple rectangular, circular or oval pit tombs (generally about 1,50 m deep); bipartite pit tombs with a slender wall dividing the internal space into two rooms for the dead; tombs with a circular or oval room preceded by a small entry chamber separated from the funeral chamber by a wall sealing the tomb; rectangular tombs defined by perimeter walls; square tombs with brick walls (a type otherwise unknown in Iran); rectangular tombs with only two supporting walls along the long sides of the burial; and circular pits with a very small entrance area. The deceased were placed in various positions, apparently of no significance, including foetal positions, supine, indifferently on the right and left side, with arms and legs in extension, seated with legs outstretched or bent, facedown with the arms under the stomach, or in a foetal position. The ceramic grave goods suggest that the area was used as a funerary complex throughout the entire occupation of the site (Sajjadi 2003, 45-63).

The new excavation project started in 2017 (Ascalone 2019d; 2019g; 2019h; Ascalone/Sajjadi 2019; 2022a; 2022b) have revealed a new uninterrupted sequence, with four main occupational phases corresponding to Phases 6-3 by M. Tosi (lastly Ascalone 2022b; Rivoltella 2022; Vecchio 2022). The new evidence has confirmed the continued occupation of the settlement, and formed the basis for new hypotheses regarding the development of the site (Tab. 5.6-7). The main phases in Area 33 can be summarised as follows:

Layer 1. *Building 33* (= Shahr-i Sokhta III, Phase 4-3);

Layer 2. *Squatter occupation* (= Shahr-i Sokhta III, Phase 5b/4);

Layer 3. *House of the Courts* (= Shahr-i Sokhta II, Phase 5a);

Layer 4. *Western Building* and *Eastern Building* (= Shahr-i Sokhta II, Phase 6).

The new research also prompted a revision of the previously proposed chronologies of Shahr-i Sokhta, changing the chronological limits based on radiocarbon dates from well-stratified archaeological contexts (on the new chronologies see Ascalone 2022b). The revised old chronological sequence, already criticised by French scholars (Jarrige *et al.* 2011) and supported by the most recent proposals made on the nearby site of Tappeh Graziani

10 In the following two campaigns (2001-2002) 104 graves were found in an area of 1,000 m² (Sajjadi 2003, n. 7). For the winter campaign 2004-2005 see Sajjadi 2005.

Absolute chronology based on ^{14}C analysis from Shahr-i Sokhta ASCALONE 2022b	Shahr-i Sokhta ASCALONE 2022b	Area 33 ASCALONE 2022b	Area 35 and 36 SAJJADI/MORADI 2022	Area 26 SAJJADI/MORADI 2017
PERIOD IA 3550-3350 BC*** 3525 BC (92.5 %) 3338 BC	SiS I.10 (Early Uruk) (Harappa 1)		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)	Virgin soil	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		Layer 1
PERIOD IV 2400-2300 BC** 2500 BC (80.7 %) 2295 BC	SiS IV.1 (ED IIIb) (Harappa 3B)			Layer 0 Upper Layer
GAP 2300-2100 BC				
PERIOD V (RUD-I BIABAN PHASE) 2100-2000 BC	SIS V.0 (UR III) (Harappa 3C) (BMAC)			

*^{14}C calibrated on Shahr-i Sokhta samples collected from Area 33 archaeological layers;
**^{14}C calibrated on samples from Building 26;
***^{14}C calibrated on Shahr-i Sokhta samples collected from Area 36 in eastern Residential Area;
****^{14}C calibrated on Shahr-i Sokhta samples collected from Room 88 in Area 35;
*****^{14}C calibrated on Tappeh Graziani samples in HELWING *et al.* 2019.

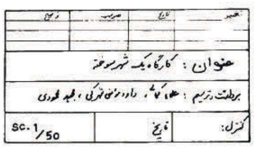
▲*Tab. 5.8. New chronology for Shahr-i Sokhta.*

(HELWING *et al.* 2019), is summarised below and in Tab. 5.8.

SiS IA (Phases 10-9): 3550-3350 BC
SiS IB (Phase 8): 3350-3100 BC
SiS IC (Phase 7): 3100-3000 BC
SiS IIA (Phase 6A-B): 3000-2850 BC
SiS IIB (Phase 5A-B): 2850-2650 BC
SiS IIC (Phase 4): 2650-2600 BC
SiS IIIA (Phase 3): 2600-2450 BC
SiS IIIB (Phase 2): 2450-2400 BC
SiS IV (Phase 1): 2400-2300 BC
SiS V (Phase 0): 2100-2000 BC

The revised chronologies shed new light on the role of Shahr-i Sokhta and the Iranian plateau in the development of complex societies in eastern Iran between the 4th and 3rd millennium BC. In light of the new evidence, it seems necessary to re-evaluate the history of the Iranian Bronze Age.

۱.۱–نقشه کارگاه شماره ۱
بناهای یادمانی



▲*Fig. 5.7. Building 1 at Shahr-i Sokhta (Ascalone 2020, 14).*

5.4.2. Weights, potential weights, possible weights and associated finds (Cat. no. 1065-1117)

The catalogue includes 14 previously published 'potential weights' (Cat. no. 1065-1066, 1068, 1072-1077, 1111-1112, 1114-1116; in Ascalone 2019b; 2019e; 2020), 10 'possible weights' (Cat. no. 1067, 1103-1111), and 28 objects without a metrological function (Cat. no. 1069-1071, 1077-1101, 1117). The possible weights include all of the spherical objects, which were probably not used as balance weights but could have been used for another form of administrative accounting (Fig. 5.10-11). The objects not considered as balance weights include numerous flat, polished and worked stones, all of which come from funerary contexts. CQA of these objects returns no statistically significant mathematical sequence, thus suggesting that overall the objects were not used for metrological purposes. Instead, however, some of the objects could have been used for other accounting actions.

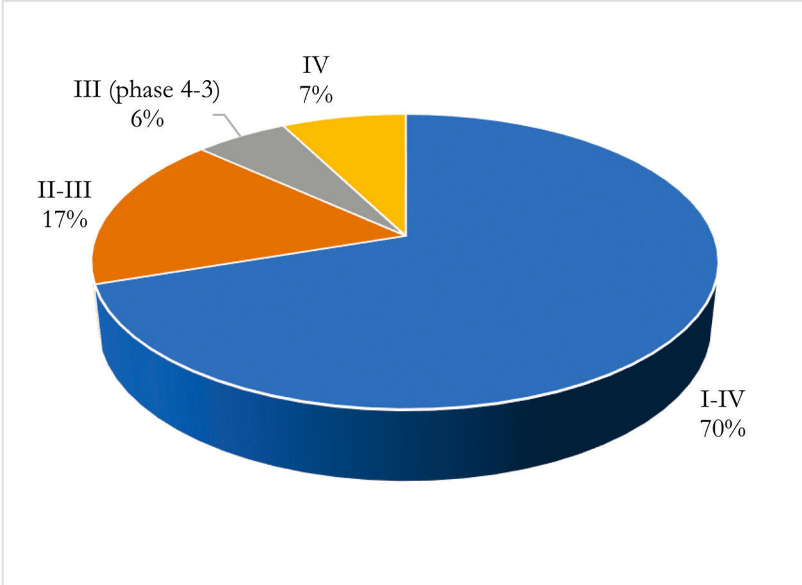
5.4.2.1. Archaeological contexts

As for balance weights, only those found in Buildings 1 and 33 (Cat. no. 1065, 1068, 1072-1077, 1111-1112, 1114-1116) were found in well-defined contexts and can be discussed in detail (Fig. 5.7-9).

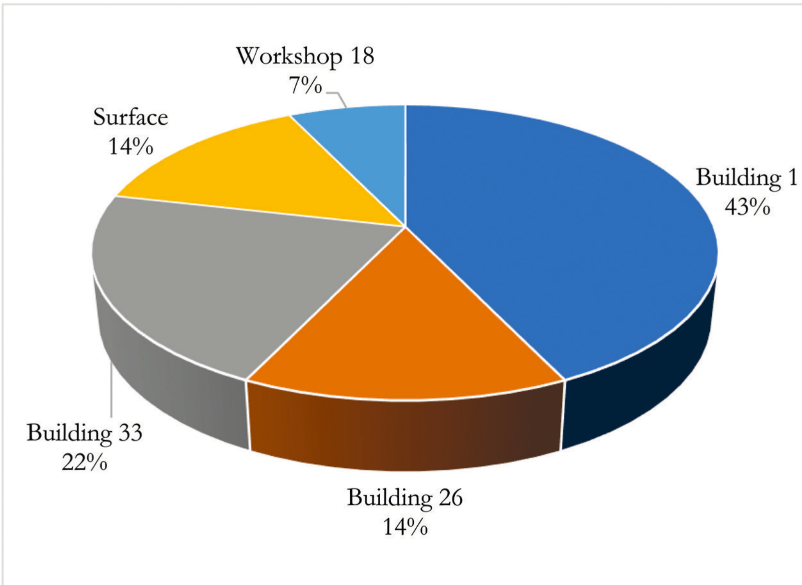
The majority of weights (bar unstratified surface finds Cat. no. 1072 and 1074) date to Period III, a defining historical period marked by the transition from the Kot-Diji to the Early Harappan period, which saw the development from proto-states to full-state organisation in the Indus Valley.

Five weights (Cat. no. 1066, 1077, 1112, 1114 and 1116) were found in Building 1, located in the Residential Quarters which have been extensively excavated by Iranian archaeologists since 1999 (Sajjadi/Moradi 2012; 2014, 77-84). Within the building, six major occupation phases (levels A-F) dating to Periods II and III could be identified. Three of the above weights (Cat. no. 1077, 1112, 1116) were found in well-defined rooms in levels D and E, in close association with other administrative artefacts (Fig. 5.7). Cat. no. 1112 was found in Space 10, a narrow room adjoining Room 6, a storage area located in the south-eastern part of the building (Rooms 9, 31-32, 52-53), in which numerous administrative items (such as clay bi-cones, clay balls and discs, triangular terracotta 'cakes', bone rings, storage vases, seal impressions and jar stoppers) were found (Sajjadi/Moradi 2014, 81). Weights Cat. no. 1066, 1077 and 1116 were recovered from Room 2, bordering rectangular rooms in the central part of Building 1. The weights were found in association with seals, seal impressions, textile fragments, metal, stone and wooden artefacts, and zoomorphic/anthropomorphic clay figurines. The evidence from Building 1 demonstrates the existence of a complex administration system between the first and the second half of the 3rd millennium BC in the lower part of Helmand River: a well-structured organisation, aimed at controlling economic practice through the use of administrative markers.

Three other specimens come from Building 33 (a fourth, Cat. no. 1074, from the surface in Area 33): Cat. no. 1073 was found on the Surface L.20, a large space with heavily eroded structures (Ascalone 2019d, 52-61). Cat. no. 1076 was found on the floor of L.16 in the north-western corner of the room, close to the building's kitchen sector. Cat. no. 1075, however, was recovered from a more superficial level without closed contexts. All three specimens can be attributed to the final occupations phase of the building, *i. e.* Phases 4 of Period III, calibrated to 2600-2450 BC.



▲*Fig. 5.8. Distribution of weights, potential and possible weights according to their archaeological contexts.*



▲*Fig. 5.9. Distribution of potential weights from Shahr-i Sokhta according to their archaeological contexts.*

5.4.2.2. Catalogue

5.4.2.2.1. Ovoid (Type 1a): Cat. no. 1065-1072

1065. Shahr-i Sokhta. - SiS 2017.734, Area 1, Building 1, Cut 3, Space 74 - Ovoid, incomplete, potential weight, chert. L. 4.1 cm, H. 2.7 cm, W. 3.1 cm, 49.10+x g - Shahr-i Sokhta II-III, 3000-2400 BC - Ascalone 2019b, no. 4; 2020, no. 4.

1066. Shahr-i Sokhta. - SiS 17.33.127, Area 33, Building 33, Phase 1, L. 16 - Ovoid, good, potential weight, limestone. L. 6.0 cm, H. 4.4 cm, W. 2.0 cm, 84.66 g - Proto-ICS, Shahr-i Sokhta III, Phase 4-3, 2600-2450 BC - Ascalone 2019e, no. 3.

1067. Shahr-i Sokhta. - SiS 3961.47, Square MJO - Ovoid, good, possible weight, limestone. L. 8.1 cm, D. 2.9 cm, 104.22 g - Shahr-i Sokhta I-IV, 3500-2300 BC - Ascalone 2019b, no. 1; 2020, no. 1.

1068. Shahr-i Sokhta. - SiS 3984, Surface - Ovoid, slightly worn, potential weight, stone. L. 5.2 cm, H. 4.0 cm, W. 4.5 cm, 132.92 g - Shahr-i Sokhta I-IV, 3500-2300 BC - Ascalone 2019b, no. 9; 2020, no. 9.

1069. Shahr-i Sokhta. - SiS 2025.8622, Square XDU, Cut 3, Space 1 - Ovoid, worn, stone. L. 7.0 cm, H. 3.2 cm, W. 5.1 cm, 151.40 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

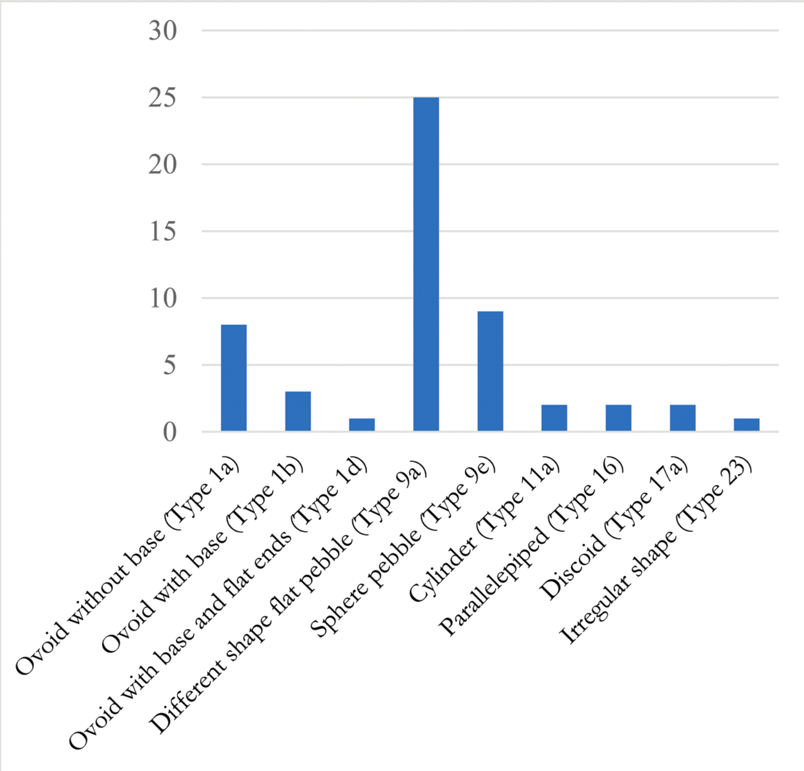


Fig. 5.10. Distribution of shapes from Shahr-i Sokhta.

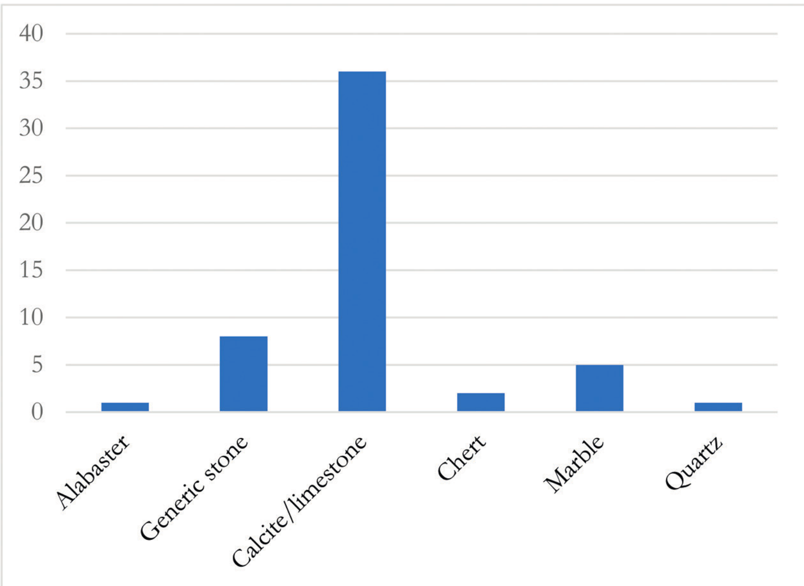


Fig. 5.11. Distribution of materials from Shahr-i Sokhta.

1070. Shahr-i Sokhta. - SiS 1940.7902. I, Area Square NFC - Ovoid, incomplete, stone. L. 6.6 cm, H. 4.5 cm, W. 5.2 cm, 230.32+x g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1071. Shahr-i Sokhta. - SiS 2022.2391, Area 1, Building 1, 2, Space Y5 - Ovoid, good, limestone. L. 7.0 cm, W. 6.1 cm, 275.21 g - Shahr-i Sokhta II-III, 3000-2400 BC.

1072. Shahr-i Sokhta. - SiS 2028.859, Cut 2, Space 25 - Ovoid, good, potential weight, stone. L. 7.6 cm, H. 5.9 cm, W. 6.1 cm, 354.74 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

5.4.2.2.2. Ovoid with base (Type 1b): Cat. no. 1073-1075

1073. Shahr-i Sokhta. - SiS 17.33.58, Area 33, Building 33, Phase 1, L. 20 - Ovoid with base, good, potential weight, limestone. L. 4.8 cm, H. 2.0 cm, W. 1.9 cm, 28.01 g - Proto-ICS, Shahr-i Sokhta III, Phase 4-3, 2600-2450 BC - Ascalone 2019e, no. 1.

1074. Shahr-i Sokhta. - SiS 17.33.55, Area 33, Surface - Ovoid with base, slightly chipped, potential weight, alabaster. L. 7.2 cm, H. 2.7 cm, W. 3.0 cm, 76.66+x g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1075. Shahr-i Sokhta. - SiS 17.33.64, Area 33, Building 33, Phase 1 - Ovoid with base, good, potential weight, limestone. L. 4.2 cm, H. 1.5 cm, W. 1.0 cm, 16.74 g - Proto-ICS, Shahr-i Sokhta III, Phase 4-3, 2600-2450 BC - Ascalone 2019e, no. 2.

5.4.2.2.3. Ovoid with base and flat ends (Type 1d): Cat. no. 1076

1076. Shahr-i Sokhta. - SiS 2018, Cut 7, 33 - Ovoid with base and flat ends, good, potential weight, chert. L. 5.0 cm, H. 3.2 cm, W. 3.0 cm, 77.89 g - Shahr-i Sokhta I-IV, 3500-2300 BC - Ascalone 2019b, no. 7; 2020, no. 7.

5.4.2.2.4. Sphere (Type 7a): Cat. no. 1077

1077. Shahr-i Sokhta. - SiS 2211.2934, Area 1, Square OYH, Building 1 - Sphere, good, potential weight, stone. D. 1.7 cm, 7.13 g - Early ICS, Shahr-i Sokhta III, 2600-2400 BC - Ascalone 2019b, no. 10; 2020, no. 10.

5.4.2.2.5. Flat pebble in various shapes (Type 9a): Cat. no. 1078-1102

1078. Shahr-i Sokhta. - SiS 3975. SiS.91, Graveyard, Surface - Flat pebble, good, limestone. L. 4.6 cm, H. 4.1 cm, W. 0.5 cm, 15.56 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1079. Shahr-i Sokhta. - SiS 3960. SiS.06.7801/2, Graveyard - Flat pebble, good, limestone. L. 5.0 cm, H. 4.2 cm, W. 0.5 cm, 20.46 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1080. Shahr-i Sokhta. - SiS 3991. SiS.05, Graveyard - Flat pebble, good, limestone. L. 6.4 cm, H. 1.8 cm, W. 0.9 cm, 20.64 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1081. Shahr-i Sokhta. - SiS 3968. SiS.05.5700/8, Graveyard - Flat pebble, good, limestone. L. 4.7 cm, H. 4.0 cm, W. 0.7 cm, 21.51 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1082. Shahr-i Sokhta. - SiS 3970. SiS.05.6505/6, Graveyard - Flat pebble, good, limestone. L. 7.3 cm, H. 4.5 cm, W. 0.6 cm, 38.21 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1083. Shahr-i Sokhta. - SiS 3992. SiS.05.5901/4, Graveyard - Flat pebble, good, limestone. L. 7.7 cm, H. 5.2 cm, W. 0.6 cm, 41.31 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1084. Shahr-i Sokhta. - SiS 3964. SiS.09.8606/7, Graveyard - Flat pebble, good, limestone. L. 6.8 cm, H. 4.7 cm, W. 0.7 cm, 42.32 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1085. Shahr-i Sokhta. - SiS 3993. SiS.05.5812/6, Graveyard - Flat pebble, good, limestone. L. 6.4 cm, H. 4.4 cm, W. 0.8 cm, 43.83 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1086. Shahr-i Sokhta. - SiS 3965. SiS.05.5902/4, Graveyard - Flat pebble, good, limestone. L. 6.6 cm, H. 6.0 cm, W. 0.7 cm, 50.40 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1087. Shahr-i Sokhta. - SiS 3956. SiS.05.5701/1, Graveyard - Flat pebble, good, limestone. L. 5.8 cm, H. 5.0 cm, W. 1.4 cm, 60.90 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1088. Shahr-i Sokhta. - SiS 3996. SiS.05.6103/4, Graveyard - Flat pebble, good, limestone. L. 6.8 cm, H. 6.3 cm, W. 0.8 cm, 63.88 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1089. Shahr-i Sokhta. - SiS 3977. SiS.91, Graveyard - Flat pebble, good, limestone. L. 7.7 cm, H. 5.3 cm, W. 0.8 cm, 66.91 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1090. Shahr-i Sokhta. - SiS 3969. SiS.05.5505/1, Graveyard - Flat pebble, good, limestone. L. 8.2 cm, H. 5.1 cm, W. 0.9 cm, 70.69 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1091. Shahr-i Sokhta. - SiS 3976. SiS.91, Graveyard - Flat pebble, good, limestone. L. 6.8 cm, H. 6.2 cm, W. 0.9 cm, 71.74 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1092. Shahr-i Sokhta. - SiS 3983. SiS.91, Graveyard - Flat pebble, good, limestone. L. 5.8 cm, H. 5.5 cm, W. 1.5 cm, 73.58 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1093. Shahr-i Sokhta. - SiS 3967. SiS.91, Graveyard - Flat pebble, good, limestone. L. 7.7 cm, H. 4.5 cm, W. 1.3 cm, 76.72 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1094. Shahr-i Sokhta. - SiS 3966. SiS.05, Graveyard - Flat pebble, good, limestone. L. 8.7 cm, H. 7.8 cm, W. 0.7 cm, 83.93 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1095. Shahr-i Sokhta. - SiS 3997. SiS.05.6007/6, Graveyard - Flat pebble, good, limestone. L. 8.2 cm, H. 4.8 cm, W. 1.2 cm, 84.27 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1096. Shahr-i Sokhta. - SiS 3957. SiS.06.6710/5, Graveyard - Flat pebble, good, limestone. L. 7.2 cm, H. 5.9 cm, W. 1.0 cm, 84.74 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1097. Shahr-i Sokhta. - SiS 3998. SiS.06.6708/4, Graveyard - Flat pebble, good, limestone. L. 8.7 cm, H. 4.3 cm, W. 1.4 cm, 86.69 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1098. Shahr-i Sokhta. - SiS 3958. SiS.06.6710/5, Graveyard - Incomplete flat pebble, limestone. L. 8.6 cm, H. 6.9 cm, W. 1.0 cm, 103.84+x g.

1099. Shahr-i Sokhta. - SiS 3994. SiS.03.4314/12, Graveyard - Flat pebble, good, limestone. L. 8.6 cm, H. 7.8 cm, W. 1.0 cm, 117.58 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1100. Shahr-i Sokhta. - SiS 3955. SiS.09.8603/1, Graveyard - Flat pebble, good, limestone. L. 10.7 cm, H. 7.3 cm, W. 1.2 cm, 170.76 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1101. Shahr-i Sokhta. - SiS 3954. SiS.09.8615/6, Graveyard - Flat pebble, good, limestone. L. 14.1 cm, H. 9.3 cm, W. 0.8 cm, 247.50 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1102. Shahr-i Sokhta. - SiS 3959. SiS.02.3505/4, Graveyard - Flat pebble, good, limestone. L. 8.2 cm, H. 8.2 cm, W. 2.8 cm, 296.73 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

5.4.2.2.6. Sphere pebble (Type 9d): Cat. no. 1103-1110

1103. Shahr-i Sokhta. - SiS 180. 2300, Area 1, Building 1, 2, Space X5 - Sphere pebble, perfect, possible weight, limestone. D. 1.2 cm, 1.55 g - Shahr-i Sokhta II-III, 3000-2400 BC.

1104. Shahr-i Sokhta. - SiS 184. 2385, Area 1, Building 1, 2, Space X5 - Sphere pebble, perfect, possible weight, limestone. D. 1.3 cm, 3.14 g - Shahr-i Sokhta II-III, 3000-2400 BC.

1105. Shahr-i Sokhta. - SiS 199, Square GFM - Sphere pebble, perfect, possible weight, marble. D. 1.5 cm, 4.16 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

1106. Shahr-i Sokhta. - SiS 2258. 26173, Area 26, Square NXS, Building 26 - Sphere pebble, perfect, possible weight, marble. D. 1.8 cm, 4.37 g - Early ICS, Shahr-i Sokhta IV, 2400-2300 BC.

1107. Shahr-i Sokhta. - SiS 184. 2385, Area 1 IV, Building 1, 2, Space X5 - Sphere pebble, perfect, possible weight, limestone. D. 1.3 cm, 3.14 g - Shahr-i Sokhta II-III, 3000-2400 BC.

1108. Shahr-i Sokhta. - SiS 2256. 26122, Area 26, SD.H, Building 26, 1 - Sphere pebble, perfect, possible weight, limestone. D. 2.2 cm, 9.54 g - Early ICS, Shahr-i Sokhta IV, 2400-2300 BC.

1109. Shahr-i Sokhta. - SiS 182. 2385, Area 1, Building 1 - Sphere pebble, good, possible weight, limestone. D. 2.0/1.7 cm, 11.96 g - Shahr-i Sokhta II-III, 3000-2400 BC.

1110. Shahr-i Sokhta. - SiS 2254. 26127, Area 26, Square SD.H, Building 26, 2, Space 1 - Sphere pebble, slightly worn, possible weight, limestone. D. 2.5 cm, 13.73 g - Early ICS, Shahr-i Sokhta IV, 2400-2300 BC.

5.4.2.2.7. Cylinder-shaped (Type 11a): Cat. no. 1111-1112

1111. Shahr-i Sokhta. - SiS 1949, Area C - Cylinder-shaped, fragmented, potential weight, marble. H. 2.9 cm, D. 2.0 cm, 22.45+x g - Proto/Early ICS, Shahr-i Sokhta III-IV, 2600-2300 BC - Ascalone 2019b, no. 6; 2020, no. 6.

1112. Shahr-i Sokhta. - SiS 2859. 4059, Area 1, Building

1, Cut 15, Space 10 - Cylinder-shaped, incomplete, potential weight, limestone. H. 6.0 cm, D. 3.8 cm, 83.97+x g - Proto/Early ICS, Shahr-i Sokhta III, 2600-2400 BC - Ascalone 2019b, no. 2; 2020, no. 2.

5.4.2.2.8. Parallelepiped (Type 16a): Cat. no. 1113-1114

1113. Shahr-i Sokhta. - SiS 2516. 238, Area 1, Building 1, Cut 11, Space 1 - Parallelepiped, slightly chipped, marble. L. 4.4 cm, H. 2.0 cm, W. 2.0 cm, 39.81 g - Shahr-i Sokhta II-III, 3000-2600 BC.

1114. Shahr-i Sokhta. - SiS 1939. 2901, Area C - Parallelepiped, good, potential weight, red stone. L. 4.1 cm, H. 2.6 cm, W. 2.6 cm, 68.61 g - Shahr-i Sokhta II-IV, 3000-2300 BC - Ascalone 2019b, no. 3; 2020, no. 3.

5.4.2.2.9. Discoid (Type 17a): Cat. no. 1115-1116

1115. Shahr-i Sokhta. - SiS 2225. 180083, Area 18, Workshop 18, 6, Space 2 - Discoid, good, potential weight, limestone. H. 1.4 cm, D. 4.0 cm, 40.67 g - Shahr-i Sokhta III-IV, 3000-2300 BC - Ascalone 2019b, no. 5; 2020, no. 5.

1116. Shahr-i Sokhta. - SiS 1961. 458, Area 1, Building 1, Cut 5, Space 2 - Discoid, good, potential weight, marble. H. 3.3 cm, D. 4.8 cm, 135.92 g - Proto/Early ICS, Shahr-i Sokhta III, 2600-2400 BC - Ascalone 2019b, no. 8; 2020, no. 8.

5.4.2.2.10 Irregular shape (Type 23): Cat. no. 1117

1117. Shahr-i Sokhta. - SiS 3989, Area C, Surface - Black stone. H. 3.4 cm, D. 7.2 cm, 135.85 g - Shahr-i Sokhta I-IV, 3500-2300 BC.

4.1.2.3. Metrological notes

The potential weights from Building 1 adhere to a number of different weight system, thus confirming an adaptive, flexible approach to weighing procedures in the Sistan region in the mid-3rd millennium BC. Four weights seem to be related to the Indus Valley base unit of *c.* 13.65 g (Cat. no. 1114-1116, 1067: 5 x 13.72 g, 3 x 13.56 g, 10 x 13.59 g and 8 x 13.03 g). Cat. no. 1065 could be based on the Lower Mesopotamian shekel of 8.40 g (6 x 8.18 g). Two specimens can be connected to the 7.83 g shekel most common in Inner Syria and northern Mesopotamia (Cat. no. 1076-1077: 10 x 7.79 g, 1 x 7.13+x g). A single ovoid specimen (Cat. no. 1068) could have been used to convert between the Harappan and the Mesopotamian systems (10 x 13.29 g = 16 x 8.30 g).

The mass values of the three weights from well-stratified contexts in Building 33 connect them to western weight systems, as is common also in Konar Sandal (Ascalone 2020, no. 13). Metrologically, Cat. no. 1073 (28.01 g) equates to three units of 9.34 g, or two Harappan shekels of 14 g. Cat. no. 1075 (16.74 g) corresponds to two Mesopotamian shekels of 8.37 g, and Cat. no. 1076 (84.44 g) is equivalent to ten shekels of 8.44 g.

The evidence from Shahr-i Sokhta demonstrates a sophisticated understanding of the metrological systems of the surrounding areas. In the absence of an original standardisation of weights, Shahr-i Sokhta adopted various aspects of the weight systems already in existence in Mesopotamia, the Jiroft valley and the Greater Indus Valley, thus facilitating trade in all directions. This 'fluid' approach to weighing turned Shahr-i Sokhta into a bustling central hub for 'international' trade during the 3rd millennium BC. Although this is not the space for detailed hypotheses, it seems clear that Shahr-i Sokhta merchants would have been able to convert to other, not commonly used weight systems as well, in order to facilitate the trade with lapis lazuli (from Badakshan, across Helmand River; see Piperno/Tosi 1973, 18-19; Biscione *et al.* 1974, 41; Tosi 1974a, 17; Tusa 1977, 259; Piperno 1983, 320; Sajjadi 2003, 75), alabaster/calcite/gypsum (Tosi 1969, 329; Ciarla 1979; 1981; Festuccia 2019), carnelian/calcedony (Piperno 1979, 125, 132), and gold (Jarrige, C./Tosi 1981, 137; Sajjadi 2014, 676).

5.5. Gorgan plain

The chronologies of the Gorgan region are based on the stratigraphic sequences of the three major excavated sites: Tureng Tepe (latest reports in Deshayes 1976a; 1976b; for a complete bibliography see Ascalone 2006a, 91-93), Shah Tepe (Arne 1945), and Tepe Hissar (Schmidt 1933; 1937a; 1937b; Dyson/Howard 1989). The typological and stratigraphic chronologies were recently confirmed by radiocarbon analysis. Tepe Hissar still represents the most important site for understanding the development of complex civilisations that arose between the 4th and 3rd millennium BC along the northern trade route of the Iranian plateau. Due to its relatively precise stratigraphic documentation and a number of specific chronological studies based on radiocarbon analysis of the occupational levels, Tepe Hissar's chronological sequences are considered as representative for the entire region.

Located 3 km south-east of Damghan, Tepe Hissar comprises a low tappeh in the shape of an irregular ogival, with a central core covering a rectangular surface area of 200 m x 300 m. A large tappeh is surrounded by smaller dwellings that are mostly concentrated in the western part of the area. Between 1931-1932, an American campaign led by E. F. Schmidt[11] investigated the hills that constituted the central nucleus of the larger settlement development (the 'North Flat', the 'Main Mound', the 'South Hill', the 'Painted Pottery Flat', the 'Treasure Hill', and the 'Red Hill'). The reconstructed

11 The campaign was supported by the Pennsylvania Museum of Art in Philadelphia, with a significant financial contribution by Mr. William Boyce Thompson; in 1932, the American Institute for Persian Art and Archaeology also participated in the funding of the archaeological activities in Tepe Hissar.

stratigraphic sequences identified three main occupational periods, broken into detailed cultural sub-phases explaining possible 'breaks' or 'changes' within the reconstructed main phases (IA-B-C; IIA-B; IIIA-B-C).

E. F. Schmidt's excavations provided the basis for a general understanding of the distinctive features of the cultures of northern Iran, for the reconstruction of the commercial dynamics that developed along the long Khorasan road, and for a new critical approach to the fleeting movements and uncertain origins of the Indo-Arian people (SCHMIDT 1933; 1937a; 1937b; DESHAYES 1969; DYSON 1987). After the first campaign, the American archaeologists compared Hissar I to the terminal phases of the Ubaid period and the entire Uruk period in Mesopotamia; Hissar II to the Proto-Elamite phases of the Iranian plateau and Susa III; and Hissar III to the Iranian Bronze Age (SCHMIDT 1937a, 319-326).[12]

Hissar SCHMIDT 1937a	Main Mound period DYSON/HOWARD 1989	Main Mound levels DYSON/HOWARD 1989	^{14}C
IIIC	A	1	2150-1885 BC
	B	2	
			2640-2390 BC
?	C1	3	
	C2	4	
IIIB	D1	5	3360-2995 BC
	D2	6	3175-2920 BC 3355-3165 BC
	D3	7	3375-3150 BC 3380-3160 BC
II	E1	8	
	E2	9	4590-4545 BC
	E3	10	
I?	F1	11	
	F2	12	4345-3515 BC
	F3	13	

▲*Tab. 5.9. Comparative stratigraphic analysis from Main Mound at Tepe Hissar.*

DYSON 1987	SCHMIDT 1937a	Revisited period	Building 1	Building 2	Building 3
B					
	IIIC	IIIB			
C					
	IIIB				31
D1	IIIB	II			3a
				21	
D2	IIIB	II			3
D3	IIIB	II		2/2a	
E			1-sub?		

▲*Tab. 5.10. Comparative stratigraphic analysis among the main buildings of Tepe Hissar.*

5.5.1. Chronologies

A re-evaluation of the chronological sequences proposed by E. F. Schmidt prompted an overall reconsideration of the 1930s excavations. Under the direction of R. H. Dyson and M. Tosi, a new campaign financed by the Iranian Centre for Archaeological Research, the University of Turin and the University Museum of Pennsylvania, was launched to redefine the chronological sequence of Tepe Hissar, and to better understand the settlement's wider role between the 4th and 3rd millennium BC (DYSON/HOWARD 1989). A series of new radiocarbon analyses shed detailed light on the internal dynamics of occupational development, whilst confirming some initial chronological hypotheses proposed by E. F. Schmidt (DYSON/LAWN 1989, tab. XVI-XVII). The new periodic sequences based on radiocarbon dates mostly obtained from the Main Mound identified an intermediate period between IIIC and IIIB, and rebutted a first settlement phase (A) during Period III (Tab. 5.9).

The redefined periodic sequences of the site made it possible to reconsider the occupational periods of some of the most important buildings. The buildings identified by E. F. SCHMIDT (1933; 1937a) on the Main Mound were mostly assigned a slightly earlier date, while Buildings 1 and 2 were shifted from Period III to Period II (Tab. 5.10).

Period IIIB/C (Phase C1-2): c. *2600-2200 BC (Main Mound and North Flat)*

Period IIIB/C (or IIIB after subsequent corrections) was first identified by R. H. Dyson and M. Tosi. The phase shows similarities to Early Dynastic III and the Akkadian period, thus giving archaeological context to the radiocarbon dates between 2640 BC and 2290 BC (DYSON/LAWN 1989, tab. XVI). Typological comparisons suggest a slightly later end date during Ur III (2150 BC), when new ceramic styles were developed and the layout of the city underwent significant changes.

Evidence for this period primarily comes from the Main Mound (levels 4-3) and the North Flat (Burnt Building),[13] but no traces could be found on the South Hill,[14] Treasure Hill or The Twins. The material culture shows similarities with Turkmenistan: in this period, oval flat gold pearls appear (SCHMIDT 1937a, fig. 138, pl. LXVI,H2360), similar to what was produced in the workshops in

12 More recent analyses have shown that Period IC shares typological similarities with Gabristan IV: 6-4 and Sialk III6-7b (*c.* 3500-3300 BC). Hissar IB produced ceramic vessels similar to those from Gabristan II: 10-9 and Sialk III4-5 (*c.* 4000-3800 BC). Hissar IA shares material culture similarities with Gabristan I and Sialk III1-2-3 (*c.* 4700-4000 BC). See FAZELI *et al.* 2005.

13 Radiocarbon dates from the Burnt Building on the North Flat suggest a time period between 2420 BC and 2290 BC, contemporary to Hissar IIIB/C of the Main Mound.

14 Treasure Hill seems to have been occupied at a later time, between the second half of the 20th and the end of the 18th century BC (^{14}C: 1940-1705 BC).

Turkmenistan, such as at Altyn Tepe (Masson/Kiiatkina 1981, fig. 11) or Mohenjo-Daro (Wheeler 1968, pl. XXVI).

Period IIIC (Phases B/A): c. *2200-1900 BC (Main Mound)*

Evidence for the final phase of Bronze Age Tepe Hissar primarily comes from the Main Mound (Phases A and B, levels 1-2), and to a very limited extent from the North Flat area. Culturally, the period continued the settlement's orientation towards Turkmenistan, as suggest by the adoption of large alabaster discs (Schmidt 1937a: pl. LXII)), widely spread between Kopet Dagh and the Murghab Valley (also Masson 1981, fig. 22,1).[15]

Small alabaster columns (Schmidt 1937a, fig. 132, pl. LXI) found in the Burnt Building (*c.* 2400-2300 BC) can be compared to specimens from southern Central Asia, in particular from the near Tureng Tepe IIIC (see Chapter 2). Typological similarities with Turkmenistan can also be found in stamp seal typology (or compartmented seals), which relate the Goran plain to cultures from Namazga IV-V and Turan.[16]

5.5.2. Weights, potential weights, possible weights and associated finds (Cat. no. 1118-1120)

The three objects currently kept in the Gorgan Museum were found in the vicinity of Tepe Hissar and in the province of Mindasht. Cat. no. 1120 belongs to the category described in Chapter 2.13, with a presumed cultic, ceremonial and/or symbolic function based on its funerary find context (Vidale 2017, 47-50). The two large, perforated ovoids, however, are more difficult to understand, but the absence of an archaeological context or comparable specimens from other areas make a weighing function unlikely.

5.5.2.1. Archaeological context and chronology

The lack of contextual information for the three specimens from the Gorgan plain makes their interpretation at best speculative. Based on comparisons to similar specimens from other Central Asian sites (see Chapter 2.13), Cat. no. 1120 could be tentatively dated to around 2200 BC to 1800 BC, when the so-called Oxus civilisation (or Bactria-Margiana Archeological Complex) flourished in western Central Asia (Turkmenistan) and Afghanistan (Amiet 1986a, 195; Hiebert/Lamberg-Karlovsky 1992; Francfort 1994; 2005; Potts 2008; Francfort/Tremblay 2010; Ascalone 2014; 2018a).

5.5.2.2. Catalogue

5.5.2.2.1. Large ovoid with perforation (Type 1k): Cat. no. 1118-1119

1118. Mindasht. - No context - Perforated ovoid, perfect, limestone. L. 14.4 cm, D. 7.9 cm, 1,240.30 g - Mus. Gorgan (GM 4621).

1119. Mindasht. - No context - Perforated ovoid, perfect, limestone. L. 30.50 cm, D. 6.13 cm, 1,731.30 g - Mus. Gorgan (GM 4620).

5.5.2.2.2. Small column (Type 13): Cat. no. 1120

1120. Unknown. - No context - Column, slightly worn, limestone. L. 18.3 cm, D. 10.2 cm, 9.4 cm, 2,380.00 g - ICS, 2200-2000 BC - Mus. Gorgan (GM 1097).

5.5.2.3. Metrological notes

Due to the lack of archaeological contexts, the Gorgan objects cannot be considered as balance weights with certainty. Their mass values (1,240.30 g, 1,731.30 g and 2,380 g), however, would fit the Mesopotamian mina (2 ½ x 496.12 g; 3 ⅔ x 473.03 g; 4 x 476 g).

15 As no evidence for alabaster processing workshops could be found, the miniature columns were likely imported (Voigt/Dyson 1992, 171).

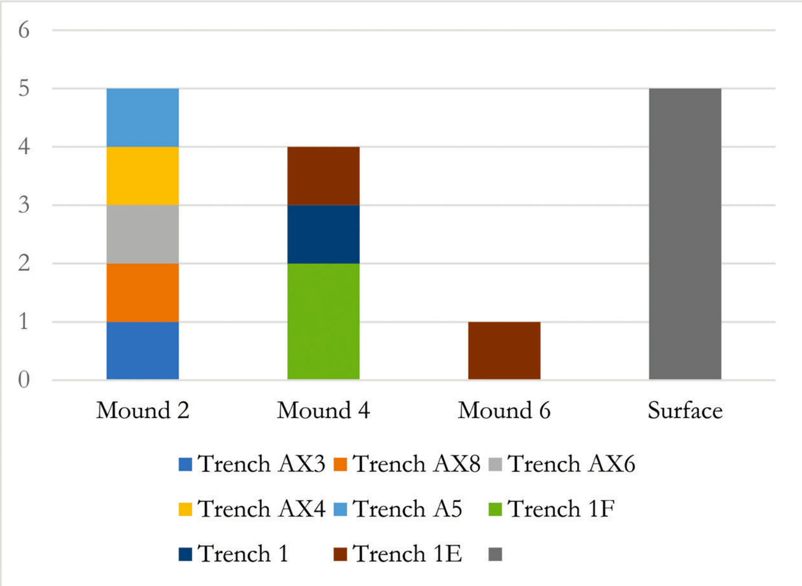
16 Compartmental seals also existed outside of the traditional Turanian boundaries: see Tepe Yahya IVB (one specimen; Lamberg-Karlovsky 1972, 94, fig. 4,F; Hiebert/Lamberg-Karlovsky 1992, 13, pl. IIb), Shahdad (six specimens and 78 impressions; Hakemi 1972, pl. 21,b, 22,b, 23,b, 24,b-c, 26,323; 1973, pl. X; 1976, 138a, fig. 8; Salvatori/Vidale 1982, fig. 5,19, 6,5-7; Hakemi/Sajjadi 1989, 146; Hiebert/Lamberg-Karlovsky 1992, 13, pl. IIIb), Kenarau (one; Rahbar 1991), Damin (two seals; Tosi 1974a, 43-44, fig. 20-21), Saidiğ (one seal; Lamberg-Karlovsky/Tosi 1973, 4, tab. 1) and Bampur IV (one seal; de Cardi 1967a, fig. 2; 1967b, 134; 1968, 148; 1970, 328, fig. 47.15, 51).

6.1. Rakhigarhi

Rakhigarhi is situated on the north bank of the Drishadvati River in the state of Haryana, 150 km from Delhi. The archaeological site occupied an area of at least 80 ha, but is today mostly covered by two modern villages. The ancient settlement was founded in the late 4th millennium BC, and flourished during the Early and Mature Harappan period (*c.* 2500-1900 BC), with archaeological evidence for deliberate, planned urban development. Several walled residential areas with well-defined streets were identified on Mound 2, also known as the Citadel, which further revealed a platform with fire altars and numerous cattle bones. The archaeological remains include typical Harappan material such as a lapidary's workshop and domestic drains.

Rakhigarhi comprises seven mounds (RGR-1-7), three of which (RGR-1, RGR-2 and RGR-6) were occupied during the pre-formative phase followed by the Early Harappan settlement (RGR-7) (Fig. 6.1). Between 1997 and 2000, archaeological

Fig. 6.1. Map of the Greater Indus showing sites with weights (modified after Rahmstorf *2020, fig. 2).*



▲*Fig. 6.2. Distribution of weights, potential and possible weights according to their archaeological contexts from Rakhigari.*

excavations were carried out by the Archaeological Survey of India (ASI) (Nath 1998; 1999; 2001; see also Nath *et al.* 2014, 83-100), and from 2013 to 2016 the Department of Archaeology of Deccan College Post-Graduate and Research Institute investigated the necropolis and surrounding area (Shinde *et al.* 2008).

6.1.1. Chronologies

The archaeological evidence reveals occupation during two major cultural periods (Early Harappan = Period I and Mature Harappan = Period II) and two sub-periods (Period IA and IB) (Nath *et al.* 2015, 10).

Evidence for Period IA was only discovered at RGR-6, which revealed three distinct structural phases: 1) a thick mud platform and plain red ware as well as 'chocolate' slipped ware ceramics turned on a slow wheel; 2) a circular structure characterised by wedge-shaped mud bricks and a regular structure as well as early forms of decorated pottery; 3) a shift from rectangular to round structures. Calibrated radiocarbon dates have suggested a range from 6420±110 BP to 6230±320 BP for Period IA.

Period IB is defined by settlements comprising dwellings located at right angles parallel to the streets. The material culture includes copper objects, terracotta bull figurines, toy cart frames, shell bracelets, chert blades, and steatite beads. Calibrated radiocarbon dates provide a range from 5910±130 BP to 5230±60 BP for Period IB.

During Period II, the site underwent a large-scale expansion and marked changes in lifestyle. The occupation of mound RGR-6 ceased towards the end of Period I, while RGR-1 and RGR-2 continued with the process of urbanisation. Radiocarbon dates place Period II between 4560±90 BP to 4320±90 BP.

6.1.2. Weights, potential weights, possible weights and associated finds (Cat. no. 1121-1135)

Eleven of the 15 objects from Rakhigarhi can be considered as certain balance weights (Cat. no. 1121-1122, 1127-1135), due to their cubic and parallelepiped shapes. The remaining four objects (Cat. no. 1123-1126) can be seen as 'potential weights', given the wide diffusion of discoid-shaped weights in all the major Harappan centres. Despite being made of terracotta, the above-mentioned specimens find widespread comparisons in recently excavated settlements, particularly in Gujarat (see the numerous specimens from Dholavira). Cat. no. 1122, of peculiar shape and material (a fluvial limestone), has a mass value connected to the western systems, and was previously assumed to be an import from Baluchistan, Sistan, or other areas peripheral to the Harappan metrological tradition (Ascalone 2018c, 20-22).

6.1.2.1. Archaeological contexts

All of the weights excavated in Rakhigarhi were found in Period II Mature Harappan contexts, in association with typical Harappan objects such as etched beads, red pottery, or bracelets. Five weights were recovered from the surface (Cat. no. 1122-1123, 1129-1130, 1134), five from Mound 2 (Cat. no. 1121, 1126, 1128, 1132, 1135), four from Mound 4 (Cat. no. 1125, 1127, 1131, 1133) and one from Mound 6 (Cat. no. 1124) (Fig. 6.2-3).

At Mounds 2 and 6, a public (market) area and a private housing area could be identified. RGR-2 revealed an extensive mud brick platform, a granary, an area prepared for mercantile activities, and fortification walls running from north to south and from east to west. In addition to these structures related to daily activities, a 22 m long and 12 m wide podium was also found, made of 13 rows of variously sized bricks (7 cm x 14 cm x 28 cm; 7.5 cm x 15 cm x 30 cm; 8 cm x 16 cm x 32 cm). The podium was probably connected to public (religious?) activities and could be accessed by paths from all four sides. The mercantile area, consisting of five interconnected sections, with structures of similar dimensions (5.4 m x 2.2 m) comprising a large room connected to two smaller rooms in the south. The barn has an 'L' shape and consists of ten separate rectangular blocks (Nath 2014, 118-121).

RGR-6 is located in the north-eastern part of Mound 6, and the 1997-2000 excavations revealed a residential complex separated by a dense network of streets. The earliest, circular houses are similar to the Early Harappan structures revealed at RGR-1. During the later urban phase, the settlement developed a standard architecture expressed as houses comprising seven rooms (Nath 2014, 121-123).

6.1.2.2. Catalogue

6.1.2.2.1. Sphere pebble (Type 9d): Cat. no. 1121

1121. Rakhigarhi. - 2801, RGR-2.1, AX/316029, Mound 2, Trench AX3, NE-NW - Sphere pebble, incomplete, limestone. D. 4.81 cm, 65.65+x g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 14, fig. 14.

6.1.2.2.2. Parallelepiped (Type 16a): Cat. no. 1122

1122. Rakhigarhi. - Surface - Parallelepiped, good, limestone. L. 3.69 cm, H. 1.81 cm, W. 2.18 cm, 47.99 g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 10, fig. 10.

6.1.2.2.3. Discoid in terracotta (Type 17e): Cat. no. 1123-1126

1123. Rakhigarhi. - Surface - Discoid, slightly chipped, potential weight, terracotta. H. 1.45 cm, D. 4.08 cm, 31.43+x g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 8, fig. 8.

1124. Rakhigarhi. - 1022, RGR-6, E1/015017, Mound 6, Trench 1E-NE - Discoid, slightly chipped, potential weight, terracotta. H. 1.70 cm, D. 3.77 cm, 21.81+x g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 11, fig. 11.

1125. Rakhigarhi. - 1040, RGR-4.1, F/0015035, Mound 4, Trench 1F-NE - Discoid, slightly chipped, potential weight, terracotta. H. 0.89 cm, D. 2.69 cm, 7.29+x g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 12, fig. 12.

1126. Rakhigarhi. - 2343, RGR-2.1, AX/816003, Mound 2, Trench AX8 - Discoid, incomplete, potential weight, terracotta. L. 6.64 cm, H. 3.15 cm, D. 7.22 cm, 87.23+x g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 13, fig. 13.

6.1.2.2.4. Cuboid (Type 18a): Cat. no. 1127-1135

1127. Rakhigarhi. - 54, Mound 4, Trench 1, NE - Cuboid, incomplete, agate. L. 1.91 cm, H. 2.41 cm, W. 2.43 cm, 15.33+x g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 1, fig. 1.

1128. Rakhigarhi. - 2736, RGR-2.1, Mound 2, Trench AX6 - Cuboid, good, chert. L. 0.72 cm, H. 0.54 cm, W. 0.55 cm, 1.21 g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 2, fig. 2.

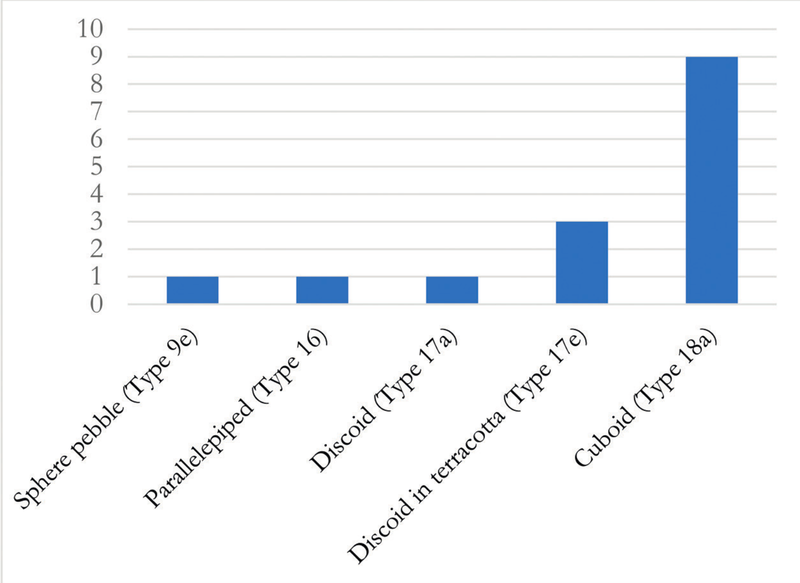
1129. Rakhigarhi. - Surface - Cuboid, perfect, agate. L. 1.11 cm, H. 1.28 cm, W. 1.30 cm, 7.01 g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 3, fig. 3.

1130. Rakhigarhi. - 135, Surface - Cuboid, perfect, chert. L. 1.28 cm, H. 1.10 cm, W. 1.30 cm, 4.55 g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 4, fig. 4.

1131. Rakhigarhi. - 334, RGR-4.1, E/140003, Mound 4, Trench 1E - Cuboid, good, agate. L. 0.33 cm, H. 0.70 cm, W. 0.71 cm, 0.45 g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 5, fig. 5.

1132. Rakhigarhi. - 2084, RGR-2.1, 1984-16015, Mound 2, Trench AX4 - Cuboid, good, chert. L. 0.88 cm, H. 0.84 cm, W. 0.66 cm, 1.78 g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 6, fig. 6.

1133. Rakhigarhi. - 764, RGR-4.1, IF/0015010, Mound 4, Trench 1F - Cuboid, good, chert. L. 1.72 cm, H. 2.62 cm, W. 2.56 cm, 28.21 g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 7, fig. 7.



▲*Fig. 6.3. Distribution of shapes from Rakhigarhi.*

1134. Rakhigarhi. - Surface - Cuboid, good, agate. L. 0.84 cm, H. 0.86 cm, W. 0.55 cm, 0.91 g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 9, fig. 9.

1135. Rakhigarhi. - 3308, RGR-2.1, A/5160002, Mound 2, Trench A5 - Cuboid, good, chert. L. 0.73 cm, H. 0.62 cm, W. 1.10 cm, 0.91 g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 15, fig. 15.

6.1.2.3. Metrological notes

A metrological analysis of the Rakhigarhi weights was recently published by the author (Ascalone 2018c), challenging previous conceptions about weighing practices at Harappa, Mohenjo-daro and Chanhu-daru. Interestingly, the metrological evidence from Rakhigarhi suggests a slightly heavier unit than commonly found along the Indus Valley. This suggests that regional variants developed along the valley, and that the metrological evidence should not be considered as cohesive and homogenous as previously assumed.

It was the study of the Harappan weighing systems that initially kickstarted fieldwork in the sites along the Indus River Valley (Hemmy 1931; 1938a; 1943; Vats 1940, 360-366; see also Hendrickx-Baudot 1972; Ascalone/Peyronel 1999; 2003; Rahmstorf 2020). Problematically, the first metrological studies used a very selective, biased sample, only including weights with a mass greater than 6 g, and those weights that could easily be connected to the unit of *c.* 13.65 g. Tampering with the metrological data provided a homogeneous state-model, that prevented the identification of regional variations (A. S. Hemmy wrote: '*A number are noted as doubtfully weights. In the cases where the calculated values of the unit diverge markedly from the Harappa standard, it is unlikely that they were used for weighing*' in Hemmy 1943, 236 and 'All doubtful specimens were rejected, including those with unlikely ratios, as well as all with weights below 6 gms' in Hemmy 1943, 237).

Later excavations unearthed new weights at Lothal (Rao 1985, 560-565, pl. 257,B), Kanmer (Kharakwal *et al.* 2007, fig. 11-12), Bhirrana (Rao *et al.* 2005, 66), Banawali (Bisht 1993, 119, pl. 10, 18), Kalibangan (Thapar 1975, 28; Lal *et al.* 2003, 237, pl. LIII), Rojdi (Chitalwala 1989, 158, fig. 82,1-4; 2004, 93, fig. 8), Rangpur (Rao 1962-1963), Nagwada (Hedge *et al.* 1991), and Surkotada (Margabandhu 1989, pl. LXXI,a). Complemented by recently found specimens from Kotada Bhadli (Ruikar *et al.* 2015), Rakhigarhi, Farmana (in the Ghaggar valley; Ascalone 2018c) and the major sites in Gujarat, it is now possible to identify processes of strong regionalisation, with a number of different base units connected to the sites' geographical and economic-social origins.

The weights from Rakhigarhi and Farmana (see below) seem to follow a binary system for the fractions (Cat. no. 1129, 1131-1132, 1134-1135) and a decimal system (Cat. no. 1133) for the multiples of the Indus Valley standard unit. Metrological analysis of the Rakhigarhi weights, however, shows a slight shift towards a heavier unit of *c.* 14.43 g. The base unit of the cubic weights falls in the range between 14.02 g and 14.56 g, therefore higher than the classic Harappan unit known from Harappa, Mohenjo-daro and Chanu-daro. As stated by K. M. Kenoyer (2010, 117) '*the (Indus) weights are not absolutely standardized throughout the Harappan region*'.

Metrological analysis of the cubic weights from Rakhigarhi shows the following:

Cat. no. 1128: 1.21 g x 12 (?) = 14.54 g

Cat. no. 1129: 7.01 g x 2 = 14.02 g

Cat. no. 1130: 4.55 g x 3 (?) = 13.65 g; x 2 = 9.10 g

Cat. no. 1131: 0.45 g x 32 = 14.40 g

Cat. no. 1132: 1.78 g x 8 = 14.24 g

Cat. no. 1133: 28.21 g ÷ 2 = 14.10 g

Cat. no. 1134: 0.91 g x 16 = 14.56 g

Cat. no. 1135: 0.91 g x 16 = 14.56 g

The weights from Kotada Bhadli, located in modern day-Gujarat's Kutch district, confirms the numerous typological variations of Harappan weights (Ruikar *et al.* 2015): cubic, truncated spherical, sphendonoid, pebble, discoid, biconvex, lentoid and elliptical weights made of limestone, sandstone, dolerite, chert and steatite have been brought to light, all of which can be traced back to the Greater Indus Valley and foreign weight systems. This wide, heterogenous variety of weights from the Indus Valley has never been published before.

The mass values of the Rakhigarhi weights show a variation of the traditional base unit of 13.65 g. All other cubic weights from the centers of Haryana also return values connected to a base unit of around 14.40 g, thus forcing a revision of previous studies that returned a somewhat simplistic, homogenous view of Harappan weight metrology. On this basis, the possibility of localisms and regionalisms not just within the metrological system but within the Harappan civilisation itself should be addressed. Similar to Mesopotamia, it seems plausible that in the Greater Indus Valley a number of regional metrological systems co-existed alongside a standardised traditional system. It remains unclear whether the development of alternative units was related to local variables, specific social groups, the weighing of specific materials or objects, or for specific functions. It becomes clear, however, that one of the future challenges of Harappan metrology will be to identify and investigate the individual weighing variables present in the major settlements of the Greater Indus Valley in the second half of the 3rd millennium BC.

Cat. no. 1122, with a mass of 47.99 g, has a morphology (parallelepiped with rounded upper corners) and material (limestone) unusual for Haryana weights. Its mass can easily be seen as six Mesopotamian shekels of 7.99 g (= 47.99 g ÷ 6), slightly underestimated due to some surface abrasions. The existence of Mesopotamian units in the historical settlements of Harappa, Mohenjo-daro and Chanhu-daro (Ascalone/Peyronel 1999, 354-362; 2003, 374-385), in Gujarat and in Haryana (Ascalone 2018c, no. 10, 20), as well as in Sistan-va-Baluchistan (Ascalone 2019b, no. 2, 4, 8-10; 2020, no. 4, 7, 9-10) and the Halil River Valley (Ascalone 2020, no. 13) has previously been demonstrated, thus confirming the spread of Mesopotamian-Indus contacts within a wider regional system involving not only Lower Mesopotamia and the coasts of the Greater Indus Valley but also the sites in Haryana and eastern Iran (Jiroft and Lower Helmand).

Somewhat less cohesive is Cat. no. 1130 with a mass of 4.55 g, which could represent half of the shekel obtained by dividing the western mina (470 g) by 50 (4.55 g x 2 = 9.10 g) or ⅓ (uncommon in the Indus system) of the Harappan shekel (evidence from Dholavira confirms that the western shekel of 9.40 g was present; on the Indus sites see Ascalone/Peyronel 1999, 354-362; 2003, 374-385).

6.2. Farmana

Farmana is a Mature Harappan site located in the same Ghaggar basin as Rakhigarhi. During the excavations directed by V. Shinde of the Deccan College Postgraduate and Research Institute of Pune, two main occupational periods were identified (*c.* 3500-2000 BC) (Shinde *et al.* 2008; Dangi 2011). The settlement comprises a total of 18.5 ha (929 m x 50 m, with archaeological deposits to a depth of 8 m) plus a cemetery area about 1 km away, which have been successfully excavated over a number of campaigns.

Between 2007 and 2009 four main residential complexes dating to the Mature Harappan period have been identified, one of which consisted of 26 rooms and three or four kitchens organised around a central courtyard, a common layout during the second half of the 3rd millennium BC. Excavations in the centre of the site have revealed regular urban planning typical for the Harappan culture, with a main road up to 4 m wide to allow the passage of carts, as confirmed by the cart tracks found on the paved road surface.

Particularly interesting is the excavated necropolis (unfortunately heavily damaged by farming), which revealed 70 burials from the Harappan period. The majority of the burials have a northwesterly/southeasterly orientation, with only few graves orientated north/south or northeast/southwest.

6.2.1. Chronologies

The site was occupied from the middle of the 4th to the beginning of the 2nd millennium BC (*c.* 3500-1900 BC). The first occupational phase (*c.* 3500-3000 BC) revealed evidence from the Ghaggar-Hakka culture, with characteristic red ware, incised ware, bichrome ware and black burnished or grey ware, very similar to the material culture from Kunal (Khatri/Acharya 1995, 84-86), Bhirrana in the Fatehabad district (Rao *et al.* 2005, 60-68), and Girawad (Shinde *et al.* 2008, 136-137). The second phase (*c.* 3000-2500 BC) is contemporary with the Early Harappan period (similar to the sites of Banawali and Kalibangan, both of which were entirely surrounded by a single defensive wall), but evidence for the layout of the settlement during this period is scarce (Dangi 2011, 67).

The final, best understood period (*c.* 2500-2000 BC) can be attributed to the Mature Harappan phase, comprising the characteristic archaeological features of the Harappan culture. During this period, the settlement was subject to extensive urban planning, and measures and weights, traditional Harappan pottery, steatite seals and other typical Harappan material culture (*e. g.* copper spearheads, arrowheads, terracotta bulls, bracelets, triangular and circular 'cakes', and beads made of bone, shell, steatite and other semi-precious stones) were adopted.

6.2.2. Weights, potential weights, possible weights and associated finds (Cat. no. 1136-1143)

Two weights (Cat. no. 1142-1143) found in Farmana are in the traditional cuboid shape. Two other specimens (Cat. no. 1138-1139) are parallelepipeds, suggesting that they were also used as balance weights (the manufacturing traces on Cat. no. 1139 suggest that it is an unfinished weight). The two spherical objects with base (Cat. no. 1136-1137) can also be interpreted as balance weights. The function of the two discoid-shaped objects (Cat. no. 1140-1141) remains unclear, although these types of objects were often used as weights in Gujarat.

6.2.2.1. Archaeological contexts

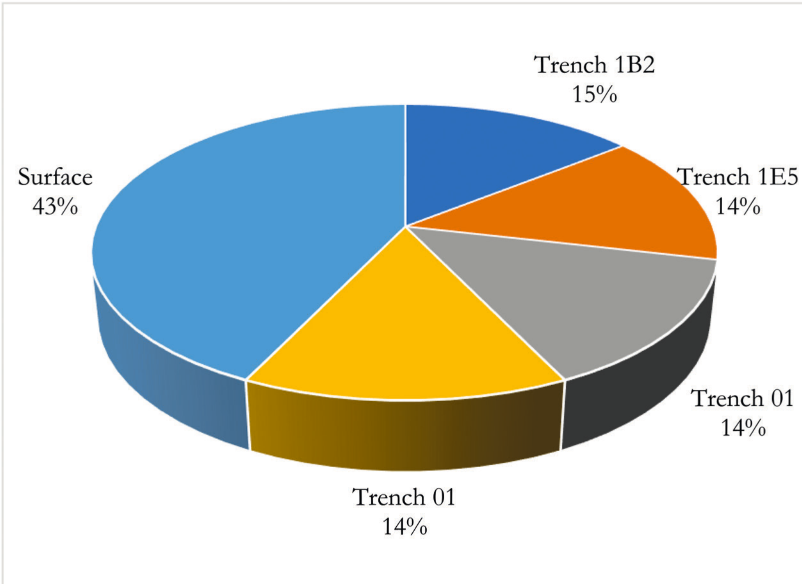
Three of the weights were surface finds (Cat. no. 1136-1137, 1143), but all others were found in Mature Harappan layers and date to the second half of the 3rd millennium BC. None of weights were found in closed archaeological contexts (Fig. 6.4-6).

6.2.2.2. Catalogue

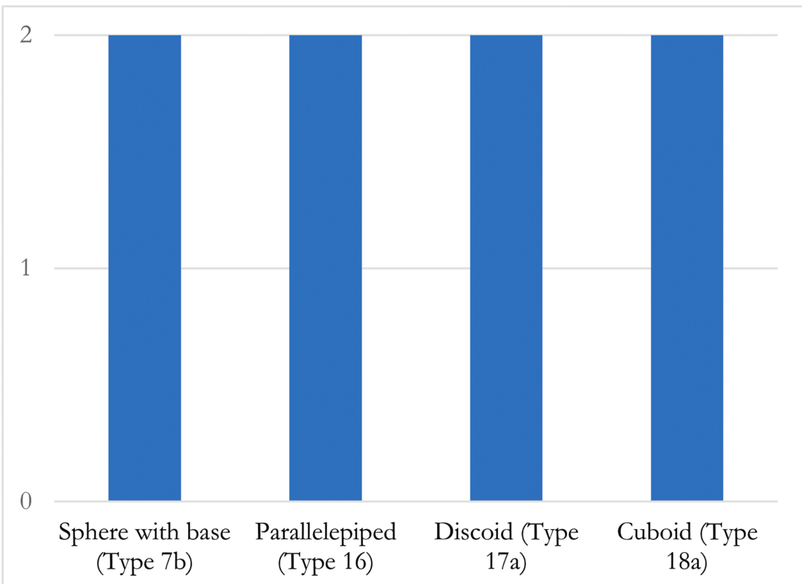
6.2.2.2.1. Sphere with base (Type 7b): Cat. no. 1136-1137

1136. Farmana. - 1527/b, MAH/D.C/0008815, Surface - Sphere with base, worn, incomplete, limestone. H. 3.46 cm, D. 3.35 cm, 54.33+x g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 23, fig. 23.

1137. Farmana. - 1527/a, MAH/D.C/0008815, Surface - Sphere with base, worn, limestone. H. 2.66

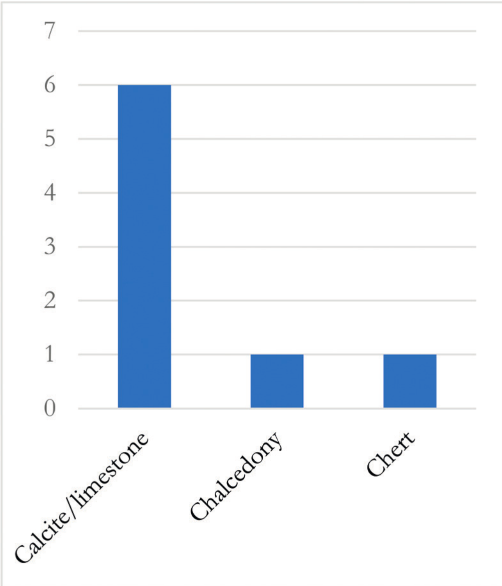


▼*Fig. 6.4. Distribution of weights and potential weights according to their archaeological contexts from Farmana.*



▲*Fig. 6.5. Distribution of shapes from Farmana.*

Fig. 6.6. Distribution of materials from Farmana.



cm, D. 3.13 cm, 59.86 g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 22, fig. 22.

6.2.2.2.2. Parallelepiped (Type 16a): Cat. no. 1138-1139

1138. Farmana. - 50, 1B208002, Trench 1B2, NE - Parallelepiped, good, calcite. L. 1.44 cm, H. 1.98 cm, W. 0.97 cm, 7.09 g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 17, fig. 17.

1139. Farmana. - 734, 1E508001, Trench 1E5, NE-SE - Parallelepiped, slightly chipped, chalcedony. L. 2.46 cm, H. 1.76 cm, W. 2.41 cm, 13.82+x g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 18, fig. 18.

6.2.2.2.3. Discoid (Type 17a): Cat. no. 1140-1141

1140. Farmana. -1562/a, MAH/D.C/0008821 - Discoid, chipped, potential weight, limestone. H. 3.28 cm, D. 4.27 cm, 32.20+x g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 21, fig. 21.

1141. Farmana. - 29, 107009, Trench 01, NE - Discoid, heavily worn, limestone. H. 3.40 cm, D. 4.58 cm, 41.27+x g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 20, fig. 20.

6.2.2.2.4. Cuboid (Type 18a): Cat. no. 1142-1143

1142. Farmana. - 19, 107005, Trench 01, NW - Cuboid, good, chert. L. 0.98 cm, H. 0.73 cm, W. 0.79 cm, 1.86 g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 16, fig. 16.

1143. Farmana. - 38, Surface - Cuboid, heavily worn, potential weight, limestone. L. 4.28 cm, H. 4.09 cm, 28.85+x g - Mature Harappan, 2500-1900 BC - Ascalone 2018c, no. 19, fig. 19.

6.2.2.3. Metrological notes

Preliminary metrological analysis of the Farmana weights has shown the presence of a heavier unit in Haryana, or at least in the Ghaggar River Basin (Ascalone 2018c, 17-18). As in Rakhigarhi, the weights from Farmana concentrate around higher values between 14.18 g and 14.88 g. Excluding the most likely unfinished Cat. no. 1139, the two potential discoidal weights (Cat. no. 1140-1141) and the incomplete Cat. no. 1136, analysis of the remaining weights returns values much higher than the traditional unit of 13.65 g. Cat. no. 1142 (1.86 g) represents ⅛ of a unit of 14.88 g, Cat. no. 1138 is ½ of a 14.18 g shekel. The cuboid weight (Cat. no. 1143) can be interpreted as two units of 14.42 g (x 2 = 28.85 g).

Based on the evidence from the two settlements in the Ghaggar River Basin, the question arises whether the individual, regional styles found in the material culture also spread to the use of weights and measures.

6.3. Kuntasi

The ancient site of Kuntasi, locally known as Bibi-no-Timbo, is located in the Rakkot district on the right bank of the river Phulki. The site covers an area of *c.* 2 ha and rises of 7 m above ground level. Excavations were led by M. K. Dhavalikar (Deccan College) in collaboration with M. R. Rawal and Y. M. Chitalwala (Dhavalikar *et al.* 1996). The site comprises two major chronological phases, dated to the Harappan period with signs of decline during the beginning of the 2nd millennium BC. The settlement layout shows a fortification enclosing an area of 125 m^2, and there is evidence for a 'lower town' with private housing (stone foundations and mud bricks) located on four sides of an open central courtyard. Based on its riverside location, structural evidence (a ramp leading to the river, a watchtower and a platform), and very specific material culture including a stone anchor, Kuntasi has been interpreted as a high tide sea port (Patel/Rajesh 2006, 53-54).

6.3.1. Chronologies

The excavations have revealed two major chronological phases dating to the Harappan period (*c.* 2500-1700 BC). Phase I was attributed to the Mature Harappan phases (*c.* 2500-1900 BC), Phase II to the final years of the Harappan period (*c.* 1900-1700 BC) (Rawat 2015, 192-194). The Phase I ceramics are closely related to Harappan material culture, with traditional black-on-red ware and bichrome ware with red and buff surfaces and painted decorations in black and brown. Other finds include typical Harappan objects such as terracotta toy cart frames, faience and steatite beads, long-barrel carnelian beads, a squared faience seal, gold beads, copper rings, and cuboid weights. A pot discovered in a domestic context contained thousands of steatite micro-beads, some bracelets and two copper rings. Period II shows a general decline of the settlement, with material culture similar to the previous phase albeit with some morphological variations and the addition of regional Ahar type black and red ware.

6.3.2. Weights, potential weights, possible weights and related-finds (Cat. no. 1144-1145)

Based on the methodological approach for the identification of balance weights outlined in the Introduction, Cat. no. 1144 should be considered a possible, Cat. no. 1145 a certain weight.

6.3.2.1. Archaeological contexts

The two weights from Kuntasi (Cat. no. 1144-1145) were found in two different trenches (Trenches K2 and I, respectively), but unfortunately no information about their contexts was provided in the excavation reports. However, the reports explicitly mention that the balance weights were found in Mature Harappan levels (Rawat 2015, 192). On this basis, the weights can be dated to the second half of the 3rd millennium BC.

6.3.2.2. Catalogue

6.3.2.2.1. Discoid in terracotta (Type 17e): Cat. no. 1144

1144. Kuntasi. - 4394, KTS, Trench K2, ST (20A) - Discoid, slightly chipped, potential weight, terracotta. H. 1.86 cm, D. 3.31 cm, 30.14+x g - Mature Harappan, 2500-1900 BC.

6.3.2.2.2. Cuboid (Type 18a): Cat. no. 1145

1145. Kuntasi. - 1908, KTS-I 1908-89, Trench I - Cuboid, perfect, black chert. L. 1.21 cm, H. 1.22 cm, W. 1.28 cm, 5.46 g - Mature Harappan, 2500-1900 BC.

4.3.2.3. Metrological notes

The Kuntasi weights do not easily fit into the known weight systems of the region. The cuboid weight (Cat. no. 1145) could be considered a local production mimicking western weighing standards, representing ⅔ of the traditional Mesopotamian shekel counted at 8.19 g (x ⅔ = 5.46 g). This Mesopotamian unit is commonly found throughout the Greater Indus Valley (Ascalone/Peyronel 1999, 354-362; 2003, 374-385), in Haryana (Ascalone 2018c, no. 10, 20), and in Gujarat. Although there are no definite Mesopotamian imports amongst the weights collected for this research, A. S. Hemmy previously suggested that the collection of artefacts he studied may have included imported weights from the west: ‘It is just possible that these barrel-shaped weights may have been importations from other parts of India, perhaps from places nearer the coast where communication with Elam and Sumer, where the barrel-shaped weight was most popular, was perhaps easier’ (Hemmy 1938, 400-401; see also Rahmstorf 2020).

6.4. Nageshwar

Nageshwar, situated on the southern coast of the Gulf of Kutch (district of Jamnagar, 17 km northeast of Dwaaraka), was a site dedicated to the procurement and processing of marine shells. A large amount of shell-working waste material has been found in various areas of the site, each of which could be connected with a different activity. The *Turbinella* area is located some distance from the settlement, near a large fresh water lake in modern Nageshwar village. The Harappan mound (measuring 120 m x 100 m) was destroyed in 1976 during the construction of earthworks, which brought to light a 2.5 m thick deposit of Harappan culture debris. Successive excavations in 1983-1984, conducted by the Maharaja Sayajirao University of Baroda, revealed 2.0-2.6 m thick Harappan layers. The recovered artefacts belong to the classic Harappan material culture including ceramics, beads, blades, polishers, copper-sheet, ‘triangular terracotta cakes’, bracelets, toy cart frames, and a single cubic weight. Thousands of pottery fragments scattered across the entire site allowed a preliminary dating of the settlement. Zooarchaeological analysis of bones found during the excavations revealed an impressive range of animals including cattle, buffalo, sheep, goat, bull, black buck, hare and turtle (Bhan/Kenoyer 1984, 115-120; Hedge *et al.* 1990).

6.4.1. Chronologies

The excavations revealed two major chronological phases, Periods IA and IB, both of which could be attributed to the Mature Harrapan period (*c.* 2500-1900 BC) based on typological comparisons of ceramics. The pottery mostly consists of reserved slip ware, fine grey ware, buff ware, sturdy red ware and coarse red ware. Some fragments display geometric, floral and faunal pattern decorations made with black pigments.

6.4.2. Weights, potential weights, possible weights and associated finds (Cat. no. 1146)

Cat. no. 1146 is undoubtedly a balance weight that can be used on an equal-armed scale.

6.4.2.1. Archaeological contexts

The weight from Nageshwar (Cat. no. 1146) was a surface find from Area 4D without archaeological context.

6.4.2.2. Catalogue

6.4.2.2.1. Cuboid (Type 18a): Cat. no. 1146

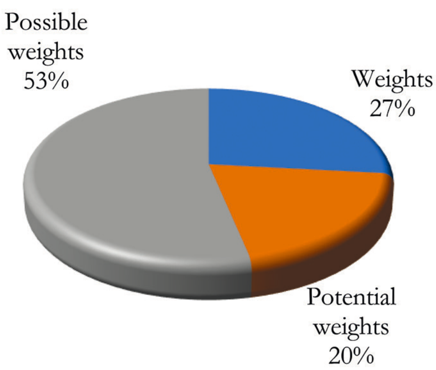
1146. Nageshwar. - 154, Surface, Area 4D - Cuboid, perfect, agate. L. 1.22 cm, H. 1.25 cm, W. 0.92 cm, 3.40 g - Mature Harappan, 2500-1900 BC.

4.4.2.3. Metrological notes

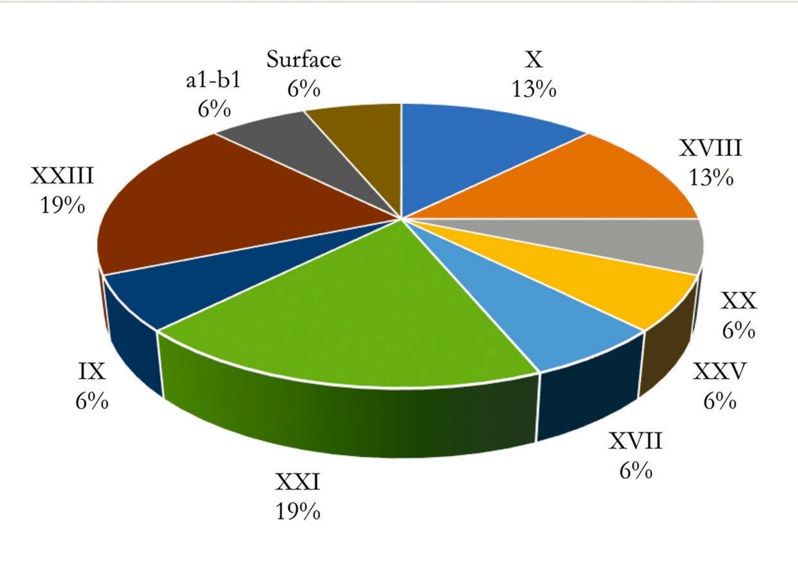
The weight from Nageshwar is a perfect example of Greater Indus Valley balance weights, both in terms of its material (agate), shape (cubic) and mass. Cat. No. 1146 is a ¼ of the unit counted at 13.60 g (3.40 g x 4).

6.5. Nagwada

The site of Nagwada, also known as Godh, covers an area of 1.5 ha located on the eastern shore of



▶*Fig. 6.7. Diffusion of weights, potential weights, possible weights and related-finds from Nagwada.*



▲*Fig. 6.8. Distribution of weights and potential weights according to their archaeological contexts from Nagwada.*

the Little Rann of Kutch in Dasada Taluka (Surendranagar district) in the northern part of Gujarat's coast. Excavations carried out by M. S. University of Baroda's Department of Archaeology and Ancient History between 1985 and 1989 revealed that it was a beadmaking and shell-working site, with a single major chronological period divided in to sub-periods (Hedge *et al.* 1985; 1988; Hedge/Sonawane 1986).

6.5.1. Chronologies

Nagwada's chronology consists of a single period with two subphases. Phase IA (*c.* 3000-2500 BC) is represented by different burial types with ceramic grave good similar to Early Harappan pottery found in Sindh and Baluchistan (Ajithprasad/Sonawane 2011). Phase IB belongs to the Mature Harappan period (*c.* 2200-1900 BC), as indicated by the size of mud bricks (32 cm x 16 cm x 8 cm), bead and shell industry, inscribed terracotta seals, copper celts, and pottery including painted and plain sturdy red ware, buff ware, perforated ware with typical Harappan features such as goblets, 'S' profiled jars, large storage jars, dishes-on-stand, medium sized disc-based vases, beakers, and cylindrical perforated jars. Radiocarbon dating places the end of Period IB around 1860±80 BC (Ajithprasad/Sonawane 2011, 243; see also Hedge *et al.* 1988, 55-65; Ajithprasad/Sonawane 1994, 37-49).

6.5.2. Weights, potential weights, possible weights and associated finds (Cat. no. 1147-1162)

The objects collected by the Maharaja Sayajirao University of Baroda require a different functional interpretation. Morphologically, the cubic, cuboid and parallelepiped specimens are in line with the metrological tradition of the Mature Harappan period (Cat. no. 1157, 1159-1161) and should be considered as balance weights (Fig. 6.7). The function of the spherical objects (Cat. no. 1147-1156), however, is less certain. As discussed in the introduction, the function of an object can only be determined by analysis of multiple features. The spherical objects from Nagwada show clear signs of workmanship. These objects were produced by stone craftsmen for a specific function that can only be hypothesised. Cat. no. 1147-1148 comprise a base which allows the objects to be placed on a flat surface, thus indicating that they may have been used as balance weights. Cat. no. 1149-1156, on the other hand, may have had other functions, perhaps related to accounting and administrative records. In the specific case of the spherical specimens from Nagwada, it was decided to consider the spherical objects with base as 'potential weights' (neither of which have a mass related to the weight systems of the Harappan period), and those without base as 'possible weights'. Finally, the discoidal Cat. no. 1158 was also considered as a 'potential weight' due to its unusual, slightly convex shape and a mass unrelated to the Harappan systems.

6.5.2.1. Archaeological contexts

All of the objects from Nagwada date to the final phase of the Mature Harappan period (*c.* 2200-1900 BC). The weights were found scattered across the entire site, never in association with other weights or potential weights. Two of the weights (Cat. no. 1155 and 1162) were found in waste pits dating to the final years of the settlement (Fig. 6.8-10).

6.5.2.2. Catalogue

6.5.2.2.1. Sphere with base (Type 7b): Cat. no. 1147-1148

1147. Nagwada. - 1639, Trench X, A4 - Sphere with base, good, potential weight, limestone. H. 1.36 cm, D. 1.50 cm, 2.83 g - Mature Harappan, 2200-1900 BC.

1148. Nagwada. - 2760, Trench XVIII, B4 - Sphere with base, good, potential weight, limestone. H. 1.37 cm, D. 1.41 cm, 2.95 g - Mature Harappan, 2200-1900 BC.

6.5.2.2.2. Sphere pebble (Type 9d): Cat. no. 1149-1156

1149. Nagwada. - 1186, Trench X, B2 - Sphere pebble, good, possible weight, limestone. D. 1.36 cm, 2.10 g - Mature Harappan, 2200-1900 BC.

1150. Nagwada. - 2499, Trench, B1 - Sphere pebble, good, possible weight, limestone. D. 1.25 cm, 2.23 g - Mature Harappan, 2200-1900 BC.

1151. Nagwada. - 2046, Trench XXV, B2 - Sphere pebble, good, possible weight, limestone. D. 1.43 cm, 2.74 g - Mature Harappan, 2200-1900 BC.

1152. Nagwada. - 2323, Trench XVII, 1, Fii - Sphere pebble, good, possible weight, limestone. D. 1.49 cm, 3.26 g - Mature Harappan, 2200-1900 BC.

1153. Nagwada. - 2437, Trench XVIII, B2 - Sphere pebble, good, possible weight, limestone. D. 1.56 cm, 3.27 g - Mature Harappan, 2200-1900 BC.

1154. Nagwada. - 3095, Trench XXI, A2 - Sphere pebble, good, possible weight, limestone. D. 1.53 cm, 3.38 g - Mature Harappan, 2200-1900 BC.

1155. Nagwada. - 1226, Trench IX, Bulk A, Pit 1 - Sphere pebble, good, possible weight, limestone. D. 1.74 cm, 6.88 g - Mature Harappan, 2200-1900 BC.

1156. Nagwada. - 3189, Trench XXIII, 3 - Sphere pebble, good, possible weight, limestone. D. 2.41 cm, 13.73 g - Mature Harappan, 2200-1900 BC.

6.5.2.2.3. Parallelepiped (Type 16a): Cat. no. 1157

1157. Nagwada. - 3090, Trench XXI, B - Parallelepiped, slightly chipped, chert (red stone). L. 1.81 cm, H. 1.61 cm, W. 2.36 cm, 15.62+x g - Mature Harappan, 2200-1900 BC.

6.5.2.2.4. Discoid (Type 17a): Cat. no. 1158

1158. Nagwada. - 554, Trench V, Area a1-b1, A1 - Discoid, good, potential weight, stone. H. 1.99 cm, D. 3.09 cm, 3.14 g - Mature Harappan, 2200-1900 BC.

6.5.2.2.5. Cuboid (Type 18a): Cat. no. 1159-1161

1159. Nagwada. - 3453, Surface - Cuboid, perfect, agate. L. 0.80 cm, H. 0.64 cm, W. 0.80 cm, 0.97 g - Mature Harappan, 2200-1900 BC.

1160. Nagwada. - 3700, Trench XXIII, A1 - Cuboid, perfect, agate. L. 0.97 cm, H. 0.86 cm, W. 0.97 cm, 1.92 g - Mature Harappan, 2200-1900 BC.

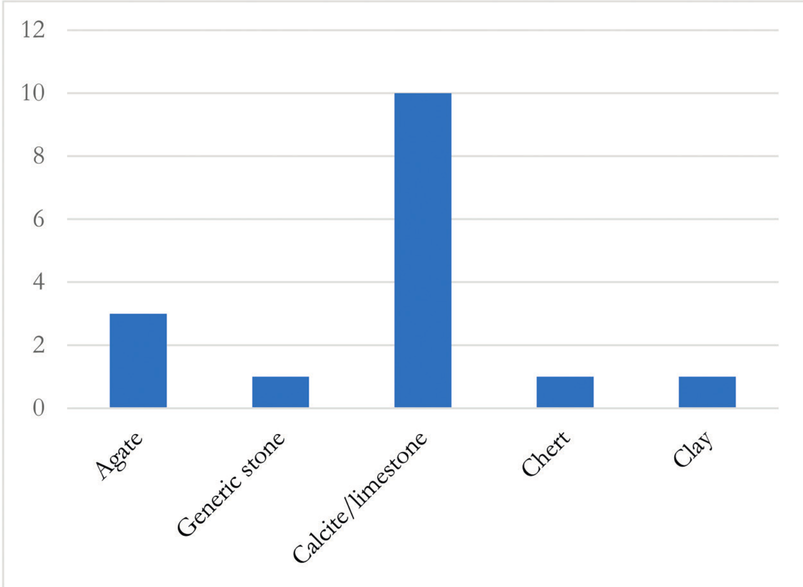
1161. Nagwada. - 2975, Trench XXI, A1 - Cuboid, perfect, agate. L. 3.02 cm, H. 2.49 cm, W. 2.95 cm, 54.32 g, Mature Harappan, 2200-1900 BC.

6.5.2.2.6. Cuboid in terracotta (Type 18b): Cat. no. 1162

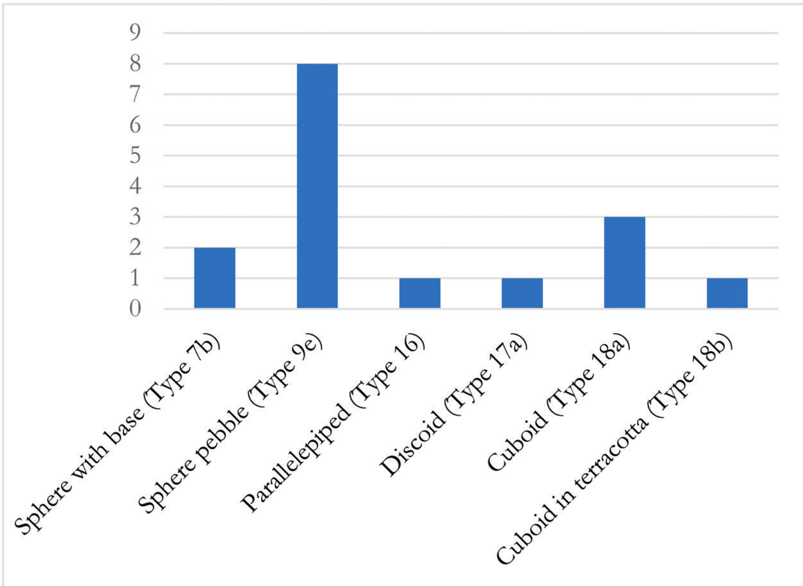
1162. Nagwada. - 3235, Trench XXIII, Pit 2 - Fragmented cuboid, terracotta. L. 5.33 cm, H. 3.63 cm, W. 4.95 cm, 118.83+x g - Mature Harappan, 2200-1900 BC.

6.5.2.3. Metrological notes

Due to the uncertain function of Cat. no. 1147-1158 and their small number, metrological analysis was only carried out for Cat. no. 1159-1162, which can be considered as balance weights with certainty.



▲*Fig. 6.9. Distribution of shapes from Nagwada.*



▲*Fig. 6.10. Distribution of materials from Nagwada.*

Analysis of the four Nagwada weights yields interesting results. While Cat. no. 1161 (54.32 g) and Cat. no. 1162 (118.83+x g) follow the traditional Harappan unit of 13.65 g (four shekels of 13.58 g and ten shekels of 11.88+x g, respectively), Cat. no. 1159 and 1160 seem to belong to western systems. While Cat. no. 1159 with a mass of 0.97 g cannot easily be related to any unit due to its relatively small mass (0.97 g x 8 = 7.76 g?), Cat. no. 1160 is of particular interest. With a mass of 1.92 g, the weight represents fractions of three different shekels (¼ of 7.68 g, ⅕ of 9.60 g, ⅙ of 11.52 g), all of which are derivatives of the 470 g mina. These units were commonly used in northern Mesopotamia and Inner Syria from the middle of the 3rd millennium BC. As outlined in the previous chapters, the existence of a mina of *c.* 470 g in the ancient Near East has been identified based on epigraphic evidence dating back to the Late Bronze Age, and new archaeological evidence from Ebla (Ascalone/Peyronel 2006a, 80-99), Tell Judeyde (Braidwood/Braidwood 1960, 324, fig. 377: 5), Tell Beydar (Milano 2004, no. 3, 5-6), Tell Brak (Oates *et al.* 2001, fig. 485, no. 35), Tell Sweyhat (with inscription reading '1 mina') (Holland 1975, 75-76), Tell Mumbaqa (Czichon/Werner 1998, 97-98, 869-870, pl. 92), Tepe Gawra (Speiser 1935, 2, tav. 43a,2.6; 92, no. 5, 8, 22-24), Koructepe (van Loon 1978, 105), Tell Selenkahiye (van Loon 2001, 9.451, no. 380, 446, 460, S. 7, W.3, 5), Troy (Schmidt, H. 1902, no. 6860-6861, 6864, 6868-6870, 6872-6877, 6881-6882, 6888-6889, 6891, 6893, 6895-6900, 8762-8763; Bobokhyan 2006, fig. 5, no. 6, 19, 35), Poliochni (Petruso 1978, no. 44, 47-49), Tarsus (Goldman 1956, no. 123-124, 132), Susa (with metrological inscriptions) (Cat. no. 20, 70, 80, 220, 530, 669), Girsu (Cat. no. 760, 762, 765, 776, 799, 784, 820, 831, 834, 844, 848, 856, 867-868, 870-871) and Kish (Cat. no. 874, 876, 879, 882-883, 886). Evidence from Gujarat suggests that the western shekels existed as early as the mid-3rd millennium BC.

6.6. Shikarpur

Shikarpur, locally known as Valamiyo Timbo, is a Harappan site located in Bhachau, in the Kutch district. Shikarpur is a large, approximately rectangular mound, *c.* 8 m elevated from the surrounding plain. Although eroded by the weather, the rectangular, fortified layout of the settlement is still visible. The fortified area spans an area of 95 m x 84 m, covering approximately 0.8 ha. The site was excavated between 1987 and 1990 by the Gujarat State Department of Archaeology under the direction of Raval (IAR 1987-1988; 1988-1989; 1993). From 2007 to 2014, the settlement was re-excavated by the Maharaja Sayaijirao University of Baroda, which has led to a better understanding of the chronology and function of the settlement (Bhan/Ajithprasad 2008, 1-9; 2009, 1-9; Chase *et al.* 2014, 63-78). Excavations conducted in the eastern part of the site outside the fortified area have revealed structural remains connected to dwellings and small-scale household production areas including pottery. The only evidence for large-scale production comes from Rohri chert blades. The settlement has been interpreted as one of the major trading sites of the region (IAR 2007; 2013-2014).

6.6.1. Chronologies

Shikarpur comprises over 3 m of Harappan material desposits. The earlier excavations identified 20 distinct stratigraphic layers, with layers 1-9 dating to the Mature Harappan period (*c.* 2500-1900 BC) and layers 10-20 to the Early Harappan phase (*c.* 3000-2500 BC). Large amounts of typical Harappan material culture were recovered, including terracotta bulls, rams, toy carts, bracelets, 'triangular cakes', shell beads, semi-precious stone pendants and beads, copper rings, and chisels (IAR 1963-1964).

The later excavations carried out by Maharaja Sayaijirao University identified three major phases of Harappan occupation (Rajesh 2018, 104-105). Phase I belongs to the Classical Harappan phase. Trenches Es4, Eh1 and Eg4 show that the occupied areas were predominantly on a stabilised reddened sand dune. The material culture from Phase I comprises a range of Harappan objects including a long fluted blade-core, several long blades of Rohri chert, a few semi-precious stones, faience and steatite beads, terracotta bracelets, toy cart frames and wheels, human figurines made of terracotta, inscribed seals and seals impressions, a large copper axe, bracelets and ladles, and chert cubic weights. Phase II can be distinguished from Phase I by the predominance of Sorath Harappan pottery, whereas Phase III is defined by the complete absence of Classical Harappan artefacts with pottery related to Rangpur IIC, Rojdi C, and Bagasra Phase IV.

6.6.2. Weights, potential weights, possible weights and associated finds (Cat. no. 1163-1169)

All of the objects from Shikarpur, including the two terracotta specimens (Cat. no. 1168-1169), should be considered as balance weights due to their morphology. The presence of clay/terracotta weights opens up discussions of different socio-economic systems including the production of 'official' and 'private' balance weights, as discussed in the Introduction.

6.6.2.1. Archaeological contexts

The 2007 excavation reports mentioned the discovery of numerous unfinished cubic weights found in the vicinity of a workshop for the production of beads (and weights?) (IAR 2007). Otherwise, the Shikarpur weights mostly come from individual contexts, with Cat. no. 1167 being the only surface find, with the exception of Cat. no. 1166 and 1169 which were found in the same context (Fig. 6.11-13).

The contextual evidence ascribes all of the weights to Periods I and II of the settlement (as identified by the more recent excavations), with the only exception being Cat. no. 1163, which was found in a trench that dates back to the earliest settlement phases (Period III) during the Early Harappan period. Its morphology, however, places the weights in the second half of the 3rd millennium BC.

Cat. no. 1164 and 1168 were in Trenches Eh1 and Eh2, respectively, located within the fortified area in close proximity to structures dating to Period I. Cat. no. 1165 was found outside the Citadel in Ik12 (level 3), near structures associated with the first two periods. Cat. no. 1166 and 1169 were found outside the Citadel where the structures are associated with the first two occupation periods. They were found in close proximity to each other in Em13, a trench dated to Periods I and II; a large, 25 m x 10 m trench excavated through the central area of the fortification, recovered wall structures from the Mature Harappan period, dated between the mid-3rd and early-2nd millennium BC. The weights were found in more recent layers and should be dated to the end of the Harappan period.

6.6.2.2. Catalogue

6.6.2.2.1. Parallelepiped (Type 16a): Cat. no. 1163

1163. Shikarpur. - 3878, Area C, Trench Iv3, 8 - Parallelepiped, slightly chipped, rugosa and genus limestone. L. 1.78 cm, H. 1.07 cm, W. 1.53 cm, 7.19+x g - Mature Harappan, 2500-1900 BC.

6.6.2.2.2. Cuboid (Type 18a): Cat. no. 1164-1167

1164. Shikarpur. - 182, Area C, Trench Eh2, 7 - Cuboid, perfect, chert. L. 1.02 cm, H. 1.00 cm, W. 0.73 cm, 1.77 g - Mature Harappan, 2500-1900 BC.

1165. Shikarpur. - 3445, Area C, Trench Ik12, 3 - Cuboid, perfect, chert. L. 1.24 cm, H. 1.21 cm, W. 1.23 cm, 4.15 g - Mature Harappan, 2500-1900 BC.

1166. Shikarpur. - 1880, Area C, Trench Em13, 2 - Cuboid, slightly chipped, chert. L. 1.86 cm, H. 1.64 cm, W. 1.85 cm, 13.70 g - Mature Harappan, 2200-1900 BC.

1167. Shikarpur. - 1365, Surface - Cuboid, incomplete, red stone. L. 2.71 cm, H. 2.44 cm, W. 2.61 cm, 26.12+x g - Mature Harappan, 2500-1900 BC.

6.6.2.2.3. Cuboid in terracotta (Type 18b): Cat. no. 1168-1169

1168. Shikarpur. - 1050, Area C, Trench Eh1, 13, 733 - Cuboid, incomplete, terracotta. L. 2.34 cm, H. 2.31 cm, W. 2.67 cm, 19.77+x g - Mature Harappan, 2500-1900 BC.

1169. Shikarpur. - 1933, Area C, Trench Em13, 2 - Cuboid, chipped, terracotta. L. 2.87 cm, H. 2.91 cm, W. 3.43 cm, 40.31+x g - Mature Harappan, 2200-1900 BC.

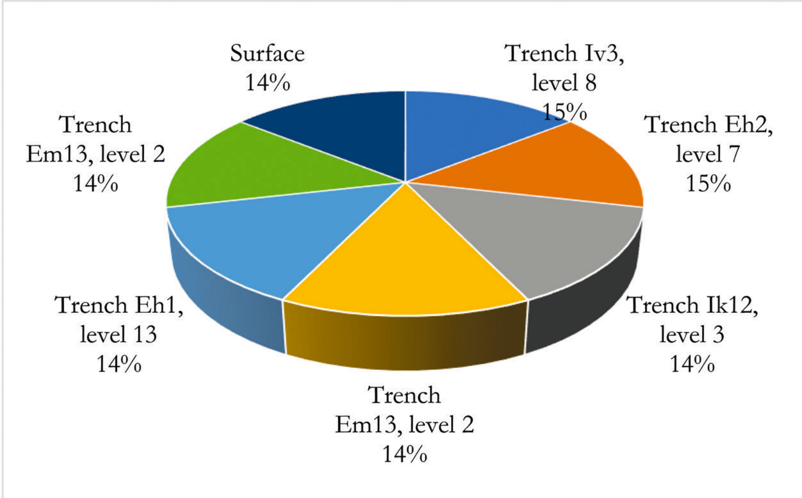
6.6.2.3. Metrological notes

Three weights (Cat. no. 1167-1169) are incomplete and cannot be analysed metrologically. Analysis of the remaining weights returns values that are only partially compatible with the local unit. Cat. no. 1164 and 1166 can easily be related to the local unit as ⅛ shekel (1.77 g x 8 = 14.16 g) and one shekel (13.70 g). Cat. no. 1163 and 1165 show connections with western systems, with Cat. no. 1165 (4.15 g) being equivalent to half a Mesopotamian shekel of 8.30 g.

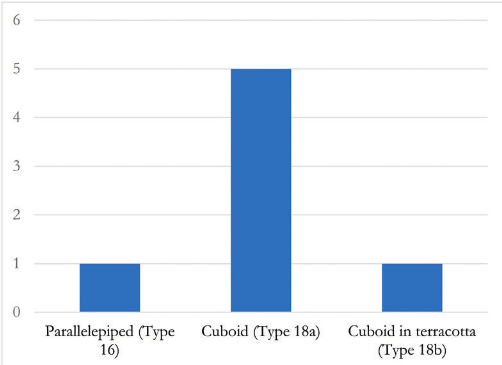
6.7. Bagasra

Bagasra is located in Maliya in the Rajkot district, on the south-eastern shore of the Gulf of Kutch. The site is located *c.* 500 m from the Gulf and was first explored during the late 1980s by a joint campaign carried out by the Deccan College of Pune and the Gujarat State Archaeology Department. Between 1995 and 2005, annual excavation campaigns were conducted by the Department of Archaeology and Ancient History of the Maharaja Sayaijirao University of Baroda (IAR 1995-1996; 1996-1997; 1997-1998; 1999-2000; Sonawane *et al.* 2003, 21-50; Bhan *et al.* 2004, 153-158; Chase *et al.* 2014, 63-78).

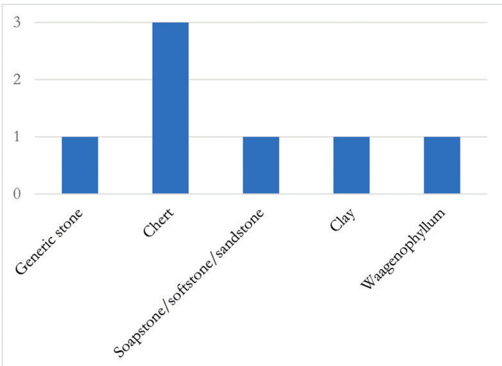
The excavations have revealed a rectangular fortified Harappan settlement covering an area of



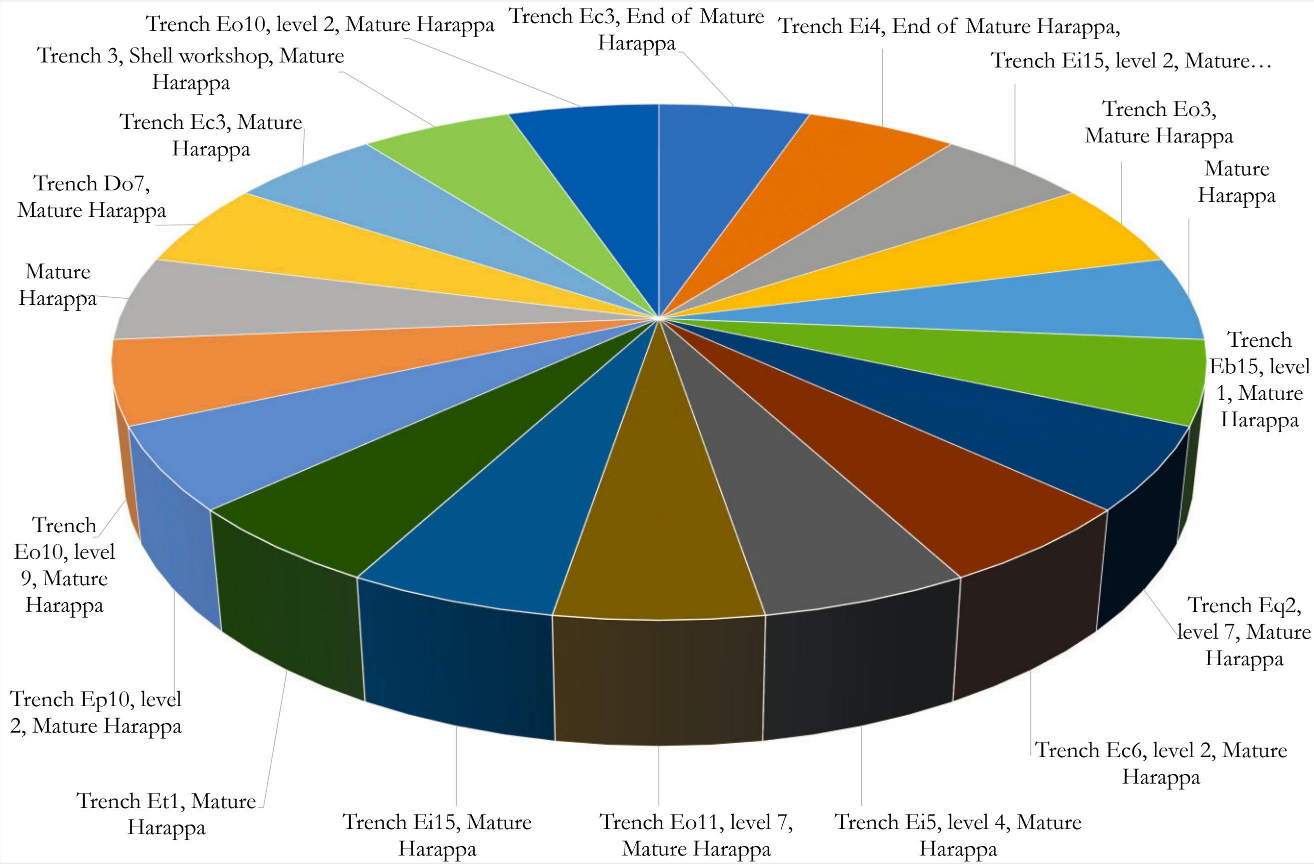
▲*Fig. 6.11. Distribution of weights and potential weights according to their archaeological contexts from Shikarpur.*



◀*Fig. 6.12. Distribution of shapes from Shikarpur.*



◀*Fig. 6.13. Distribution of materials from Shikarpur.*



▲*Fig. 6.14. Distribution of weights and potential weights according to their archaeological contexts from Bagasra.*

160 m x 120 m, with four major archaeological phases. The site was likely a commercial outpost, as suggested by its proximity to the Gulf coast and the evidence recovered during the excavation campaigns. The excavations have revealed numerous workshops for the processing of shells, semi-precious stones, faience and copper, and other raw materials (Bhan *et al.* 2004, 154).

Turbinella pyrum was processed on an almost industrial scale in a rectangular structure near the north-western outskirts of the settlement, where thousands of unused *Turbinella pyrum* shells were found alongside thousands of unfinished and finished circlets and large quantities of micro shell waste.

Similar evidence was found for the processing of faience in the eastern periphery area, where large numbers of white rock quartz (used to create silica powder) fragments were recovered. Stone bead production was identified outside the fortification in the southern half of the settlement, where large numbers of stone beads in various stages of the production process as well as specialist drills and raw materials were found.

The excavators suggest that the large-scale production took place not only to satisfy local demands (as in Nageshwar for example) but to be exported to an external market, taking advantage of the geographic location of the settlement (Bhan *et al.* 2004, 156-157).

6.7.1. Chronologies

Four occupational phases could be identified in Bagasra. Phases I to III can be ascribed to the Harappan Urban period (*c.* 2500-1900 BC), with Phase I being characterised by Anarta pottery and classical Harappan material culture; Phase II is defined by the construction of the fortification wall; and Phase III can be identified through a predominance of Sorath Harappan pottery (Rajesh 2018, 111). The final occupation phase (Phase IV) belongs to the Post-Urban Harappan period, with Sorath pottery connected to Rangpur IIC and Rojdi C, and a total absence of typical Harappan finds.

6.7.2. Weights, potential weights, possible weights and associated finds (Cat. no. 1170-1188)

Based on their morphologies and/or mass values, the majority of the 19 objects from Bagasra (Cat. no. 1170-1172, 1176-1188) should be considered as balance weights. Cat. no. 1173-1175, however, were most likely used for smoothing or polishing other materials.

6.7.2.1. Archaeological contexts

All of the Bagasra weights come from Harappan period contexts and should be dated to the second half of the 3rd millennium BC. Most of the weights were found in a number of trenches, with few exceptions (Fig. 6.14-16). The site was divided into a grid of nine 300 m x 300 m squares, with the mound in the central square, numbered 1-9 starting from the north-western square. Each square was then subdivided into a further grid of nine 100 m x 100 m squares with designated letters A-I (Sonawane *et al.* 2003, 24).

The weights were recovered from exclusively Harappan period layers in 12 different trenches (Ec3, Ei4, Ei15, Eb15, Eq2, Ec6, Eo10, Et1, Eq10, Eo10, Do7, Ec3). Evidence for the post-Harappan Period IV was only found in Trenches Er13, Eo10 and Es4, excavated outside the fortification wall.

Apart from Cat. no. 1181 and 1185, which were recovered from spoil heaps from grid squares Et1 and Do7, the weights were found *in situ* in Harappan layers. Detailed stratigraphic and contextual considerations can be made for a group of weights including Cat. no. 1183 from Trench Eo10, where a deep trench was excavated to the natural soil level: the weight was found in level 9, attributed by the excavators to Period I (Early Harappan), prior to the construction of the fortifications (levels 11-8 were attributed to the pre-urban phase of the settlement). Contextual considerations are also possible for Cat. no. 1177 from level 7 in Trench Eq2, which dates to the second construction phase of the fortifications in Period II.

Finally, Cat. no. 1187, which was found in the shell workshop near the north-western outskirts of the settlements, is contextually one of the most interesting weights. This perfect cubic agate weight was found in association with thousands of finished and unfinished *Turbinella pyrum* bracelets as well as copious amounts of waste fragments, in a room within the workshop. The mud brick structure measured *c.* 5.6 m x 3.2 m and comprised two chambers. The second chamber contained three large heaps of shell bracelets, thousands of unfinished and finished shell circlets, and a large quantity of micro shell waste. The shells were likely sorted by quality and used for different purposes (Bhan *et al.* 2004, 155). The presence of an extremely well-made weight representing two Harappan shekels in a shell processing workshop suggests that balance weights were not only used during mercantile trading, but also for the creation and manufacturing of objects and materials. The use of weights in processing workshops confirms the assumptions from the Introduction that weights were instruments not exclusively used for trading but also used for other daily functions, used not only by merchants but by a number of different people. Working on the assumption that different types and materials for balance weights were related to the different groups of people who used them, the presence of a 'high-quality' weight in the Bagasra shell workshop may suggest that the workshops were not only involved in the manufacturing of objects, but also directly responsible for their subsequent sale and distribution.

As addressed in Chapter 3, a second consideration is the use of standard shell blocks, which are very common in Dholavira. These cylindrical blocks made of *Turbinella pyrum* could have been specifically created to make trade easier, by storing them in stacks of pre-determined size. The value of these stacks could be judged at a glance, thus enabling easier and rapid sales. The presence of a standard Harappan weight in the shell workshops could indicate that the carver cut them into blocks of standardised shape and weight (Kenoyer 2008, 21).

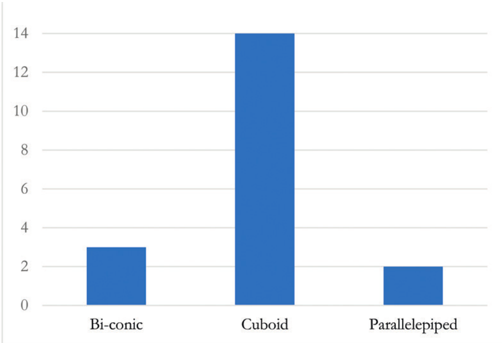


Fig. 6.15. Distribution of shapes from Bagasra.

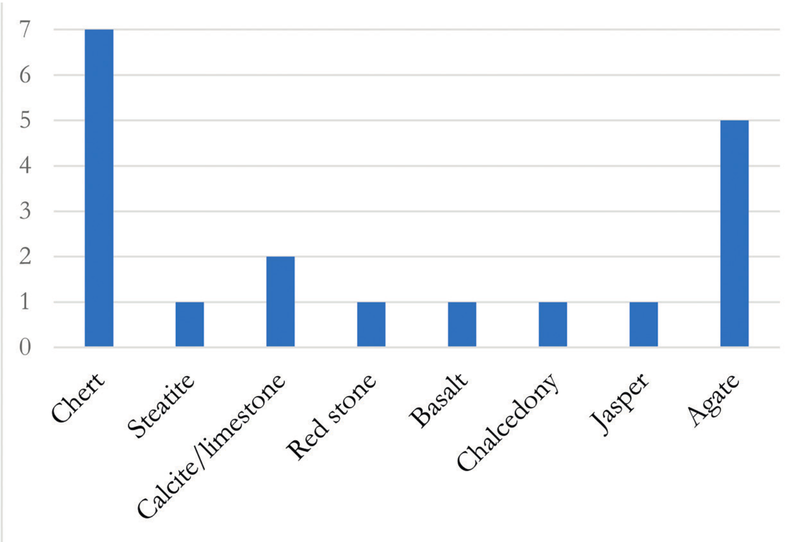


Fig. 6.16. Distribution of materials from Bagasra.

6.7.2.2. Catalogue

6.7.2.2.1. Biconic (Type 12): Cat. no. 1170-1172

1170. Bagasra. - 4142, Area C, Trench Ec3 - Biconic, perfect, chert. H. 0.89 cm, D. 1.08 cm, 2.15 g - Mature Harappan, 2500-1900 BC.

1171. Bagasra. - 6715, Area C, Trench Ei4 - Biconic, slightly chipped, steatite. H. 1.07 cm, D. 1.45 cm, 3.17+x g - Mature Harappan, 2500-1900 BC.

1172. Bagasra. - 6527, Area C, Trench Ei15, layer 2 - Biconic, good, limestone. H. 3.39 cm, D. 4.82 cm, 127.56 g - Mature Harappan, 2500-1900 BC.

6.7.2.2.2. Parallelepiped (Type 16a): Cat. no. 1173-1175

1173. Bagasra. - 1888, Area C, Trench Eo3 - Parallelepiped, good, possible weight, red stone. L. 2.67 cm, H. 1.72 cm, W. 2.09 cm, 27.69 g - Mature Harappan, 2500-1900 BC.

1174. Bagasra. - 1724, Area C - Parallelepiped, fragmented and chipped, possible weight, chert. L. 4.71 cm, H. 1.50 cm, W. 2.64 cm, 3.27+x g - Mature Harappan, 2500-1900 BC.

1175. Bagasra. - 7090, Area C, Trench Ei5, layer 4 - Parallelepiped, fragmented, possible weight, basalt. L. 1.89 cm, H. 2.31 cm, W. 0.33 cm, 3.18+x g - Mature Harappan, 2500-1900 BC.

6.7.2.2.3. Cuboid (Type 18a): Cat. no. 1176-1188

1176. Bagasra. - 4974, Area C, Trench Eb15, layer 1 - Cuboid, good, limestone. L. 0.79 cm, H. 0.84 cm, W. 0.80 cm, 1.15 g - Mature Harappan, 2500-1900 BC.

1177. Bagasra. - 1655, Area C, Trench Eq2, layer 7 - Cuboid (irregular), incomplete, chert. L. 1.05 cm, H. 0.94 cm, W. 0.85 cm, 1.84+x g - Mature Harappan, 2500-1900 BC.

1178. Bagasra. - 3251, Area C, Trench Ec6, layer 2 - Cuboid, good, chalcedony. L. 1.01 cm, H. 0.90 cm, W. 0.89 cm, 2.17 g - Mature Harappan, 2500-1900 BC.

1179. Bagasra. - 7174, Area C, Trench Eo11, layer 7 - Cuboid, chipped, jasper. L. 1.43 cm, H. 1.41 cm, W. 1.12 cm, 4.71+x g - Mature Harappan, 2500-1900 BC.

1180. Bagasra. - 6469, Area C, Trench Ei15 - Cuboid, chipped, chert. L. 1.51 cm, H. 1.76 cm, W. 1.20 cm, 5.80+x g - Mature Harappan, 2500-1900 BC.

1181. Bagasra. - 2380, Area C, Trench Et1, ashy layer 2 - Cuboid, good, chert. L. 1.24 cm, H. 1.41 cm, W. 1.39 cm, 6.88 g - Mature Harappan, 2500-1900 BC.

1182. Bagasra. - 8437, Area C, Trench Ep10, layer 2 - Cuboid, perfect, chert. L. 1.37 cm, H. 1.39 cm, W. 1.38 cm, 6.95 g - Mature Harappan, 2500-1900 BC.

1183. Bagasra. - 5895, Area C, Trench Eo10, layer 9 - Cuboid, perfect, agate. L. 1.52 cm, H. 1.50 cm, W. 1.31 cm, 7.18 g - Mature Harappan, 2500-1900 BC.

1184. Bagasra. - Area C - Cuboid, good, agate. L. 1.47 cm, H. 1.50 cm, W. 1.44 cm, 7.69 g - Mature Harappan, 2500-1900 BC.

1185. Bagasra. - 660, Area C, Trench Do7, dump in layer 2 - Cuboid, good, agate. L. 1.86 cm, H. 1.83 cm, W. 1.81 cm, 14.85 g - Mature Harappan, 2500-1900 BC.

1186. Bagasra. - 3862, Area C, Trench Ec3 - Cuboid, chipped, agate. 11.78+x g - Mature Harappan, 2500-1900 BC.

1187. Bagasra. - 8568, Area C, 3, shell workshop - Cuboid, perfect, agate. L. 2.49 cm, H. 1.90 cm, W. 2.39 cm, 27.35 g - Mature Harappan, 2500-1900 BC.

1188. Bagasra. - 4491, Area C, Trench Eo10, layer 2 - Cuboid, good, slightly worn, chert. L. 4.33 cm, H. 3.10 cm, W. 4.13 cm, 130.11 g - Mature Harappan, 2500-1900 BC.

6.7.2.3. Metrological notes

Metrological analysis of the Bagasra weights is mostly consistent with the historical documentation for Harappan weights, based on dividing the western mina of 470 g by 60 (see Ascalone/Peyronel 1999, 354-362; 2003, 374-385; Rahmstorf 2020, 83-85 and the data from Dholavira in this volume for information on foreign weight systems). Fragmented weights (Cat. no. 1171, 1177, 1179-1180, 1186) were not included in the analysis, with the exception of Cat. no. 1184 which is equivalent to one shekel unit of 7.83 g (slightly underestimated at 7.69 g). The weights from Bagasra fit well into the system of the Greater Indus Valley, with factors ⅟12 (Cat. no. 1176: 1.15 g x 12 = 13.80 g), ⅙ (Cat. no. 1170: 2.15 g x 6 = 12.90 g; Cat. no. 1178: 2.17 g x 6 = 13.02 g), ½ (Cat. no. 1181: 6.88 g x 2 = 13.76 g; Cat. no. 1182: 6.95 g x 2 = 13.90 g; Cat. no. 1183: 7.18 g x 2 = 14.36 g), 2 (Cat. no. 1187: 27.35 g ÷ 2 = 13.67 g) and 10 (Cat. no. 1172: 127.56 g ÷ 10 = 12.76 g). The analysis demonstrates that the weights from Bagasra are based on a unit of *c.* 13.70 g, with multiples of 2, 4, 10, 20, 40, 100, 200, 400 *etc.* and fractions of ½, ¼, ⅙, ⅛, ⅟16, with only Cat. no. 1176 (= ⅟12) standing out as a peculiarity. The same system was demonstrated for other major Indus Valley sites such as Harappa, Mohenjo-daro or Chanhu-daro.

6.8. Dholavira

The ancient site of Dholavira is located on the island of Khadir between two monsoon channels (Manhar and Mansar), in Bhachau, Kutch district, in Gujarat. The ancient settlement and adjacent cemetery cover an area of more than 100 ha, half of which was surrounded by Harappan fortifications. Archaeological excavations were carried out from 1989-2004 by R. S. Bisht (Archaeological Survey of India) (IAR 1989-1990; 1990-1991; 1991-1992; 1992-1993; 1993-1994; 1996-1997; 1997-1998; 1998-1999; 1999-2000; 2000-2001; Bisht 1989a, 397-408; 1989b, 265-272; 1991, 71-82; 1994; 1997, 107-120; 1998-1999, 14-37; 2000, 11-23; 2004, 35-48; 2006, 283-338; 2010, 75-76). The settlement was likely founded as a small town during the Early Harappan period around 3000 BC, which by the Mature Harappan period had developed into a three-partite citadel with a squared fortification. An urban crisis following a destructive earthquake around 2200 BC forced extensive reconstructions that included expansion eastwards to include the Lower Town areas, until the city was abandoned around *c.* 2000 BC.

6.8.1. Chronologies

Based on stratigraphic layers and thermoluminescence dating of four samples (Physical Research Laboratory Gujarat), a clear chronological sequence between the 3rd and the mid-2nd millennium BC could be defined (Bisht 1989a, 397-408; 1989b, 265-272; 1991, 71-82; 1994; 1997, 107-120; 1998-1999, 14-37; 2000, 11-23; 2004, 35-48; 2006, 283-338; 2010, 75-76) (Tab. 6.1).

Period/Stage I: 3000-2900 BC

Period/Stage II: 2900-2800 BC
Period/Stage III: 2800-2500 BC
Period/Stage IV: 2500-2100 BC
Period/Stage V: 2100-2000 BC
Period/Stage VI: 1950-1800 BC
Period/Stage VII: 1500-1450 BC

Evidence for all seven periods has been found in the area surrounding the Citadel, whereas the Middle and Lower Towns can only be traced between Periods III-V (*c.* 2800-2000 BC, Harappa 2-3C) (Bisht 2006-2007, 82-83).

Period I: the earliest settlement at Dholavira was surrounded by a presumably massive fortification wall which could be traced in the southwestern corner of the enclosed area. Further evidence comes from the western gate of the Castle. Wall remains from the east, made of standardised 9 cm x 18 cm x 36 cm bricks, suggest an extensive fortified area. Evidence for copper-working, bead-making, shell-working and intricate ceramics have been found, all of which are common features of Early Harappan culture.

Period II: during this period, a substantial brick wall was added to the inside of the pre-existing fortification. A new residential area developed in the northern area of the enclosure. Period I pottery shapes, similar to those from Amri IIB in the Sindh region, continued to be in use, but both the quality and the overall quantity of ceramics increased.

Period III: divided into subphases IIIA and IIIB, this period saw a widening of the earlier fortifications, the formation of a castle within the enclosed area and the addition of a new fortified structure which the excavators identified as a Bailey in the west. The northern town walls were founded, while reservoirs were created in the south, west and north. This period also saw the first introduction of Harappan material culture: a square seal made of steatite without inscriptions, Indus signs, and a single cubic weight (Cat. no. 1881). Towards the end of Period III, a natural disaster significantly damaged the settlement, largely destroying the defensive wall and the castle. Subsequent major rebuilding of the main buildings drastically altered the overall layout of the settlement. The Lower Town was added and the city walls were extended eastwards (Bisht 1998-1999, 16-17).

Period IV: contemporary with the Mature Harappan period, the overall layout of the settlement remained unchanged including the monumental buildings, gateways, fortifications and drainage systems. The material culture comprised classic Harappan artefacts including pottery, seals, beads, and objects made of gold, copper, ivory, shell, faience, steatite and clay. Local variations are mostly visible in the contemporary ceramics.

Period V: during this period the settlement underwent a general decline, perhaps as a direct consequence of the period of occupational crisis in Phase 3B, which immediately followed the supposed earthquake at the end of 3A. The Citadel appears to have been particularly affected, which shines an interesting light on the social and political organisation of the settlement around the end of the 3rd millennium BC, when Dholavira's elites seemingly underwent a drastic downsizing of their administrative and organisational control. At the end of this period, a new earthquake once again caused devastating destruction to the settlement, and severe flooding caused an economic crisis and shortages.

Chronology	Indus periods	Harappa periods	Dholavira archaeological phases
3500-2800 BC		Period 1 (Ravi culture)	I (3300-2900 BC)
2900-2600 BC	Early Harappa	Period 2 (Kot-Diji phase)	II (2900-2800 BC)
2600-2500 BC	Mature Harappa	Period 3A	III (2800-2500 BC)
2500-2300 BC		Period 3B	IV (2500-2100 BC)
2300-2000 BC		Period 3C	
			V (2100-2000 BC)
2000-1800 BC	Late Harappa	Period 4	VI (2000-1800 BC)
1800-1700 BC		Period 5	

▲*Tab. 6.1. Chronology and archaeological periods from Greater Indus and Dholavira.*

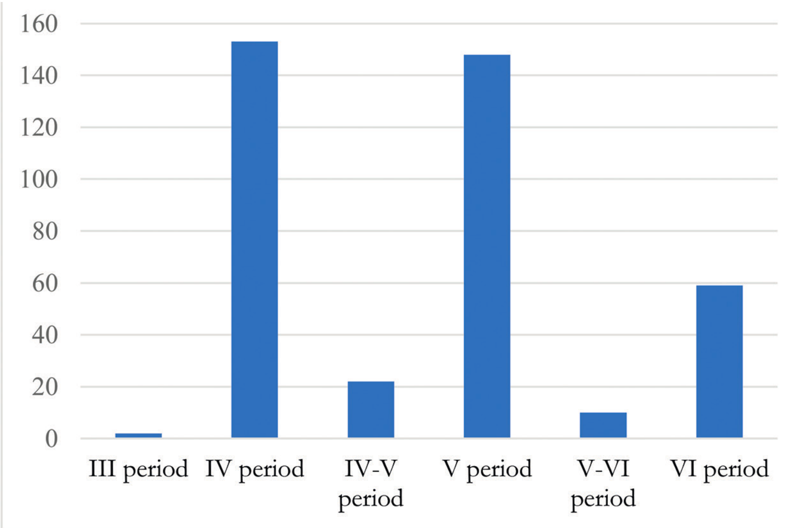
Period VI: this phase is a period of cultural transformation, with the introduction of new pottery traditions from Sindh, Rajasthan, Gujarat and northern regions. By this point, the settlement had been reduced to a smaller town confined to the Citadel and to the southern area of the Middle Town, with new urban structures built following a different layout. At the same time, the new painted black ware, red and black painted grey ware, as well as coarse ware bearing incised or appliqué decorations became popular.

Period VII: there is no evidence of Harappan material culture from this period. All traces of an urban settlement structure had disappeared, and new circular houses (still known as 'bunga' in modern rural India) appeared.

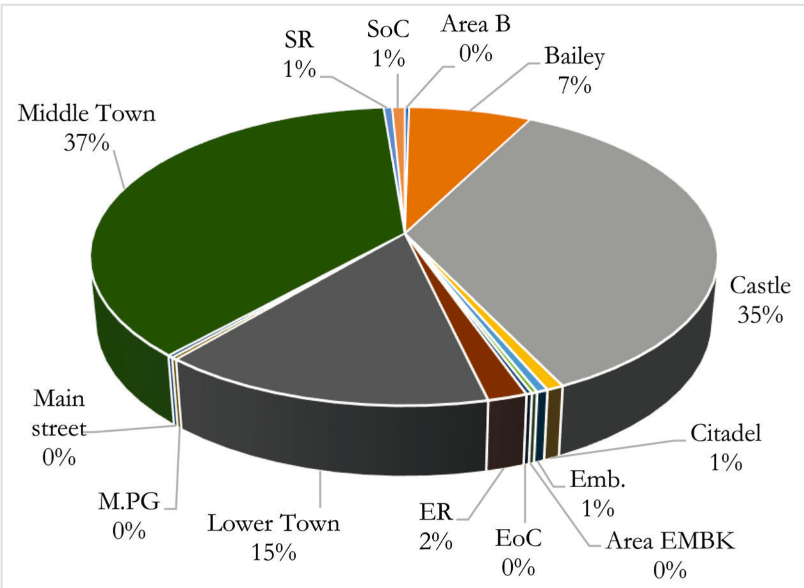
6.8.2. Weights, potential weights, possible weights and related-finds (Cat. no. 1189-2058)

Of the 870 relevant finds from Dholavira, 435 (Cat. no. 1650-1996, 1294-1355, 1997-2015, 2051-2057) can be considered as balance weights with certainty, due to their morphologies common for balance weights along the Indus River Valley: 347 cuboids, 62 biconicals, ten truncated hemispheres, nine hemispheres, and seven dome-shaped specimens (Fig. 6.17-18). At least 36 should be excluded, as they were most likely net sinkers (Cat. no. 2017-2045, truncated cones with a perforation to allow a rope passing through) or playing tokens (Cat. no. 2016, 2046-2050, 2058, conical, triangular and trapezoid-shaped).

The ovoid specimens with flat ends (Cat. no. 1189-1199) most likely represent unfinished beads and should therefore be considered as possible weights. The remaining 393 specimens can be con-



▲*Fig. 6.17. Distribution of weights and potential weights according to their archaeological contexts from Dholavira.*



▲*Fig. 6.18. Archaeological distribution of weights at Dholavira.*

sidered as potential weights and allow a more in-depth functional analysis.

The ovoid weights with base (Cat. no. 1200-1202) would be extremely untypical beads; instead, it seems likely that they could have been used as balance weights. Based on the hypothesis outlined in Chapter 2, the common occurrence of spherical objects with or without base (Cat. no. 1204-1217) in Greater Indus Valley contexts suggests that they were used as balance weights. A different argument must be made for the discoidal (Cat. no. 1506-1608) and parallelepiped (Cat. no. 1609-1649) objects, for which the use as balance weights has been confirmed at least for the heaviest specimens (Cat. no. 1502-1505, 1598-1607). The smaller specimens, however, may also have been used for other purposes. As such, not all of the discoidal and parallelepiped specimens collected for this volume were used as balance weights with certainty. Particularly objects of Types 16 and 17a should be subject to detailed individual analysis. The 56 cylindrical *Turbinella pyrum* objects, which are particularly widespread along the coast of Gujarat (Hornell 1916, 71) and between the Makran coast and the Little Rann of Kutch (Kenoyer 2008, 24), deserve particular mention; it seems likely that these highly standardised cylindrical objects were not used as balance weights, but rather were processed objects ready to be sold at market. They are semi-processed shell blanks sold in standardised blocks in the major settlements along the Indus (see Kenoyer 2008, 21), Iran (Durante 1979a; 1979b), in southern Mesopotamia (Woolley 1934; 1955; Gensheimer 1984; see also Zettler/Horne 1998, 80, Figs. 21a and 23a), Gujarat (Kenoyer 1983; lastly Nath *et al.* 2014), and the Greater Indus Valley (for Rakhigarhi see Nath 2018, 58-60; for Lohari-ragho, Mitahthal, Banawali, Bhirrana, Kalibangan, Madina, Farmana, Baror, Dhalewan, Karsola see Nath 2018, tab. 12; Balakot in Dales/Kenoyer 1977; Nageshwar in Bhan/Kenoyer 1980-1981).

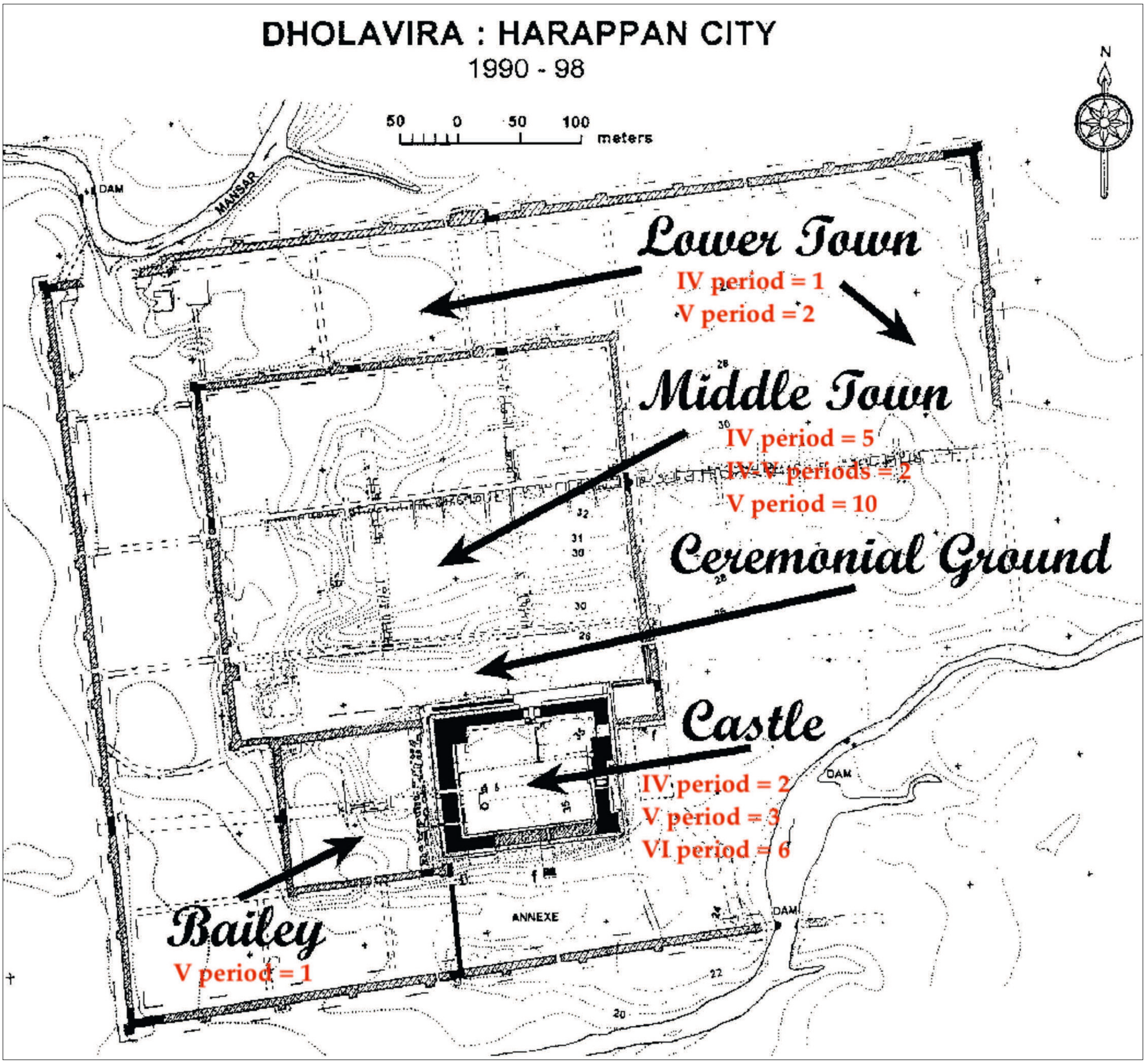
▼ *Tab. 6.2. Archaeological distribution of objects for periods at Dholavira.*

	III	IV	IV–V	V	V–VI	VI	Uncertain	Total
Castle	2	30	1	25	3	44	38	143
Lower Town	0	15	1	24	1	2	16	59
Middle Town	0	92	13	82	0	5	55	247
Bailey	0	10	2	11	2	2	2	29
Uncertain	0	6	5	6	4	6	/	27
Total	2	153	22	148	10	59	111	505

6.8.2.1. Archaeological contexts

Dholavira is one of the few sites where precise contextual and stratigraphic analysis of the archaeological material has been possible. Of the 870 objects recorded, 505 have an archaeological context, thus allowing to trace the evolution and development of balance weights between Dholavira's chronological Stages III and VI. Specifically, it was possible to associate individual weights with the major features of the city, such as the Acropolis (consisting of Castle and Bailey), the Middle Town and the Lower Town (Fig. 6.18-24).

Castle: unlike at Mohenjo-daro, Harappa or Kalibangan, the citadel at Dholavira was established in the southern part of the city and consisted of two fortified structures: the so-called Castle and the Bailey (Bisht 2000, 14). The Castle is a fortified complex with a water collection area and a monumental entrance with two ramparts. It is widely believed that the Castle housed the settlement's elite (Bisht 1991, 72-73). Covering an area of 140 m x 120 m, the Castle had a maximum height of over 16 m (Bisht 1989a, 399-400).



▲*Fig. 6.19. Distribution of foreign weights in Dholavira (modified after* B*isht 1997).*

Bailey: the Bailey is a separate fortified area located on the western side of the Castle. It was likely a residential area for officials connected to the Citadel. The structures were built during Phase III as an addition to the pre-existing Castle. With a square layout, the fortifications measure 120 m on each side with circular inner rooms.

Middle Town: the Middle Town is located to the north of the Citadel (west of the Lower Town) and covers an area of 340 m x 242 m. Protected by a fortified wall with bastions, the Middle Town comprised a number of main streets which separated the inner area into six distinct blocks.

Lower Tower: the Lower Town is located in the north-east of the city, to the east of the Middle Town. It covers an area of 300 m x 330 m and is surrounded by a fortified perimeter wall. Domestic structures within the Lower Town vary significantly in size; the structures include domestic rooms and also a platform area. Unlike the Citadel, neither the Middle nor the Lower Town had sophisticated sewage systems. Instead, ceramic waste vessels were buried in the soil close to the houses.

The contextual and stratigraphic data (Tab. 6.2-3) show a height of weighing activities in Periods

▼*Tab. 6.3. Archaeological distribution of weights and potential weights for periods at Dholavira.*

	III	IV	IV–V	V	V–VI	VI	Uncertain	Total
Castle	2	30	1	25	3	44	35	140
Lower Town	0	15	1	24	1	2	15	58
Middle Town	0	83	12	80	0	5	53	233
Bailey	0	10	2	11	2	2	2	29
Uncertain	0	6	5	6	4	6	/	27
Total	2	144	21	146	10	59	105	487

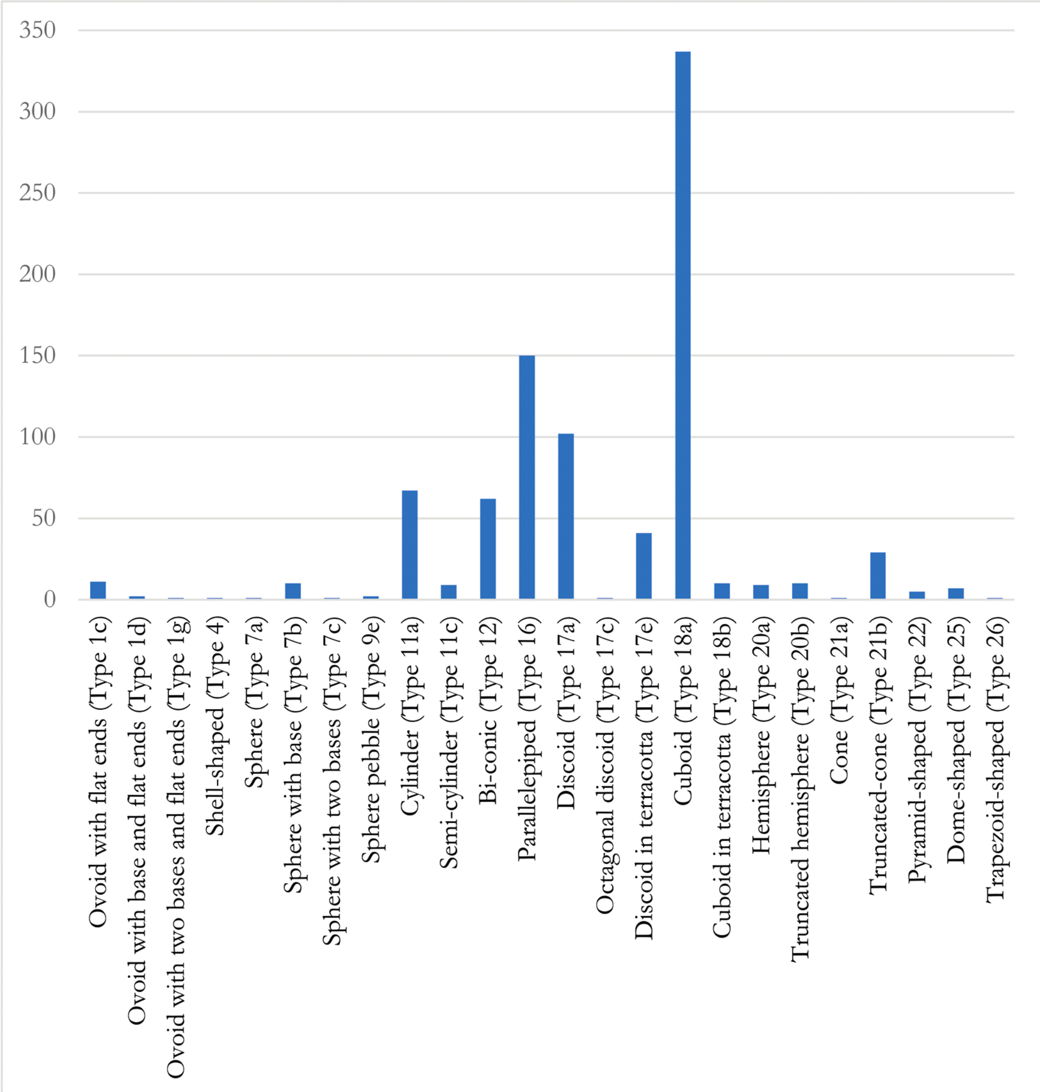
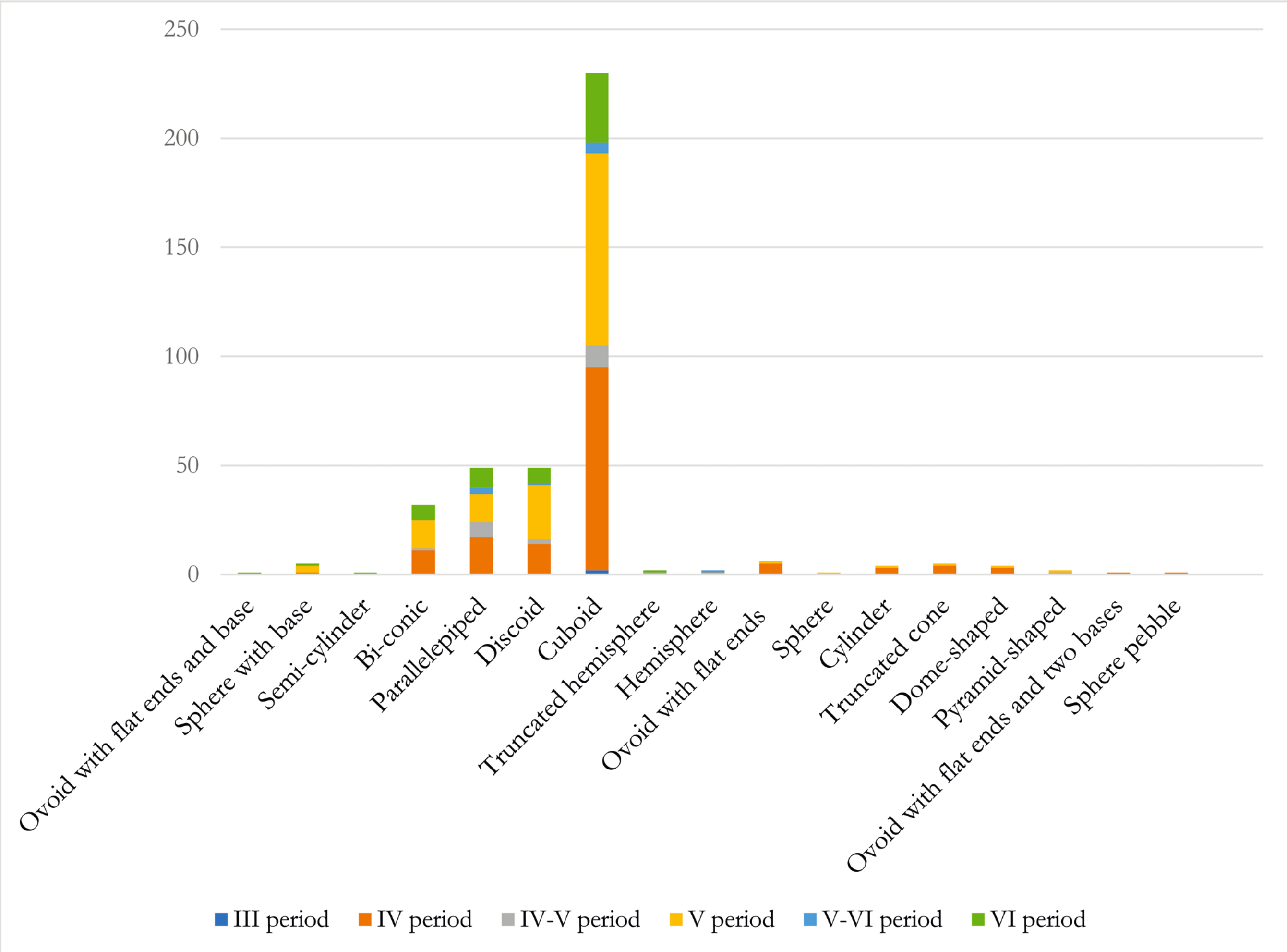


Fig. 6.20. Distribution of shapes from Dholavira.

IV and V, immediately followed by a drastic reduction in metrological activities in Period VI. Of the 394 weights with archaeological contexts, 333 date to Periods IV and VI of the site, demonstrating the height of weighing activities during the first centuries of the 2nd millennium BC.

The chronological distribution of weights in the Mature Harappan period is almost completely homogenous, with 144 specimens dating to Period IV and 146 to Period V. The subsequent 60 % reduction in Period VI (59 specimens) coincides with the great cultural transformations occurring during this period, which saw the introduction of new pottery styles and significant urban rebuilding. Of particular interest are the two weights (Cat. no. 1656 and 1881) from Period III, both of which were found in the Castle on the Acropolis. Both are early specimens of the traditional cubic morphology that is generally associated with the Harappan period during the second half of the 3rd millennium BC. Cat. no. 1881, an agate cube representing half of a Harappan shekel counted at 14.06 g, comes from a secure context (Trench 48x92x4) which suggests that this type of balance weight was probably used as early as the second quarter of the 3rd millennium BC. This discovery (and that of other objects, particularly ceramics) helps to overcome the historical refusal to investigate settlements that come from the periphery of the Harappan civilisation, the epicentre of which has always been considered the Hakka-Ghaggar-Nara Valley, as integral parts of that very culture. As such, the presumed centre of the culture has often been studied against the geographically peripheral area, which in recent decades led to antithetical views based on (outdated) theories developed during the second half of the 20th century (Adams 1966; Dales 1966; Fairservis 1967; Mughal 1990, 187). The recent excavations in Gujarat, however, have made it possible to overcome this historiographical misconception and to recognise regional Harappan manifestations in Saurashtra, also known as 'Sorath Harappan'. The evidence shows that a well-developed and established Early Harappan phase existed in Gujarat, contemporaneous with the regions of Sindh and Baluchistan (Shirvalkar 2013, 306; *contra* Possehl/Herman 1990).

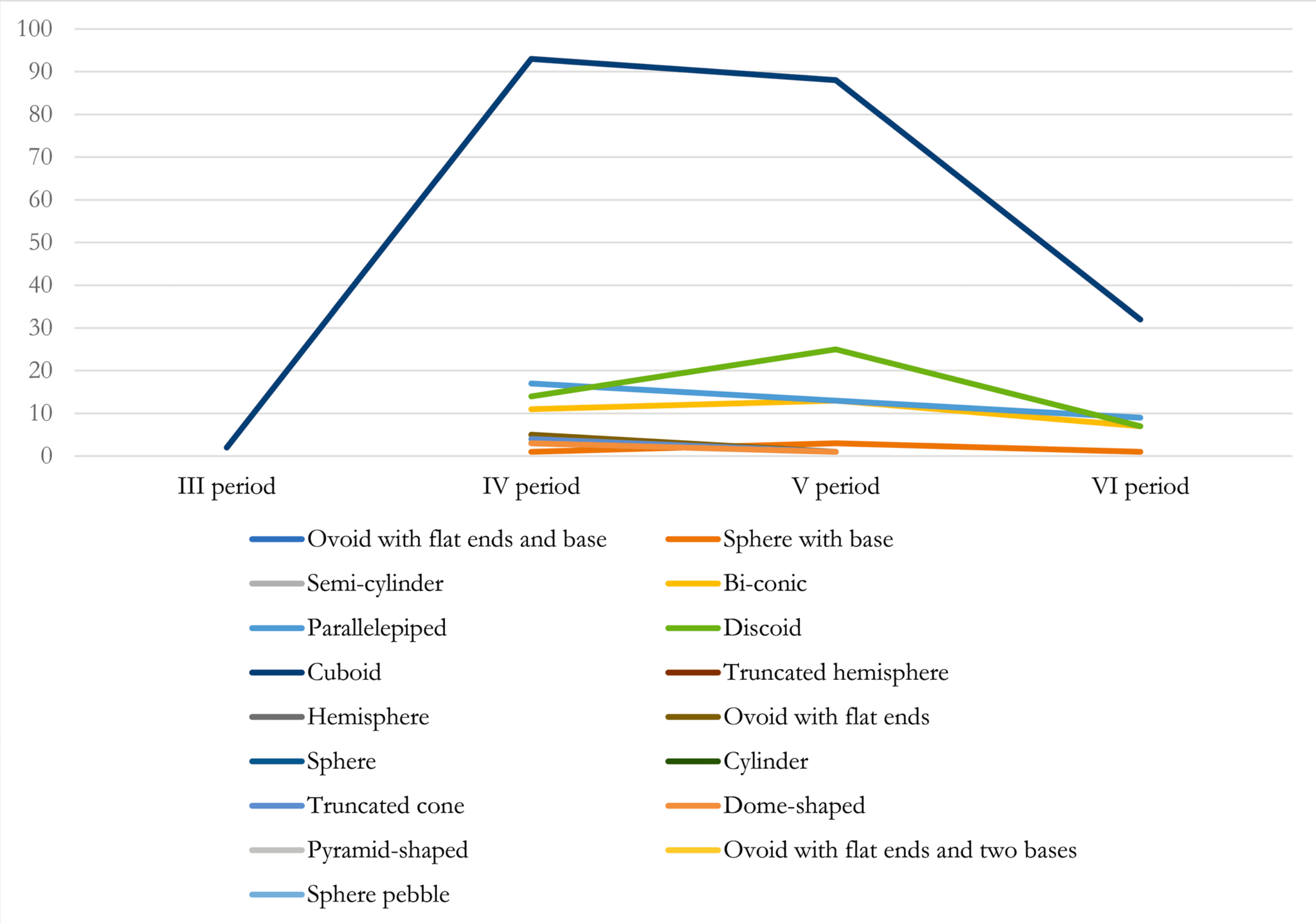


▲*Fig. 6.21. Distribution of shapes for period from Dholavira.*

Chronological analysis of the contexts in which the weights were found shows that between Periods IV and V the majority of the specimens come from the Middle Town, whereas Period VI weights mostly come from the Acropolis. This is perhaps unsurprising, as during Period VI the settlement underwent significant downsizing and subsequently mostly concentrated around the Acropolis. During the Mature Harappan period, balance weights were distributed widely across the city (79 specimens from the Acropolis, 40 from the Lower Town), with the largest concentration of weights in the Middle Town (185 specimens). This type of distributional analysis allows two cautious preliminary historical hypotheses:

1) Weighing activities were common throughout the town and not specific to any type of social group. This hypothesis is supported by the large diversity of weights, made of various materials from agate to clay/terracotta, and their (in-)accuracy, which does not always seem to follow the standardised Harappan shekel of 13.65 g. Some mass variation could also be the result of social differences rather than geographical and/or regional differences. This interpretation of the wide distribution of balance weights across the site fits well with the hypothesis suggested by K. M. Kenoyer (1991, 359): '*Three systems of trade/exchange may have existed during the Harappan Phase. The first, based on the standardized weight system, may reflect a centralized authority or a coalition of merchants that maintained the standardized system to control the trade of specific commodities. The second system was probably regional, involving the exchange of grain for other commodities using generalized measures in baskets, bales, or pottery vessels. The third possible form is the exchange of goods for services between occupational specialists and those controlling land, grain or livestock*'. The three systems identified by K. M. Kenoyer seem to fit the physical features (accuracy, material and morphology) of balance weights and their distribution within the Dholavira site.

Excluding the copper weights, of which all but four specimens (Cat. no. 1666, 1669, 1676 and 1829) date to Period VI and were mostly found on the Acropolis, the distribution of weights seems significant. Around 10 % of the weights from secure contexts are made from semi-precious stones (agate, chalcedony, carnelian and jasper) of which only seven specimens were found in the Lower Town, compared to 34 specimens from the Middle Town and 25 from the Acropolis. These numerical ratios seem to be less evident for the terracotta weights, of which nine specimens were found in the



▲*Fig. 6.22. Diachronic distribution of shapes from Dholavira.*

Castle, 15 in the Middle Town and six in the Lower Town.

In other words, it seems that there were different 'levels' of economy present in the settlements of the second half of the 3rd millennium BC, levels that did not only involve the mercantile or administrative elite of a settlement, but all layers of Harappan society. At the same time, it could be argued that the existence of different weights and weighing systems is due to the products they were used to quantify for, as was the case in Mesopotamia and Central Syria (wool and copper).

2) Seemingly, the inhabitants of the Middle Town played an unusual, important role within the settlement. The extremely large number of weights (175 specimens) from Periods IV and V suggests a class of people particularly well versed in commercial and administrative activities. These people could be interpreted as Kenoyer's first group, a merchant class heavily involved in commercial activities.

Considering the archaeological contexts of the Middle Town, particular attention should be paid to Trench 45x43: the Mature Harappan layers 1-25 have revealed a structure with large numbers of shell bracelets and other goods made from various materials, with a particular abundance of copper and chert blade. Within this context, seven cuboid and one biconic weight (Cat. no. 1332, 1653, 1659, 1722, 1740, 1745, 1959, 1982) have been found in association with each other:

Cat. no. 1332: 3.99 g x 2 = 7.98 g
Cat. no. 1653: 0.32 g x 24 = 7.68 g
Cat. no. 1659: 0.48+x g
Cat. no. 1722: 1.77 g x 8 = 14.16 g
Cat. no. 1740: 1.93 g x 4 = 7.72 g
Cat. no. 1745: 1.98 g x 4 = 7.92 g
Cat. no. 1959: 51.86+x g
Cat. no. 1982: 2,520.00+x g

The balance weights seem to adhere to an unusual base unit. Excluding the three chipped weights (Cat. no. 1659, 1959, 1982) and the extremely light Cat. no. 1722, the remaining weights (Cat. no. 1332, 1653, 1740, 1745) return western values between the Syrian or Eblaite shekel of 7.83 g and the Mesopotamian unit.

Contextual analysis of those weights (excluding 'potential weights' and 'possible weights') connected with foreign standards confirm that they are noticeably more widespread on the Acropolis and in the Middle Town between Periods IV and VI, with 16 weights referring to the Mesopotamian/Syrian/Egyptian systems coming from the Acropolis (out of 169 weights = *c.* 9 %), 23 from the Middle Town (out of 233 = *c.* 10 %), and only three from the Lower Town (out of 58 = *c.* 5 %). This suggests that the elite Middle Town merchants traded not only on a local and regional scale but also 'internationally'.

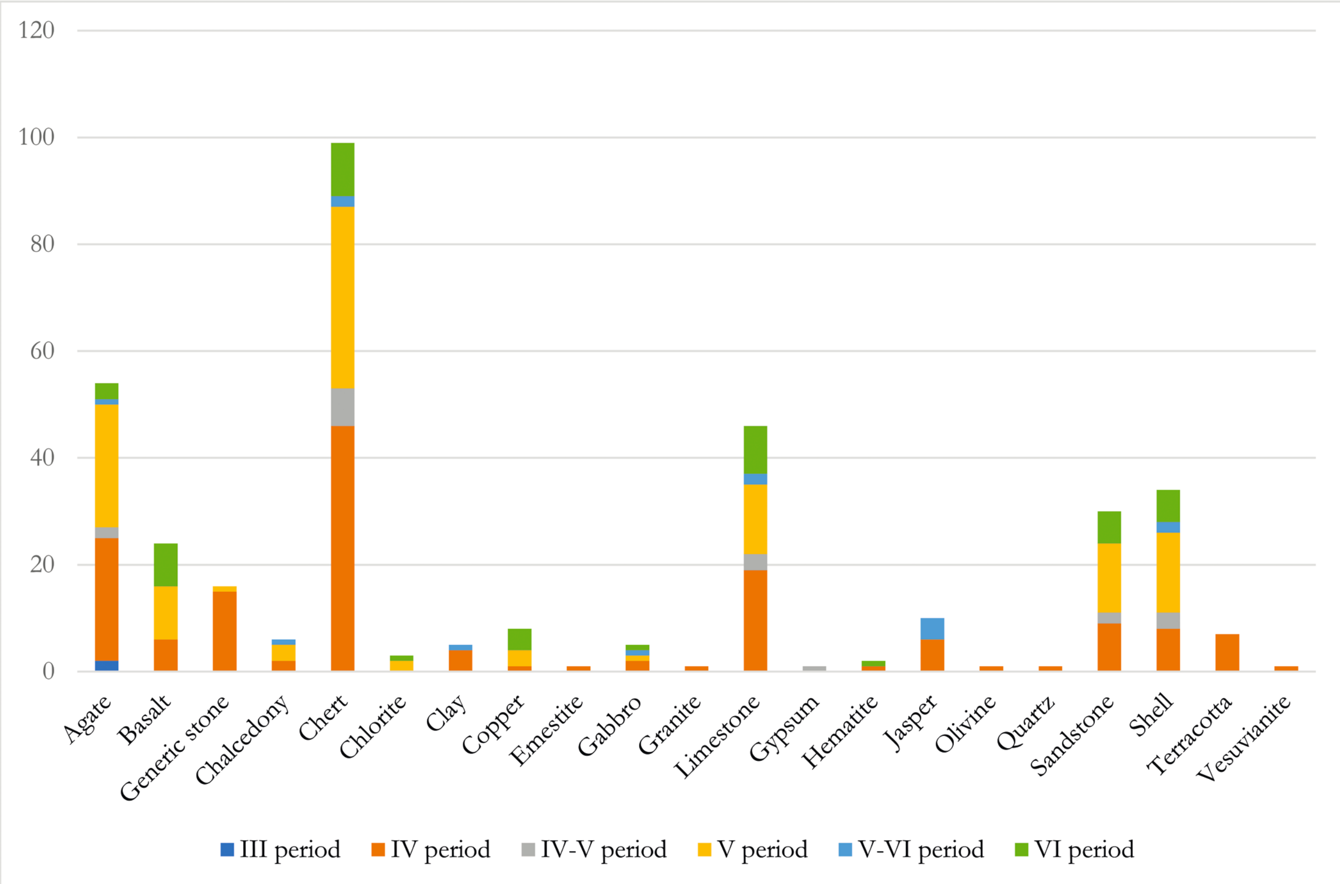


Fig. 6.23. Diachronic distribution of shapes from Dholavira.

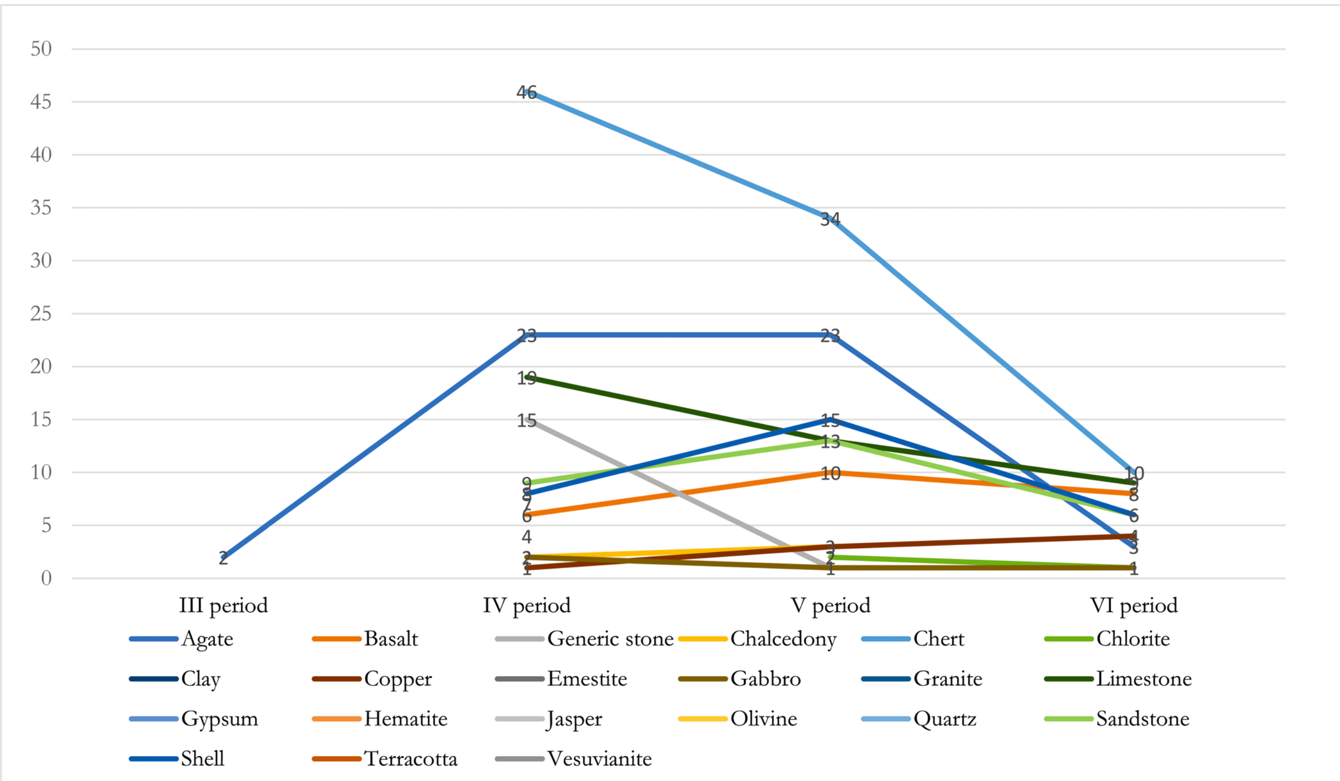


Fig. 6.24. Distribution of materials for period from Dholavira.

This 'international' connection of the Middle Town seem to be confirmed by two balance weights made of hematite, a material difficult to source from Gujarat regional contexts and rarely used by Indus Valley civilisations. The cuboid Cat. no. 1884 comes from a Late Harappan context (Trench 66x54x3, level 1), whereas Cat. no. 1563 (discoidal) was found in level 2 of Trench 55x82x1 which dates to Period IV of the settlement when Dholavira was fully part of Harappan culture.

The domestic structure from Trench 15x24 in the Lower Town has returned three balance weights (Cat. no. 1595, 1713 and 1750) from a secure context. In the same area, a structure comprising rows of bricks indicating at least two occupational phases was found, with large amounts of archaeological materials between the brick rows. In both the Middle and the Lower Town, balance weights are generally found in association with numerous other archaeological objects.

6.8.2.2. Catalogue

6.8.2.2.1. Ovoid with flat ends (Type 1c): Cat. no. 1189-1199

1189. Dholavira. - DHR 31559, Middle Town, Pit s/b 1, 55x3x1+2 - Ovoid with flat ends, good, serpentinite. L. 0.80 cm, H. 0.62 cm, 0.45 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1190. Dholavira. - DHR 50354, Castle, Level 5, 47x84x4 - Ovoid with flat ends, good, agate. L. 0.55 cm, H. 0.40 cm, 0.55 g.

1191. Dholavira. - DHR 43021, Middle Town, Level 2, 55x78x1 - Ovoid with flat ends, good, gate. L. 0.94 cm, H. 0.71 cm, 0.74 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1192. Dholavira. - DHR 32169, Level 5, 65x33x3 - Ovoid with flat ends, good, jasper. L. 1.19 cm, H. 0.79 cm, 1.03 g.

1193. Dholavira. - DHR 16740, Middle Town, Level 6 - 55x57x3 - Ovoid with flat ends, good, agate. L. 0.87 cm, H. 1.26 cm, 1.86 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1194. Dholavira. - DHR 52420, Citadel, Level 25, 47x73x3 - Ovoid with flat ends, good, agate. L. 1.10 cm, H. 1.29 cm, 2.13 g.

1195. Dholavira. - DHR 41734, Middle Town, Level 2, 55x86x3 - Ovoid with flat ends, good, agate. L. 1.02 cm, H. 1.37 cm, 2.26 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1196. Dholavira. - DHR 40545, Level 1, 28x96x1 - Ovoid with flat ends, good, chalcedony. L. 1.05 cm, H. 1.47 cm, 2.65 g.

1197. Dholavira. - DHR 40506, Middle Town, Level 3, 55x86x1 - Ovoid with flat ends, good, agate. L. 1.37 cm, H. 1.49 cm, 5.53 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1198. Dholavira. - DHR 4609, Level 2, XA 19/1 - Ovoid with flat ends, good, agate. L. 1.41 cm, H. 1.90 cm, 6.43 g.

1199. Dholavira. - DHR 45029, Middle Town, Level 3, 55x87x4 - Ovoid with flat ends, good, jasper. L. 2.10 cm, H. 3.94 cm, 29.26 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

6.8.2.2.2. Ovoid with base and flat ends (Type 1d): Cat. no. 1200-1201

1200. Dholavira. - DHR 35673, Middle Town, Level 2, 15x14x4 - Ovoid with base and flat ends, good, chert. L. 1.99 cm, H. 0.95 cm, W. 0.88 cm, 4.30 g.

1201. Dholavira. - DHR 39886, Castle, Level 1, 47x79x2 - Ovoid with base and flat ends, slightly chipped, stone. L. 1.08 cm, H. 0.83 cm, W. 2.27 cm, 4,44+x g - Period VI, Late Harappan (4), 1950-1800 BC.

6.8.2.2.3. Ovoid with two bases and flat ends (Type 1g): Cat. no. 1202

1202. Dholavira. - DHR 32948, Middle Town, Level 1, 65x33x1 - Ovoid with base and flat ends, good, agate. L. 1.24 cm, H. 0.78 cm, 1.17 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

6.8.2.2.4. Shell-shaped (Type 4): Cat. no. 1203

1203. Dholavira. - DHR 28555, Bulk, 55x94x1+4 - Shell, good, shell. L. 1.09 cm, H. 1.03 cm, W. 0.62 cm, 1.21 g.

6.8.2.2.5. Sphere (Type 7a): Cat. no. 1204

1204. Dholavira. - DHR 48688, Castle, Level 5, 47x84x1 - Sphere, good, agate. H. 1.16 cm, D. 1.00 cm, 1.88 g - Period V, Mature Harappan (3C), 2100-2000 BC.

6.8.2.2.6. Sphere with base (Type 7b): Cat. no. 1205-1214

1205. Dholavira. - DHR 21646, Level 6c, 58x54x3 - Sphere with base, good, shell. H. 0.79 cm, D. 0.76 cm, 0.82 g.

1206. Dholavira. - DHR 25404, Pit 1 s/b 2, 23x10x2 - Sphere with base, good, terracotta. H. 1.03 cm, D. 0.87 cm, 1.01 g.

1207. Dholavira. - DHR 7298, Middle Town, Level 3, 55x85xbaulk - Sphere with base, heavily chipped, sandstone. L. 2.94 cm, H. 2.81 cm, W. 2.53 cm, 29.66+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1208. Dholavira. - DHR 15293c, Level 1, 48x42x4 - Sphere with base, good, steatite. L. 3.38 cm, H. 3.03 cm, W. 2.84 cm, 42.11 g.

1209. Dholavira. - DHR 52310, Lower Town, Level 1, 35x32x4 - Sphere with base, good, stone. L. 3.45 cm, H. 3.44 cm, W. 3.05 cm, 53.77 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1210. Dholavira. - DHR 17450, Middle Town, Level 6, 44x44 - Sphere with base, chipped, sandstone. H. 3.62 cm, D. 3.09 cm, 62.47+x g - Period V, Mature Harappan (3C), 2100-2000 BC.

1211. Dholavira. - DHR 54428, Castle, Level 1, 47x35x2 - Sphere with base, heavily chipped, limestone. H. 6.02 cm, D. 4.02 cm, 65.00+x g - Period VI, Late Harappan (4), 1950-1800 BC.

1212. Dholavira. - DHR 54520, Level 2, 57x60x2 - Sphere with base, good, stone. L. 1.20 cm, H. 1.80 cm, W. 1.65 cm, 70.00 g.
1213. Dholavira. - DHR 54434, Castle, Level 3, 47x74x3 - Sphere with base, good, limestone. H. 6.39 cm, D. 6.39 cm, 250.00 g - Period V, Mature Harappan (3C), 2100-2000 BC.
1214. Dholavira. - DHR 54455 - Sphere with base, slightly worn, limestone. H. 6.01 cm, D. 6.41 cm, 350.00 g.

6.8.2.2.7. Sphere with two bases (Type 7c): Cat. no. 1215

1215. Dholavira. - DHR 36448, Middle Town, Level 2, 45x3x3 - Sphere with two bases, good, sandstone. H. 2.90 cm, D. 3.40 cm, 34.84 g.

6.8.2.2.8. Sphere pebble (Type 9d): Cat. no. 1216-1217

1216. Dholavira. - DHR 54468, Middle Town, Level 4, 54x58x1 - Sphere pebble, good, stone. L. 1.30 cm, H. 1.09 cm, W. 0.52 cm, 4.32 g - Period IV, Mature Harappan (3B), 2500-2100 BC.
1217. Dholavira. - DHR 54462 - Sphere pebble, good, basalt. L. 3.53 cm, H. 3.46 cm, W. 2.18 cm, 7.84 g.

6.8.2.2.9. Cylinder-shaped (Type 11a): Cat. no. 1218-1284

1218. Dholavira. - DHR 19658 - Cylinder-shaped, good, shell. H. 0.67 cm, D. 0.46 cm, 0.33 g.
1219. Dholavira. - DHR 43443, Level 11, 46x43x2+3 - Cylinder-shaped, good, shell. H. 0.70 cm, D. 0.64 cm, 0.54 g.
1220. Dholavira. - DHR 9924, Level 2, 46x43x2-3 - Cylinder-shaped, good, shell. H. 0.73 cm, D. 0.68 cm, 0.56 g.
1221. Dholavira. - DHR 13112a - Cylinder-shaped, good, shell. H. 0.60 cm, D. 0.41 cm, 0.57 g.
1222. Dholavira. - DHR 20884 - Cylinder-shaped, good, shell. H. 0.79 cm, D. 0.58 cm, 0.63 g.
1223. Dholavira. - DHR 12096, Level 2, 46x36 - Cylinder-shaped, good, shell. H. 0.72 cm, D. 0.68 cm, 0.66 g.
1224. Dholavira. - DHR 20550, Level 4c, 58x54x1 - Cylinder-shaped, good, shell. H. 0.76 cm, D. 0.73 cm, 0.68 g.
1225. Dholavira. - DHR 39541, Level 7, 47x73x2 - Cylinder-shaped, good, shell. H. 0.74 cm, D. 0.71 cm, 0.68 g.
1226. Dholavira. - DHR 30977, Level 3, 47x57x2/3 - Cylinder-shaped, good, shell. L. 0.74 cm, W. 0.72 cm, 0.70 g.
1227. Dholavira. - DHR 13920. Level 2, 44x48x3 - Cylinder-shaped, good, shell. H. 0.74 cm, D. 0.73 cm, 0.70 g.
1228. Dholavira. - DHR 20452, 58x53x3 - Cylinder-shaped, good, shell. H. 0.75 cm, D. 0.72 cm, 0.72 g.
1229. Dholavira. - DHR 16679, Level 2C, 67x19x1+4 - Cylinder-shaped, slightly chipped, shell. H. 0.80 cm, D. 0.77 cm, 0.72+x g.
1230. Dholavira. - DHR 9986, Level 1, 37x90 - Cylinder-shaped, chipped, shell. H. 0.77 cm, D. 0.74 cm, 0.75+x g.
1231. Dholavira. - DHR 964, Level 1, XH 19 - Cylinder-shaped, good, shell. H. 0.76 cm, D. 0.75 cm, 0.76 g.
1232. Dholavira. - DHR 20969, Level 8, 58x53x3 - Cylinder-shaped, good, shell. H. 0.75 cm, D. 0.69 cm, 0.76 g.
1233. Dholavira. - DHR 20479b, Level 8, 58x53x3 - Cylinder-shaped, good, shell. H. 0.70 cm, D. 0.78 cm, 0.76 g.
1234. Dholavira. - DHR 20964, 58x54x4/58x54x3 - Cylinder-shaped, good, shell. H. 0.75 cm, D. 0.77 cm, 0.79 g.
1235. Dholavira. - DHR 46642 - Cylinder-shaped, good, shell. H. 0.80 cm, D. 0.70 cm, 0.79 g.
1236. Dholavira. - DHR 29941, Middle Town, Level 1, 65x3x2 - Cylinder-shaped, good, shell. H. 0.81 cm, D. 0.65 cm, 0.79 g.
1237. Dholavira. - DHR 20887, 58x543+58x55x4 - Cylinder-shaped, good, shell. H. 0.80 cm, D. 0.66 cm, 0.80 g.
1238. Dholavira. - DHR 9194, 45x14x1 - Cylinder-shaped, good, shell. H. 0.76 cm, D. 0.74 cm, 0.80 g.
1239. Dholavira. - DHR 20764, Level 1, 35x33x3 - Cylinder-shaped, good, shell. H. 0.80 cm, D. 0.71 cm, 0.81 g.
1240. Dholavira. - DHR 48412, Surface - Cylinder-shaped, good, shell. H. 0.78 cm, D. 0.71 cm, 0.83 g.
1241. Dholavira. - DHR 24774, Level 26-29, 57x47x-3+57x51x2 - Cylinder-shaped, good, shell. H. 0.77 cm, D. 0.69 cm, 0.84 g.
1242. Dholavira. - DHR 3639, Level 10, A 13/1 - Cylinder-shaped, good, shell. H. 0.81 cm. D. 0.71 cm, 0.84 g.
1243. Dholavira. - DHR 20890, Erosion, 58x54x3 +58x55x4 - Cylinder-shaped, good, shell. H. 0.78 cm, D. 0.83 cm, 0.85 g.
1244. Dholavira. - DHR 28133, Level 8, 37x55x2+3 - Cylinder-shaped, good, shell. H. 0.76 cm, D. 0.79 cm, 0.85 g.
1245. Dholavira. - DHR 19788, Level 3, 47x46, 47/48 - Cylinder-shaped, good, shell. H. 0.75 cm, D. 0.77 cm, 0.85 g.
1246. Dholavira. - DHR 41315, Level 24, 35x83x1+2 - Cylinder-shaped, good, shell. H. 1.24 cm, D. 0.52 cm, 0.85 g.
1247. Dholavira. - DHR 8178, Level 4w, Drain 1c, 47x47x4 - Cylinder-shaped, good, shell. H. 1.77 cm, D. 0.46 cm, 0.85 g.
1248. Dholavira. - DHR 21057, 58x55x4+58x54x3 - Cylinder-shaped, good, shell. H. 0.78 cm, D. 0.77 cm, 0.86 g.
1249. Dholavira. - DHR 18390 - Cylinder-shaped, good, shell. H. 0.78 cm, D. 0.76 cm, 0.86 g.
1250. Dholavira. - DHR 14996, Level 2, 48x43x4 - Cylinder-shaped, slightly chipped, shell. H. 0.80 cm, D. 0.76 cm, 0.86 g.

1251. Dholavira. - DHR 29700, Surface, 57X8 - Cylinder-shaped, good, shell. H. 0.78 cm, D. 0.71 cm, 0.87 g.

1252. Dholavira. - DHR 20706, Level 4, 58x52x2 - Cylinder-shaped, good, shell. H. 0.76 cm, D. 0.85 cm, 0.87 g.

1253. Dholavira. - DHR 20882, Level 4, 58x52x2 - Cylinder-shaped, good, shell. H. 0.81 cm, D. 0.73 cm, 0.88 g.

1254. Dholavira. - DHR 21810 - Cylinder-shaped, good, shell. H. 0.75 cm, D. 0.72 cm, 0.88 g.

1255. Dholavira. - DHR 21055 - Cylinder-shaped, good, shell. H. 0.81 cm, D. 0.78 cm, 0.89 g.

1256. Dholavira. - DHR 1382, Level 3, XF-25/3 - Cylinder-shaped, good, shell. H. 0.83 cm, D. 0.71 cm, 0.89 g.

1257. Dholavira. - DHR 18871, 58x31x2 - Cylinder-shaped, good, shell. H. 0.81 cm, D. 0.74 cm, 0.90 g.

1258. Dholavira. - DHR 1260, XE.22/1-2 - Cylinder-shaped, good, shell. H. 0.83 cm, D. 0.80 cm, 0.91 g.

1259. Dholavira. - DHR 10261, Level 7, 47x8x2 - Cylinder-shaped, good, shell. H. 0.84 cm, 0.92 g.

1260. Dholavira. - DHR 21811, Bailey, Level 3, 58x54x4 - Cylinder-shaped, good, shell. H. 0.85 cm, W. 0.78 cm, D. 0.71 cm, 0.93 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1261. Dholavira. - DHR 20453, Level 8, 58x53x3 - Cylinder-shaped, good, shell. H. 0.80 cm, D. 0.76 cm, 0.95 g.

1262. Dholavira. - DHR 44743, Castle, Level 7, 47x95x1 - Cylinder-shaped, good, shell. H. 0.82 cm, D. 0.81 cm, 0.95 g.

1263. Dholavira. - DHR 721, Level 3, D-19/2 - Cylinder-shaped, good, shell. H. 0.82 cm, D. 0.74 cm, 0.99 g.

1264. Dholavira. - DHR 20959, Erosion, 58x54x3 +58x55x4 - Cylinder-shaped, chipped, shell. H. 0.84 cm, D. 0.75 cm, 1.00+x g.

1265. Dholavira. - DHR 537, Surface, XE-22 - Cylinder-shaped, good, shell. H. 1.41 cm, D. 0.62 cm, 1.08 g.

1266. Dholavira. - DHR 22818, Middle Town, Level 21a, 57x57x2 - Cylinder-shaped, good, terracotta. L. 1.01 cm, W. 1.01 cm, 1.30 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1267. Dholavira. - DHR 48852 - Cylinder-shaped, good, shell. H. 0.50 cm, D. 0.99 cm, 1.99 g.

1268. Dholavira. - DHR 41832, Castle, Level 8, 47x63x3 - Cylinder-shaped, worn, sandstone. H. 1.08 cm, D. 1.28 cm, 2.22 g.

1269. Dholavira. - DHR 11949, Level 4, 65x34x1 - Cylinder-shaped, good, shell. H. 1.64 cm, D. 0.78 cm, 2.26 g.

1270. Dholavira. - DHR 19337, Level 3, 54x58x3 - Cylinder-shaped, good, shell. H. 1.19 cm, D. 1.15 cm, 3.00 g.

1271. Dholavira. - DHR 5005, Level 3, 48x72xR5 - Cylinder-shaped, slightly chipped, shell. H. 0.85 cm, D. 2.20 cm, 3.12+x g.

1272. Dholavira. - DHR 2299, Level 3, A-16/4 - Cylinder-shaped, chipped, shell. H. 2.20 cm, D. 0.87 cm, 3.15+x g.

1273. Dholavira. - DHR 20085 - Cylinder-shaped, good, shell. H. 1.32 cm, D. 0.98 cm, 3.50 g.

1274. Dholavira. - DHR 30727 - Cylinder-shaped, good, shell. H. 0.81 cm, D. 1.78 cm, 10.25 g.

1275. Dholavira. - DHR 4171 - Cylinder-shaped, chipped, limestone. H. 2.52 cm, D. 2.55 cm, 11.00+x g.

1276. Dholavira. - DHR 14357, Level 2, 47x50x1 - Cylinder-shaped, good, steatite. H. 2.45 cm, D. 1.58 cm, 12.13 g.

1277. Dholavira. - DHR 17891, Middle Town, Level 3, 65x43x3 - Cylinder-shaped, good, shell. H. 2.30 cm, D. 1.47 cm, 12.76 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1278. Dholavira. - DHR 22550, Level 2, 24x7x3 - Cylinder-shaped, slightly worn, limestone. H. 2.22 cm, D. 2.10 cm, 13.47 g.

1279. Dholavira. - DHR 26545, Level 1, 58x36x2 - Broken cylinder-shaped, limestone. H. 2.62 cm, D. 2.02 cm, 19.87+x g.

1280. Dholavira. - DHR 2932, Bailey, Level 1, xn 19 - Cylinder-shaped, heavily chipped, chert. H. 3.30 cm, D. 2.01 cm, 33.72+x g - Period V, Mature Harappan (3C), 2100-2000 BC.

1281. Dholavira. - DHR 18373, Level 2, 57x57x3 - Cylinder-shaped, heavily chipped, sandstone. L. 2.34 cm, H. 2.30 cm, W. 3.43 cm, 34.40+x g.

1282. Dholavira. - DHR 37604, Level 3, 35x63x4 - Cylinder-shaped, good, limestone. H. 2.61 cm, D. 2.28 cm, 37.60 g.

1283. Dholavira. - DHR 6923, Level 8, 57x5x2 - Cylinder-shaped, good, limestone. H. 3.60 cm, D. 3.11 cm, 67.27 g.

1284. Dholavira. - DHR 54417 - Cylinder-shaped, chipped, limestone. H. 17.20 cm, D. 23.50 cm, 12,070.00+x g.

6.8.2.2.10. Semi-cylinder-shaped (Type 11c): Cat. no. 1285-1293

1285. Dholavira. - DHR 32423, Level 1, 55x83x2 - Semi-cylinder-shaped, good, shell. L. 0.83 cm, H. 0.79 cm, W. 0.53 cm, 0.79 g.

1286. Dholavira. - DHR 3712 - Semi-cylinder-shaped, good, shell. L. 0.99 cm, H. 0.48 cm, 1.01 g.

1287. Dholavira. - DHR 19470, Level 4, 58x53x3 - Semi-cylinder-shaped, good, shell. L. 1.27 cm, H. 1.07 cm, W. 0.67 cm, 1.79 g.

1288. Dholavira. - DHR 10812, Pit s/b 1, 45x94x3 - Semi-cylinder-shaped, good, shell. L. 1.63 cm, H. 1.09 cm, W. 0.57 cm, 1.82 g.

1289. Dholavira. - DHR 24888, 47x88x2+3 - Semi-cylinder-shaped, good, shell. L. 1.25 cm, H. 1.17 cm, W. 0.69 cm, 1.84 g.

1290. Dholavira. - DHR 13293, Level 6, 57x20x2 - Semi-cylinder-shaped, good, shell. L. 1.43 cm, H. 1.08 cm, W. 0.58 cm, 1.87 g.

1291. Dholavira. - DHR 18581, Level 1, 57x60x4 - Semi-cylinder-shaped, good, shell. L. 1.40 cm, H. 1.04 cm, W. 0.80 cm, 1.98 g.

1292. Dholavira. - DHR 14498, Castle, Level 2, 48x92x2 - Semi-cylinder-shaped, good, shell. L. 3.16 cm, H. 2.77 cm, W. 2.34 cm, 44.52 g - Period VI, Late Harappan (4), 1950-1800 BC.

1293. Dholavira. - DHR 6763 - Semi-cylinder-shaped, slightly chipped, limestone. L. 2.80 cm, D. 1.50 cm.

6.8.2.2.11. Biconic (Type 12): Cat. no. 1294-1355

1294. Dholavira. - DHR 27137, 47x79x3x4 - Biconic, good, shell. H. 0.65 cm, D. 0.46 cm, 0.32 g.

1295. Dholavira. - DHR 28528, Middle Town, Pit s/b 1, 55x3x4 - Biconic, good, agate. L. 0.79 cm, H. 0.77 cm, W. 0.58 cm, 0.52 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1296. Dholavira. - DHR 20103, Level 1, 57x43x1 - Biconic, good, shell. H. 0.74 cm, D. 0.52 cm, 0.61 g.

1297. Dholavira. - DHR 6342, Level 2, 48x14x4 - Biconic, good, agate. H. 0.85 cm, D. 0.52 cm, 0.64 g.

1298. Dholavira. - DHR 54456, Lower Town, 25x24x2 - Biconic, good, chert. L. 1.58 cm, H. 1.53 cm, W. 1.21 cm, 0.68 g - Period VI, Late Harappan (4), 1950-1800 BC.

1299. Dholavira. - DHR 53041, Lower Town, Level 1, 35x42x1 - Biconic, good, shell. L. 0.94 cm, H. 0.90 cm, W. 0.48 cm, 0.77 g.

1300. Dholavira. - DHR 40614, Middle Town, Level 18, 35x83x1+2 - Biconic, good, jasper. H. 0.81 cm, D. 0.78 cm, 0.81 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1301. Dholavira. - DHR 24331, Level 2, 57x10x4 - Biconic, good, shell. H. 0.92 cm, D. 0.56 cm, 0.85 g.

1302. Dholavira. - DHR 52905, Castle, Level 29, 47x73x3 - Biconic, good, shell. H. 0.59 cm, D. 0.95 cm, 0.85 g.

1303. Dholavira. - DHR 34643, 45/23x4 - Biconic, good, shell. H. 0.90 cm, D. 0.64 cm, 0.89 g.

1304. Dholavira. - DHR 27245, Middle Town, Surface, 46X25 - Biconic, good, agate. L. 1.03 cm, H. 1.02 cm, W. 0.67 cm, 1.12 g.

1305. Dholavira. - DHR 9959, Middle Town, Level 3, 45x34x2 - Biconic, good, agate. L. 1.02 cm, H. 0.99 cm, W. 0.79 cm, 1.19 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1306. Dholavira. - DHR 54454 - Biconic, good, limestone. H. 0.57 cm, D. 0.69 cm, 1.36 g.

1307. Dholavira. - DHR 48625, Castle, Level 5, 47x84x2 R-9 - Biconic, good, shell. H. 1.11 cm, D. 0.65 cm, 1.37 g.

1308. Dholavira. - DHR 19833, Middle Town, Level 1a, 54x58x2 - Biconic, good, chalcedony. H. 1.06 cm, D. 0.94 cm, 1.47 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1309. Dholavira. - DHR 46902, Castle, Baulk, 47x84x1 - Biconic, good, chalcedony. H. 1.05 cm, D. 0.83 cm, 1.48 g.

1310. Dholavira. - DHR 54486, Lower Town, Level 1, 25x7x1 - Biconic, good, stone. H. 1.34 cm, D. 1.00 cm, 1.50 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1311. Dholavira. - DHR 10302, Castle, Level 2, 55x4x3 - Biconic, good, shell. H. 1.15 cm, D. 0.65 cm, 1.50 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1312. Dholavira. - DHR 54470 - Biconic, good, agate. H. 1.57 cm, D. 1.04 cm, 1.51 g.

1313. Dholavira. - DHR 54449, EMBK, Level 1, 38x83x2 - Biconic, good, stone. H. 4.43 cm, D. 5.04 cm, 1.52 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1314. Dholavira. - DHR 31189, Castle, Level 2, 65x33x2 - Biconic, good, agate. H. 1.07 cm, D. 0.83 cm, 1.53 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1315. Dholavira. - DHR 50688, Middle Town, Level 5, 47x84x1 R. 5 - Biconic, good, chert. H. 1.11 cm, W. 0.92 cm, 1.67 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1316. Dholavira. - DHR 36655, Middle Town, Level 5, 45x3x3 - Biconic, good, agate. L. 1.12 cm, H. 1.10 cm, W. 0.84 cm, 1.75 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1317. Dholavira. - DHR 9890, Middle Town, Level 1, 55x4x2 - Biconic, good, agate. L. 1.18 cm, H. 1.17 cm, W. 0.80 cm, 1.75 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1318. Dholavira. - DHR 51788, Area Middle Town, Surface - Biconic, good, agate. H. 1.20 cm, D. 0.83 cm, 1.76 g.

1319. Dholavira. - DHR 772, Level 1a, c-19/3 - Biconic, good, agate. H. 1.17 cm, D. 0.78 cm, 1.78 g.

1320. Dholavira. - DHR 34090, Castle, Level 1, 47x85x1 - Biconic, good, agate. L. 1.19 cm, H. 1.20 cm, W. 0.76 cm, 1.80 g - Period VI, 1950-1800 BC.

1321. Dholavira. - DHR 6829, Castle, Level 5, 57x5x2 - Biconic, good, agate. H. 1.21 cm, D. 0.75 cm, 1.81 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1322. Dholavira. - DHR 46997, Surface, 35X73 - Biconic, good, terracotta. H. 1.13 cm, D. 1.05 cm, 2.21 g.

1323. Dholavira. - DHR 18023, Area Middle Town, Level 2, 35x64x2 - Biconic, good, agate. H. 1.31 cm, D. 1.04 cm, 2.67 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1324. Dholavira. - DHR 4510, Castle, Level 16, A 17/1+2 - Biconic, good, agate. H. 1.17 cm, D. 1.00 cm, 2.68 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1325. Dholavira. - DHR 4125, Castle, Level 8, A. 16/3 - Biconic, good, agate. H. 1.30 cm, D. 1.15 cm, 2.71 g - Period V, Mature Harappan (3B), 2500-2100 BC.

1326. Dholavira. - DHR 49400, Castle, Level 5, R.5 47x84x1 - Biconic, good, agate. H. 1.31 cm, D. 1.09 cm, 2.80 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1327. Dholavira. - DHR 33964, Castle, Level 1, 47x85x4 - Biconic, good, stone. H. 1.40 cm, D. 0.84 cm, 3.44 g - Period VI, Late Harappan (4), 1950-1800 BC.

1328. Dholavira. - DHR 39103, Middle Town, Level 2, 35x73x1 - Biconic, good, agate. L. 1.50 cm, H. 1.49 cm, W. 0.89 cm, 3.49 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1329. Dholavira. - DHR 560, Castle, Level 1, H 19/4 - Biconic, good, agate. H. 1.45 cm, D. 1.05 cm, 3.50 g - Period VI, Late Harappan (4), 1950-1800 BC.

1330. Dholavira. - DHR 16946, Middle Town, Level 3, 44x45x2 - Biconic, good, soapstone. L. 1.66 cm, H. 1.46 cm, W. 0.92 cm, 3.81 g.

1331. Dholavira. - DHR 9463, Middle Town, Level 2a, 45x94x7 - Biconic, good, agate. H. 1.52 cm, D. 1.17 cm, 3.95 g.

1332. Dholavira. - DHR 54460, Middle Town, Level 2c, 45x43x3 - Biconic, good, chert. L. 1.30 cm, H. 1.28 cm, W. 0.87 cm, 3.99 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1333. Dholavira. - DHR 28379, Area Middle Town, Level 1, 55x3x4 - Biconic, good, agate. L. 1.49 cm, H. 1.47 cm, W. 1.16 cm, 3.99 g.

1334. Dholavira. - DHR 47247, Area Castle, Level 6, 47x85x4 - Biconic, worn, chert. L. 1.50 cm, H. 1.49 cm, W. 1.24 cm, 4.11 g.

1335. Dholavira. - DHR 43193 - Biconic, good, shell. H. 1.13 cm, D. 1.58 cm, 4.50 g.

1336. Dholavira. - DHR 47915, Surface, SR.1 - Biconic, good, agate. L. 1.52 cm, H. 1.49 cm, W. 1.43 cm, 5.03 g.

1337. Dholavira. - DHR 14159, Middle Town, Level 2, 45x41x3 - Biconic, chipped, agate. H. 1.33 cm, D. 1.64 cm, 5.29+x g - Period V, Mature Harappan (3C), 2100-2000 BC.

1338. Dholavira. - DHR 6755, Castle, Level 23, 47x48x4 - Biconic, good, chalcedony. H. 1.88 cm, D. 1.16 cm, 5.86 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1339. Dholavira. - DHR 1870, Middle Town, Level 1, ZA 3/2 - Biconic, good, agate. H. 1.48 cm, D. 1.77 cm, 6.74 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1340. Dholavira. - DHR 1562, XE 23/2 - Biconic, good, agate. L. 1.78 cm, H. 1.76 cm, W. 1.54 cm, 7.39 g.

1341. Dholavira. - DHR 45892, Castle, Level 2, 47x92x2 - Biconic, good, red stone. H. 1.29 cm, D. 1.69 cm, 7.77 g - Period VI, Late Harappan (4), 1950-1800 BC.

1342. Dholavira. - DHR 37619, Middle Town, Level 1, 35x63x1 - Biconic, unfinished?, sandstone. H. 1.60 cm, D. 2.15 cm, 8.55+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1343. Dholavira. - DHR 46990, Level 1, 47x85 - Biconic, good, stone. H. 2.28 cm, D. 1.71 cm, 13.39 g.

1344. Dholavira. - DHR 15657, Castle, Level 1, 56x55x4 - Biconic, good, steatite. L. 2.16 cm, H. 2.15 cm, W. 1.72 cm, 13.40 g - Period VI, Late Harappan (4), 1950-1800 BC.

1345. Dholavira. - DHR 9470, Middle Town, Pit s/b 1, 55x14x1 - Biconic, good, terracotta. L. 2.18 cm, H. 2.08 cm, W. 1.79 cm, 16.25 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1346. Dholavira. - DHR 10133, Middle Town, Level 2, 45x84x3 - Biconic, good, limestone. L. 2.56 cm, H. 2.47 cm, W. 1.69 cm, 17.25 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1347. Dholavira. - DHR 54300, Surface - Biconic, heavily chipped, sandstone. H. 2.07 cm, D. 2.91 cm, 18.85+x g.

1348. Dholavira. - DHR 28086, Middle Town, Level 2, 55x63x4 - Biconic, slightly chipped, agate. H. 2.32 cm, D. 2.78 cm, 26.74+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1349. Dholavira. - DHR 3507, Area Castle, Level 4, A 16/4 - Biconic, perfect, agate. L. 2.80 cm, H. 2.79 cm, W. 2.29 cm, 26.99 g.

1350. Dholavira. - DHR 54480, Level 1, 57x43x4 - Biconic, chipped, limestone. H. 5.55 cm, D. 6.20 cm, 580.00+x g.

1351. Dholavira. - DHR 54560, Lower Town, Level 1, 35x3x4 - Biconic, good, shell. L. 1.20 cm, H. 0.87 cm, W. 0.47 cm, 1,330.00 g.

1352. Dholavira. - DHR 54502, Middle Town, Level 2, 55x94x3 - Biconic, good, limestone. L. 2.03 cm, H. 2.01 cm, W. 2.47 cm, 1,350.00 g.

1353. Dholavira. - DHR 54415, Castle, Level 3, 47x77 - Biconic, good, limestone. L. 13.00 cm, H. 10.60 cm, 2,690.00 g.

1354. Dholavira. - DHR 54404b - Broken biconic, basalt. H. 8.31 cm, D. 20.80 cm, 3,860.00+x g.

1355. Dholavira. - DHR 9125, Level 2, zb 7/4 - Biconic, slightly chipped, basalt. H. 15.00 cm, D. 21.50 cm, 10,300.00+x g.

6.8.2.2.12. Parallelepiped (Type 16a): Cat. no. 1356-1505

1356. Dholavira. - DHR 11409, Level 6, 47x15 - Parallelepiped, good, shell. L. 0.68 cm, H. 0.64 cm, W. 0.28 cm, 0.30 g.

1357. Dholavira. - DHR 14559, Level 4, 48x42x1 - Parallelepiped, good, shell. L. 0.98 cm, H. 0.84 cm, W. 0.25 cm, 0.46 g.

1358. Dholavira. - DHR 39323, Castle, Level 2, 47x73x2 - Parallelepiped, good, shell. L. 0.52 cm, H. 9.71 cm, W. 0.87 cm, 0.52 g - Period VI, Late Harappan (4), 1950-1800 BC.

1359. Dholavira. - DHR 8257, Middle Town, Level 15, 57x5x3 - Parallelepiped, good, shell. L. 0.93 cm, H. 0.78 cm, W. 0.27 cm, 0.53 g.

1360. Dholavira. - DHR 19486, Level 1D, 57x60x1 - Parallelepiped, good, shell. L. 0.99 cm, H. 0.80 cm, W. 0.77 cm, 0.53 g.

1361. Dholavira. - DHR 10403, Level 2, 55x33x1 - Parallelepiped, good, shell. L. 0.84 cm, H. 0.74 cm, W. 0.35 cm, 0.54 g.

1362. Dholavira. - DHR 37134, Middle Town, Level 3, 45x73x4 - Parallelepiped, good, shell. L. 0.89 cm, H. 0.85 cm, W. 0.39 cm, 0.56 g.

1363. Dholavira. - DHR 30109, Middle Town, Level 1, 65x3x2 - Parallelepiped, good, shell. L. 0.97 cm, H. 0.69 cm, W. 0.46 cm, 0.56 g.

1364. Dholavira. - DHR 18222, Surface - Parallelepiped, good, shell. L. 1.02 cm, H. 0.81 cm, W. 0.31 cm, 0.58 g.

1365. Dholavira. - DHR 11889, Level 3, 55x44x4 - Parallelepiped, good, shell. L. 1.00 cm, H. 0.77 cm, W. 0.38 cm, 0.59 g.

1366. Dholavira. - DHR 18572, Level 4, 45x33x3 - Parallelepiped, good, shell. L. 1.21 cm, H. 0.83 cm, W. 0.28 cm, 0.62 g.

1367. Dholavira. - DHR 36223, Middle Town, Surface, 35x62x2 - Parallelepiped, good, shell. L. 0.84 cm, H. 0.82 cm, W. 0.37 cm, 0.65 g.

1368. Dholavira. - DHR 1392 - Irregular parallelepiped, worn, copper. L. 0.71 cm, H. 0.29 cm, W. 0.31 cm, 0.66 g.

1369. Dholavira. - DHR 22787, Level 7, 24x9x2 - Parallelepiped, good, shell. L. 0.93 cm, H. 0.79 cm, W. 0.41 cm, 0.66 g.

1370. Dholavira. - DHR 24737, Level 19-26, 57x47x-3+57x51x2 - Parallelepiped, good, shell. L. 0.98 cm, H. 0.73 cm, W. 0.52 cm, 0.67 g.

1371. Dholavira. - DHR 18290, Level 1, 57x57x3 - Parallelepiped, good, shell. L. 1.11 cm, H. 0.95 cm, W. 0.32 cm, 0.69 g.

1372. Dholavira. - DHR 15293a, Castle, Level 1, 48x42x4 - Parallelepiped, worn, copper. L. 0.80 cm, H. 0.77 cm, W. 0.39 cm, 0.69 g - Period VI, Late Harappan (4), 1950-1800 BC.

1373. Dholavira. - DHR 46091, Lower Town, Level 38, 46x61x3 - Parallelepiped, fragmented, agate. L. 1.33 cm, H. 0.68 cm, W. 0.45 cm, 0.71+x g - Period V, Mature Harappan (3C), 2100-2000 BC.

1374. Dholavira. - DHR 38998, Castle, Level 3, 47x47x2 - Parallelepiped, fragmented, worn, copper. L. 0.80 cm, H. 0.75 cm, W. 0.38 cm, 0.76+x g - Period VI, Late Harappan (4), 1950-1800 BC.

1375. Dholavira. - DHR 26348 - Parallelepiped, good, shell. L. 0.80 cm, H. 0.65 cm, W. 0.32 cm, 0.77 g.

1376. Dholavira. - DHR 14993, Castle, Level 1, 47x50x4 - Parallelepiped, good, basalt. L. 0.78 cm, H. 0.75 cm, W. 0.38 cm, 0.86 g - Period VI, Late Harappan (4), 1950-1800 BC.

1377. Dholavira. - DHR 3915, Level 2, ZF7/3 - Parallelepiped, good, shell. L. 0.90 cm, H. 0.81 cm, W. 0.52 cm, 0.92 g.

1378. Dholavira. - DHR 12579, Level 3, 55x94 - Parallelepiped, good, shell. L. 1.00 cm, H. 0.87 cm, W. 0.43 cm, 0.93 g.

1379. Dholavira. - DHR 1316, Level 1, A 19/2 - Parallelepiped, good, shell. L. 1.12 cm, H. 0.94 cm, W. 0.43 cm, 0.94 g.

1380. Dholavira. - DHR 14270, Castle, Level 1, 48x41x1 - Parallelepiped, good, shell. L. 1.10 cm, H. 1.10 cm, W. 0.38 cm, 0.99 g - Period V-VI, Mature-Late Harappan (3C-4), 2200/2100-1800 BC.

1381. Dholavira. - DHR 22992 - Parallelepiped, good, shell. L. 1.00 cm, H. 0.81 cm, W. 0.56 cm, 0.99 g.

1382. Dholavira. - DHR 17774 - Parallelepiped, good, shell. L. 1.06 cm, H. 0.90 cm, W. 0.47 cm, 1.01 g.

1383. Dholavira. - DHR 18827, Level 2, 58x54x1 - Parallelepiped, good, shell. L. 0.99 cm. H. 0.98 cm, W. 0.41 cm, 1.02 g.

1384. Dholavira. - DHR 43485, Middle Town, Level 1, 55x88x2 - Parallelepiped, good, shell. L. 1.05 cm, H. 0.90 cm, W. 0.47 cm, 1.04 g.

1385. Dholavira. - DHR 19038, Level 3, 57x56x4 - Irregular parallelepiped, good, shell. L. 1.01 cm, H. 0.83 cm, W. 0.65 cm, 1.05 g.

1386. Dholavira. - DHR 45021, Middle Town, Level 3, 55x87x4 - Parallelepiped, good, shell. L. 1.05 cm, H. 0.97 cm, W. 0.52 cm, 1.10 g.

1387. Dholavira. - DHR 54472, Middle Town, Level 2a, 55x84x3 - Parallelepiped, good, sandstone. H. 1.19 cm, W. 2.10 cm, 1.16 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1388. Dholavira. - DHR 10338, Level 4, 57x18x1 - Parallelepiped, good, shell. L. 1.22 cm, H. 0.77 cm, W. 0.59 cm, 1.18 g.

1389. Dholavira. - DHR 37309, Castle, Level 4, 47x75x3 - Parallelepiped, good, limestone. L. 1.59 cm, H. 0.71 cm, W. 0.68 cm, 1.26 g.

1390. Dholavira. - DHR 27237, Surface, 45x44 - Parallelepiped, good, shell. L. 1.29 cm, H. 0.94 cm, W. 0.50 cm, 1.30 g.

1391. Dholavira. - DHR 24079, Level 6, 36x34x4 - Parallelepiped, good, terracotta. L. 1.45 cm, H. 1.14 cm, W. 0.83 cm, 1.42 g.

1392. Dholavira. - DHR 26854, Level 3, 47x79x3+4 - Parallelepiped, good, shell. L. 1.33 cm, H. 0.73 cm, 1.50 g.

1393. Dholavira. - DHR 25442, Middle Town, Level 2, 37x64x3 - Parallelepiped, worn, copper. L. 0.75 cm, H. 0.73 cm, W. 0.63 cm, 1.55 g.

1394. Dholavira. - DHR 54558, Level 3, 25x5x1 - Parallelepiped, good, shell. L. 1.40 cm, H. 0.73 cm, W. 0.51 cm, 1.63 g.

1395. Dholavira. - DHR 691, Surface, xj-19/1+4 - Parallelepiped, good, shell. L. 1.52 cm, H. 0.79 cm, W. 0.57 cm, 1.66 g.

1396. Dholavira. - DHR 26852 - Parallelepiped, good, sandstone. L. 1.69 cm, H. 0.39 cm, W. 1.61 cm, 1.70 g.

1397. Dholavira. - DHR 40617, Level 6, 48x98 - Parallelepiped, good, terracotta. L. 0.97 cm, H. 0.93 cm, W. 0.68 cm, 1.71 g.

1398. Dholavira. - DHR 16615, 58x31x2+3 - Parallelepiped, good, shell. L. 1.30 cm, H. 1.20 cm, W. 0.53 cm, 1.73 g.

1399. Dholavira. - DHR 54463, Middle Town, Level 3, B 19/3 - Parallelepiped, worn, agate. H. 1.09 cm, W. 0.77 cm, 1.74 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1400. Dholavira. - DHR 49845, Level 6, 47x74x4 - Parallelepiped, good, shell. L. 0.28 cm, H. 0.07 cm, W. 0.03 cm, 1.75 g.

1401. Dholavira. - DHR 21948, Lower Town, Level 1, 25x1x2 - Parallelepiped, good, shell. L. 1.46 cm, H. 1.14 cm, W. 0.52 cm, 1.78 g.

1402. Dholavira. - DHR 18213, Surface - Parallelepiped, good, shell. L. 1.46 cm, H. 1.41 cm, W. 0.42 cm, 1.78 g.

1403. Dholavira. - DHR 29678, Level 2, 55x83x1 - Parallelepiped, worn, shell. L. 1.29 cm, H. 1.14 cm, W. 0.54 cm, 1.80 g.

1404. Dholavira. - DHR 52021, Lower Town, Level 1, 35x32x1 - Parallelepiped, worn, copper. L. 1.02 cm, H. 1.02 cm, W. 0.67 cm, 1.80 g.

1405. Dholavira. - DHR 23586, Level 3, 28x8x1 - Parallelepiped, good, shell. L. 1.45 cm, H. 0.99 cm, W. 0.56 cm, 1.82 g.

1406. Dholavira. - DHR 16535, Level 2, 55x51x1 - Parallelepiped, good, shell. L. 1.13 cm, H. 1.10 cm, W. 0.70 cm, 1.87 g.

1407. Dholavira. - DHR 14555, Level 1, 48x41x2 - Parallelepiped, good, shell. L. 1.68 cm, H. 1.48 cm, W. 0.40 cm, 1.91 g.

1408. Dholavira. - DHR 23979, Level 6, 47x18x1 - Parallelepiped, good, shell. L. 1.64 cm, H. 1.08 cm, W. 0.77 cm, 1.92 g.

1409. Dholavira. - DHR 11408, Level 6 - Parallelepiped, good, shell. L. 1.35 cm, H. 0.99 cm, W. 0.63 cm, 1.92 g.

1410. Dholavira. - DHR 19478, Level 3, 54x58x1 - Parallelepiped, good, shell. L. 1.42 cm, H. 0.99 cm, W. 0.61 cm, 1.93 g.

1411. Dholavira - DHR 44895 - Parallelepiped, slightly chipped, shell. L. 1.85 cm, H. 1.04 cm, W. 0.48 cm, 1.94 g.

1412. Dholavira. - DHR 29493, Level 7, 66x55x1 - Parallelepiped, good, shell. L. 1.41 cm, H. 1.08 cm, W. 0.56 cm, 2.00 g.

1413. Dholavira. - DHR 49816, Lower Town, 35x22x1 - Parallelepiped, good, hornblende. L. 1.15 cm, H. 1.02 cm, W. 0.76 cm, 2.00 g.

1414. Dholavira. - DHR 51501, Castle, Level 18, 47x73x3 - Parallelepiped, good, shell. L. 1.33 cm, H. 1.14 cm, W. 0.51 cm, 2.03 g.

1415. Dholavira. - DHR 33139, Castle, Level 8/9, 47x88x3 - Parallelepiped, good, stone. L. 1.53 cm, H. 1.14 cm, W. 0.64 cm, 2.08 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1416. Dholavira. - DHR 22657, Castle, 47x88x4 - Parallelepiped, slightly chipped, gabbro. L. 0.95 cm, H. 0.79 cm, W. 1.30 cm, 2.12+x g.

1417. Dholavira. - DHR 33021, Level 1, 67x32x2 - Parallelepiped, good, shell. L. 1.60 cm, H. 1.27 cm, W. 0.43 cm, 2.15 g.

1418. Dholavira. - DHR 18130, Middle Town, 44x43x2/3 - Parallelepiped, good, jasper. L. 1.56 cm, H. 1.06 cm, W. 0.68 cm, 2.17 g.

1419. Dholavira. - DHR 18110, Castle, Level 3b, 47x98x2 - Parallelepiped, good, agate. L. 1.30 cm, H. 1.28 cm, W. 0.61 cm, 2.27 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1420. Dholavira. - DHR 51635, Castle, Level 19, 47x73x3 - Parallelepiped, worn, copper. L. 1.21 cm, H. 1.13 cm, W. 0.69 cm, 2.30 g.

1421. Dholavira. - DHR 46333, Lower Tower, Level 4, 25x83x2 - Parallelepiped, good, terracotta. L. 1.70 cm, H. 1.65 cm, W. 0.60 cm, 2.31 g.

1422. Dholavira. - DHR 54458, Castle, Level 2, XA 19 - Parallelepiped, worn, slightly chipped, agate. L. 1.10 cm, H. 1.08 cm, W. 0.84 cm, 2.32+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1423. Dholavira. - DHR 18011, Middle Town, Level 3, 56x53x2 - Parallelepiped, good, shell. L. 1.44 cm, H. 1.15 cm, W. 0.62 cm, 2.48 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1424. Dholavira. - DHR 390, Level 1, B. 19/1 - Irregular parallelepiped, good, shell. L. 1.56 cm, H. 1.37 cm, W. 0.58 cm, 2.72 g.

1425. Dholavira. - DHR 9528, Middle Town, Level 4, 45x14x1 - Parallelepiped, good, shell. L. 2.09 cm, H. 1.73 cm, W. 0.39 cm, 2.86 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1426. Dholavira. - DHR 9508, Pit s/b 2, 45x34x4 - Parallelepiped, slightly chipped, steatite. L. 1.42 cm, H. 1.41 cm, W. 0.71 cm, 2.90+x g.

1427. Dholavira. - DHR 53002, Castle, Level 1, 46x61x3 - Parallelepiped, worn, copper. L. 1.27 cm, H. 1.23 cm, W. 0.75 cm, 3.07 g.

1428. Dholavira. - DHR 11845, Middle Town, Pit s/b 1, 45x40 - Parallelepiped, good, shell. L. 1.45 cm, H. 1.23 cm, W. 0.76 cm, 3.38 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1429. Dholavira. - DHR 47121, Middle Town, Level 3, 35x52x2 - Parallelepiped, good, sandstone. L. 1.62 cm, H. 1.06 cm, W. 0.96 cm, 3.43 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1430. Dholavira. - DHR 18422, Area Bailey, Level 1, 58x55x3 - Parallelepiped, good, siltstone. L. 1.50 cm, H. 1.11 cm, W. 0.68 cm, 3.55 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1431. Dholavira. - DHR 18087, Level 2, 57x99x1 - Parallelepiped, broken, steatite. L. 1.50 cm, H. 1.17 cm, W. 0.98 cm, 3.65+x g.

1432. Dholavira. - DHR 37470 - Parallelepiped, good, limestone. L. 1.65 cm, H. 0.69 cm, W. 1.15 cm, 3.67 g.

1433. Dholavira. - DHR 44587, Surface - Parallelepiped, slightly chipped, terracotta. L. 1.73 cm, H. 1.67 cm, W. 0.87 cm, 3.73 g.

1434. Dholavira. - DHR 22309, ER, Level 1b, 37x49x4 - Parallelepiped, worn, terracotta. L. 1.92 cm, H. 1.17 cm, W. 1.23 cm, 4.49 g - Period VI, Late Harappan (4), 1950-1800 BC.

1435. Dholavira. - DHR 34092b, Area Castle, Level 1, 47x85x1 - Parallelepiped, slightly chipped, shell. L. 2.62 cm, H. 0.89 cm, W. 0.83 cm, 4.65 g.

1436. Dholavira. - DHR 14729, Level 2, 65x64x3 - Parallelepiped, good, shell. L. 1.98 cm, H. 1.58 cm, W. 0.73 cm, 4.72 g.

1437. Dholavira. - DHR 23877, Lower Town, 24x3x3 - Parallelepiped, good, stone. L. 2.57 cm, H. 2.03 cm, W. 0.75 cm, 5.81 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1438. Dholavira. - DHR 718, Level 3, D. 19/2 - Parallelepiped, slightly chipped, shell. L. 2.48 cm, H. 1.68 cm, W. 0.66 cm, 6.31+x g.

1439. Dholavira. - DHR 46381, Middle Town, Level 2, 35x63x2 - Parallelepiped, good, terracotta. L. 2.25 cm, H. 1.98 cm, W. 0.94 cm, 6.40 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1440. Dholavira. - DHR 33706, Middle Town, Level 2, 35x73x2 - Parallelepiped, worn, sandstone. L. 2.19 cm, H. 1.96 cm, W. 1.01 cm, 6.58 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1441. Dholavira. - DHR 18401, Emb, Level 1, 28x51x2/2 - Parallelepiped, good, shell. L. 1.90 cm, H. 1.84 cm, W. 0.77 cm, 6.67 g - Period V-VI, Mature-Late Harappan (3C-4), 2200/2100-1800 BC.

1442. Dholavira. - DHR 19677, Middle Town, Level 2, 45x33x4 - Parallelepiped, good, terracotta. L. 2.38 cm, H. 1.37 cm, W. 0.89 cm, 6.70 g - Period V, Mature Harappan (3C), 2200-2000/1900 BC.

1443. Dholavira. - DHR 16405, Level 2 R-8, 56x55x4 - Parallelepiped, good, shell. L. 2.90 cm, H. 1.44 cm, W. 0.70 cm, 6.76 g.

1444. Dholavira. - DHR 26016, Lower Town, Level 18, 25x5x2 - Parallelepiped, worn, sandstone. L. 2.13 cm, H. 1.52 cm, W. 1.37 cm, 6.77 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1445. Dholavira. - DHR 16404 - Parallelepiped, slightly worn, limestone. L. 1.92 cm, H. 1.17 cm, W. 1.23 cm, 6.84 g.

1446. Dholavira. - DHR 51375, Middle Town, Surface - Parallelepiped, worn, sandstone. L. 2.82 cm, H. 1.90 cm, W. 0.95 cm, 6.94 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1447. Dholavira. - DHR 25365, Pit 1 s/b 2, 23x10x2 - Parallelepiped, worn, sandstone. L. 3.16 cm, H. 1.56 cm, W. 1.02 cm, 7.60 g.

1448. Dholavira. - DHR 8144, Pit a s/b 31, 48x92x4 - Parallelepiped, good, sandstone. L. 3.53 cm, H. 2.02 cm, W. 0.69 cm, 8.41 g.

1449. Dholavira. - DHR 19761, Lower Town, Level 1, 35x33x1 - Parallelepiped, good, terracotta. L. 2.48 cm, H. 2.27 cm, W. 1.07 cm, 9.10 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1450. Dholavira. - DHR 49895, Castle, Level 2, 47x23x3 - Fragmented parallelepiped, terracotta. L. 2.66 cm, H. 2.54 cm, W. 1.02 cm, 10.80+x g - Period V, Mature Harappan (3C), 2100-2000 BC.

1451. Dholavira. - DHR 18583, Middle Town, Level 4, 45x33x3 - Parallelepiped, good, terracotta. L. 3.12 cm, H. 2.78 cm, W. 0.75 cm, 11.20 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1452. Dholavira. - DHR 8513, Level 3, 37x31x3 - Parallelepiped, good, shell. L. 2.35 cm, H. 1.48 cm, W. 1.46 cm, 12.05 g.

1453. Dholavira. - DHR 5466, Level 2, 48x82x3+4 - Parallelepiped, chipped, stone. L. 2.98 cm, H. 2.95 cm, W. 1.04 cm, 12.29+x g.

1454. Dholavira. - DHR 16147, Castle, Level 2, 48x41x1 - Parallelepiped, good, sandstone. L. 3.19 cm, H. 2.08 cm, W. 1.28 cm, 12.76 g - Period VI, Late Harappan (4), 1950-1800 BC.

1455. Dholavira. - DHR 47784, Lower Town, Level 1, 35x42x4 - Parallelepiped, slightly chipped, limestone. L. 2.98 cm, H. 2.98 cm, W. 1.40 cm, 13.20 g.

1456. Dholavira. - DHR 23219, Area Middle Town, Level 5, 54x67x3 - Parallelepiped, good, shell. L. 2.64 cm, H. 1.62 cm, W. 1.38 cm, 13.54 g.

1457. Dholavira. - DHR 18710, Area Lower Town, Level 1, 27x73x3 - Parallelepiped, slightly chipped, jasper. L. 2.01 cm, H. 1.58 cm, W. 1.55 cm, 13.69 g.

1458. Dholavira. - DHR 54487 - Parallelepiped, chipped, siltstone. L. 2.38 cm, H. 1.97 cm, W. 1.82 cm, 13.76+x g.

1459. Dholavira. - DHR 17681 - Parallelepiped, worn, sandstone. L. 2.00 cm, H. 1.90 cm, W. 1.81 cm, 13.77 g.

1460. Dholavira. - DHR 9761 - Parallelepiped, slightly chipped, shell. L. 1.43 cm, H. 1.11 cm, W. 1.71 cm, 14.11 g.

1461. Dholavira. - DHR 37227, ER, Level 16, 37x56x4 - Parallelepiped, heavily worn, limestone. L. 3.21 cm, H. 3.20 cm, 14.42 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1462. Dholavira. - DHR 5999, Level 32, 48x92x3+4 - Fragmented parallelepiped, limestone. L. 2.90 cm, H. 2.19 cm, W. 1.36 cm, 15.58+x g.

1463. Dholavira. - DHR 44435, Middle Town, Level 6, 46x71x3 - Parallelepiped, good, sandstone. L. 3.62 cm, H. 2.27 cm, W. 1.04 cm, 15.64 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1464. Dholavira. - DHR 53991, Area Middle Town, Level 19 - Parallelepiped, slightly chipped, emestite. L. 3.73 cm, H. 2.60 cm, W. 0.73 cm, 16.43+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1465. Dholavira. - DHR 53940, Castle, Level 19, 47x74x4 - Fragmented parallelepiped, limestone. L. 3.56 cm, H. 2.55 cm, W. 1.12 cm, 16.88+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1466. Dholavira. - DHR 44336, Middle Town, Level 4, 55x87x2 - Parallelepiped, good, limestone. L. 3.00 cm, H. 2.31 cm, W. 1.59 cm, 17.15 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1467. Dholavira. - DHR 53905, Castle, Level 18, 47x74x4 - Parallelepiped, fragmented, sandstone. L. 2.66 cm, H. 2.63 cm, W. 1.86 cm, 21.07+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1468. Dholavira. - DHR 53902, Castle, Level 18, 47x74x4 - Parallelepiped, fragmented, basalt. L. 3.52 cm, H. 2.26 cm, W. 1.74 cm, 21.50+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1469. Dholavira. - DHR 8181, Level 1, 48x1x1 - Parallelepiped, slightly chipped, limestone. L. 3.15 cm, H. 2.35 cm, W. 2.02 cm, 23.42+x g.

1470. Dholavira. - DHR 37013, Level 2, 45x53x1 - Parallelepiped, slightly chipped, stone. L. 3.41 cm, H. 3.15 cm, W. 1.59 cm, 23.67 g.

1471. Dholavira. - DHR 26175, Sr-2 - Parallelepiped, slightly chipped, shell. L. 2.81 cm, H. 2.33 cm, W. 1.57 cm, 26.48 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1472. Dholavira. - DHR 5846, Castle, MBR 1b, Pit 1, 58x2x3 - Parallelepiped, slightly chipped, stone. L. 3.53 cm, H. 1.87 cm, W. 1.65 cm, 27.28 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1473. Dholavira. - DHR 556, Castle, Level 1, C 19/1 - Parallelepiped, good, gabbro. L. 3.22 cm, H. 2.91 cm, W. 1.24 cm, 27.36 g - Period V-VI, Mature Harappan (3C)-Late Harappan (4), 2200/2100-1800 BC.

1474. Dholavira. - DHR 40248, Area Middle Town, Level 1, 55x75x1 - Parallelepiped, good, granite. L. 6.69 cm, H. 4.92 cm, W. 3.28 cm, 270.83 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1475. Dholavira. - DHR 35267, Level 8, 37x56x4 - Parallelepiped, slightly chipped, sandstone. L. 4.00 cm, H. 3.56 cm, W. 1.14 cm, 29.02 g.

1476. Dholavira. - DHR 9203, Level 1, 45x94 - Parallelepiped, good, sandstone. L. 4.13 cm, H. 1.97 cm, W. 1.93 cm, 29.33 g.

1477. Dholavira. - DHR 38118, Level 2, 46x54x1 - Parallelepiped, heavily chipped, limestone. L. 4.14 cm, H. 2.79 cm, W. 1.65 cm, 29.62+x g.

1478. Dholavira. - DHR 7451, Level 2, 47x62x1 - Parallelepiped, chipped, stone. L. 3.54 cm, H. 3.53 cm, W. 1.49 cm, 30.42+x g.

1479. Dholavira. - DHR 30898, Level 3, 47x67x1+2 - Parallelepiped, slightly chipped, sandstone. L. 3.33 cm, H. 2.42 cm, W. 2.37 cm, 30.65+x g.

1480. Dholavira. - DHR 23869, Surface - Parallelepiped, deliberately fragmented, limestone. L. 4.97 cm, H. 4.07 cm, W. 2.28 cm, 33.89 g.

1481. Dholavira. - DHR 54476, Lower Town, Level 2, 25x9x1 - Parallelepiped, good, stone. L. 1.85 cm, H. 1.79 cm, W. 1.17 cm, 34.68 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1482. Dholavira. - DHR 30496, Level 11, 37x55x2+3 - Parallelepiped, slightly chipped, terracotta. L. 3.85 cm, H. 2.44 cm, W. 2.26 cm, 36.87+x g.

1483. Dholavira. - DHR 18808, 54x58x1 - Parallelepiped, good, sandstone. L. 3.83 cm, H. 3.39 cm, W. 1.88 cm, 39.59 g.

1484. Dholavira. - DHR 4545, Level 7, A 13/4 - Fragmented parallelepiped, sandstone. L. 3.21 cm, H. 2.33 cm, W. 1.73 cm, 41.60+x g.

1485. Dholavira. - DHR 34175, Middle Town, Level 4, 35x63x4 - Parallelepiped, fragmented, stone. L. 4.16 cm, H. 3.58 cm, W. 1.59 cm, 41.80 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1486. Dholavira. - DHR 17543, Level 6, 56x54x3 - Parallelepiped, worn, sandstone. L. 5.02 cm, H. 4.11 cm, W. 1.37 cm, 42.47 g.

1487. Dholavira. - DHR 13451, Level 1, 5x64x1 - Parallelepiped, good, siltstone. L. 4.99 cm, H. 3.40 cm, W. 1.08 cm, 43.93 g.

1488. Dholavira. - DHR 37806, Castle, Level 3, 47x75x1 - Parallelepiped, slightly chipped, sandstone. L. 5.26 cm, H. 5.03 cm, W. 1.34 cm, 55.33 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1489. Dholavira. - DHR 19914, Lower Town, Level 1, 25x63x3 - Parallelepiped, slightly chipped, limestone. L. 2.50 cm, H. 2.22 cm, W. 4.34 cm, 59.03 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1490. Dholavira. - DHR 6535 - Parallelepiped, slightly chipped, sandstone. L. 3.88 cm, H. 3.54 cm, W. 1.98 cm, 59.64 g.

1491. Dholavira. - DHR 45122, Level 2, 48x98x99 - Parallelepiped, chipped, limestone. L. 6.02 cm, H. 3.95 cm, W. 1.57 cm, 66.54+x g - Period VI, Late Harappan (4), 1950-1800 BC.

1492. Dholavira. - DHR 24651, Level 2, 48x48x1 - Parallelepiped, good, stone. L. 6.02 cm, H. 3.48 cm, W. 2.60 cm, 78.17 g.

1493. Dholavira. - DHR 37705, ER, Level 18, 37x56x4 - Parallelepiped, heavily chipped, limestone. L. 4.68 cm, H. 4.06 cm, W. 1.86 cm, 78.81+x g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1494. Dholavira. - DHR 577, Castle, Surface, A 14/4 - Parallelepiped, slightly chipped, sandstone. L. 4.54 cm, H. 4.35 cm, W. 2.67 cm, 90.26+x g - Period VI, Late Harappan (4), 1950-1800 BC.

1495. Dholavira. - DHR 25977, Level 15, 25x5x2 - Parallelepiped, chipped, limestone. L. 5.75 cm, H. 3.10 cm, W. 2.54 cm, 96.20+x g.

1496. Dholavira. - DHR 37226 - Parallelepiped, fragmented. L. 3.48 cm, H. 2.61 cm, W. 1.89 cm.

1497. Dholavira. - DHR 44116, Lower Town - Parallelepiped, worn, limestone. L. 3.53 cm, H. 1.64 cm, W. 1.04 cm.

1498. Dholavira. - DHR 54524 - Parallelepiped, chipped, limestone. L. 6.41 cm, H. 5.01 cm, W. 1.95 cm, 110.00+x g.

1499. Dholavira. - DHR 14999, Middle Town, Level 1, 56x55x1 - Parallelepiped, slightly worn, limestone. L. 4.07 cm, H. 3.88 cm, W. 3.19 cm, 116.37 g - Period VI, Late Harappan (4), 1950-1800 BC.

1500. Dholavira. - DHR 39128, Surface - Parallelepiped, worn, stone. L. 4.05 cm, H. 3.26 cm, W. 5.62 cm, 117.60 g.

1501. Dholavira. - DHR 38663, Middle Town, Level 21, 45x3x3 - Parallelepiped, heavily chipped, limestone. L. 8.09 cm, H. 5.79 cm, W. 3.09 cm, 238.15+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1502. Dholavira. - DHR 54413, Middle Town, Level 7, 55x78x4 - Parallelepiped, chipped, stone. L. 8.30 cm, H. 7.54 cm, W. 3.95 cm, 510.00+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1503. Dholavira. - DHR 54479, Middle Town, Level 2, 45x94x1 - Parallelepiped, good, chert. L. 1.66 cm, H. 1.62 cm, W. 1.18 cm, 810.00 g.

1504. Dholavira. - DHR 54405 - Parallelepiped, slightly chipped, limestone. L. 21.00 cm, H. 7.30 cm, 3,860.00+x g.

1505. Dholavira. - DHR 54409, Surface - Parallelepiped, slightly chipped, limestone. L. 9.00 cm, H. 8.80 cm, W. 3.00 cm, 4,590.00+x g.

6.8.2.2.13. Discoid (Type 17a): Cat. no. 1506-1607

1506. Dholavira. - DHR 35317, Level 4, 47x85x2 - Discoid, good, shell. H. 5.34 cm, D. 2.52 cm, 0.13 g.

1507. Dholavira. - DHR 16340 - Discoid, perfect, shell. H. 0.17 cm, D. 0.69 cm, 0.13 g.

1508. Dholavira. - DHR 6740, Level 5, 1 R-3N, 57x5x4 - Discoid, good, shell. H. 0.57 cm, D. 0.32 cm, 0.20 g.

1509. Dholavira. - DHR 47386, Level 5, 35x73 - Discoid, good, jasper. H. 0.66 cm, D. 0.32 cm, 0.28 g.

1510. Dholavira. - DHR 37720 - Discoid, perfect, shell. H. 1.02 cm, D. 0.18 cm, 0.28 g.

1511. Dholavira. - DHR 35376, Area Middle Town, 45x3x3 - Discoid, worn, copper. H. 0.27 cm, D. 0.59 cm, 0.29 g.

1512. Dholavira. - DHR 33851 - Discoid, good, shell. W. 0.19 cm, D. 0.85 cm, 0.35 g.

1513. Dholavira. - DHR 21074, Area Castle, Level 10, 47x94x2 - Discoid, good, shell. H. 0.71 cm, D. 0.48 cm, 0.41 g.

1514. Dholavira. - DHR 45743, Castle, Level 32, 46x61x3 - Discoid, good, shell. H. 0.10 cm, D. 0.25 cm, 0.47 g - Period VI, Late Harappan (4), 1950-1800 BC.

1515. Dholavira. - DHR 38315, Level 8, 45x53x2 - Discoid, good, jasper. H. 1.00 cm, D. 0.43 cm, 0.52 g.

1516. Dholavira. - DHR 26572, Level 1, 36x42 - Discoid, good, steatite. L. 0.81 cm, H. 0.80 cm, W. 0.53 cm, 0.57 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1517. Dholavira. - DHR 3175 - Discoid, perfect, shell. H. 0.27 cm, D. 1.25 cm, 0.63 g.

1518. Dholavira. - DHR 50018, Level 1, 37x78x1 - Discoid, good, shell. H. 0.89 cm, D. 0.48 cm, 0.71 g.

1519. Dholavira. - DHR 35857, Level 1, 46x54x3 - Discoid, good, shell. L. 1.62 cm, W. 1.59 cm, 0.74 g.

1520. Dholavira. - DHR 20957, 58x55x4+58x54x3 - Discoid, slightly chipped, shell. H. 0.80 cm, D. 0.63 cm, 0.75+x g.

1521. Dholavira. - DHR 20963, Level 5b, 58x55x4 +58x54x3 - Discoid, good, shell. H. 0.78 cm, D. 0.67 cm, 0.77 g.

1522. Dholavira. - DHR 16619, Level 5, 48x41x1 - Discoid, good, shell. H. 0.90 cm, D. 0.64 cm, 0.87 g.

1523. Dholavira. - DHR 1179, XE 22/3+4 - Discoid, good, shell. H. 0.86 cm, D. 0.72 cm, 0.91 g.

1524. Dholavira. - DHR 15146, Lower Town, Level 1, 35x53x1 - Discoid, good, agate. L. 0.99 cm, H. 0.98 cm, W. 0.54 cm, 0.94 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1525. Dholavira. - DHR 19840, Bailey, Level 1 s/b 3, 58x51x1 - Discoid, good, agate. L. 1.01 cm, H. 1.00 cm, W. 0.56 cm, 0.97 g - Period V-VI, Mature Harappan (3C)-Late Harappan (4), 2200/2100-1800 BC.

1526. Dholavira. - DHR 30634, Level 1, 66x54x1 - Discoid, good, shell. H. 0.94 cm, D. 0.64 cm, 0.97 g.

1527. Dholavira. - DHR 26583, Level 2, 47x89x3 - Discoid, worn, copper. W. 0.45 cm, D. 0.87 cm, 1.00 g.

1528. Dholavira. - DHR 18911, Level 2, 57x56x1 - Discoid, good, shell. H. 1.02 cm, D. 0.53 cm, 1.04 g.

1529. Dholavira. - DHR 47329, Middle Town, Level 3, 35x73 - Discoid, good, steatite. L. 1.14 cm, H. 1.07 cm, W. 0.75 cm, 1.07 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1530. Dholavira. - DHR 1502 - Discoid, good, shell. H. 0.93 cm, D. 0.64 cm, 1.11 g.

1531. Dholavira. - DHR 27071, Surface, 47x35x2 - Discoid, good, shell. H. 1.06 cm, D. 0.53 cm, 1.12 g.

1532. Dholavira. - DHR 41203 - Discoid, good, shell. H. 0.31 cm, D. 0.89 cm, 1.24 g.

1533. Dholavira. - DHR 49997, Area Castle, r-8 47x84x2 - Discoid, good, sandstone. H. 0.72 cm, D. 1.22 cm, 1.26 g.

1534. Dholavira. - DHR 52499, Middle Town, Level 2, 55x37x1 - Discoid, good, agate. L. 0.95 cm, H. 0.83 cm, 1.28 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1535. Dholavira. - DHR 35896, Level 13, 35x63x2 - Discoid, perfect, agate. H. 0.91 cm, D. 0.53 cm, 1.40 g.

1536. Dholavira. - DHR 33916, Middle Town, Level 2, 43x3x3 - Discoid, fragmented, limestone. L. 1.44 cm, H. 1.27 cm, W. 0.72 cm, 1.44+x g - Period V, Mature Harappan (3C), 2100-2000 BC.

1537. Dholavira. - DHR 28732, Middle Town, Level 2, 45x93x2 - Discoid, good, stone. H. 0.88 cm, D. 1.16 cm, 1.46 g.

1538. Dholavira. - DHR 29885, Middle Town, Level 1, 45x83x3 - Discoid, chipped, chert. H. 0.81 cm, D. 0.93 cm, 1.47+x g - Period V, Mature Harappan (3C), 2100-2000 BC.

1539. Dholavira. - DHR 48354, Level 1, 35x73x324 - Discoid, fragmented or unfinished, shell. H. 0.82 cm, D. 1.00 cm, 1.54+x g.

1540. Dholavira. - DHR 45681, Level 11, 37x37x2 - Discoid, good, shell. L. 1.15 cm, H. 1.14 cm, W. 0.66 cm, 1.72 g.

1541. Dholavira. - DHR 18658, Level 2, 57x54x3 - Discoid, good, shell. H. 0.83 cm, D. 1.11 cm, 1.77 g.

1542. Dholavira. - DHR 9891, Middle Town, Level 10, 35x53x3 - Discoid, good, stone. H. 1.16 cm, D. 0.54 cm, 1.84 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1543. Dholavira. - DHR 50560 - Discoid, fragmented, shell. H. 1.30 cm, D. 0.62 cm, 1.87+x g.

1544. Dholavira. - DHR 48257 - Discoid, heavily chipped, shell. H. 0.75 cm, D. 1.21 cm, 1.93+x g.

1545. Dholavira. - DHR 32962, Middle Town, Level 1, 45x94 - Discoid, good, stone. H. 1.08 cm, D. 0.77 cm, 2.01 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1546. Dholavira. - DHR 53075, Castle, Level 12, 47x84x1 - Discoid, good, stone. H. 0.72 cm, D. 1.73 cm, 2.20 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1547. Dholavira. - DHR 18523, Level 1, 57x58x1 - Discoid, good, shell. H. 1.31 cm, D. 0.71 cm, 2.26 g.

1548. Dholavira. - DHR 45758, Middle Town, Level 1, 55x89x2 - Discoid, worn, shell. H. 0.85 cm, D. 1.28 cm, 2.38 g.

1549. Dholavira. - DHR 39676, Middle Town, Level 5, 35x83x1+2 - Discoid, good, clay. H. 1.09 cm, D. 1.44 cm, 2.50 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1550. Dholavira. - DHR 15550, Pit s/b 28, 35x53x4 - Discoid, erased, shell. L. 0.75 cm, W. 1.42 cm, 2.58 g.

1551. Dholavira. - DHR 1960, Level 1, ZA 6 - Discoid, slightly chipped, shell. H. 0.98 cm, D. 1.24 cm, 2.86 g.

1552. Dholavira. - DHR 46015, Middle Town, Level 2, 35x63x1 - Discoid, good, grey limestone. H. 1.45 cm, D. 0.84 cm, 3.12 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1553. Dholavira. - DHR 43405, Level 3, 67x54x1 - Discoid, fragmented, sandstone. H. 1.21 cm, D. 1.53 cm, 3.20+x g.

1554. Dholavira. - DHR 15363, Middle Town, Level 2, 56x55x1 - Discoid, good, shell. H. 1.60 cm, D. 0.70 cm, 3.32 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1555. Dholavira. - DHR 38371, Level 3, 55x82x2 - Discoid, good, shell. H. 0.67 cm, D. 0.41 cm, 3.32 g.

1556. Dholavira. - DHR 37238a, Middle Town, Level 3, 45x73x4 - Discoid, good, agate. L. 1.61 cm, H. 1.58 cm, W. 0.85 cm, 3.50 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1557. Dholavira. - DHR 24508, Castle, Level 7b, 47x88x2 - Discoid, slightly chipped, clay. H. 1.07 cm, D. 1.67 cm, 3.50 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1558. Dholavira. - DHR 19831a, Middle Town, Level 1a, 54x58x2 - Discoid, good, stone. H. 1.52 cm, D. 0.75 cm, 3.50 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1559. Dholavira. - DHR 8159, Level 2, 57x16x2 - Discoid, good, sandstone. H. 0.83 cm, D. 1.61 cm, 3.52 g.

1560. Dholavira. - DHR 50310, Level 1, 37x78x2 - Discoid, good, sandstone. H. 1.55 cm, D. 0.88 cm, 3.54 g.

1561. Dholavira. - DHR 40372, Middle Town, Level 4, 55x76x1 - Discoid, good, shell. L. 1.55 cm, H. 1.44 cm, W. 0.80 cm, 3.62 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1562. Dholavira. - DHR 54474, Level 5, 47x7x3 - Discoid, good, stone. H. 2.36 cm, D. 3.91 cm, 3.64 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1563. Dholavira. - DHR 38350, Middle Town, Level 2, 55x82x1 - Discoid, good, hematite. H. 1.19 cm, D. 0.76 cm, 3.81 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1564. Dholavira. - DHR 54466, Middle Town, Level 1, 55x52 - Discoid, good, chalcedony. H. 0.80 cm, D. 0.57 cm, 3.93 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1565. Dholavira. - DHR 31149, Level 1, XJ19 QD.1 - Discoid, good, copper. L. 0.36 cm, W. 0.34 cm, 3.99 g - Period VI, Late Harappan (4), 1950-1800 BC.

1566. Dholavira. - DHR 33788, Level 3, 45x23x3 - Discoid, good, sandstone. L. 2.21 cm, H. 2.17 cm, W. 0.74 cm, 4.22 g.

1567. Dholavira. - DHR 38685, Middle Town, Level 22, 45x3x3 - Discoid, fragmented, limestone. H. 0.79 cm, D. 2.16 cm, 4.44+x g.

1568. Dholavira. - DHR 15654, Middle Town, Level 1 R7, 56x55x4 - Discoid, good, sandstone. H. 1.81 cm, D. 0.87 cm, 5.26 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1569. Dholavira. - DHR 9074, Surface - Discoid, good, shell. L. 1.89 cm, H. 1.83 cm, W. 0.93 cm, 6.34 g.

1570. Dholavira. - DHR 19127, Castle, Level 1A, 58x53x1 - Discoid, slightly chipped, stone. H. 1.20 cm, D. 2.04 cm, 6.68 g - Period VI, Late Harappan (4), 1950-1800 BC.

1571. Dholavira. - DHR 17765 - Discoid, good, stone. H. 1.86 cm, D. 1.01 cm, 6.90 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1572. Dholavira. - DHR 37143, Level 3, 35x63x4 - Discoid, good, sandstone. L. 0.70 cm, H. 2.08 cm, W. 0.84 cm, 7.03 g.

1573. Dholavira. - DHR 29637 - Discoid, good, shell. H. 1.62 cm, D. 1.75 cm, 7.11 g.

1574. Dholavira. - DHR 19883, Pit 1, 57x58x4 - Discoid, good, stone. H. 1.90 cm, D. 1.04 cm, 7.25 g.

1575. Dholavira. - DHR 54477, Castle, 47x9x3 - Discoid, good, chalcedony. L. 2.36 cm, H. 2.23 cm, W. 1.06 cm, 7.39 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1576. Dholavira. - DHR 39174, Surface - Discoid, slightly chipped, agate. H. 1.10 cm, D. 2.20 cm, 7.39+x g.

1577. Dholavira. - DHR 37147, Middle Town, Level 6, 35x63x4 - Discoid, good, stone. H. 0.85 cm, D. 2.49 cm, 7.60 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1578. Dholavira. - DHR 50095, Castle, Level 6, 47x84 R-8 - Discoid, good, limestone. H. 2.32 cm, D. 1.03 cm, 9.61 g.

1579. Dholavira. - DHR 19776, 47x46+47x4x8 - Discoid, good, shell. H. 2.29 cm, D. 0.91 cm, 9.79 g.

1580. Dholavira. - DHR 54469 - Discoid, good, black stone. H. 0.67 cm, D. 0.28 cm, 10.17 g.

1581. Dholavira. - DHR 46988, Surface, 47x84x2 - Discoid, good, shell. H. 1.13 cm, D. 2.29 cm, 11.70 g.

1582. Dholavira. - DHR 18081, Level 3, 35x64x3 - Discoid, good, shell. H. 1.27 cm, W. 2.44 cm, D. 2.35 cm, 12.73 g.

1583. Dholavira. - DHR 43187, Castle, Surface, 47x75x2 - Discoid, good, stone. H. 1.18 cm, D. 2.19 cm, 13.88 g.

1584. Dholavira. - DHR 7559, Castle, Level 2, 47x48x1 - Discoid, fragmented, steatite. H. 1.41 cm, D. 2.84 cm, 14.60+x g - Period VI, Late Harappan (4), 1950-1800 BC.

1585. Dholavira. - DHR 11929, Bailey, Level 4, 57x17 - Discoid, good, shell. L. 1.59 cm, H. 2.70 cm, W. 2.69 cm, 15.91 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1586. Dholavira. - DHR 41367, Middle Town, Level 1, 45x69x4 - Discoid, good, sandstone. H. 1.90 cm, D. 2.71 cm, 16.40 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1587. Dholavira. - DHR 34092a, Level 20, Level 1, 47x85x1 - Discoid, good, shell. H. 2.54 cm, D. 1.59 cm, 26.09 g.

1588. Dholavira. - DHR 52551, Middle Town, Level 2, 35x32x4 - Discoid, good, gabbro. H. 1.89 cm, D. 2.85 cm, 27.04 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1589. Dholavira. - DHR 54467, Middle Town, Level 2, 55x84x4 - Discoid, good, sandstone. H. 0.99 cm, D. 1.75 cm, 27.29 g.

1590. Dholavira. - DHR 50042, Castle, Level 6, 47x74x3 - Discoid, good, shell. H. 3.18 cm, D. 1.62 cm, 33.80 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1591. Dholavira. - DHR 31308, Area Middle Town, Surface, 65x33x4 - Discoid, worn, stone. L. 3.96 cm, H. 3.72 cm, W. 2.73 cm, 44.87 g.

1592. Dholavira. - DHR 35287, Pit 1, 35x63x1 - Discoid, good, limestone. H. 1.28 cm, D. 5.57 cm, 46.72 g.

1593. Dholavira. - DHR 18432, 57x57x3 - Discoid, worn, sandstone. H. 2.40 cm, D. 3.55 cm, 49.28 g.

1594. Dholavira. - DHR 21312, Lower Town, Level 3, 35x33x2 - Discoid, good, stone. H. 1.99 cm, D. 3.71 cm, 49.71 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1595. Dholavira. - DHR 13474, Lower Town, Level 2, 15x24x1 - Discoid, chipped, stone. H. 2.99 cm, D. 4.08 cm, 71.13+x g - Period V, Mature Harappan (3C), 2200-2000/1900 BC.

1596. Dholavira. - DHR 34386, Castle, Level 1, 47x84x2 - Discoid, good, sandstone. H. 3.70 cm, D. 3.07 cm, 77.70 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1597. Dholavira. - DHR 50961, 48/86 - Discoid, badly chipped, stone. L. 4.18 cm, H. 4.06 cm, W. 2.74 cm, 78.11+x g.

1598. Dholavira. - DHR 33914, Level 2, 35x83x2 - Discoid, good, stone. H. 2.09 cm, D. 6.22 cm, 98.53 g.

1599. Dholavira. - DHR 44447, Surface - Discoid, good, sandstone. L. 5.16 cm, H. 4.87 cm, W. 4.08 cm, 102.62 g.

1600. Dholavira. - DHR 22020, Middle Town, Level 5, 55x60x1 - Discoid, good, limestone. H. 4.91 cm, D. 5.91 cm, 270.00 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1601. Dholavira. - DHR 21569, 54x68x1 - Discoid, slightly chipped, limestone. H. 3.70 cm, D. 6.38 cm, 270.54+x g.

1602. Dholavira. - DHR 54445, Middle Town, 46x64x1 - Discoid, slightly chipped, limestone. H. 5.05 cm, D. 7.12 cm, 490.00+x g.

1603. Dholavira. - DHR 54411, ER, Level 13, 37x57x1 - Discoid, chipped, limestone. L. 10.70 cm, H. 7.70 cm, W. 3.10 cm, 550.00+x g - Period V, Mature Harappan (3C), 2100-2000 BC.

1604. Dholavira. - DHR 54402, Castle, Level 2, 47x17x1 - Discoid, good, limestone. H. 18.85 cm, D. 19.69 cm, 4,050.00 g - Period VI, Late Harappan (4), 1950-1800 BC.

1605. Dholavira. - DHR 54403, Castle, Level 3, 57x10x4 - Discoid, chipped, limestone. H. 12.00 cm, D. 20.20 cm, 4,550.00+x g - Period VI, Late Harappan (4), 1950-1800 BC.

1606. Dholavira. - DHR 54408 - Discoid, slightly chipped, limestone. H. 7.71 cm, D. 20.60 cm, 4,830.00+x g.

1607. Dholavira. - DHR 54404a, Middle Town, Level 1, 55x73 - Discoid, good, limestone. H. 1.97 cm, D. 1.43 cm, 11,170.00 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

6.8.2.2.14. Octagonal discoid (Type 17c): Cat. no. 1608

1608. Dholavira. - DHR 11197, Level 6, 46x43x2-3 - Octagonal discoid, good, shell. H. 1.18 cm, D. 0.89 cm, 2.51 g.

6.8.2.2.15. Discoid in terracotta (Type 17e): Cat. no. 1609-1649

1609. Dholavira. - DHR 47940, Castle, Pit 1 s/b 18, 47x63x2/3 - Discoid, good, terracotta. H. 0.45 cm, D. 1.28 cm, 0.70 g.

1610. Dholavira. - DHR 15628, Level 3a, 15x34x4 - Discoid, good, terracotta. L. 1.48 cm, H. 1.39 cm, W. 0.39 cm, 0.94 g.

1611. Dholavira. - DHR 54511, Level 2a, 35x94x2 - Discoid, good, terracotta. H. 0.66 cm, D. 1.19 cm, 0.97 g.

1612. Dholavira. - DHR 14913, Middle Town, Room 1, 55x52x1 - Discoid, good, terracotta. H. 1.16 cm, D. 1.16 cm, 1.47 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1613. Dholavira. - DHR 32616, Level 9, 38x31x1 - Discoid, good, terracotta. H. 0.92 cm, D. 1.18 cm, 1.51 g.

1614. Dholavira. - DHR 35167, Level 1, 46x62x4 - Discoid, good, terracotta. H. 0.76 cm, D. 1.42 cm, 1.72 g.

1615. Dholavira. - DHR 47801, Level 2, 47x94x4 - Discoid, slightly chipped, terracotta. H. 0.73 cm, D. 1.50 cm, 1.92 g.

1616. Dholavira. - DHR 42252, Level 1, 45x70x2 - Discoid, worn, terracotta. L. 1.65 cm, H. 1.52 cm, W. 0.72 cm, 1.97 g.

1617. Dholavira. - DHR 24334 - Discoid, good, terracotta. H. 1.32 cm, D. 0.86 cm, 2.00 g.

1618. Dholavira. - DHR 43393, Lower Town, Pit 3, 25x93x3 - Discoid, good, terracotta. H. 0.92 cm, D. 1.18 cm, 2.15 g.

1619. Dholavira. - DHR 41881 - Discoid, worn, terracotta. H. 0.94 cm, D. 1.46 cm, 2.20 g.

1620. Dholavira. - DHR 36927, Middle Town, Level 2, 35x63x3 - Discoid, chipped, terracotta. H. 0.98 cm, D. 1.52 cm, 2.60+x g - Period V, Mature Harappan (3C), 2100-2000 BC.

1621. Dholavira. - DHR 23040, Level 2, 25x9x2 - Discoid, good, terracotta. H. 0.80 cm, D. 1.65 cm, 2.80 g.

1622. Dholavira. - DHR 518, Middle Town, Level 5, 35x83x1+2 - Discoid, chipped, terracotta. H. 1.04 cm, D. 1.51 cm, 2.90+x g - Period IV.

1623. Dholavira. - DHR 25179, Level 1, 23x9x2 - Discoid, good, terracotta. H. 0.67 cm, D. 2.04 cm, 2.99 g.

1624. Dholavira. - DHR 50837, Level 4, 48x99 - Discoid, good, terracotta. H. 1.54 cm, D. 1.18 cm, 3.13 g.

1625. Dholavira. - DHR 33818, Level 3, 45x13x3 - Discoid, slightly chipped, terracotta. H. 2.10 cm, D. 0.68 cm, 3.54 g.

1626. Dholavira. - DHR 34192, Level 4, 35x63x4 - Discoid, good, terracotta. H. 0.69 cm, D. 2.40 cm, 4.35 g.

1627. Dholavira. - DHR 3215, Area Middle Town, Level 8, 48x09x1 - Discoid, worn, terracotta. L. 1.61 cm, H. 1.58 cm, W. 1.38 cm, 4.43 g.

1628. Dholavira. - DHR 47970, Level 6, 48x98 - Discoid, good, terracotta. H. 1.63 cm, D. 1.27 cm, 4.88 g.

1629. Dholavira. - DHR 34127, Middle Town, Level 1, 45x23x1 - Discoid, worn, terracotta. H. 1.17 cm, D. 1.96 cm, 5.23 g.

1630. Dholavira. - DHR 28608, Middle Town, Pit s/b 1, 55x3x4 - Discoid, good, terracotta. L. 2.11 cm, H. 2.07 cm, W. 0.68 cm, 5.72 g - Period VI, Late Harappan (4), 1950-1800 BC.

1631. Dholavira. - DHR 34414, Middle Town, Level 2, 45x13x1 - Discoid, chipped, terracotta. H. 0.73 cm, D. 2.76 cm, 5.77+x g.

1632. Dholavira. - DHR 53063, Castle, Level 7, 47x61x3 - Discoid, chipped, terracotta. H. 1.22 cm, D. 2.06 cm, 6.13+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1633. Dholavira. - DHR 23344, Lower Town, Level 4, 25x7x3 - Discoid, worn, terracotta. H. 1.13 cm, D. 2.32 cm, 6.80 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1634. Dholavira. - DHR 33887, Level 3, 35x73x3 - Discoid, good, terracotta. H. 0.75 cm, D. 2.89 cm, 7.24 g.

1635. Dholavira. - DHR 43713, ER, Level 23, 37x46x4 - Discoid, good, terracotta. L. 2.35 cm, H. 2.18 cm, W. 1.19 cm, 7.50 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1636. Dholavira. - DHR 34430, Middle Town, Level 3, 35x73x4 - Discoid, good, terracotta. H. 0.67 cm, D. 2.58 cm, 8.01 g.

1637. Dholavira. - DHR 37298, Middle Town, Level 6, 35x63x4 - Discoid, good, terracotta. H. 2.59 cm, D. 1.47 cm, 9.67 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1638. Dholavira. - DHR 34032, Level 4, 67x21x1 - Discoid, slightly chipped, terracotta. H. 1.10 cm, D. 3.40 cm, 10.99 g.

1639. Dholavira. - DHR 17779, Castle, Level 3b, 47x98x2 - Discoid, good, terracotta. H. 1.93 cm, D. 2.53 cm, 15.02 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1640. Dholavira. - DHR 35547, Middle Town, Pit s/b 1, 46x54x2 - Discoid, good, terracotta. H. 1.06 cm, D. 3.46 cm, 15.73 g.

1641. Dholavira. - DHR 3919, Level 15/16, XF 22/4 - Discoid, good, terracotta. L. 2.73 cm, H. 2.73 cm, W. 1.82 cm, 16.22 g.

1642. Dholavira. - DHR 35455, Castle, Level 4, 47x85x2 - Discoid, good, terracotta. H. 1.21 cm, D. 3.76 cm, 18.81 g.

1643. Dholavira. - DHR 36161, Level 2, 48x29x1 - Discoid, chipped, terracotta. H. 1.08 cm, D. 4.07 cm, 20.02 g.

1644. Dholavira. - DHR 34368, Level 1, 35x93x4 - Discoid, fragmented, chipped, terracotta. H. 1.01 cm, D. 4.29 cm, 20.88+x g.

1645. Dholavira. - DHR 34003, Pit 1, 35x63x1 - Discoid, slightly chipped, terracotta. H. 1.22 cm, D. 4.15 cm, 25.87+x g.

1646. Dholavira. - DHR 36278, Level 6, 67x21x1 - Discoid, slightly chipped, terracotta. H. 1.68 cm, D. 4.76 cm, 47.22+x g.

1647. Dholavira. - DHR 35298, Level 8, 37x56x4 - Discoid, slightly worn, terracotta. H. 1.82 cm, D. 5.50 cm, 62.68 g.

1648. Dholavira. - DHR 36160, Level 2, 48x29x1 - Discoid, good, terracotta. H. 5.88 cm, D. 2.03 cm, 66.06 g.

1649. Dholavira. - DHR 33914 - Discoid, slightly chipped, terracotta. H. 1.88 cm, D. 6.02 cm, 99.54 g.

6.8.2.2.16. Cuboid (Type 18a): Cat. no. 1650-1986

1650. Dholavira. - DHR 18791, Middle Town, Level 4, 45x33x3 - Cuboid, good, shell. H. 0.42 cm, W. 0.39 cm, 0.16 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1651. Dholavira. - DHR 13498, Middle Town, Level 1, 15x74x3 - Cuboid, good, chert. L. 0.50 cm, H. 0.50 cm, W. 0.51 cm, 0.26 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1652. Dholavira. - DHR 11468, Middle Town, Level 1, 55x64x1 - Cuboid, good, shell. L. 0.53 cm, H. 0.53 cm, W. 0.41 cm, 0.29 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1653. Dholavira. - DHR 20441, Middle Town, Level 9, 45x43x2 - Cuboid, good, shell. L. 0.58 cm, H. 0.56 cm, W. 0.37 cm, 0.32 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1654. Dholavira. - DHR 19910, Lower Town, Level 1, 25x63x3 - Cuboid, good, shell. L. 0.61 cm, H. 0.60 cm, W. 0.41 cm, 0.36 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1655. Dholavira. - DHR 37881, Middle Town, Level 13, 45x3x3 - Cuboid, chipped, carnelian. L. 0.67 cm, H. 0.65 cm, W. 0.44 cm, 0.38+x g.

1656. Dholavira. - DHR 27255, III, 2-3A, Castle, Surface, 48x24 - Cuboid, fragmented, agate. L. 0.74 cm, H. 0.71 cm, 0.39+x g - Kot-Diji Phase, 2800-2500 BC.

1657. Dholavira. - DHR 3673, Lower Town, MBR Level 1B, XE 23/1 - Cuboid, good, agate. L. 0.67 cm, H. 0.66 cm, W. 0.47 cm, 0.44 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1658. Dholavira. - DHR 18300, Middle Town, Level 1, 57x54x2 - Cuboid, good, chert. L. 0.64 cm, H. 0.61 cm, W. 0.57 cm, 0.48 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1659. Dholavira. - DHR 21257, Middle Town, Level 20, 45x43x2 - Cuboid, fragmented, shell. L. 0.74 cm, H. 0.66 cm, W. 0.47 cm, 0.48+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1660. Dholavira. - DHR 7098, Middle Town, 35x64x4 - Cuboid, good, shell. L. 0.75 cm, H. 0.68 cm, W. 0.50 cm, 0.52 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1661. Dholavira. - DHR 39354, Middle Town, Level 2, 35x83x1+2 - Cuboid, good, agate. L. 0.65 cm, H. 0.64 cm, W. 0.54 cm, 0.52 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1662. Dholavira. - DHR 20005, Middle Town, Level 6, 45x42x2 - Cuboid, good, shell. L. 0.79 cm, H. 0.70 cm, W. 0.41 cm, 0.55 g.

1663. Dholavira. - DHR 35179, Middle Town, Pit, 35x63x1 - Cuboid, good, shell. L. 0.76 cm, H. 0.75 cm, W. 0.47 cm, 0.58 g.

1664. Dholavira. - DHR 2586, Castle, Level 3, zc 7 qD. 3 - Cuboid, worn, copper. L. 0.64 cm, H. 0.60 cm, W. 0.52 cm, 0.58 g - Period VI, Late Harappan (4), 1950-1800 BC.

1665. Dholavira. - DHR 18015, Middle Town, Surface - Cuboid, good, chert. L. 0.82 cm, H. 0.62 cm, W. 0.51 cm, 0.62 g.

1666. Dholavira. - DHR 40955, Middle Town, Level 2, 55x85x2 - Cuboid, worn, copper. L. 0.73 cm, H. 0.71 cm, W. 0.41 cm, 0.65 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1667. Dholavira. - DHR 37241, Middle Town, Level 2, 45x63x3 - Cuboid, good, chert. L. 0.74 cm, H. 0.69 cm, W. 0.60 cm, 0.71 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1668. Dholavira. - DHR 49971, Lower Town, Surface - Cuboid, good, agate. L. 0.72 cm, H. 0.70 cm, W. 0.63 cm, 0.76 g.

1669. Dholavira. - DHR 52092, Lower Town, Level 2, 35x32x2 - Cuboid, worn, copper. L. 0.78 cm, H. 0.71 cm, W. 0.46 cm, 0.77 g - Mature Harappan (3C), 2100-2000 BC.

1670. Dholavira. - DHR 5064, Castle, Level 24, 48x92x1 - Cuboid, slightly chipped, chert. L. 0.80 cm, H. 0.78 cm, W. 0.61 cm, 0.81+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1671. Dholavira. - DHR 25641, Surface - Cuboid, good, chert. L. 0.82 cm, H. 0.76 cm, W. 0.67 cm, 0.83 g.

1672. Dholavira. - DHR 15244, Middle Town, Level 2, 55x55x2 - Cuboid, fragmented, chert. L. 0.83 cm, 0.84+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1673. Dholavira. - DHR 38351, Middle Town, Level 2, 55x82x1 - Cuboid, good, shell. L. 0.94 cm, H. 0.75 cm, W. 0.56 cm, 0.85 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1674. Dholavira. - DHR 25296, Lower Town, Pit s/b 2, 23x10x2 - Cuboid, good, chert. L. 0.78 cm, H. 0.72 cm, W. 0.67 cm, 0.86 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1675. Dholavira. - DHR 9729, Level 3, 26x64x2 - Cuboid, worn, Copper. L. 0.74 cm, H. 0.69 cm, W. 0.54 cm, 0.86 g.

1676. Dholavira. - DHR 38008, Middle Town - Cuboid, worn, copper. L. 0.62 cm, H. 0.61 cm, W. 0.72 cm, 0.89 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1677. Dholavira. - DHR 49049 - Cuboid, good, chert. L. 0.79 cm, H. 0.77 cm, W. 0.70 cm, 0.90 g.

1678. Dholavira. - DHR 49880 - Cuboid, good, quartz. L. 0.71 cm, H. 0.70 cm, W. 0.60 cm, 0.90 g.

1679. Dholavira. - DHR 4279, Level 1, XG19 - Cuboid, worn, copper. L. 0.80 cm, H. 0.69 cm, W. 0.48 cm, 0.90 g.

1680. Dholavira. - DHR 4408, Level 8, A17/1 - Cuboid, chipped, shell. L. 0.90 cm, H. 0.82 cm, W. 0.51 cm, 0.91 g.

1681. Dholavira. - DHR 25729 - Cuboid, good, chert. L. 0.81 cm, H. 0.68 cm, W. 0.80 cm, 0.92 g.

1682. Dholavira. - DHR 52132, Lower Town, Level 2, 35x32x2 - Cuboid, good, agate. L. 0.86 cm, H. 0.86 cm, W. 0.58 cm, 0.94 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1683. Dholavira. - DHR 25137, Lower Town, Level 3, 24x1x4 - Cuboid, good, chert. L. 0.83 cm, H. 0.75 cm, W. 0.69 cm, 0.97 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1684. Dholavira. - DHR 1247, Castle, Level 10, 45x74x2 - Cuboid, good, chert. L. 0.84 cm, H. 0.80 cm, W. 0.67 cm, 0.97 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1685. Dholavira. - DHR 33764, Middle Town, Level 3, 35x63x4 - Cuboid, good, shell. L. 0.91 cm, H. 0.83 cm, W. 0.60 cm, 1.00 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1686. Dholavira. - DHR 19015, Bailey, Level 3, 57x60x2 - Cuboid, good, chalcedony. L. 0.80 cm, H. 0.79 cm, W. 0.69 cm, 1.00 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1687. Dholavira. - DHR 25380, Lower Town, Level 3, 26x4x4 - Cuboid, good, chert. L. 0.81 cm, H. 0.79 cm, W. 0.66 cm, 1.00 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1688. Dholavira. - DHR 52303, Lower Town, Level 1, 35x32x4 - Cuboid, good, limestone. L. 0.79 cm, H. 0.77 cm, W. 0.81 cm, 1.03 g - Period IV, Mature Harappan (3B), 2100-2000 BC.

1689. Dholavira. - DHR 3922, Level 2, XR 19/1 - Cuboid, slightly chipped, chert. L. 0.88 cm, H. 0.82 cm, W. 0.48 cm, 1.04 g.

1690. Dholavira. - DHR 43188, Level 1, 45x70x2 - Cuboid, good, chert. L. 0.76 cm, H. 0.70 cm, W. 0.83 cm, 1.05 g.

1691. Dholavira. - DHR 19359, Bailey, Level 7, 58x52x1 - Cuboid, good, agate. L. 0.92 cm, H. 0.81 cm, W. 0.64 cm, 1.08 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1692. Dholavira. - DHR 24976, Castle - Cuboid, good, agate. L. 0.85 cm, H. 0.84 cm, W. 0.74 cm, 1.10 g.

1693. Dholavira. - DHR 2423, Castle, XE 22/2 - Cuboid, good, shell. L. 0.90 cm, H. 0.86 cm, W. 0.61 cm, 1.15 g.

1694. Dholavira. - DHR 31843, Middle Town, Level 2, 55x33x1/2 - Cuboid, good, shell. L. 0.90 cm, H. 0.83 cm, W. 0.64 cm, 1.17 g.

1695. Dholavira. - DHR 18459, Surface, 58x53x4 - Cuboid, good, shell. L. 0.96 cm, H. 0.92 cm, W. 0.55 cm, 1.19 g.

1696. Dholavira. - DHR 9979, Lower Town, Level 3, 46x39 - Cuboid, good, shell. L. 0.84 cm, H. 0.83 cm, W. 0.73 cm, 1.20 g - Period VI, Late Harappan (4), 1950-1800 BC.

1697. Dholavira. - DHR 52762, Middle Town, Level 5 - Cuboid, good, agate. L. 0.87 cm, H. 0.85 cm, W. 0.73 cm, 1.21 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1698. Dholavira. - DHR 12914, Middle Town, Level 3, 25x64 - Cuboid, good, chert. L. 0.80 cm, H. 0.80 cm, W. 0.79 cm, 1.22 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1699. Dholavira. - DHR 47339, Middle Town, Level 5, 35x73 - Cuboid, worn, copper. L. 1.24 cm, H. 1.02 cm, W. 0.65 cm, 1.24 g.

1700. Dholavira. - DHR 34021, Middle Town, Level 3, 45x13x3 - Cuboid, good, agate. L. 1.10 cm, H. 0.75 cm, W. 0.73 cm, 1.31 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1701. Dholavira. - DHR 29927, Castle, Level 2+3, 57x7x1+4 - Cuboid, good, chert. L. 0.90 cm, H. 0.89 cm, W. 0.53 cm, 1.31 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1702. Dholavira. - DHR 39151, Level 2, 45x3x2 - Cuboid, good, jasper. L. 1.10 cm, H. 1.08 cm, W. 0.64 cm, 1.46 g.

1703. Dholavira. - DHR 23727, Middle Town, Level 1, 24x3x3 - Cuboid, heavily worn, gypsum. L. 0.87 cm, H. 0.85 cm, W. 0.77 cm, 1.48+x g - Period IV/V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1704. Dholavira. - DHR 51975, Surface, 35x32x1 - Cuboid, worn, copper. L. 0.60 cm, H. 0.91 cm, W. 0.96 cm, 1.50 g.

1705. Dholavira. - DHR 46905, 47x85 - Cuboid, worn, copper. L. 0.54 cm, H. 0.88 cm, W. 0.81 cm, 1.50 g.

1706. Dholavira. - DHR 17569, Castle, Level 6, 48x41x1 - Cuboid, worn, copper. L. 0.93 cm, H. 0.92 cm, W. 0.68 cm, 1.56 g.

1707. Dholavira. - DHR 11458, Castle, Level 5, 47x96x3 - Cuboid, good, shell. L. 0.89 cm, H. 0.88 cm, W. 0.77 cm, 1.58 g - Period VI, Late Harappan (4), 1950-1800 BC.

1708. Dholavira. - DHR 15078, Middle Town, Level 1, 47x50x4 - Cuboid, good, shell. L. 1.07 cm, H. 1.04 cm, W. 0.57 cm, 1.61 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1709. Dholavira. - DHR 16281, Level 1, 55x51x1 - Cuboid, good, basalt. L. 0.95 cm, H. 0.95 cm, W. 0.66 cm, 1.61 g.

1710. Dholavira. - DHR 43182, Middle Town, Level 1, 45x71x4 - Cuboid, good, chert. L. 0.93 cm, H. 0.91 cm, W. 0.84 cm, 1.67 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1711. Dholavira. - DHR 27940, Middle Town, Level 3, 55x13x4 - Cuboid, good, chert. L. 0.96 cm, H. 0.96 cm, W. 0.77 cm, 1.69 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1712. Dholavira. - DHR 35008, Pit 1, 35x63x2 - Cuboid, good, basalt. L. 0.97 cm, H. 0.93 cm, W. 0.70 cm, 1.70 g.

1713. Dholavira. - DHR 13664, Level 2, 15x24x3 - Cuboid, good, shell. L. 1.03 cm, H. 1.00 cm, W. 0.65 cm, 1.72 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1714. Dholavira. - DHR 29100, Middle Town, Level 2, 55x23x3 - Cuboid, good, limestone. L. 1.02 cm, H. 0.95 cm, W. 0.85 cm, 1.72 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1715. Dholavira. - DHR 9925, Middle Town, Level 2, 46x43 - Cuboid, good, black stone. L. 0.85 cm, H. 0.83 cm, W. 0.63 cm, 1.72 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1716. Dholavira. - DHR 48174, Middle Town, Surface, 47x66 - Cuboid, good, chert. L. 0.97 cm, H. 0.95 cm, W. 0.85 cm, 1.73 g.

1717. Dholavira. - DHR 40000, 35x83x1+2 - Cuboid, good, chert. L. 1.01 cm, H. 0.95 cm, W. 0.84 cm, 1.73 g.

1718. Dholavira. - DHR 10615, Lower Town, Level 11, 45x84 - Cuboid, good, chert. L. 0.94 cm, H. 0.92 cm, W. 0.84 cm, 1.73 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1719. Dholavira. - DHR 9939, Middle Town, Pit s/b 2, 25x64 - Cuboid, good, chert. L. 0.99 cm, H. 0.92 cm, W. 0.87 cm, 1.74 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1720. Dholavira. - DHR 41038, Middle Town, 46x63x2 - Cuboid, good, basalt. L. 0.88 cm, H. 0.82 cm, W. 0.75 cm, 1.74 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1721. Dholavira. - DHR 19700, Middle Town, Level 1a, 54x58x2 - Cuboid, good, chert. L. 0.98 cm, H. 0.96 cm, W. 0.80 cm, 1.76 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1722. Dholavira. - DHR 21169, Middle Town, Level 18, 45x43x2 - Cuboid, good, chert. L. 0.98 cm, H. 0.97 cm, W. 0.81 cm, 1.77 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1723. Dholavira. - DHR 5501, Level 1, 1x100x3 - Cuboid, good, chert. L. 0.96 cm, H. 0.94 cm, W. 0.86 cm, 1.78 g.

1724. Dholavira. - DHR 48112, Level 2, 35x42x4 - Cuboid, good, chert. L. 0.96 cm, H. 0.97 cm, W. 0.86 cm, 1.80 g.

1725. Dholavira. - DHR 53305, Middle Town, Level 4, 55x95x1 - Cuboid, slightly chipped, chert. L. 1.08 cm, H. 0.99 cm, W. 0.71 cm, 1.80 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1726. Dholavira. - DHR 3886, Level 1, ZB-9 - Cuboid, good, chert. L. 1.06 cm, H. 0.91 cm, W. 0.80 cm, 1.80 g.

1727. Dholavira. - DHR 9809, Middle Town, Level 5, 45x74 - Cuboid, good, chert. L. 1.00 cm, H. 0.96 cm, W. 0.82 cm, 1.83 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1728. Dholavira. - DHR 2902, Castle, Level 19, XE.22/1 - Cuboid, good, limestone. L. 1.00 cm, H. 0.90 cm, W. 0.72 cm, 1.83 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1729. Dholavira. - DHR 4911, Castle, Level 2, 48x72xR.1N - Cuboid, good, basalt. L. 1.02 cm, H. 0.99 cm, W. 0.75 cm, 1.84 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1730. Dholavira. - DHR 195, Castle, Surface, Zone 2 - Cuboid, good, shell. L. 1.02 cm, H. 1.07 cm, W. 0.66 cm, 1,84 g.

1731. Dholavira. - DHR 14256, Middle Town, Level 1, 45x45x4 - Cuboid, good, carnelian. L. 0.92 cm, H. 0.95 cm, W. 0.88 cm, 1.85 g.

1732. Dholavira. - DHR 33305 - Cuboid, good, chert. L. 0.98 cm, H. 0.98 cm, W. 0.71 cm, 1.87 g.

1733. Dholavira. - DHR 40796, Middle Town, Level 2, 47x80x4 - Cuboid, good, agate. L. 1.16 cm, H. 1.01 cm, W. 0.60 cm, 1.89 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1734. Dholavira. - DHR 11145, Middle Town, Level 3, 45x64 - Cuboid, good, basalt. L. 1.09 cm, H. 1.09 cm, W. 0.89 cm, 1.89 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1735. Dholavira. - DHR 39230, Area Castle, 47x79 - Cuboid, perfect, chert. L. 1.03 cm, H. 1.02 cm, W. 0.80 cm, 1.91 g.

1736. Dholavira. - DHR 20721, Level 1, 48x45x3 - Cuboid, good, gabbro. L. 0.89 cm, H. 0.83 cm, W. 0.95 cm, 1.91 g.

1737. Dholavira. - DHR 26005, Surface, 59x13 - Cuboid, good, chert. L. 1.02 cm, H. 1.01 cm, W. 0.83 cm, 1.91 g.

1738. Dholavira. - DHR 5837, SoC, Level 1, 48x82x1+2 - Cuboid, good, agate. L. 1.02 cm, H. 1.01 cm, W. 0.84 cm, 1.92 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1739. Dholavira. - DHR 32024, Middle Town, Level 1, 55x3x1 - Cuboid, good, limestone. L. 0.98 cm, H. 0.96 cm, W. 0.88 cm, 1.93 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1740. Dholavira. - DHR 21291, Middle Town, Level 17, 45x43x2 - Cuboid, good, chert. L. 1.07 cm, H. 1.02 cm, W. 0.77 cm, 1.93 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1741. Dholavira. - DHR 2959, Level 2, ZT.7/1 - Cuboid, good, limestone. L. 0.98 cm, H. 0.95 cm, W. 0.89 cm, 1.94 g.

1742. Dholavira. - DHR 15792, Middle Town, Level 3, 56x54x1 - Cuboid, good, sandstone. L. 1.07 cm, H. 0.97 cm, W. 0.78 cm, 1.95 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1743. Dholavira. - DHR 13677, Level 2, 15x44x3 - Cuboid, chipped, agate. L. 1.14 cm, H. 1.07 cm, W. 0.81 cm, 1.95+x g.

1744. Dholavira. - DHR 14778, Middle Town, Surface, 55x52 - Cuboid, good, basalt. L. 0.87 cm, H. 0.83 cm, W. 0.70 cm, 1.96 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1745. Dholavira. - DHR 20006, Level 6, 45x43x2 - Cuboid, worn, copper. L. 1.08 cm, H. 0.92 cm, W. 0.90 cm, 1.98 g.

1746. Dholavira. - DHR 48619, Castle, Level 5, 47x84x1 - Cuboid, good, chert. L. 1.01 cm, H. 1.00 cm, W. 0.83 cm, 2.00 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1747. Dholavira. - DHR 45714, Castle, Level 12, 47x95x1 - Cuboid, fragmented, chert. L. 1.43 cm, H. 1.19 cm, W. 0.66 cm, 2.00+x g.

1748. Dholavira. - DHR 27018, Castle, Level 7, 47x89x2 - Cuboid, good, basalt. L. 0.83 cm, H. 0.82 cm, W. 0.79 cm, 2.07 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1749. Dholavira. - DHR 14187, Middle Town, Pit 1, 45x48x3 - Cuboid, good, basalt. L. 1.04 cm, H. 1.00 cm, W. 0.80 cm, 2.08 g.

1750. Dholavira. - DHR 16465, Level 28, 15x24x3 - Cuboid, good, stone. L. 1.00 cm, H. 1.00 cm, W. 0.57 cm, 2.08 g.

1751. Dholavira. - DHR 18097, Level 4, 57x32x3 - Cuboid, good, agate. L. 1.07 cm, H. 1.02 cm, W. 0.87 cm, 2.09 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1752. Dholavira. - DHR 44790, Middle Town, Level 2, 45x68x4 - Cuboid, good, sandstone. L. 1.08 cm, H. 0.98 cm, W. 0.96 cm, 2.10 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1753. Dholavira. - DHR 18230, Level 14, 44x43x2 - Cuboid, chipped, agate. L. 1.13 cm, H. 0.99 cm, W. 0.85 cm, 2.13+x g.

1754. Dholavira. - DHR 29297, Middle Town, Level 1, 45x93x3 - Cuboid, good, chert. L. 1.04 cm, H. 1.04 cm, W. 0.89 cm, 2.19 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1755. Dholavira. - DHR 54281, Level 9 - Cuboid, good, chert. L. 1.12 cm, H. 0.92 cm, W. 0.80 cm, 2.20 g.

1756. Dholavira. - DHR 19224, Area M.PG, Level 3, 54x58x1 - Cuboid, good, limestone. L. 0.97 cm, H. 0.95 cm, W. 0.62 cm, 2.27 g - Period V-VI, Mature Harappan (3C)-Late Harappan (4), 2200/2100-1800 BC.

1757. Dholavira. - DHR 1483 - Cuboid, good, black stone. L. 0.90 cm, H. 0.91 cm, W. 0.88 cm, 2.32 g.

1758. Dholavira. - DHR 44828, Middle Town, Level 7, 45x95x1 - Cuboid, good, agate. L. 1.10 cm, H. 1.10 cm, W. 0.93 cm, 2.36 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1759. Dholavira. - DHR 46125, Area Lower Town, Level 1, 38x95x4 - Cuboid, good, chert. L. 1.04 cm, H. 1.01 cm, W. 0.84 cm, 2.36 g - Period V-VI, Mature Harappan (3C)-Late Harappan (4), 2200/2100-1800 BC.

1760. Dholavira. - DHR 52493, Citadel, Level R2, 47x84x1 - Cuboid, worn, copper. L. 1.09 cm, H. 1.07 cm, W. 1.00 cm, 2.38 g.

1761. Dholavira. - DHR 3208, Castle, Level 7, A 18/1 - Cuboid, good, basalt. L. 1.08 cm, H. 1.04 cm, W. 0.69 cm, 2.39 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1762. Dholavira. - DHR 1475, Castle, Surface, XF Level 21/1 - Cuboid, fragmented, basalt. L. 1.02 cm, H. 1.02 cm, W. 0.98 cm, 2.45+x g - Period VI, Late Harappan (4), 1950-1800 BC.

1763. Dholavira. - DHR 54485, Middle Town, Level 9, 45x33x3 - Cuboid, good, sandstone. L. 2.25 cm, H. 2.06 cm, W. 1.59 cm, 2.53 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1764. Dholavira. - DHR 21591, Bailey, Level 15a, 57x57x2 - Cuboid, good, limestone. L. 1.08 cm, H. 1.08 cm, W. 0.87 cm, 2.54 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1765. Dholavira. - DHR 43186, Middle Town, Level 1, 55x85x4 - Cuboid, good, basalt. L. 1.28 cm, H. 1.26 cm, W. 0.76 cm, 2.56 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1766. Dholavira. - DHR 1500, Area Bailey, Level 1, XK 19/4 - Cuboid, fragmented, chert. H. 1.28 cm, W. 0.90 cm, 2.56+x g - Period V-VI, Mature Harappan (3C)-Late Harappan (4), 2200/2100-1800 BC.

1767. Dholavira. - DHR 48220, Lower Town, Level 1, 35x22x1 - Cuboid, heavily chipped, agate. L. 1.26 cm, H. 1.16 cm, W. 0.92 cm, 2.64+x g - Period V, Mature Harappan (3C), 2100-2000 BC.

1768. Dholavira. - DHR 9872, 45x64x1 - Cuboid, worn, copper. L. 1.13 cm, H. 1.13 cm, W. 0.76 cm, 2.76 g.

1769. Dholavira. - DHR 48678, Castle, Level 5, 47x84x1 - Cuboid, slightly chipped, agate. L. 1.23 cm, H. 1.21 cm, W. 0.95 cm, 3.00 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1770. Dholavira. - DHR 16722 - Cuboid, good, shell. L. 1.24 cm, H. 1.12 cm, W. 1.10 cm, 3.09 g.

1771. Dholavira. - DHR 34923, Level Sb 1, 45x13x4 - Cuboid, badly chipped, steatite. L. 1.81 cm, H. 1.61 cm, W. 1.07 cm, 3.15+x g.

1772. Dholavira. - DHR 19384, Bailey, Level 4, 57x58x3 - Cuboid, good, limestone. L. 1.19 cm, H. 1.11 cm, W. 1.09 cm, 3.23 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1773. Dholavira. - DHR 20189, Level 2, 47x98x2 - Cuboid, fragmented, chert. L. 1.65 cm, H. 1.14 cm, W. 0.91 cm, 3.24+x g.

1774. Dholavira. - DHR 23226, Level 3, 54x68x102 - Cuboid, good, limestone. L. 1.22 cm, H. 1.20 cm, W. 0.90 cm, 3.25 g.

1775. Dholavira. - DHR 48483, Middle Town, Level 1, 35x52x1 - Cuboid, good, sandstone. L. 1.36 cm, H. 1.07 cm, W. 0.80 cm, 3.30 g.

1776. Dholavira. - DHR 52283 - Cuboid, perfect, agate. L. 1.12 cm, H. 1.01 cm, W. 1.19 cm, 3.36 g.

1777. Dholavira. - DHR 30373, Middle Town, Level 1, 55x93x3 - Cuboid, good, agate. L. 1.30 cm, H. 1.26 cm, W. 0.97 cm, 3.38 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1778. Dholavira. - DHR 18041, Middle Town, Level 4, 35x94x4 - Cuboid, good, chert. L. 1.22 cm, H. 1.17 cm, W. 1.05 cm, 3.39 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1779. Dholavira. - DHR 54451 - Cuboid, good, chert. L. 0.85 cm, H. 1.28 cm, W. 1.27 cm, 3.39 g.

1780. Dholavira. - DHR 13794, Middle Town, Level 1, 44x48x3 - Cuboid, good, chert. L. 1.20 cm, H. 1.20 cm, W. 0.97 cm, 3.40 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1781. Dholavira. - DHR 12544a, Middle Town, Level 2, 55x74 - Cuboid, good, chert. L. 1.21 cm, H. 1.18 cm, W. 1.07 cm, 3.40 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1782. Dholavira. - DHR 12544b, Middle Town, Level 2, 55x74 - Cuboid, good, chert. L. 1.21 cm, H. 1.18 cm, W. 1.07 cm, 3.42 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1783. Dholavira. - DHR 36616, Middle Town, Level 1, 46x61x3 - Cuboid, good, chert. L. 1.27 cm, H. 1.19 cm, W. 0.95 cm, 3.42 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1784. Dholavira. - DHR 47007, Castle, Level 1, 47x85 - Cuboid, good, agate. L. 1.21 cm, H. 1.19 cm, W. 1.05 cm, 3.42 g - Period VI, Late Harappan (4), 1950-1800 BC.

1785. Dholavira. - DHR 43183, Castle, Level 5, 47x63x3 - Cuboid, good, chert. L. 1.23 cm, H. 1.17 cm, W. 1.01 cm, 3.43 g - Period VI, Late Harappan (4), 1950-1800 BC.

1786. Dholavira - Middle Town, 65x23x1 - Cuboid, good, chert. L. 1.22 cm, H. 1.15 cm, W. 1.13 cm, 3.44 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1787. Dholavira. - DHR 1623, Middle Town, Level 3, 55x84 - Cuboid, good, olivine. L. 1.56 cm, H. 1.54 cm, W. 0.62 cm, 3.44 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1788. Dholavira. - DHR 969, Castle, Level 2, A.13/1 - Cuboid, good, gabbro. L. 1.29 cm, H. 1.20 cm, W. 0.89 cm, 3.46 g - Period VI, Late Harappan (4), 1950-1800 BC.

1789. Dholavira. - DHR 34880, Middle Town, Level 1, 45x23x4 - Cuboid, good, sandstone. L. 1.22 cm, H. 1.20 cm, W. 1.00 cm, 3.47 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1790. Dholavira. - DHR 19565, Bailey, Level 4, 57x54x1 - Cuboid, good, shell. L. 1.48 cm, H. 1.32 cm, W. 0.74 cm, 3.47 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1791. Dholavira. - DHR 36349, Pit s/b 1, 46x54x4 - Cuboid, good, chert. L. 1.24 cm, H. 1.22 cm, W. 1.02 cm, 3.48 g.

1792. Dholavira. - DHR 9439, Middle Town, Level 4, 46x44 - Cuboid, good, shell. L. 1.17 cm, H. 1.17 cm, W. 1.11 cm, 3.48 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1793. Dholavira. - DHR 51874, Castle, Level 2, 47x73x3 - Cuboid, good, chert. L. 1.23 cm, H. 1.22 cm, W. 1.12 cm, 3.48 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1794. Dholavira. - DHR 13545, Lower Town, Level 1, 15x64x3 - Cuboid, good, chert. L. 1.26 cm, H. 1.26 cm, W. 0.95 cm, 3.49 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1795. Dholavira. - DHR 20319, Bailey, Level 4, 57x58x2 - Cuboid, good, chert. L. 1.25 cm, H. 1.21 cm, W. 0.97 cm, 3.49 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1796. Dholavira. - DHR 26899, Castle, Level 3, 47x79x3+4 - Cuboid, good, basalt. L. 1.28 cm, H. 1.26 cm, W. 0.91 cm, 3.50 g - Period VI, Late Harappan (4), 1950-1800 BC.

1797. Dholavira. - DHR 10764, Level 2, 73x5 - Cuboid, good, agate. L. 1.34 cm, H. 1.31 cm, W. 0.85 cm, 3.50 g.

1798. Dholavira. - DHR 23424, Lower Town, Level 1, 24x5x2 - Cuboid, good, chert. L. 1.25 cm, H. 1.17 cm, W. 1.05 cm, 3.50 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1799. Dholavira. - DHR 24941, Lower Town, 24x9 - Cuboid, good, chert. L. 1.29 cm, H. 1.23 cm, W. 0.98 cm, 3.50 g.

1800. Dholavira. - DHR 7116, Middle Town, Level 1, 35x64x4 - Cuboid, good, chert. L. 1.31 cm, H. 1.24 cm, W. 0.99 cm, 3.51 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1801. Dholavira. - DHR 22312, Castle, Level 2c, 47x99x2 - Cuboid, good, chert. L. 1.26 cm, H. 1.18 cm, W. 1.02 cm, 3.51 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1802. Dholavira. - DHR 52781, Castle, Level 28, 47x73x3 - Cuboid, good, carnelian. L. 1.22 cm, H. 1.20 cm, W. 1.14 cm, 3.51 g.

1803. Dholavira. - DHR 27593, Area Bailey, Level 5, 67x52x1 - Cuboid, worn, gabbro. L. 1.19 cm, H. 1.17 cm, W. 1.10 cm, 3.52 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1804. Dholavira. - DHR 38720, Middle Town, Level 10, 45x54x2 - Cuboid, good, chert. L. 1.26 cm, H. 1.23 cm, W. 0.98 cm, 3.52 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1805. Dholavira. - DHR 18178, Castle, Level 4, XG.19/2 - Cuboid, good, basalt. L. 1.02 cm, H. 1.02 cm, W. 0.98 cm, 3.52 g - Period VI, Late Harappan (4), 1950-1800 BC.

1806. Dholavira. - DHR 18307, Middle Town, Level 1, 57x57x1 - Cuboid, good, chert. L. 1.21 cm, H. 1.18 cm, W. 1.03 cm, 3.53 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1807. Dholavira. - DHR 44136, Middle Town, Level 2, 55x77xbauL.k - Cuboid, good, hornblende. L. 1.39 cm, H. 1.27 cm, W. 0.96 cm, 3.53 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1808. Dholavira. - DHR 3320, Castle, Level 7, A17/1 - Cuboid, good, chert. L. 1.23 cm, H. 1.23 cm, W. 1.00 cm, 3.55 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1809. Dholavira. - DHR 49092, Level 5, 47x74x1 - Cuboid, good, shell. L. 1.48 cm, H. 1.32 cm, W. 0.84 cm, 3.57 g.

1810. Dholavira. - DHR 9833, Middle Town, Pit s/b 4, 45x14 - Cuboid, good, chert. L. 1.25 cm, H. 1.24 cm, W. 1.01 cm, 3.57 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1811. Dholavira. - DHR 41037, Middle Town, Level 3, 45x69x3 - Cuboid, good, limestone. L. 1.13 cm, H. 1.12 cm, W. 1.07 cm, 3.58 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1812. Dholavira. - DHR 22592, Middle Town, Level 3, 54x67x3 - Cuboid, good, agate. L. 1.19 cm, H. 1.13 cm, W. 1.11 cm, 3.59 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1813. Dholavira. - DHR 41039, Middle Town, Level 2, 55x35x2 - Cuboid, good, sandstone. L. 1.30 cm, H. 1.17 cm, W. 1.09 cm, 3.59 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1814. Dholavira. - DHR 47319, Middle Town, 35x83x3 - Cuboid, good, chert. L. 1.35 cm, H. 1.31 cm, W. 0.89 cm, 3.60 g.

1815. Dholavira. - DHR 14683, Middle Town, Level 1, 56x55x3 - Cuboid, good, limestone. L. 1.30 cm, H. 1.29 cm, W. 0.92 cm, 3.64 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1816. Dholavira. - DHR 43185, Middle Town, Level 3, 55x76x2 - Cuboid, good, limestone. L. 1.19 cm, H. 1.19 cm, W. 1.10 cm, 3.64 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1817. Dholavira. - DHR 1741, Middle Town, Level 3, XK.19/1 - Cuboid, good, chert. L. 1.27 cm, H. 1.22 cm, W. 0.97 cm, 3.67 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1818. Dholavira. - DHR 8215, Level 23, 35x44x4 - Cuboid, unfinished?, black stone. L. 1.10 cm, H. 1.06 cm, W. 0.88 cm, 3.68 g.

1819. Dholavira. - DHR 45169, Castle, Level 1, 47x84x1 - Cuboid, good, chert. L. 1.22 cm, H. 1.21 cm, W. 1.05 cm, 3.68 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1820. Dholavira. - DHR 16820, Middle Town, Level 10, 56x51x2 - Cuboid, good, chert. L. 1.28 cm, H. 1.26 cm, W. 0.99 cm, 3.68 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1821. Dholavira. - DHR 17784, Middle Town, Level 8, 56x56x2 - Cuboid, good, agate. L. 1.31 cm, H. 1.26 cm, W. 0.97 cm, 3.71 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1822. Dholavira. - DHR 27118, Middle Town, 48x38x3+4 - Cuboid, good, chert. L. 1.34 cm, H. 1.26 cm, W. 0.93 cm, 3.74 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1823. Dholavira. - DHR 6593, Middle Town, Level 1, 57x5x1 - Cuboid, good, gabbro. L. 1.20 cm, H. 1.17 cm, W. 1.01 cm, 3.76 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1824. Dholavira. - DHR 46496, Middle Town, Level 3, 47x75x4 - Cuboid, good, chert. L. 1.31 cm, H. 1.30 cm, W. 1.00 cm, 3.77 g - Period V, Mature Harappan (3C), 2200-2000/1900 BC.

1825. Dholavira. - DHR 25943, Lower Town, Level 13b, 25x5x2 - Cuboid, good, basalt. L. 1.44 cm, H. 1.12 cm, W. 1.20 cm, 3.79 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1826. Dholavira. - DHR 23843, Middle Town, Level 3, 54x58x4 - Cuboid, good, chert. L. 1.26 cm, H. 1.25 cm, W. 1.01 cm, 3.81 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1827. Dholavira. - DHR 11114, Middle Town, Level 1, 45x4 - Cuboid, good, basalt. L. 1.43 cm, H. 1.37 cm, W. 0.79 cm, 3.85 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1828. Dholavira. - DHR 34878, Middle Town, Level 1, 45x13x4 - Cuboid, good, chert. L. 1.27 cm, H. 1.25 cm, W. 1.15 cm, 4.02 g.

1829. Dholavira. - DHR 42639, S.R, Level 16, 48x68 - Cuboid, worn, copper. L. 1.33 cm, H. 1.24 cm, W. 0.90 cm, 4.05 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1830. Dholavira. - DHR 16721, Middle Town, Level 2R-8, 56x55x4 - Cuboid, good, stone. L. 1.24 cm, H. 1.12 cm, W. 1.13 cm, 4.14 g.

1831. Dholavira. - DHR 34269, Castle, Level 1, 47x85x4 - Cuboid, chipped, sandstone. L. 1.44 cm, H. 1.43 cm, W. 0.99 cm, 4.33+x g.

1832. Dholavira. - DHR 52797, Middle Town, Level 2, 55x96x1 - Cuboid, fragmented, agate. L. 1.50 cm, H. 1.35 cm, W. 1.18 cm, 4.33+x g.

1833. Dholavira. - DHR 11576, Middle Town, Level 3, 55x24 - Cuboid, chipped, worn, basalt. L. 1.58 cm, H. 1.38 cm, W. 1.37 cm, 4.38+x g.

1834. Dholavira. - DHR 43192, Castle, Level 2, 47x95x1 - Cuboid, slightly chipped, chert. L. 1.39 cm, H. 1.35 cm, W. 0.99 cm, 4.41+x g.

1835. Dholavira. - DHR 8013, Level 1, 48x1x1 - Cuboid, worn, sandstone. L. 2.37 cm, H. 2.19 cm, W. 0.62 cm, 4.52 g.

1836. Dholavira. - DHR 47223, Castle, Level 6, 47x85x4 - Cuboid, good, stone. L. 1.18 cm, H. 1.16 cm, W. 1.06 cm, 4.60 g - Period VI, Late Harappan (4), 1950-1800 BC.

1837. Dholavira. - DHR 7107, Level 6, 37x82x1 - Cuboid, fragmented sandstone. L. 1.86 cm, H. 1.30 cm, W. 1.29 cm, 4.82+x g - Period VI, Late Harappan (4), 1950-1800 BC.

1838. Dholavira. - DHR 38135, Middle Town, Surface - Cuboid, good, sandstone. L. 1.45 cm, H. 1.43 cm, W. 1.02 cm, 5.02 g.

1839. Dholavira. - DHR 31650, Middle Town, Level 2, 65x33x4 - Cuboid, heavily chipped, stone. L. 1.61 cm, H. 1.58 cm, W. 1.52 cm, 5.36 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1840. Dholavira. - DHR 3728, Area Castle, Level 2, C 19/4 - Cuboid, slightly chipped, basalt. L. 1.51 cm, H. 1.35 cm, W. 1.33 cm, 5.62 g.

1841. Dholavira. - DHR 6756, Castle, Level 23, 47x48x4 - Cuboid, worn, copper. L. 1.38 cm, H. 1.24 cm, W. 1.22 cm, 5.70 g.

1842. Dholavira. - DHR 25336, Lower Town, Level 3, 23x10x3 - Cuboid, fragmented or unfinished, shell. L. 1.60 cm, H. 1.48 cm, W. 1.13 cm, 5.78+x g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1843. Dholavira. - DHR 43190, Emb, Level 1, 28x95x2 - Cuboid, chipped, limestone. L. 1.58 cm, H. 1.39 cm, W. 1.26 cm, 6.04+x g - Period V-VI, Mature-Late Harappan (3C-4), 2200/2100-1800 BC.

1844. Dholavira. - DHR 54471, Middle Town, Level 4, 54x74x1 - Cuboid, slightly chipped, jasper. L. 1.40 cm, H. 1.36 cm, W. 1.36 cm, 6.29+x g - Period V, Mature Harappan (3B), 2500-2100 BC.

1845. Dholavira. - DHR 3025, Castle, Level 6, A. 18/1 - Cuboid, good, chert. L. 1.70 cm, H. 1.68 cm, W. 0.99 cm, 6.30 g - Period VI, Late Harappan (4), 1950-1800 BC.

1846. Dholavira. - DHR 15142, Middle, Level 1, 35x53x4 - Cuboid, good, shell. L. 1.51 cm, H. 1.39 cm, W. 1.26 cm, 6.32 g - Period V, Mature Harappan (3C), 2200-2000/1900 BC.

1847. Dholavira. - DHR 15680, Middle Town, Level 2, 35x53x4 1 - Cuboid, good, basalt. L. 1.47 cm, H. 1.44 cm, W. 1.24 cm, 6.41 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1848. Dholavira. - DHR 54461, Middle Town, Level 3, 65x44x1 - Cuboid, fragmented, chert. L. 2.37 cm, H. 2.27 cm, W. 2.08 cm, 6.41+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1849. Dholavira. - DHR 9192, Middle Town, Level 5, 45x4x2 - Cuboid, good, chert. L. 1.70 cm, H. 1.47 cm, W. 1.06 cm, 6.52 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1850. Dholavira. - DHR 14211, Middle Town, Level 1, 44x49x4 - Cuboid, slightly chipped, sandstone. L. 1.62 cm, H. 1.57 cm, W. 1.19 cm, 6.64 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1851. Dholavira. - DHR 54118, Castle, Level 21b, 47x74x21 - Cuboid, good, black stone. L. 1.24 cm, H. 1.23 cm, W. 1.19 cm, 6.69 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1852. Dholavira. - DHR 7234, Level 9, 46x60x1+2 - Cuboid, good, basalt. L. 1.42 cm, H. 1.36 cm, W. 1.39 cm, 6.71 g.

1853. Dholavira. - DHR 16536, Level 2, 55x51x1 - Cuboid, good, agate. L. 1.60 cm, H. 1.50 cm, W. 1.12 cm, 6.75 g.

1854. Dholavira. - DHR 3816, Castle, Level 2, C. 19/3 - Cuboid, good, chert. L. 1.50 cm, H. 1.45 cm, W. 1.22 cm, 6.75 g - Period VI, Late Harappan (4), 1950-1800 BC.

1855. Dholavira. - DHR 6561, Castle, Level 1, 57x5x3 - Cuboid, good, chert. L. 1.63 cm, H. 1.62 cm, W. 1.18 cm, 6.76 g - Period VI, Late Harappan (4), 1950-1800 BC.

1856. Dholavira. - DHR 54176, Castle, Level 16, 47x84x1 - Cuboid, good, chert. L. 1.57 cm, H. 1.56 cm, W. 1.15 cm, 6.78 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1857. Dholavira. - DHR 17751, Castle, Level 9, 47x50x3 - Cuboid, good, chert. L. 1.48 cm, H. 1.41 cm, W. 1.37 cm, 6.78 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1858. Dholavira. - DHR 48158, Lower Town, Level 1, 35x33x1 - Cuboid, slightly chipped, chert. L. 1.59 cm, H. 1.50 cm, W. 1.28 cm, 6.80 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1859. Dholavira. - DHR 33094, Middle Town, Level 2, 45x84 baulk - Cuboid, good, chert. L. 1.65 cm, H. 1.64 cm, W. 1.09 cm, 6.81 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1860. Dholavira. - DHR 46623, Middle Town, Level 4, 55x86xbulk - Cuboid, good, agate. L. 1.59 cm, H. 1.50 cm, W. 1.28 cm, 6.81 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1861. Dholavira. - DHR 28945, Middle Town, Level 2, 45x93x2 - Cuboid, slightly chipped, chert. L. 1.54 cm, H. 1.48 cm, W. 1.32 cm, 6.82 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1862. Dholavira. - DHR 8373, Middle Town, Level 2, 46x45x1+2 - Cuboid, good, chert. L. 1.54 cm, H. 1.52 cm, W. 1.26 cm, 6.82 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1863. Dholavira. - DHR 37072, Middle Town, Pit 2 s/b 1, 46x54x1 - Cuboid, good, chert. L. 1.56 cm, H. 1.51 cm, W. 1.28 cm, 6.82 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1864. Dholavira. - DHR 15014, Lower Town, Level 2, 15x34x3 - Cuboid, good, chert. L. 1.53 cm, H. 1.52 cm, W. 1.22 cm, 6.83 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1865. Dholavira. - DHR 15021, Castle, Level 6, F 19 - Cuboid, good, chert. L. 1.52 cm, H. 1.43 cm, W. 1.35 cm, 6.85 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1866. Dholavira. - DHR 11992, Middle Town, Level 3, 65x4x2 - Cuboid, good, chert. L. 1.56 cm, H. 1.56 cm, W. 1.26 cm, 6.86 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1867. Dholavira. - DHR 26544, Area Bailey, Level 2, 58x18x3 - Cuboid, good, basalt. L. 1.48 cm, H. 1.43 cm, W. 1.29 cm, 6.90 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1868. Dholavira. - DHR 26544, Area Bailey, Level 2, 58x18x3 - Cuboid, good, basalt. L. 1.48 cm, H. 1.43

cm, W. 1.29 cm, 6.90 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1869. Dholavira. - DHR 22101, Lower Town, Level 2, 25x5x4 - Cuboid, good, chert. L. 1.59 cm, H. 1.57 cm, W. 1.15 cm, 6.91 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1870. Dholavira. - DHR 29833, Middle Town, Level 1, 45x93x4 - Cuboid, good, agate. L. 1.75 cm, H. 1.60 cm, W. 1.15 cm, 6.92 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1871. Dholavira. - DHR 2053, Castle, Level 2, ZA. 19/1 - Cuboid, good, chert. L. 1.51 cm, H. 1.50 cm, W. 1.32 cm, 6.93 g - Period VI, Late Harappan (4), 1950-1800 BC.

1872. Dholavira. - DHR 19496, Area Bailey, Level 3, 57x60x2 - Cuboid, good, chert. L. 1.53 cm, H. 1.45 cm, W. 1.33 cm, 6.94 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1873. Dholavira. - DHR 54450 - Cuboid, good, chert. L. 1.48 cm, H. 1.21 cm, W. 1.25 cm, 6.94 g.

1874. Dholavira. - DHR 21945, Middle Town, Surface - Cuboid, good, shell. L. 1.49 cm, H. 1.40 cm, W. 1.29 cm, 6.98 g - Period VI, Late Harappan (4), 1950-1800 BC.

1875. Dholavira. - DHR 18085, Middle Town, Level 5, 45x4x1 - Cuboid, good, chert. L. 1.45 cm, H. 1.45 cm, W. 1.33 cm, 7.00 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1876. Dholavira. - DHR 11566, Castle, Level 2a, 45x54x4 - Cuboid, chipped, stone. L. 1.80 cm, H. 1.62 cm, W. 1.59 cm, 7.02 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1877. Dholavira. - DHR 19813, Area Bailey, Level 4b, 57x57x2 - Cuboid, worn, stone. L. 1.50 cm, H. 1.50 cm, W. 1.75 cm, 7.02 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1878. Dholavira. - DHR 54448, Castle, Level 5, 47x84x1 Room 3 - Cuboid, good, stone. L. 1.51 cm, H. 1.52 cm, W. 1.37 cm, 7.02 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1879. Dholavira. - DHR 52313, Lower Town, Level 1, 35x32x4 - Cuboid, unfinished?, shell. L. 1.91 cm, H. 1.58 cm, W. 1.34 cm, 7.05+x g.

1880. Dholavira. - DHR 37249, Middle Town, Level 3, 45x73x4 - Cuboid, fragmented, chert. L. 2.03 cm, H. 1.38 cm, W. 1.26 cm, 7.06+x g - Period V, Mature Harappan (3C), 2100-2000 BC.

1881. Dholavira. - DHR 9092, Castle, Level 37, 48x92x4 - Cuboid, good, agate. L. 1.72 cm, H. 1.58 cm, W. 1.09 cm, 7.08 g - Period III, Dholavira Culture (2-3A), 2800-2500 BC.

1882. Dholavira. - DHR 16875 - Cuboid, good, basalt. L. 1.70 cm, H. 1.60 cm, W. 1.21 cm, 7.09 g.

1883. Dholavira. - DHR 25520, Lower Town, Level 4, 23x10x4 - Cuboid, good, agate. L. 1.55 cm, H. 1.45 cm, W. 1.31 cm, 7.11 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1884. Dholavira. - DHR 30340, Middle Town, Level 1, 66x54x3 - Cuboid, good, hematite. L. 1.44 cm, H. 1.26 cm, W. 1.15 cm, 7.18 g - Period IV, Late Harappan (4), 1950-1800 BC.

1885. Dholavira. - DHR 9802, Middle Town, Level 4, 35x94 - Cuboid, good, chert. L. 1.54 cm, H. 1.46 cm, W. 1.40 cm, 7.64 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1886. Dholavira. - DHR 20062, SoC, Level 3, 58x54x4 - Cuboid, perfect, basalt. L. 1.30 cm, H. 1.27 cm, W. 1.21 cm, 7.82 g - Period VI, Late Harappan (4), 1950-1800 BC.

1887. Dholavira. - DHR 8502, Middle Town, Level 9, 35x44x4 - Cuboid, good, basalt. L. 1.54 cm, H. 1.37 cm, W. 1.32 cm, 8.05 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1888. Dholavira. - DHR 3504, Castle, Level 8, A 13/4 - Cuboid, slightly chipped, unpolished/unfinished?, chert. L. 1.62 cm, H. 1.59 cm, W. 1.45 cm, 8.17+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1889. Dholavira. - DHR 32922, Level 1, 55x53 - Cuboid, good, stone. L. 2.34 cm, H. 1.76 cm, W. 1.33 cm, 8.28 g.

1890. Dholavira. - DHR 14262, Middle Town, Level 1, 45x48x3 - Cuboid, good, shell. L. 1.88 cm, H. 1.64 cm, W. 1.63 cm, 8.54 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1891. Dholavira. - DHR 1480, Level 2, XG 19/3 - Cuboid, unfinished, stone. L. 1.76 cm, H. 1.60 cm, W. 1.64 cm, 9.02 g.

1892. Dholavira. - DHR 8823, Lower Town, Level 3, 35x54x1+4 - Cuboid, fragmented, chert. H. 1.99 cm, W. 1.43 cm, 9.19+x g - Period V, 2200-2000/1900 BC.

1893. Dholavira. - DHR 10382, Middle Town, Level 10, 45x84 - Cuboid, fragmented chert. L. 2.64 cm, H. 1.99 cm, W. 1.49 cm, 9.66+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1894. Dholavira. - DHR 2929, Bailey, Level 2, XM.19/4 - Cuboid, good, limestone. L. 1.76 cm, H. 1.60 cm, W. 1.56 cm, 10.06 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1895. Dholavira. - DHR 32846, Lower Town, Surface - Fragmented cuboid, black stone. L. 1.77 cm, H. 1.63 cm, W. 1.14 cm, 10.63+x g.

1896. Dholavira. - DHR 46623b, Level 4, 55x86xbaulk - Cuboid, good, limestone. L. 2.05 cm, H. 1.91 cm, W. 1.82 cm, 11.42 g.

1897. Dholavira. - DHR 23325, Bailey, Level 29, 57x57x2 - Cuboid, fragmented, agate. H. 2.43 cm, W. 2.01 cm, 12.15+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1898. Dholavira. - DHR 27629, Bailey, Level 6, 67x52x1 - Cuboid, good, basalt. L. 1.80 cm, H. 1.75 cm, W. 1.59 cm, 12.20 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1899. Dholavira. - DHR 14676, Level 1, 56x52x2 - Cuboid, good, sandstone. L. 1.98 cm, H. 1.95 cm, W. 1.69 cm, 12.70 g.

1900. Dholavira. - DHR 54473, Level 2, 65x64x1 - Cuboid, slightly chipped, grey stone. L. 1.22 cm, H. 0.97 cm, W. 0.67 cm, 13.40+x g.

1901. Dholavira. - DHR 10072, Lower Town, Pit s/b 2, 25x64 - Cuboid, good, chert. L. 2.07 cm, H. 1.99 cm, W. 1.50 cm, 13.53 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1902. Dholavira. - DHR 35039, Middle Town, Level 3, 45x13x4 - Cuboid, good, basalt. L. 1.83 cm, H. 1.83 cm, W. 1.63 cm, 13.54 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1903. Dholavira. - DHR 18678, Area B, Level 1A, 58x51x2 - Cuboid, slightly chipped, unpolished, limestone. L. 2.09 cm, H. 2.08 cm, W. 1.72 cm, 13.54 g.

1904. Dholavira. - DHR 7363, Middle Town, Level 3, 57x15x2 - Cuboid, good, chert. L. 1.98 cm, H. 1.94 cm, W. 1.52 cm, 13.60 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1905. Dholavira. - DHR 22743, Lower Town, Level 3, 24x7x1 - Cuboid, good, chert. L. 1.89 cm, H. 1.87 cm, W. 1.63 cm, 13.61 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1906. Dholavira. - DHR 8397, Castle, Pit s/b 28, 47x47x2 - Cuboid, good, chert. L. 1.94 cm, H. 1.91 cm, W. 1.58 cm, 13.61 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1907. Dholavira. - DHR 2375, Middle Town, Level 4, ZA 6/2 - Cuboid, good, chert. L. 1.91 cm, H. 1.89 cm, W. 1.60 cm, 13.63 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1908. Dholavira. - DHR 11219, Middle Town, Level 2, 45x44 - Cuboid, good, chert. L. 1.97 cm, H. 1.93 cm, W. 1.58 cm, 13.69 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1909. Dholavira. - DHR 12834, Middle Town, Level 1, 55x64 - Cuboid, good, agate. L. 2.08 cm, H. 2.06 cm, W. 1.34 cm, 13.69 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1910. Dholavira. - DHR 16369, Middle Town, Level 5, 55x58x4 - Cuboid, good, chert. L. 1.92 cm, H. 1.84 cm, W. 1.60 cm, 13.77 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1911. Dholavira. - DHR 53828, Castle, 47x61x4 - Cuboid, good, agate. L. 1.91 cm, H. 1.90 cm, W. 1.61 cm, 13.77 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1912. Dholavira. - DHR 40564, Lower Town, Level 1, 25x83x2 - Cuboid, good, chert. L. 2.03 cm, H. 1.97 cm, W. 1.52 cm, 13.87 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1913. Dholavira. - DHR 21549, Bailey, Level 1, 58x62x4 - Cuboid, good, chert. L. 1.99 cm, H. 1.92 cm, W. 1.61 cm, 13.90 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1914. Dholavira. - DHR 22188 - Cuboid, heavily chipped, limestone. L. 1.98 cm, H. 2.01 cm, W. 0.55 cm.

1915. Dholavira. - DHR 48684 - Cuboid, slightly chipped, gypsum. L. 0.55 cm, H. 0.53 cm, W. 0.67 cm, 14.00 g.

1916. Dholavira. - DHR 10090, Middle Town, Pit s/b 2, 45x54 - Cuboid, good, sandstone. L. 2.22 cm, H. 2.16 cm, W. 1.69 cm, 14.00 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1917. Dholavira. - DHR 49454, Middle Town, Level 25, 35x73 - Cuboid, good, sandstone. L. 2.29 cm, H. 1.81 cm, W. 1.64 cm, 14.10 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1918. Dholavira. - DHR 53503 - Cuboid, good, basalt. L. 1.70 cm, H. 1.63 cm, W. 1.30 cm, 14.16 g.

1919. Dholavira. - DHR 26231, Middle Town, Level 3, 37x45x4 - Cuboid, worn, limestone. L. 2.11 cm, H. 1.93 cm, W. 1.95 cm, 14.33 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1920. Dholavira. - DHR 3491, Castle, Level 8, j 19/2 - Cuboid, good, vesuvianite. L. 1.79 cm, H. 1.77 cm, W. 1.39 cm, 14.68 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1921. Dholavira. - DHR 1841, SoC, Level 3, XE-24 - Cuboid, good, chert. L. 2.00 cm, H. 2.00 cm, W. 1.57 cm, 14.80 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1922. Dholavira. - DHR 11736, Middle Town, Pit s/b 1, 45x44 - Cuboid, slightly chipped, limestone. L. 2.29 cm, H. 2.12 cm, W. 1.30 cm, 15.01+x g - Period V, Mature Harappan (3C), 2100-2000 BC.

1923. Dholavira. - DHR 34879, Middle Town, Level 1, 45x23x4 - Cuboid, fragmented, limestone. L. 2.37 cm, H. 2.29 cm, W. 2.10 cm, 16.20+x g.

1924. Dholavira. - DHR 34493, Castle, Level 1, 47x64x4 - Cuboid, chipped, black stone. L. 1.84 cm, H. 1.67 cm, W. 1.51 cm, 16.30+x g.

1925. Dholavira. - DHR 25733, Lower Town, Pit 1 s/b 5, 25x5x2 - Cuboid, good, stone. L. 2.46 cm, H. 1.93 cm, 16.41 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1926. Dholavira. - DHR 38770, Middle Town, Level 3, 46x71x1 - Cuboid, fragmented sandstone. L. 2.41 cm, H. 2.28 cm, W. 2.05 cm, 16.56+x g.

1927. Dholavira. - DHR 19831b, Castle, Level 1a, C 19/1 - Cuboid, slightly chipped, sandstone. L. 2.97 cm, H. 2.62 cm, W. 1.32 cm, 17.13 g - Period VI, Late Harappan (4), 1950-1800 BC.

1928. Dholavira. - DHR 22191, Level 2, 37x24x4 - Cuboid, chipped, limestone. L. 2.53 cm, H. 2.49 cm, W. 2.08 cm, 17.75+x g.

1929. Dholavira. - DHR 53896, Castle, Level 18, 47x74x4 - Cuboid, worn, sandstone. L. 3.27 cm, H. 2.81 cm, W. 1.17 cm, 17.83 g - Period VI, Late Harappan (4), 1950-1800 BC.

1930. Dholavira. - DHR 21595, Bailey, Level 15a, 57x57x2 - Cuboid, fragmented chert. L. 2.34 cm, H. 2.34 cm, W. 2.01 cm, 18.25+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1931. Dholavira. - DHR 20132 - Cuboid, worn, limestone. L. 1.81 cm, H. 1.90 cm, W. 1.85 cm, 18.54 g.

1932. Dholavira. - DHR 54475, Bailey, Level 6a, 58x51x1 - Cuboid, chipped, stone. L. 2.76 cm, H. 2.14 cm, W. 1.66 cm, 19.09+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1933. Dholavira. - DHR 15221, Middle Town, Level 4, 55x58x1 - Cuboid, worn, limestone. L. 2.69 cm, H. 2.52 cm, W. 2.03 cm, 20.35 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1934. Dholavira. - DHR 34567 - Cuboid, fragmented, limestone. L. 2.74 cm, H. 2.35 cm, W. 2.00 cm, 21.30+x g.

1935. Dholavira. - DHR 44504, Castle, Level 9 - Cuboid, chipped, chert. L. 2.61 cm, H. 2.59 cm, W.

1.74 cm, 22.31+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1936. Dholavira. - DHR 31087, ER, Level 6, 35x75x3 - Cuboid, slightly chipped, limestone. L. 2.30 cm, H. 2.26 cm, W. 1.86 cm, 22.39 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1937. Dholavira. - DHR 34372 - Cuboid, fragmented, shell. L. 2.54 cm, H. 2.52 cm, W. 1.80 cm, 22.40+x g.

1938. Dholavira. - DHR 24254, Area Bailey, Level 2, 58x52x2 - Cuboid, fragmented, stone. 23.71+x g - Period V, Mature Harappan (3C), 2100-2000 BC.

1939. Dholavira. - DHR 47175, BC, Level 5, 47x84x4 - Cuboid, slightly chipped, stone. L. 2.45 cm, H. 2.36 cm, W. 1.78 cm, 24.00+x g - Period V, Mature Harappan (3C), 2100-2000 BC.

1940. Dholavira. - DHR 54452 - Cuboid, good, stone. H. 6.75 cm, D. 3.87 cm, 26.95 g.

1941. Dholavira. - DHR 18603, Middle Town, Level 2, 45x45x1 - Cuboid, slightly chipped, chert. L. 2.34 cm, H. 2.33 cm, W. 2.09 cm, 26.97 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1942. Dholavira. - DHR 36219, Middle Town, Surface - Cuboid, slightly chipped, chert. L. 2.31 cm, H. 2.29 cm, W. 2.16 cm, 27.05+x g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1943. Dholavira. - DHR 53625, Middle Town, Level 7, 47x62x4 - Cuboid, slightly chipped, black stone. L. 2.34 cm, H. 2.32 cm, W. 2.16 cm, 27.06 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1944. Dholavira. - DHR 43191, Middle Town, Level 2, 55x78x1 - Cuboid, good, limestone. L. 2.52 cm, H. 2.49 cm, W. 1.83 cm, 27.23 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1945. Dholavira. - DHR 33384, Lower Town, Surface - Cuboid, good, chert. L. 2.47 cm, H. 2.45 cm, W. 1.89 cm, 27.24 g.

1946. Dholavira. - DHR 26979, SR, Level 6, 48x38x3+4 - Cuboid, good, chert. L. 2.45 cm, H. 2.45 cm, W. 1.86 cm, 27.25 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

1947. Dholavira. - DHR 22980, Lower Town, Level 3, 25x8x4 - Cuboid, good, chert. L. 2.53 cm, H. 2.46 cm, W. 1.80 cm, 27.25 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1948. Dholavira. - DHR 5503, ER, Level 1, 37x79x2 - Cuboid, worn, sandstone. L. 2.51 cm, H. 2.44 cm, W. 2.10 cm, 27.35 g - Period IV, Late Harappan (4), 1950-1800 BC.

1949. Dholavira. - DHR 34227, Castle, Level 2, 35x73x4 - Cuboid, good, chert. L. 2.47 cm, H. 2.42 cm, W. 1.93 cm, 27.50 g - Period VI, Late Harappan (4), 1950-1800 BC.

1950. Dholavira. - DHR 39129, Middle Town, 45x13x3 - Cuboid, slightly chipped, chert. L. 2.59 cm, H. 2.44 cm, W. 1.88 cm, 27.64 g.

1951. Dholavira. - DHR 1703, Level 1, XK 19/4 - Cuboid, slightly chipped, sandstone. L. 2.79 cm, H. 2.59 cm, W. 1.62 cm, 27.79 g.

1952. Dholavira. - DHR 9182, Level 2, 55x24x1 - Cuboid, worn, stone. L. 3.00 cm, H. 2.90 cm, W. 1.34 cm, 29.19 g.

1953. Dholavira. - DHR 39245, Castle, Level 2, 47x74x3 - Cuboid, good, limestone. L. 2.48 cm, H. 2.42 cm, W. 2.08 cm, 29.24 g - Period VI, Late Harappan (4), 1950-1800 BC.

1954. Dholavira. - DHR 24513, Castle, Level 7b, 47x88x2 - Cuboid, good, limestone. L. 2.64 cm, H. 2.56 cm, W. 1.75 cm, 29.48 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1955. Dholavira. - DHR 50599, EoC, Level 1, 37x78x2 - Cuboid, badly chipped, limestone. L. 3.02 cm, H. 2.99 cm, W. 2.04 cm, 29.70+x g - Period VI, Late Harappan (4), 1950-1800 BC.

1956. Dholavira. - DHR 10363, Middle Town, Pit s/b 2, 55x4 - Cuboid, chipped, basalt. L. 2.84 cm, W. 1.62 cm, 30.79+x g - Period IV, 2500-2100 BC.

1957. Dholavira. - DHR 16087, Pit 2 s/b 6, 5x94x3 - Cuboid, good, limestone. L. 2.89 cm, H. 2.63 cm, W. 2.39 cm, 34.48 g.

1958. Dholavira. - DHR 25984, Lower Tower, Level 14, 25x5x2 - Cuboid, slightly worn, limestone. L. 3.38 cm, H. 3.37 cm, W. 2.07 cm, 39.46 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1959. Dholavira. - DHR 20989, Middle Town, Level 8, 45x43x1 - Cuboid, fragmented, chert. L. 3.15 cm, H. 3.06 cm, W. 2.35 cm, 51.86+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1960. Dholavira. - DHR 34170, Castle, Level 1, 47x85x1 - Cuboid, slightly chipped, chert. L. 3.21 cm, H. 3.17 cm, W. 2.25 cm, 53.85+x g - Period VI, Late Harappan (4), 1950-1800 BC.

1961. Dholavira. - DHR 37805, Castle, Level 3, 47x75x1 - Cuboid, slightly chipped, chert. L. 3.15 cm, H. 3.09 cm, W. 2.38 cm, 53.92 g - Period VI, Late Harappan (4), 1950-1800 BC.

1962. Dholavira. - DHR 1168, Castle, XE 22/3+4 - Cuboid, slightly chipped, chert. L. 2.93 cm, H. 2.92 cm, W. 2.66 cm, 53.99 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1963. Dholavira. - DHR 46853, Bailey, Surface - Cuboid, perfect, chert. L. 3.03 cm, H. 3.03 cm, W. 2.48 cm, 54.40 g.

1964. Dholavira. - DHR 46416, Middle Town, Level 3, 55x79x2 - Cuboid, good, chert. L. 3.47 cm, H. 3.01 cm, W. 2.47 cm, 55.06 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1965. Dholavira. - DHR 12248 - Cuboid, slightly chipped, limestone. L. 2.81 cm, H. 3.00 cm, W. 1.45 cm, 57.40 g.

1966. Dholavira. - DHR 9322, Castle, Level 3, 47x74x1 - Cuboid, good, sandstone. L. 3.97 cm, H. 3.88 cm, W. 2.23 cm, 57.76 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1967. Dholavira. - DHR 10724, Lower Town, Level 2, 25x24x1 - Cuboid, chipped, sandstone. L. 3.21 cm, H. 2.95 cm, W. 2.71 cm, 61.04+x g - Period V, Mature Harappan (3C), 2100-2000 BC.

1968. Dholavira. - DHR 47867 - Cuboid, worn, limestone. L. 2.10 cm, H. 2.08 cm, W. 1.43 cm, 66.19 g.

1969. Dholavira. - DHR 54453 - Cuboid, slightly chipped, limestone. L. 2.21 cm, H. 2.15 cm, W. 1.54 cm, 68.03 g.

1970. Dholavira. - DHR 19323, Level 8, 45x33x3 - Cuboid, unfinished, chalcedony. L. 3.77 cm, H. 3.29 cm, W. 3.44 cm, 80.33 g.

1971. Dholavira. - DHR 40444 - Cuboid, worn, limestone. L. 3.32 cm, H. 3.28 cm, W. 2.01 cm, 87.89 g.

1972. Dholavira. - DHR 54465, Castle, Level 1, 47x35x3 - Cuboid, slightly chipped, limestone. L. 6.07 cm, H. 6.09 cm, W. 2.03 cm, 130.00 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1973. Dholavira. - DHR 47039, Castle, Level 1, 47x85 - Cuboid, slightly chipped, limestone. L. 4.21 cm, H. 3.54 cm, W. 3.58 cm, 130.40+x g - Period VI, Late Harappan (4), 1950-1800 BC.

1974. Dholavira. - DHR 37238b, Middle Town, Level 3, 45x73x4 - Cuboid, slightly chipped, chert. L. 4.31 cm, H. 4.24 cm, W. 3.08 cm, 136.72 g.

1975. Dholavira. - DHR 1230, Pit 2 s/b 2, 45x94x3 - Cuboid, fragmented, limestone. L. 5.55 cm, H. 5.03 cm, W. 3.73 cm, 191.44+x g.

1976. Dholavira. - DHR 54444, Castle, Level 5, 47x84x1 - Cuboid, worn, limestone. L. 6.07 cm, H. 4.73 cm, 199.10 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1977. Dholavira. - DHR 33518, Level 17, 48x38x1+2 - Cuboid, heavily chipped, stone. L. 6.09 cm, H. 4.59 cm, W. 3.84 cm, 248.02+x g.

1978. Dholavira. - DHR 54443, Level 1, 54x68x1 - Cuboid, slightly chipped, limestone. H. 6.60 cm, D. 4.41 cm, 326.44+x g.

1979. Dholavira. - DHR 54447, Castle, Level 5, 47x84x1 - Cuboid, worn, limestone. L. 6.30 cm, H. 4.87 cm, 400.00 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1980. Dholavira. - DHR 54420 - Cuboid, chipped, limestone. L. 0.87 cm, H. 0.54 cm, 1,310.00+x g.

1981. Dholavira. - DHR 24754, Level 1, 35x84 - Fragmented cuboid, chert. L. 11.19 cm, H. 10.74 cm, W. 9.22 cm, 1,880.00+x g.

1982. Dholavira. - DHR 54499, Middle Town, Level 19, 45x43x2 - Cuboid, chipped, chert. L. 23.93 cm, H. 22.12 cm, W. 13.36 cm, 2,520.00+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

1983. Dholavira. - DHR 54522 - Cuboid, slightly chipped, basalt. H. 4.85 cm, W. 3.42 cm, 3,030.00 g.

1984. Dholavira. - DHR 54423 - Cuboid, good, basalt. L. 14.43 cm, H. 13.71 cm, W. 8.00 cm, 3,520.00 g.

1985. Dholavira. - DHR 54410, 57x57x2 - Cuboid, good, limestone. H. 16.00 cm, D. 15.80 cm, 5,360.00 g.

1986. Dholavira. - DHR 54406 - Cuboid, slightly worn, sandstone. L. 18.40 cm, H. 9.00 cm, 5,690.00 g.

6.8.2.2.17. Cuboid in terracotta (Type 18b): Cat. no. 1987-1996

1987. Dholavira. - DHR 2352, Middle Town, Level 4, A 6 - Cuboid, good, terracotta. L. 0.86 cm, H. 0.83 cm, W. 0.68 cm, 0.72 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1988. Dholavira. - DHR 43189, Area 1, 28x95x2 - Cuboid, heavily worn, terracotta. L. 0.75 cm, H. 0.75 cm, W. 0.65 cm, 0.76 g - Period V-VI, Mature Harappan (3C-4), 2200/2100-1800 BC.

1989. Dholavira. - DHR 3665 - Cuboid, good, terracotta. L. 0.86 cm, H. 0.85 cm, W. 0.69 cm, 0.88 g.

1990. Dholavira. - DHR 19495, Area Bailey, Level 3, 57x60x2 - Cuboid, slightly chipped, terracotta. L. 1.18 cm, H. 1.17 cm, W. 1.18 cm, 2.10 g - Period V, Mature Harappan (3C), 2100-2000 BC.

1991. Dholavira. - DHR 18519, Area Bailey, Level 1, 57x56x1 - Cuboid, good, terracotta. L. 1.62 cm, H. 1.58 cm, W. 1.15 cm, 4.13 g.

1992. Dholavira. - DHR 9023, Castle, Level 2, 57x5x3 - Cuboid, chipped, terracotta. L. 1.63 cm, H. 1.56 cm, W. 1.39 cm, 5.20+x g - Period VI, Late Harappan (4), 1950-1800 BC.

1993. Dholavira. - DHR 15199, Middle Town, Level 1, 56x54x3 - Cuboid, slightly chipped, terracotta. L. 1.49 cm, H. 1.46 cm, W. 1.01 cm, 5.31+x g - Period VI, Late Harappan (4), 1950-1800 BC.

1994. Dholavira. - DHR 6645, Castle, Level 3, 57x5x3 - Cuboid, good, terracotta. L. 1.67 cm, H. 1.57 cm, W. 1.47 cm, 5.32 g - Period VI, Late Harappan (4), 1950-1800 BC.

1995. Dholavira. - DHR 6646, Castle, Level 2, 57x5x3 - Cuboid, slightly chipped, terracotta. L. 1.58 cm, H. 1.52 cm, W. 1.40 cm, 5.41 g - Period VI, Late Harappan (4), 1950-1800 BC.

1996. Dholavira. - DHR 6975, Castle, Level 9a, 57x5x2 - Cuboid, worn, terracotta. L. 1.85 cm, H. 1.77 cm, W. 1.60 cm, 5.80 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

6.8.2.2.18. Hemisphere (Type 20a): Cat. no. 1997-2005

1997. Dholavira. - DHR 53661, Castle, Level 13, 47x84x1 - Hemisphere, good, chalcedony. H. 0.67 cm, D. 0.51 cm, 0.39 g - Period V-VI, Mature Harappan (3C)-Late Harappan (4), 2200/2100-1800 BC.

1998. Dholavira. - DHR 10162, Level 2, 37x80x4 - Hemisphere, good, chert. H. 0.99 cm, D. 0.52 cm, 0.68 g.

1999. Dholavira. - DHR 52550, Lower Town, Level 2, 35x32x4 - Hemisphere, good, stone. H. 1.26 cm, D. 0.78 cm, 1.80 g - Period V, Mature Harappan (3C), 2100-2000 BC.

2000. Dholavira. - DHR 33595, Level 2, 35x83x2 - Hemisphere, good, jasper. H. 1.70 cm, D. 0.91 cm, 5.60 g.

2001. Dholavira. - DHR 12108, Area 11, 25x44 - Hemisphere, good, stone. H. 1.35 cm, D. 2.15 cm, 8.89 g.

2002. Dholavira. - DHR 52043, Castle, Level 2, 47x23x2 - Hemisphere, good, terracotta. H. 1.22 cm, D. 2.88 cm, 10.12 g.

2003. Dholavira. - DHR 47833 - Hemisphere, good, hematite. H. 1.48 cm, D. 2.18 cm, 13.79 g.

2004. Dholavira. - DHR 35961, Area Castle, Level 5, 47x74x4 - Hemisphere, fragmented, sandstone. H. 2.81 cm, D. 4.83 cm, 88.60+x g.

2005. Dholavira. - DHR 3928, Level 16, 37x56x4 - Hemisphere, good, limestone. H. 3.18 cm, D. 6.97 cm, 182.76 g.

6.8.2.2.19. Truncated hemisphere (Type 20b): Cat. no. 2006-2015

2006. Dholavira. - DHR 24683, 57x47x3+57x51x2 - Truncated hemisphere, good, shell. H. 0.40 cm, D. 0.90 cm, 0.56 g.

2007. Dholavira. - DHR 38006, Area Middle Town, Level 3, 45x73x1 - Truncated hemisphere, good, agate. L. 1.44 cm, H. 1.12 cm, D. 0.68 cm, 1.87 g.

2008. Dholavira. - DHR 15282, Level 2, 35x53 - Truncated hemisphere, good, agate. H. 1.32 cm, D. 0.81 cm, 2.24 g.

2009. Dholavira. - DHR 11069, 45x94 - Truncated hemisphere, fragmented, chipped, shell. H. 0.87 cm, D. 1.23 cm, 2.89+x g.

2010. Dholavira. - DHR 29147, Middle Town, Level 3, 66x55x1 - Truncated hemisphere, good, stone. H. 1.55 cm, D. 1.37 cm, 3.27 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

2011. Dholavira. - DHR 140, Level 2a, 45x4x1 - Truncated hemisphere, worn, stone. H. 3.16 cm, D. 2.02 cm, 32.60 g.

2012. Dholavira. - DHR 53122 - Truncated hemisphere, good, stone. H. 1.22 cm, D. 2.77 cm, 17.21 g.

2013. Dholavira. - DHR 18258, Level 15, 44x44x2 - Truncated hemisphere, good, limestone. H. 6.05 cm, D. 4.15 cm, 224.28 g.

2014. Dholavira. - DHR 22007, Area Bailey, Level 1, 57x53x4 - Truncated hemisphere, chipped, basalt. H. 6.39 cm, D. 4.84 cm, 290.00+x g - Period VI, Late Harappan (4), 1950-1800 BC.

2015. Dholavira. - DHR 29988 - Truncated hemisphere, chipped, limestone. H. 4.60 cm, D. 10.70 cm, 550.00+x g.

6.8.2.2.20. Cone (Type 21a): Cat. no. 2016

2016. Dholavira. - DHR 18317, Area 1, 57x57x3 - Cone, good, sandstone. L. 2.53 cm, H. 2.00 cm, W. 3.40 cm, 18.10 g.

6.8.2.2.21. Truncated cone (Type 21b): Cat. no. 2017-2045

2017. Dholavira. - DHR 48698, Area 1, 55x89x2 - Truncated cone, traces of suspension rope, perfect, stone. H. 0.84 cm, D. 0.46 cm, , 0.27 g.

2018. Dholavira. - DHR 48688, 55x33x3 - Truncated cone, traces of suspension rope, perfect, chert. H. 1.29 cm, D. 0.32 cm, 0.46 cm, 0.41 g.

2019. Dholavira. - DHR 32531, Level 1, 48x91x3 - Truncated cone, traces of suspension rope, perfect, hornblende. H. 0.99 cm, D. 0.44 cm, 0.54 cm, 0.54 g.

2020. Dholavira. - DHR 48687, Harappan, 34x55x4 - Truncated cone, traces of suspension rope, perfect, stone. W. 1.25 cm, D. 0.48 cm, 0.55 cm, 0.58 g.

2021. Dholavira. - DHR 32208, Citadel, Level 1, 48x91x1 - Truncated cone, traces of suspension rope, perfect, stone. H. 1.17 cm, D. 0.56 cm, 0.40 cm, 0.59 g.

2022. Dholavira. - DHR 48697, Level 2, 25x9x1 - Truncated cone, traces of suspension rope, perfect, stone. H. 0.90 cm, D. 0.50 cm, 0.73 cm, 0.64 g.

2023. Dholavira. - DHR 48694, Level 2, 37x65x1+4 - Truncated cone, traces of suspension rope, perfect, stone. H. 1.24 cm, D. 0.50 cm, 0.57 cm, 0.72 g.

2024. Dholavira. - DHR 51226, Surface - Truncated cone, traces of suspension rope, perfect, shell. H. 1.47 cm, D. 0.46 cm, 0.50 cm, 0.79 g.

2025. Dholavira. - DHR 16768, Middle Town, Level 2, 55x51x1 - Truncated cone, good, basalt. H. 1.04 cm, D. 0.67 cm, 0.81 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

2026. Dholavira. - DHR 38592, Level 3, 51/81x2 - Truncated cone, traces of suspension rope, perfect, stone. H. 1.28 cm, D. 0.52 cm, 0.64 cm, 0.91 g.

2027. Dholavira. - DHR 44610, Level 2, 55x78xbaulk - Truncated cone, good, jasper. H. 1.38 cm, D. 0.69 cm, 1.03 g.

2028. Dholavira. - DHR 48695, 65x13x1 - Truncated cone, traces of suspension rope, perfect, hornblende. H. 1.27 cm, D. 0.41 cm, 0.58 cm, 1.27 g.

2029. Dholavira. - DHR 48699, Level 14, 48x39x1 - Truncated cone, traces of suspension rope, perfect, stone. H. 1.77 cm, D. 0.59 cm, 0.71 cm, 1.32 g.

2030. Dholavira. - DHR 48691, Mean street, Level 2, 45x87x3 - Truncated cone, traces of suspension rope, perfect, hornblende. H. 1.56 cm, D. 0.59 cm, 0.79 cm, 1.56 g.

2031. Dholavira. - DHR 48689, 47x84xII - Truncated cone, traces of suspension rope, perfect, stone. H. 1.71 cm, D. 0.53 cm, 0.80 cm, 1.65 g.

2032. Dholavira. - DHR 48693, Level 2, 66x56x1 - Truncated cone, traces of suspension rope, perfect, stone. H. 1.76 cm, D. 0.82 cm, 1.98 g.

2033. Dholavira. - DHR 34817, Level 3, 45x13x1 - Truncated cone, good, limestone. H. 1.76 cm, D. 0.90 cm, 2.29 g.

2034. Dholavira. - DHR 47636, 35x73 - Truncated cone, traces of suspension rope, perfect, basalt. W. 1.57 cm, D. 6.90 cm, 9.00 cm, 2.43 g.

2035. Dholavira. - DHR 44606, Middle Town, Level 1, 55x87x3 - Truncated cone, good, basalt. H. 1.69 cm, D. 0.89 cm, 2.45 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

2036. Dholavira. - DHR 42386, Middle Town, Level 3, 55x85x4 - Truncated cone, good, basalt. H. 1.82 cm, D. 0.96 cm, 2.98 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

2037. Dholavira. - DHR 33486, Level 16, 48x38x1+2 - Truncated cone, good, stone. H. 2.01 cm, D. 0.83 cm, 3.15 g.

2038. Dholavira. - DHR 24075 - Truncated cone, good, basalt. H. 2.14 cm, D. 0.82 cm, 3.32 g.

2039. Dholavira. - DHR 19523, Middle Town, Level 4a, 57x57x2 - Truncated cone, good, clay. H. 1.68 cm, D. 1.23 cm, 3.64 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

2040. Dholavira. - DHR 39070, 35x73/35x83 - Truncated cone, perfect, limestone. L. 1.14 cm, H. 0.85 cm, W. 2.04 cm, 3.74 g.

2041. Dholavira. - DHR 27320 - Truncated cone, good, limestone. H. 1.71 cm, D. 1.30 cm, 3.88 g.

2042. Dholavira. - DHR 52438, Lower Town, Level 2, 35x32x4 - Truncated cone, good, sandstone. H. 2.02 cm, D. 1.03 cm, 4.17 g.

2043. Dholavira. - DHR 11704, Level 3, 47x6x4 - Truncated cone, perfect, jasper. L. 1.22 cm, H. 1.15 cm, W. 1.46 cm, 4.30 g.

2044. Dholavira. - DHR 38411, Middle Town, Level 19, 37x46x1 - Truncated cone, perfect, jasper. L. 1.18 cm, H. 0.76 cm, W. 2.56 cm, 5.63 g.

2045. Dholavira. - DHR 37293, Middle Town, Level 6, 35x63x4 - Truncated cone, good, basalt. H. 2.00 cm, D. 1.98 cm, 14.57 g - Period V, Mature Harappan (3C), 2100-2000 BC.

6.8.2.2.22. Pyramid-shaped (Type 22): Cat. no. 2046-2050

2046. Dholavira. - DHR 40437, Level 2, 45x24x4 - Pyramid-shaped, good, stone. L. 1.30 cm, W. 1.48 cm, 2.70 g.

2047. Dholavira. - DHR 19965, Castle, Level 5, 57x54x1 - Pyramid-shaped, good, shell. L. 1.52 cm, H. 1.38 cm, W. 0.88 cm, 3.40 g.

2048. Dholavira. - DHR 40436, Middle Town, Dump, 5x75x1 - Pyramid-shaped, good, chert. L. 2.30 cm, D. 2.40 cm, 7.25 g - Period IV-V, Mature Harappan (3B-C), 2500-2000/1900 BC.

2049. Dholavira. - DHR 4638, Level 10, 47/74 - Pyramid-shaped, good, stone. L. 2.43 cm, W. 2.43 cm, 9.05 g.

2050. Dholavira. - DHR 54484, Middle Town, Level 2, 65x54x1 - Pyramid-shaped, good, stone. L. 3.50 cm, W. 3.50 cm, 51.05 g.

6.8.2.2.23. Dome-shaped (Type 25): Cat. no. 2051-2057

2051. Dholavira. - DHR 28500, Middle Town, Level 1, 45x93x2 - Dome-shaped, good, limestone. H. 1.57 cm, D. 0.62 cm, 2.69 g - Period V, Mature Harappan (3C), 2100-2000 BC.

2052. Dholavira. - DHR 31264, Level 1, 57x10x3 - Dome-shaped, worn, stone. H. 1.62 cm, D. 0.93 cm, 2.98 g.

2053. Dholavira. - DHR 25143, Lower Town, Level 2, 26x2x4 - Dome-shaped, worn, slightly chipped, stone. H. 2.81 cm, D. 2.80 cm, 29.88+x g - Period IV, Mature Harappan (3B), 2500-2100 BC.

2054. Dholavira. - DHR 18068, Middle Town, Level 5, 45x4x1 - Dome-shaped, good, stone. H. 3.25 cm, D. 3.26 cm, 54.51 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

2055. Dholavira. - DHR 30360, Level 2, 37x75x3 - Dome-shaped, good, limestone. H. 3.65 cm, D. 3.16 cm, 58.09 g - Period IV, Mature Harappan (3B), 2500-2100 BC.

2056. Dholavira. - DHR 54426, Castle, Level 1, 47x84x1 - Dome-shaped, slightly chipped, basalt. L. 21.80 cm, H. 15.40 cm, W. 21.80 cm, 12,850.00+x g.

2057. Dholavira. - DHR 54425 - Dome-shaped, good, basalt. L. 21.80 cm, H. 15.41 cm, W. 21.80 cm, 13,620.00 g.

6.8.2.2.24. Trapezoid-shaped (Type 26): Cat. no. 2058

2058. Dholavira. - DHR 15107, Level 1, 56x55x1 - Trapezoid-shaped, good, shell. L. 1.36 cm, H. 1.32 cm, W. 1.07 cm, 3.26 g.

6.8.2.3. Metrological notes

The Indus Valley weights represent the most important dataset for metrological studies in the Middle East. Publications of the excavations at Mohenjo-daro, Chanhu-daro and Harappa carried out in the first half of the 20th century formed the archaeological foundation for our modern understanding of ancient Indus Valley civilisations. To this day, they are the basis for any analysis of Harappan material culture. Around 700 weights were published (364 from Mohenjo-daro, 215 from Harappa and 117 from Chanhu-daro) in the original excavation reports (Hemmy 1931; 1938b; 1943; Vats 1940, 360-366; on the Harappan system see also Hendrickx-Baudot 1972). The majority of the weights were made from chert or banded chert (for a brief mineralogical description see Hendrickx-Baudot 1972, n. 2), with occasional use of limestone, agate, or chalcedony. The 'standard' shape for balance weights in this region is cubic/cuboid, as evident from the 516 published cuboid specimens (Hemmy 1931, 461-462; 1938a, 401-404; the pebble-shape was first mentioned in Hemmy 1938a, 404). Other attested weight shapes are spherical, barrel-shaped, conical, perforated cones, cylindrical with flattened base and top, hemispherical, and spherical with flattened base and top. The metrological system follows a binary system for fractions, and a decimal system for multiples of the 'standard' unit (Hendrickx-Baudot 1972, 14). The standard unit has been calculated as around 13.60 g (Hendrickx-Baudot 1972, 12-15, 28; see also the preliminary evaluations by Hemmy 1931, 589-591; 1938a, 601-603; 1943, 236-237; Rahmstorf 2020), which seems connected to the Persian Gulf area where a Dilmun mina has been calculated around 1,350 g (= 100 units of *c.* 13.50 g). Metrological systems based on units of 8.40 g, 7.80 g and 9.40 g are also attested.

The knowledge base from the early 20th century excavations, supplemented by new data from recent investigations at various Gujarat settlements, particularly at Dholavira, are the foundation for a more detailed understanding of the Greater Indus weighing systems, and for the recognition of weighing variables outside the strict metrological system suggested by A. S. Hemmy. Analysis of the Dholavira weights shows concentrations of mass values not exclusively related to the traditional shekel of 13.65 g (Fig. 6.25-28).

Weights in the range of 0-2 g (Fig. 6.29)

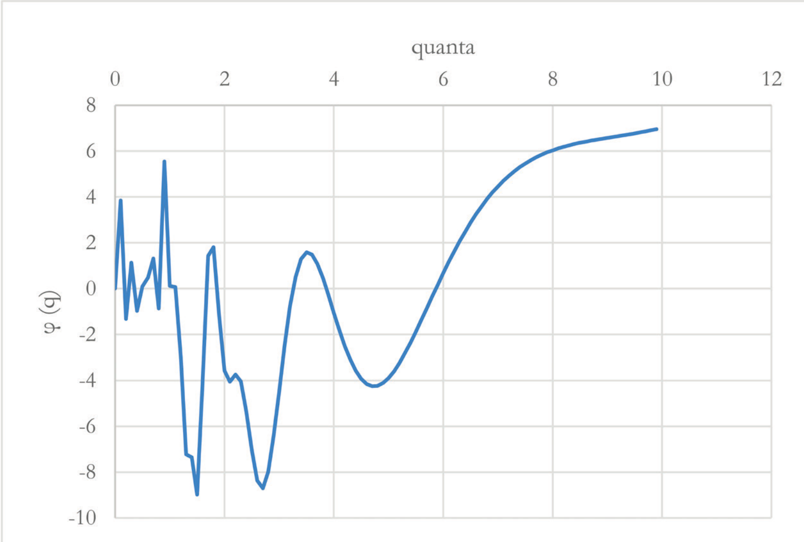
1. 0.52-0.58 g

   Analysis of the weights with mass values smaller than 2 g shows a concentration of values between 0.52 g and 0.58 g, seemingly representing 1⁄24 of the oscillating base unit between 12.48 g and 13.92 g. In this specific case, the fluctuation of the base value seems to be mostly due to the very small size of the weights analysed. This kind of result would also make it possible to identify further fractions in addition to the 'conventional' ones based on a binary system. In other words, just as there seems to be the fraction of 1⁄6 (Rahmstorf 2020, 81), similarly it seems that a value of 1⁄24 could be identified among the fractions of 1⁄16 and 1⁄32.

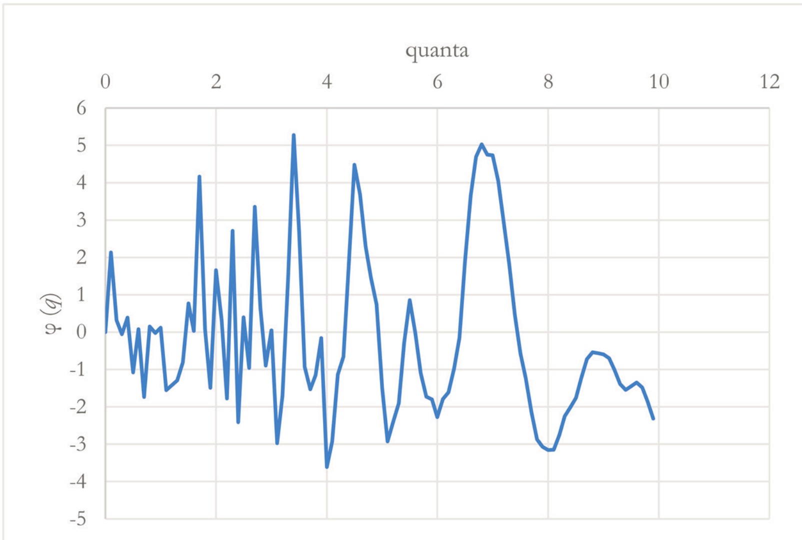
2. 0.79-0.81 g
   This anomalous concentration of weights is between 0.66 g and 0.72 g; it could represent a weighing range expressing 1⁄12 of the Mesopotamian shekel (very unlikely). Amongst the weights lighter than 2 g, the highest concentration of values is between 0.79 g and 0.81 g, which represents 1⁄16 of a slightly underestimated Harappan shekel between 12.64 g and 12.96 g.
3. 0.87-0.93 g
   This cluster of values is difficult to explain. Whilst mathematically this cluster could be interpreted as 1⁄10 of western values between 8.70 g and 9.30 g, there is no contemporary Mesopotamian textual evidence for fractions smaller than 1⁄6. Equally, the full extent of fractions and multiples of the 9.40 g shekel is not yet understood. The cluster could be considered a decimal fraction the 'Egyptian shekel' of 9.40 g (which follows a decimal system, 470 g ÷ 50 = 9.40 g), with an oscillation between 8.70 g and 9.30 g. The 9.40 g shekel was common along the Indus River Valley (Ascalone/Peyronel 2003, tab. 8), and recently identified through Cosine Quantogram Analysis amongst the weights from Harappa, Mohenjo-daro and Chanhu-daro (Rahmstorf 2020, 81-83, fig. 3).
4. 0.99-1.11 g
   Weights in the range 0.99-1.11 g seem to represent 1⁄8 of the Mesopotamian shekel, but problematically this fraction is completely absent from later 3rd millennium BC Lower Mesopotamian texts. It could be suggested that seemingly Mesopotamian cubic weights made in Indian workshops were actually made in accordance with the local weight system.
5. 1.71-1.81 g
   Weights in this range represent 1⁄8 of the Harappan shekel oscillating between 13.68 g and 14.48 g.

Weights in the range of 2-10 g (Fig. 6.30)

1. 2.09-2.29 g
   Most weights in this range represent 1⁄6 of the Harappan unit of 12.54-13.74 g. The four weights weighing precisely 2 g should be considered as 1⁄4 of the Mesopotamian unit underestimated at 8 g.



▲*Fig. 6.25. Cosine Quantogram Analysis of Dholavira weights.*

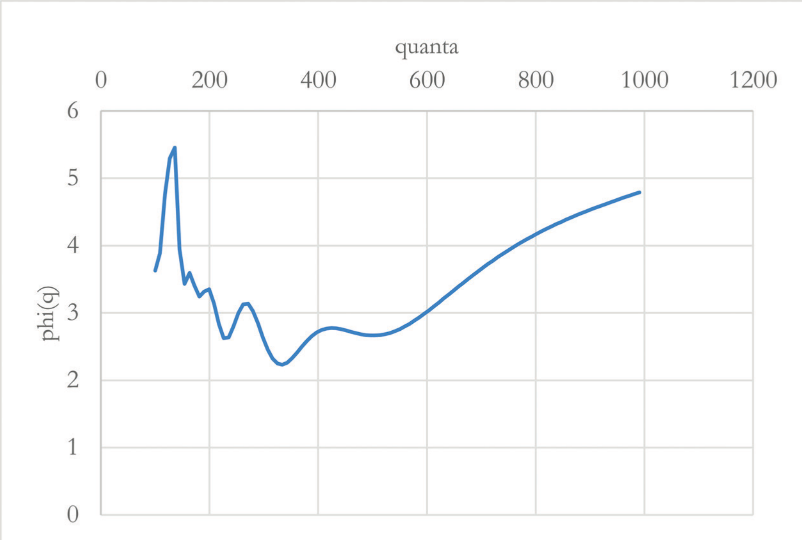


▲*Fig. 6.26. Cosine Quantogram Analysis of Dholavira cubic weights.*

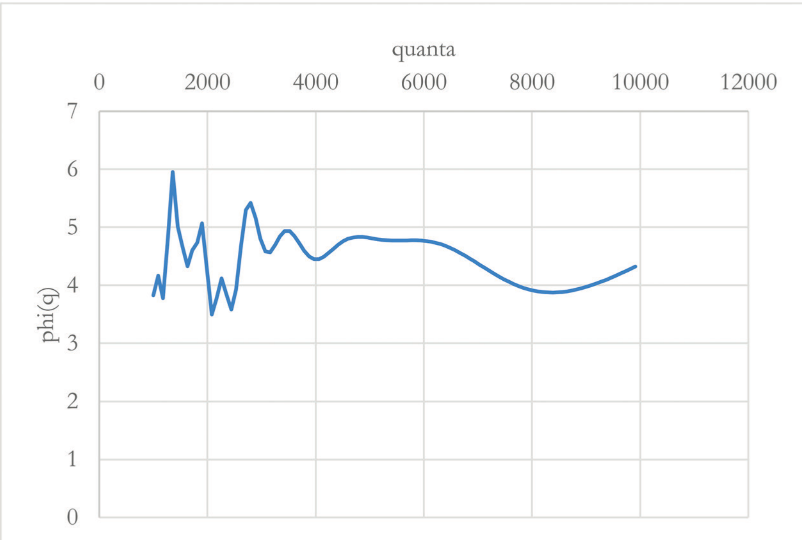
2. 3.30-3.51 g
   Weights in this range represent 1⁄4 of the basic unit of 13.20-14.04 g.
3. 6.69-7.02 g
   Weights in this range represent 1⁄2 of the Harappan shekel of 13.38-14.04 g.

Weights in the range of 10-40 g (Fig. 6.31)

1. 13.40-14.33 g
   The weights in this range represent one Harappan shekel.
2. 17.21-17.25 g
   The four weights in this range should be considered as a Mesopotamian double shekel, with a base unit between 8.60-8.62 g. As mentioned in Chapter 5, A. S. Hemmy (1931, 590, tab. I) already noted this value



▲*Fig. 6.27. Cosine Quantogram Analysis of weights with range 100-1,000 g.*



▲*Fig. 6.28. Cosine Quantogram Analysis of weights with range 1,000-13,620 g.*

as an unusual multiple of 12.5 in his reconstructed weighing sequence (1⁄16, ⅛, ¼, ½, 1, 2, 4, 12.5, 20, 40, 100, 200, 400, 500, 800). The Mesopotamian shekel spread all along the Indus Valley and was widely used in the settlements of Mohenjo-daro, Harappa and Chanhu-daro (Ascalone/Peyronel 1999, 354-362; 2003, 374-385), in the Ghaggar basin (Ascalone 2018, no. 10, 20), and in Gujarat.

3. 26.99-29.19 g
   Weights in this range represent two Harappan shekels of 13.49-14.59 g.

Weights in the range of 100-350 g (Fig. 6.32)

1. 116.37-136.72 g
   Weights in this range represent ten units of 11.64-13.67 g (slight underestimation for two specimens).
2. 182.76-199.10 g
   Weights in this range could represent 20 shekels of 9.14 g (Cat. no. 2005), a unit common amongst the weights from the Greater Indus Valley, or 15 Harappan units of 13.27 g (Cat. no. 1976, a cubic limestone weight). The Harappan sequence, however, usually follows a progressive decimal system (10, 20, 40 *etc.*), with no record of a multiple of 15. It must be noted, however, that occasionally weights produced outside the Greater Indus Valley can adhere to slightly different fractions and multiples (see specimens from Shahr-i Sokhta in Ascalone 2020, no. 1, 3, 5).
3. 270.00-270.83 g
   Weights in this range represent 20 units of the 13.50-13.54 g local shekel.

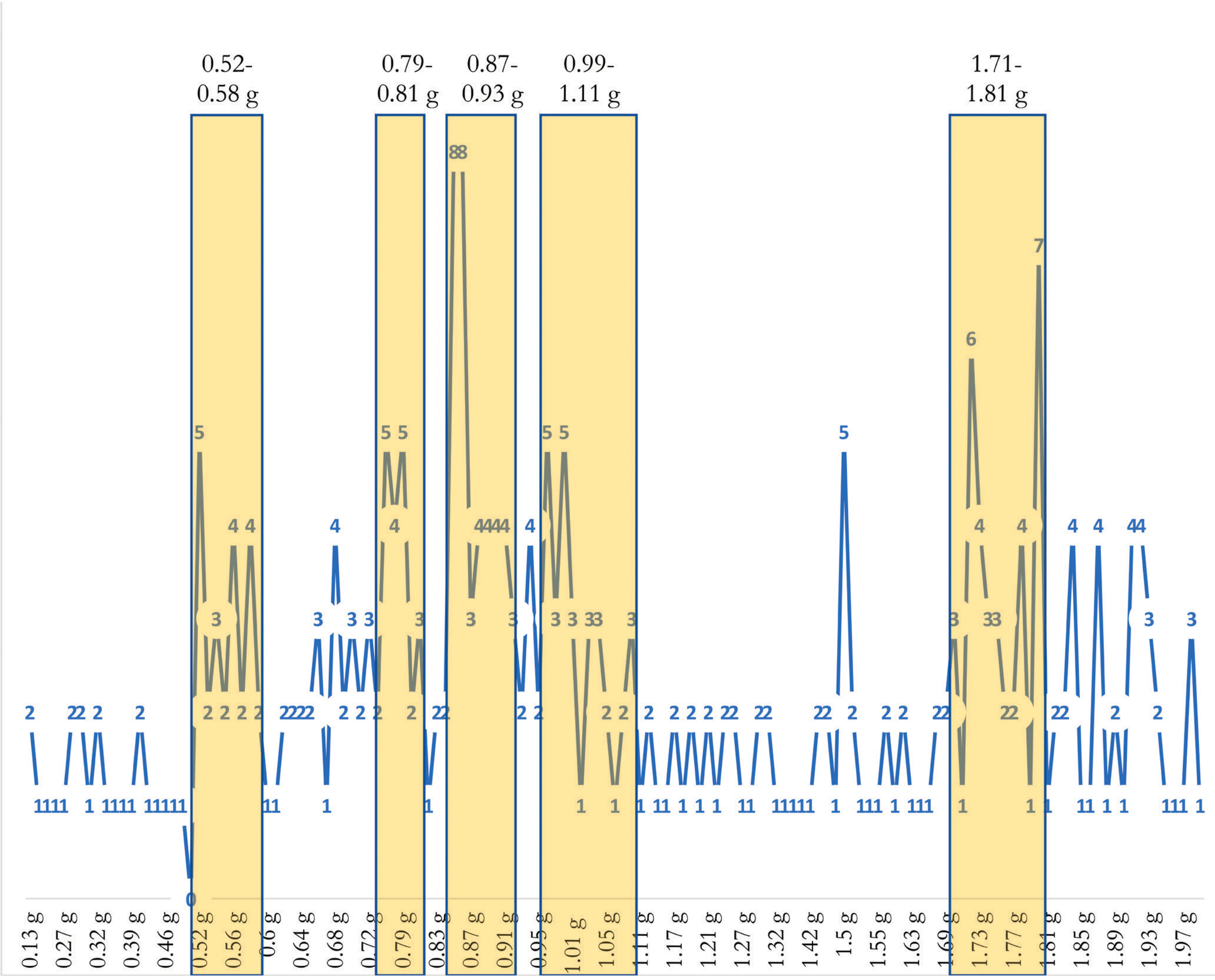
CQA of the mass values of all objects considered as weights and the cubic weights by themselves confirms a base unit of *c.* 13.60 g.

More detailed metrological analysis has been carried out on some of the more doubtful typological categories: Types 11a (Fig. 6.33), 11c (Fig. 6.34), and 16 (Fig. 6.35). As mentioned, the wide range of possible functions means that parallelepiped specimens require careful analysis on an individual basis. Type 11a and 11c shell objects, however, were analysed with CQA to understand if the stacks of cylinder-shaped *Turbinella pyrum* objects could have been created through the weighing of individual blocks. In this case, the studied objects would not be classified as weights, but as weight-regulated artefacts that can help to reconstruct the reference weight system on the basis of which they were produced.

Analysis of the undamaged parallelepipeds between 0-10 g returns two peaks (1.70 g = ⅛ of 13.60 g; 7 g = ½ of 14 g), both of which are consistent with the local system.

CQA of the *Turbynella pyrum* blocks confirmed what was previously assumed in the past by K. M. Kenoyer (2008, 21): in both graphs the peaks are at 0.85 g (= 1⁄16 of 13.60 g) and 0.90 g (= 1⁄16 of 14 g), and therefore well within the range of the Harappan weight system. This confirms that Harappan balance weights were not only used for accounting purposes, but also for the processing of raw materials, as suggested by the archaeological evidence from Bagasra (Kenoyer 2010, 115-117).

Whilst detailed analysis of each individual weight would go beyond the scope of this publication, it seems possible to identify groups of weights that may represent specimens belonging to different weighing groups than those based on the 'standard' 13.65 g shekel. For consistency, only those specimens that could be identified as balance weights with certainty and those with higher mass values were included in these groups, to avoid unintentional bias of the metrological data.



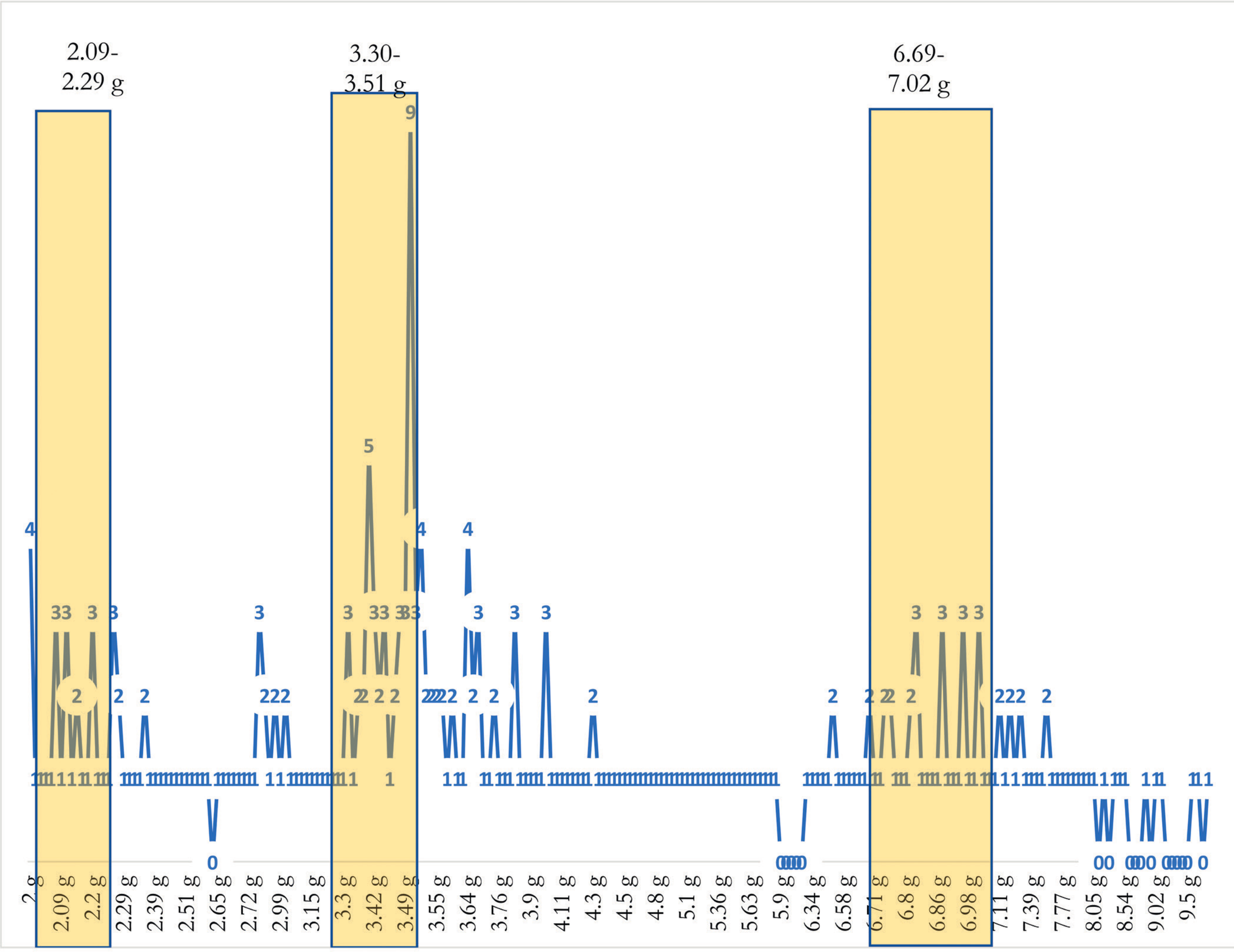
▲*Fig. 6.29. Main clusters of mass values from Dholavira (0-2 g).*

The Ghaggar group (Cat. no. 1296, 1303, 1316-1321, 1340, 1657, 1665, 1676-1682, 1696-1699, 1721-1736, 1758-1761, 1763-1764, 1796-1717, 1719-1825, 1875-1878, 1881-1884, 1916-1921, 1952-1954, 1965-1966, 1971, 1991, 1999, 2007, 2055)

This group contains all those weights that return base units much heavier than the traditional shekel. This heavier unit was previously identified by the author in the Ghaggar valley (see Rakhigarhi and Farmana weights), where no weight returned a unit less than 14.02 g, with an average of its values estimated at 14.43 g (Ascalone 2018). Based on the results from Rakhigarhi and Farmana, it was decided to name this group after the valley in which both settlements are located. However, this terminology should be considered utilitarian pending more appropriate studies of the regionalisation processes of weighing systems in the Greater Indus Valley.

The weights are:

Cat. no. 1296: 0.61 g x 24 = 14.64 g
Cat. no. 1303: 0.89 g x 16 = 14.24 g
Cat. no. 1318: 1.75 g x 8 = 14.00 g
Cat. no. 1319: 1.75 g x 8 = 14.00 g
Cat. no. 1320: 1.76 g x 8 = 14.08 g
Cat. no. 1321: 1.78 g x 8 = 14.24 g
Cat. no. 1340: 1.80 g x 8 = 14.40 g
Cat. no. 1657: 0.44 g x 32 = 14,08 g
Cat. no. 1665: 0.65 g x 24 = 14.88 g
Cat. no. 1676: 0.89 g x 16 = 14.24 g
Cat. no. 1677: 0.90 g x 16 = 14.40 g
Cat. no. 1678: 0.90 g x 16 = 14.40 g
Cat. no. 1679: 0.90 g x 16 = 14.40 g
Cat. no. 1680: 0.91 g x 16 = 14.56 g
Cat. no. 1681: 0.92 g x 16 = 14.72 g
Cat. no. 1682: 0.94 g x 16 = 15.04 g
Cat. no. 1696: 1.20 g x 12 = 14.40 g
Cat. no. 1697: 1.21 g x 12 = 14.52 g
Cat. no. 1698: 1.22 g x 12 = 14.64 g
Cat. no. 1699: 1.24 g x 12 = 14.88 g
Cat. no. 1721: 1.76 g x 8 = 14.08 g
Cat. no. 1722: 1.77 g x 8 = 14.16 g
Cat. no. 1723: 1.78 g x 8 = 14.24 g
Cat. no. 1724: 1.80 g x 8 = 14.40 g
Cat. no. 1725: 1.80 g x 8 = 14.40 g
Cat. no. 1726: 1.80 g x 8 = 14.40 g
Cat. no. 1727: 1.83 g x 8 = 14.64 g
Cat. no. 1728: 1.83 g x 8 = 14.64 g
Cat. no. 1729: 1.84 g x 8 = 14.72 g
Cat. no. 1730: 1.84 g x 8 = 14.72 g
Cat. no. 1731: 1.85 g x 8 = 14.80 g



▲*Fig. 6.30. Main clusters of mass values from Dholavira (2-10 g).*

Cat. no. 1732: 1.87 g x 8 = 14.96 g
Cat. no. 1733: 1.89 g x 8 = 15.12 g
Cat. no. 1734: 1.89 g x 8 = 15.12 g
Cat. no. 1735: 1.91 g x 8 = 15.12 g
Cat. no. 1736: 1.91 g x 8 = 15.12 g
Cat. no. 1758: 2.36 g x 6 = 14.16 g
Cat. no. 1759: 2.36 g x 6 = 14.16 g
Cat. no. 1760: 2.38 g x 6 = 14.28 g
Cat. no. 1761: 2.39 g x 6 = 14.34 g
Cat. no. 1763: 2.53 g x 6 = 15.18 g
Cat. no. 1764: 2.54 g x 6 = 15.24 g
Cat. no. 1796: 3.50 g x 4 = 14.00 g
Cat. no. 1797: 3.50 g x 4 = 14.00 g
Cat. no. 1798: 3.50 g x 4 = 14.00 g
Cat. no. 1799: 3.50 g x 4 = 14.00 g
Cat. no. 1800: 3.51 g x 4 = 14.04 g
Cat. no. 1801: 3.51 g x 4 = 14.04 g
Cat. no. 1802: 3.51 g x 4 = 14.04 g
Cat. no. 1803: 3.52 g x 4 = 14.08 g
Cat. no. 1804: 3.52 g x 4 = 14.08 g
Cat. no. 1805: 3.52 g x 4 = 14.08 g
Cat. no. 1806: 3.53 g x 4 = 14.12 g
Cat. no. 1807: 3.53 g x 4 = 14.12 g
Cat. no. 1808: 3.55 g x 4 = 14.20 g
Cat. no. 1809: 3.57 g x 4 = 14.28 g
Cat. no. 1810: 3.57 g x 4 = 14.28 g
Cat. no. 1811: 3.58 g x 4 = 14.32 g
Cat. no. 1812: 3.59 g x 4 = 14.36 g
Cat. no. 1813: 3.59 g x 4 = 14.36 g
Cat. no. 1814: 3.60 g x 4 = 14.40 g
Cat. no. 1815: 3.64 g x 4 = 14.56 g
Cat. no. 1816: 3.64 g x 4 = 14.56 g
Cat. no. 1817: 3.67 g x 4 = 14.68 g
Cat. no. 1819: 3.68 g x 4 = 14.72 g
Cat. no. 1820: 3.68 g x 4 = 14.72 g
Cat. no. 1821: 3.71 g x 4 = 14.84 g
Cat. no. 1822: 3.74 g x 4 = 14.96 g
Cat. no. 1823: 3.76 g x 4 = 15.04 g
Cat. no. 1824: 3.77 g x 4 = 15.08 g
Cat. no. 1825: 3.79 g x 4 = 15.16 g
Cat. no. 1875: 7.00 g x 2 = 14.00 g
Cat. no. 1876: 7.02 g x 2 = 14.04 g
Cat. no. 1877: 7.02 g x 2 = 14.04 g
Cat. no. 1878: 7.02 g x 2 = 14.04 g
Cat. no. 1881: 7.08 g x 2 = 14.16 g
Cat. no. 1882: 7.09 g x 2 = 14.18 g
Cat. no. 1883: 7.11 g x 2 = 14.22 g
Cat. no. 1884: 7.18 g x 2 = 14.36 g
Cat. no. 1916: 14.00 g x 1 = 14,00 g
Cat. no. 1917: 14.10 g x 1 = 14.10 g

Cat. no. 1918: 14.16 g x 1 = 14.16 g
Cat. no. 1919: 14.33 g x 1 = 14.33 g
Cat. no. 1920: 14.68 g x 1 = 14.68 g
Cat. no. 1921: 14.80 g x 1 = 14.80 g
Cat. no. 1952: 29.12 g ÷ 2 = 14.59 g
Cat. no. 1953: 29.24 g ÷ 2 = 14.62 g
Cat. no. 1954: 29.48 g ÷ 2 = 14.74 g
Cat. no. 1965: 57.40 g ÷ 4 = 14.35 g
Cat. no. 1966: 57.76 g ÷ 4 = 14.44 g
Cat. no. 1971: 87.89 g ÷ 6 = 14.65 g
Cat. no. 1991: 0.88 g x 16 = 14.08 g
Cat. no. 1999: 1.80 g x 8 = 14.40 g
Cat. no. 2007: 1.87 g x 8 = 14.96 g
Cat. no. 2055: 58.09 g ÷ 4 = 14.52 g

These 95 weights return a unit range between 14 g and 15.24 g, with an estimated mean value of 14.44 g, which is exactly in line with the mean value of the weights found at Rakhigarhi and Farmana (14.43 g). This system seems to follow binary values for both fractions (½, ¼, ⅛, ¹⁄₁₆, ¹⁄₃₂) and multiples (2, 4, 8 and 16), with the presence of an unusual factor 'x 6', which could be a variable due to exogenous factors; in fact, in fractions, sexagesimal bases are known in the divisions of ¹⁄₂₄, ¹⁄₁₂, ⅙ of the unit-base, while only one specimen (Cat. no. 1971 of 14.65 g) is known among the multiples. The base value of this unit seems to be *c.* 14.40 g (well beyond the 3 % tolerance proposed in Powell 1979, 78) and follows two numerical progressions: binary and sexagesimal.

The Western group (Cat. no. 1310-1314, 1336, 1341, 1596, 1704-1706, 1735-1743, 1765, 1827, 1885-1886, 1931, 2005)

The weights with base units deriving from the 470 g mina were previously considered by the author (Ascalone/Peyronel 1999, 354-362; 2003, 374-385; see also Rahmstorf 2020, 82-83), on the basis of first publications by A. S. Hemmy (1931; 1938a) and M. S. Vats (1940). This group of weights is similar to western metrological values with units of 7.83 g and 9.40 g, as were present in Syria and Upper Mesopotamia, especially from the middle of the 3rd millennium BC onward. Again, only objects that can be classed as balance weights with certainty were included in the analysis.

Cat. no. 1310: 1.50 g x 6 = 9.00 g; x 5 = 7.50 g
Cat. no. 1311: 1.50 g x 6 = 9.00 g; x 5 = 7.50 g
Cat. no. 1312: 1.51 g x 6 = 9.06 g; x 5 = 7.55 g
Cat. no. 1313: 1.52 g x 6 = 9.12 g; x 5 = 7.60 g
Cat. no. 1314: 1.53 g x 6 = 9.18 g; x 5 = 7.65 g
Cat. no. 1336: 5.03 g x ³⁄₂ = 7.54 g
Cat. no. 1341: 7.77 g x 1 = 7.77 g
Cat. no. 1596: 77.70 g ÷ 10 = 7.70 g
Cat. no. 1704: 1.50 g x 6 = 9.00 g
Cat. no. 1705: 1.50 g x 6 = 9.00 g
Cat. no. 1706: 1.56 g x 6 = 9.36 g; x 5 = 7.80 g
Cat. no. 1735: 1.91 g x 4 = 7.64 g
Cat. no. 1736: 1.91 g x 4 = 7.64 g
Cat. no. 1737: 1.91 g x 4 = 7.64 g

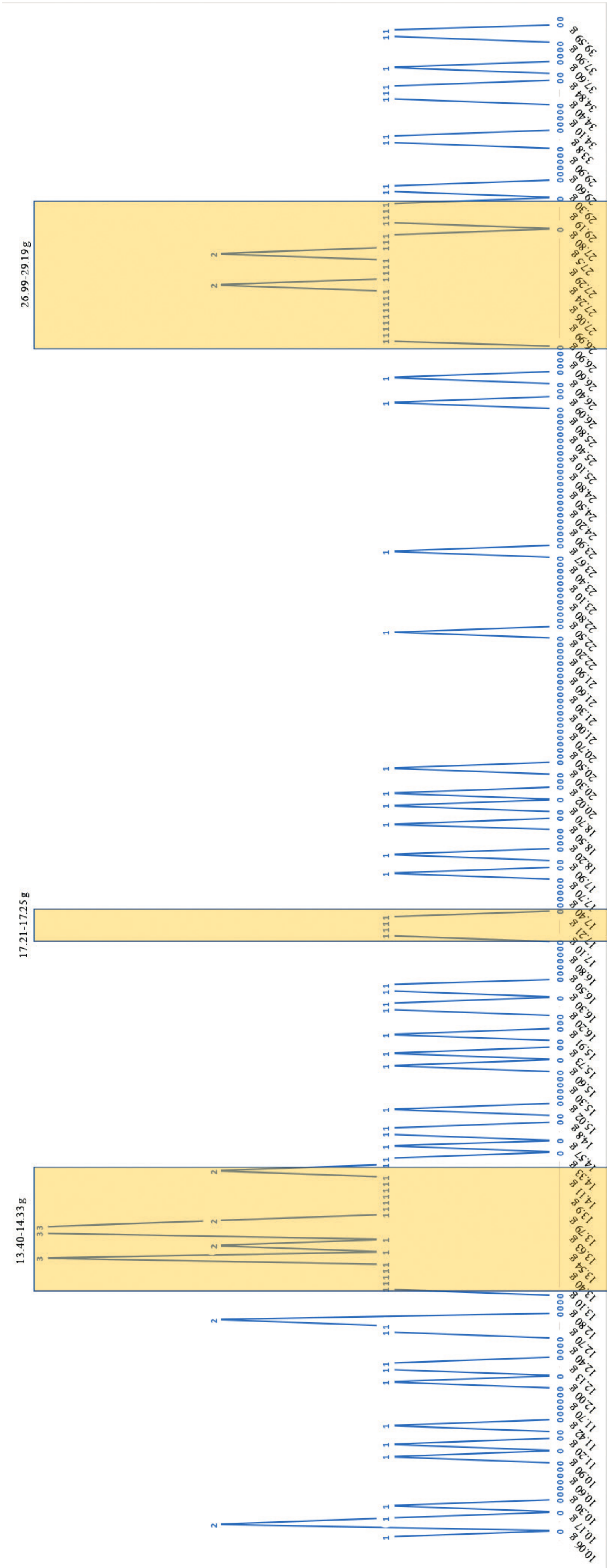


Fig. 6.31. Main clusters of mass values from Dholavira (10-40 g).

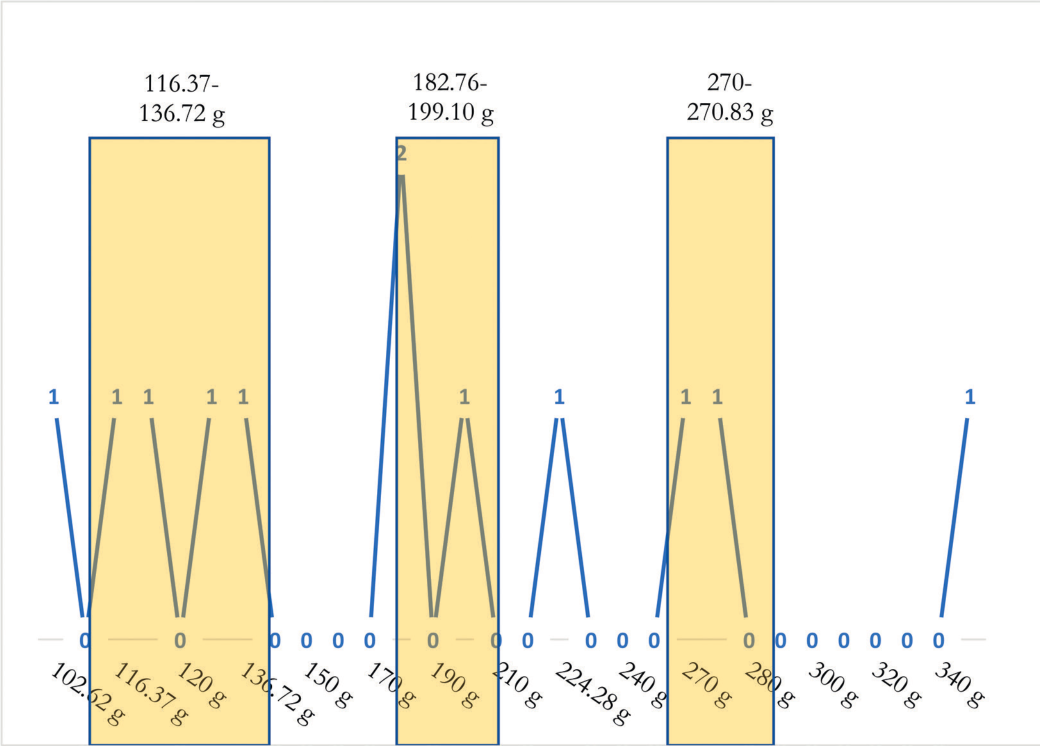


Fig. 6.32. Main clusters of mass values from Dholavira (100-350 g).

Cat. no. 1738: 1.92 g x 4 = 7.68 g
Cat. no. 1739: 1.93 g x 4 = 7.72 g
Cat. no. 1740: 1.93 g x 4 = 7.72 g
Cat. no. 1741: 1.94 g x 4 = 7.76 g
Cat. no. 1742: 1.95 g x 4 = 7.80 g
Cat. no. 1743: 1.96 g x 4 = 7.84 g
Cat. no. 1765: 2.56 g x 3 = 7.68 g
Cat. no. 1827: 3.85 g x 2 = 7.70 g
Cat. no. 1885: 7.64 g x 1 = 7.64 g
Cat. no. 1886: 7.82 g x 1 = 7.82 g
Cat. no. 1931: 18.54 g ÷ 2 = 9.27 g
Cat. no. 2005: 182.76 g ÷ 20 = 9.13 g

The Mesopotamian group (Cat. no. 1331-1334, 1345-1346, 1597, 1700-1701, 1745-1746, 1748-1752, 1828-1830, 1839-1841, 1887, 1889, 1925, 1927, 1990-1991, 1994-1996, 2000-2001, 2011-2012, 2051)

The presence of Lower Mesopotamian weights along the Indus Valley has been the subject of previous publications (Ascalone/Peyronel 1999, 357-362; 2003, 380-385). In Dholavira, at least 36 weights (Cat. no. 1700-1701 could also be considered as weights belonging to the 'Syrian' system) have mass values representing fractions of ⅙, ¼, ⅓, ½ and ⅔, as documented in Mesopotamian texts from the 3rd millennium BC (Bartash 2019, 16-59), and multiples counted at 2, 4 and 10 Mesopotamian units (Cat. no. 1887, 1889 and 2001 return base units between 8.05-8.89 g, seemingly confirming use of the light (8.40 g) and heavy (8.90 g) shekel from the middle of the 3rd millennium BC onwards - on the spread of the 8.90 g shekel see Chapter 4).

Cat. no. 1331: 3.95 g x 2 = 7.90 g
Cat. no. 1332: 3.99 g x 2 = 7.98 g
Cat. no. 1333: 3.99 g x 2 = 7.98 g
Cat. no. 1334: 4.11 g x 2 = 8.22 g
Cat. no. 1345: 16.25 g ÷ 2 = 8.13 g
Cat. no. 1346: 17.25 g ÷ 2 = 8.62 g
Cat. no. 1597: 78.11+x g ÷ 10 = 7.81+x g
Cat. no. 1700: 1.31 g x 6 = 7.86 g
Cat. no. 1701: 1.31 g x 6 = 7.86 g
Cat. no. 1745: 1.98 g x 4 = 7.92 g
Cat. no. 1746: 2.00 g x 4 = 8.00 g
Cat. no. 1748: 2.07 g x 4 = 8.28 g
Cat. no. 1749: 2.08 g x 4 = 8.32 g
Cat. no. 1750: 2.08 g x 4 = 8.32 g
Cat. no. 1751: 2.09 g x 4 = 8.36 g
Cat. no. 1752: 2.10 g x 4 = 8.40 g
Cat. no. 1828: 4.02 g x 2 = 8.04 g
Cat. no. 1829: 4.05 g x 2 = 8.10 g
Cat. no. 1830: 4.14 g x 2 = 8.28 g
Cat. no. 1839: 5.36 g x 3/2 = 8.04 g
Cat. no. 1840: 5.62 g x 3/2 = 8.43 g
Cat. no. 1841: 5.70 g x 3/2 = 8.55 g
Cat. no. 1887: 8.05 g x 1 = 8.05 g
Cat. no. 1889: 8.54 g x 1 = 8.54 g
Cat. no. 1925: 16.41 g ÷ 2 = 8.21 g
Cat. no. 1927: 17.13 g ÷ 2 = 8.55 g
Cat. no. 1990: 2.10 g x 4 = 8.40 g
Cat. no. 1991: 4.13 g x 2 = 8.26 g
Cat. no. 1994: 5.32 g x 3/2 = 7.98 g
Cat. no. 1995: 5.41 g x 3/2 = 8.11 g
Cat. no. 1996: 5.80 g x 3/2 = 8.70 g
Cat. no. 2000: 5.60 g x 3/2 = 8.40 g
Cat. no. 2001: 8.89 g x 1 = 8.89 g
Cat. no. 2011: 32.60 g ÷ 4 = 8.15 g
Cat. no. 2012: 17.21 g ÷ 2 = 8.60 g
Cat. no. 2051: 2.69 g x 3 = 8.07 g

The mina group (Cat. no. 1350-1355, 1502-1505, 1601-1602, 1605-1607, 1980-1986)

A group of weights return base values related to the Dilmunite mina, so-called due to its diffusion in the Persian Gulf area and in the textual references from Mesopotamia. The mina, counted at *c.* 1,360 g and obtained from 100 units of *c.* 13.60 g, can be recognised in at least 17 specimens, some of which are unfortunately heavily damaged (Cat. no. 1350, 1354-1355, 1502, 1504-1505, 1605-1606, 1980, 1982).

In addition to this group of Dilmunite minas, there are some weights that represent variations of Mesopotamian minas: Cat. no. 1601, a slightly chipped discoid made of limestone, represents exactly one Mesopotamian mina, with a mass of 490 g. Cat. no. 1983, a cuboid made of basalt, represents six minas of 505 g. Cat. no. 1984 represents seven minas of 502.86 g. Interestingly, the last two weights are perfectly identical in shape and made of the same material, seemingly demonstrating a standardisation of this category of weights with reference to Mesopotamian weighing values.

A final consideration can be made for Cat. no. 1604 of 4,050 g, which is discoid in shape and made of limestone. The weight demonstrates the traditional weight relationship between the Harappan and Mesopotamian weighing systems, with a ratio of 3 to 8: 4,050 g = 3 Dilmunite minas of 1,350 g or 8 Mesopotamian minas of 506.25 g. This weight, used for weighing large quantities of materials (copper?), dates to the Late Harappan period (Period VI in Dholavira), when the evidence for Harappan culture had almost completely disappeared throughout Gujarat. It could be suggested that it was used to convert weight values from the local to the Mesopotamian system.

Cat. no. 1350: 580+x g x 2 = 1,160+x g
Cat. no. 1351: 1,330 g x 1 = 1,330 g
Cat. no. 1352: 1,350 g x 1 = 1,350 g
Cat. no. 1353: 2,690 g ÷ 2 = 1,345 g
Cat. no. 1354: 3,860+x g
Cat. no. 1355: 10,300+x g
Cat. no. 1502: 510+x g x 2 = 1,020+x g
Cat. no. 1503: 810 g x 3/2 = 1,215 g
Cat. no. 1504: 3,860+x g ÷ 3 = 1,286+x g
Cat. no. 1505: 4,590+x g ÷ 4 = 1,147+x g; ÷ 10 = 459+x g
Cat. no. 1601: 490+x g x 1 = 490+x g
Cat. no. 1602: 550+x g x 2 = 1,100+x g
Cat. no. 1604: 4,050 g ÷ 3 = 1,350 g; ÷ 8 = 506.25 g
Cat. no. 1605: 4,550+x g ÷ 4 = 1,137.50+x g
Cat. no. 1606: 4,830+x g ÷ 4 = 1207.50+x g
Cat. no. 1607: 11,170 g ÷ 8 = 1,396.25 g
Cat. no. 1980: 1,310+x g x 1 = 1,310+x g
Cat. no. 1981: 1,880+x g
Cat. no. 1982: 2,520+x g ÷ 2 = 1,260+x g
Cat. no. 1983: 3,030 g ÷ 6 = 505 g

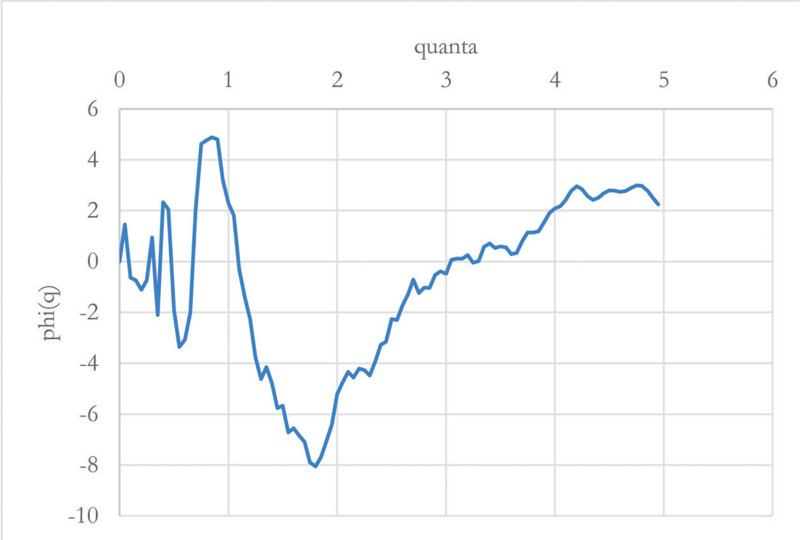


Fig. 6.33. Cosine Quantogram Analysis of Type 11a from Dholavira.

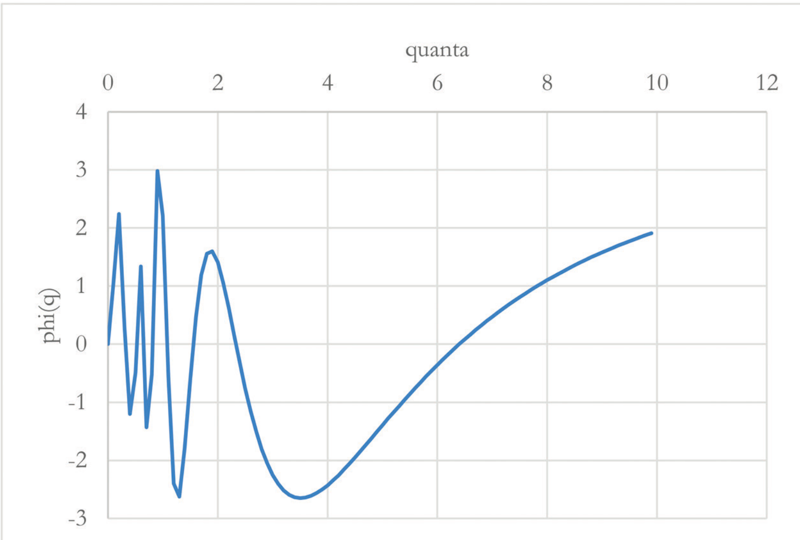


Fig. 6.34. Cosine Quantogram Analysis of Type 11c from Dholavira.

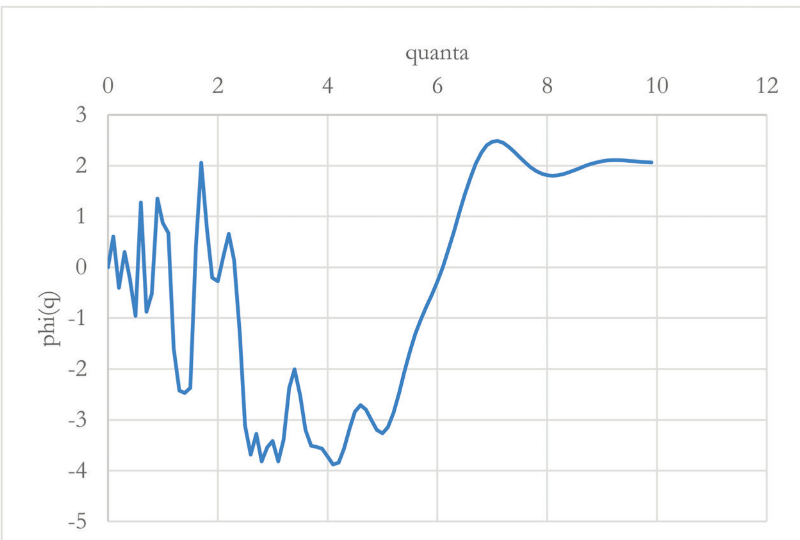


Fig. 6.35. Cosine Quantogram Analysis of Type 16 from Dholavira.

Cat. no. 1984: 3,520 g ÷ 7 = 502.86 g

Cat. no. 1985: 5,360 g ÷ 4 = 1,340 g; ÷10 = 536 g

Cat. no. 1986: 5,690 g ÷ 4 = 1,422 g; ÷ 10 = 569 g

7 Conclusions

This volume presents the results of six years of research on the Bronze Age balance weights from the Near East and South Asia. During the research, a total of 2,058 specimens have been recorded, presented here in the form of a detailed catalogue and photographic illustrations (plates). Although an extensive discussion of the historical problems would go beyond the scope of this publication, preliminary metrological analyses have been included, thus requiring at least a degree of historical considerations.

At first glance, the major findings of this research relate to typological aspects of the weights. The research has shown that objects that were previously not considered as balance weights could in fact have had a metrological function. At the same time, it has become apparent that certain other morphologies could not have been used as balance weights.

Whilst the function of Mesopotamian pebbles remains uncertain, it can now be assumed that pebbles from the Greater Indus Valley were indeed used as weights, most likely in a domestic environment. Where Types 3-6 and 22 have to be considered anomalous weight typologies, the hematite cylinders from Mesopotamia (unfinished seals), the shell cylinders from the Indus Valley (weight-regulated raw material produced for the 'international'), the sphendonoid clay objects (Type 24) particularly widespread in eastern Iran (Tepe Yahya and Shahr-i Sokhta), the miniature columns (Type 13) widely diffused in eastern Iran and Central Asia between the end of the third and the first centuries of the 2nd millennium BC, and the numerous flat pebbles that fill the tombs of Shahr-i Sokhta (Type 9a) must be excluded as balance weights. On the other hand, however, analysis of the objects recorded in this catalogue suggests that certain types that were previously not considered as balance weights, or at most highly debated, could indeed have had a metrological function. For example, steatite hand bag-shaped objects can now be considered as balance weights, most likely used for transactions involving heavy amounts of goods. Previously unconsidered typologies such as discoids, parallelepipeds and pebbles must be added to the range of Greater Indus Valley weights.

Similarly, the perforated pear-shaped weights (Type 14), commonly found in Baluchistan and along the Indus Valley, must be considered as balance weights that were established in Baluchistan during the 4th millennium BC and then subsequently spread to the major early Harappan settlements. This particular type of weights, used for weighing large quantities of material, stands in contrast to the production of steatite hand bag-shaped weights, which occurred anywhere between Central Asia and south-eastern Iran around the middle of the 3rd millennium BC. In other words, from the second half of the 4th millennium BC, two types of weights were used for heavy materials: hand bag-shaped weights, commonly found along the Halil valley (including Shahdad), the Gorgan plain (Tepe Hissar), in Margiana (Altyn Tepe, Kara Depe, Anau, Sarazm), and Bactria (Soch, Dashly, Mundigak), and pear-shaped weights used in Baluchistan (Sohr Damb, Bampur, Tepe Hussaini, Kinneru damb, Nichara), Makran (Shahi-Tump), along the Indus River Valley (Harappa, Mohenjo-daro), and in Gujarat (Lothal). During the first half of the 3rd millennium BC, two different typological 'spheres' coexisted for weighing large quantities of material, such as tin, silver, or lapis lazuli (see, for example, the inscribed weight from Ebla which was found in association with lapis lazuli blocks): one cultural sphere producing steatite (south-eastern Iran) and/or calcite/limestone/alabaster hand bag-shaped weights (Margiana and Bactria), another sphere producing pear-shaped weights dating back to the 4th millennium BC (Baluchistan and Indus Valley).

Regarding the raw materials balance weights were made of, the identification of copper/bronze objects from Dholavira and clay cubes as balance weights is of particular significance. Not only were these materials previously not considered as suitable for the production of weights, it also completely changes the perception of balance weights which in the past was often exclusively associated with regional elites and/or commercial activities.

Distributional analysis of the weights has also made it possible to formulate new historical narratives, which are addressed in this volume. The identification of a large group of locally made weights from Gujarat produced with reference to the Mesopotamian weight system provides physical evidence for the close cultural relationship frequently mentioned in 3rd millennium BC Mesopotamian texts. Furthermore, the presence of Mesopotamian cubic weights produced with mass values related to the Harappan system confirms the existence of a settled Harappan community in Mesopotamia, which was previously only hypothesised based on textual evidence and the combination of Harappan and foreign iconographic depictions on syncretic seals.

The reconstruction of the chronological sequences of the settlements has made it possible to collect new data on the earliest weighing activities in Mesopotamia and on the Iranian plateau (see also the two cubic weights from Dholavira dating back to Period III of the site, *c.* 2800-2500 BC). The weights from the Iranian plateau demonstrate that weighing activities were widespread throughout the region, in line with the extensive commercial activities during the 3rd millennium BC discussed at length in the literature. Despite the vast textual and archaeological evidence for trade between Mesopotamia, the Greater Indus Valley, and the Iranian plateau in the middle of the 3rd millennium BC, so far, no balance weights had been identified in any of the various confederations and political organisations of central and eastern Iran (Marhaši, Šimaški, Tukriš, Aratta). The existence of steatite hand bag-shaped weights around the middle of the 3rd millennium BC and the complete absence of smaller, locally made weights, suggests that balance weights were only used to quantify large amounts of material in southeastern and eastern Iran during this period. Whereas in Mesopotamia the reformation under Sargon declared the conversion between talent, mina and shekel as part of a codified, standardised system, no such official declaration took place Iran. It appears that this historical development in Mesopotamia around 2300 BC, *i. e.* the inception of a sexagesimal system of conversion ratios, did not take place in the Iranian states. Instead, they continued to use various minas (local, Harappan and Mesopotamian) without the creation of an official 'weight system'. This different evolution of weighing systems in eastern Iran and Baluchistan (an area with a weighing tradition significantly older than in Mesopotamia; see the weights from Sohr Damb) fits well with the evolution of the main settlements of the plateau. Shahr-i Sokhta collapsed around 2300 BC, Konar Sandal south did not exist beyond 2200 BC, Yahya IVB, Bampur I-IV and Shahdad III.2 ended around 2200 BC, Hissar IIIB was abandoned around 2300 BC, a new cultural phase began in Malyan (= Anshan), and a new period began in the Indus Valley (Harappa 3C).

It is difficult to explain these different historical developments, although the rise of the Sargonid dynasty, its direct control of the Persian Gulf market, and its military campaigns against the settlements of the Iranian plateau (especially Marhaši) may be the cause of the documented historical discrepancies. The Akkadian ascendancy over the entire region, and its consequent impossibility of controlling such a vast territory, between 2300-2200 BC, was followed by the rise of BMAC, which went on to fill the political gaps left by the Akkadian kingdom. In fact, a vast amount of Oxus archaeological evidence dating to around 2200 BC can be found throughout eastern Iran, from the region of Mashad up to Sistan (now devoid of Shahr-i Sokhta), from Baluchistan to the coast of Hormozgan, which brought an end to the remnants of archaic culture dating back to the first half of the 3rd millennium BC.

In conclusion, the combination of Akkad's military campaigns and a supposed migratory movement coming from the Oxus regions put an end to the cultural traditions of eastern Iran, and prevented the development of the commercial system and, with it, the reformation of weights and measures, as took place in Mesopotamia and the Greater Indus Valley.

Chronologically, particularly interesting are the two cubic weights from Period III at Dholavira, which can be ascribed to the second quarter of the 3rd millennium BC (2800-2500 BC). On the one hand, they seem to confirm the adoption of cubic balance weights before the middle of the 3rd millennium BC, and, on the other hand, that weighing activities took place in Gujarat before the definitive adoption of Harappan culture in the area, which evidently was the result of a long process that also involved Gujarat.

Another significant contribution of this volume is the contextual analysis of the Dholavira weights. Dholavira, together with Ebla, allows a contextual and chronological evaluation of balance weights and an unprecedented level, significantly more so than any other site, thus providing essential tools and data for the historical analysis of balance weights. The archaeological contexts in Dholavira have shown that weighing activities were undertaken by all inhabitants, and not just exclusively available to certain elites, merchants or other specialist groups. Instead, weighing was accessible to, and used by, all members of Dholavira society, irrespective of their status or wealth. In addition to the identification of pebbles and clay objects as weights, this revolutionary narrative imposes new and deeper considerations about the nature of weighing in the Bronze Age.

Diachronic analysis of the Dholavira contexts confirms that Mesopotamian weights were homogenously used throughout the entire occupation of the settlement (from Periods IV to VI, *c.* 2500-1800 BC), thus confirming commercial continuity along the Persian Gulf during the first two centuries of the 2nd millennium BC. Furthermore, the evidence from Dholavira makes it possible to trace the chronological development of different typologies: while 'traditional' shapes such as biconical, cubic, and parallelepiped weights were consistently used throughout the Harappan period (from Period IV/Mature Harappan to Period VI/Late Harappan), truncated cones were only used during Period IV of the site (*c.* 2500-2100 BC), dome-shaped weights were completely absent during the Late Harappan period (*c.* 2000/1900-1800 BC), and discoidal weights became suddenly significantly more common during Periods V/VI (*c.* 2100-1800 BC).

In addition to the presentation of the recorded materials and the chronological and contextual analysis of individual artefacts, various broader historical and metrological considerations may open up new fields of future research and the basis for new scientific debate in the coming years.

The major novel metrological findings are:

1. The presence of a contemporary shekel of 8.70-8.90 g (with associated mina) in some settlements in southern Mesopotamia during

the second half of the 3rd millennium BC, long before the Neo-Assyrian 1,070 g mina existed.
2. The existence of the Jiroft mina counted at *c.* 1,700 g, which easily converts to both the Harappan and Mesopotamian standards.
3. The recognition of weighing variations amongst the Greater Indus Valley weights, which are not as homogeneous as assumed in the first publications from the mid-20th century. The unit of *c.* 14.40 g could be a variation of the Harappan standard of 13.65 g.
4. The variable behaviour of the Harappan system in foreign contexts, that may deviate from a binary structure for fractions and a decimal system for multiples of the unit, thus moving away from the strong standardisation of its native region.
5. The identification of the wool Mesopotamian mina (equivalent to half a Harappan mina), as mentioned in coeval Mesopotamian texts, as a decisive driver for the development and spread of the Dilmunite mina along the Persian Gulf coast.
6. The existence of a fluid adoption of Mesopotamian and Harappan weight metrology in Iran during the second half of the 3rd millennium BC, according to new evidence from Shahr-i Sokhta and Jiroft.
7. The use of numerous clay and terracotta weights in Gujarat suggesting that weighing was not exclusively available to certain elites of the settlement.

Each of these findings necessitate deeper historical considerations:

1. Why was a shekel of *c.* 8.70-8.90 g used in addition to the standard shekel of 8.40 g? Does it represent a regional variation, or is it instead the result of the need to diversify accounting operations for different products? In this perspective, the questions arises whether the Iron Age double mina of 1,070 g (obtained from 120 shekels of 8.90 g) imposed by the Neo-Assyrian rulers and the traditional Babylonian double mina of 1,010 g (8.40 g x 120) were in fact the basis of the first Persian coinage: unlike the traditional gold stater of 8.40 g, uniformly considered as an expression of the Mesopotamian unit, the silver stater of 10.70 g could have been based on this mina of 1,070 g (1,070 g ÷ 100 = 10.70 g) and perhaps was not obtained by a regional weighing process based on the 'microasiatic' unit of 5.50 g.
2. The possibility of a heavier unit such as at Jiroft opens up a broader evaluation of the commercial role of the Iranian plateau, and makes it possible to identify a metrological link between the contemporary Mesopotamian and Harappan systems, thus restoring to the Iranian hinterland and coasts its commercial role. The presence of a system based on the supposed Jiroft mina or, more correctly, a heavy unit of *c.* 1,700 g, makes it possible to trace the socio-economic aspects of the entities of the Iranian plateau around the middle of the 3rd millennium BC. The unit of *c.* 1,700 g never developed into a sophisticated system with standardised subunits such as a shekel. This is in fact very similar to the archaic Mesopotamian weight system prior to Sargon's reform. In other words, the transition from a 'primitive' to a standardised system with clearly defined subunits never took place in Marhaši. This was likely also due to the lack of a centralised government during this period.
3. The identification of regional variations in Gujarat, and in the Greater Indus Valley in general, changes the perception of the Harappan civilisation, which was too hastily considered totally homogeneous and monolithic in the adoption of weight systems. Recognising regional variations necessitates reconsideration of the diffusion, formation and adoption of Harappan culture in Gujarat. This also suggests the presence of influential local authorities, vastly different to the often-proposed totalitarian state model commonly found in the literature. Whilst such strong cohesion may have existed on a cultural and intellectual level, it was less present on a political and social level.
4. The existence of unusual Harappan weights (*e. g.* specimens with factor 6 of the base unit) in foreign contexts confirms that conversions took place between regions with various levels of commercial relationships.
5. The hypothesis that the Dilmunite mina (1,360 g) may have been used in connection with the Mesopotamian wool mina (*c.* 670 g), and was perhaps adopted for the immediate accounting of traded goods, is in line with Mesopotamian textual documentation mentioning the import of copper from Makkan in addition to large quantities of wool and textiles exported along the sea route of the Persian Gulf. In other words, the copper ingots from Susa must be considered as a currency equivalent to the value of the quantity of wool exchanged.
6. Historically speaking, the presence of light balance weights in eastern Iran restores 'dignity' to a territory that has always been considered a simple, primitive passage between the two major river civilisations at either end. During the second half of the 3rd millennium BC, Iran played an active role in the manifestation and curation of contacts and trade.
7. The presence and distribution of clay weights in the Lower Town contexts of Gu-

jarat suggest that weighing was available to all members of society within the settlement, and not just used by a privileged elite such as merchants or administrators of public resources. The democratisation of weighing and the existence of domestic quantification in addition to official accounting, confirms the heterogeneity of weighing in the Greater Indus Valley. This opens new scenarios regarding the social relations inside and outside a settlement.

This summary provides an overview over some of the results from this study. Some of these topics have previously been addressed by the author in singles journal articles, others will be the subject of further studies in the near future. Always working on the premise that in order to give historical perspective to material culture, one must start the reconstruction of the 'whole' by analysing the objects, and not *vice versa*, thus overcoming any temptation to solipsism and moving from '*sensabilia experientiis*' to '*demonstrationes in opus*'.

Inscribed weights[1]

by Jan Tavernier

This section contains the (re-)publication of 29 weight inscriptions found on 20 duck-shaped, eight sphendonoid and one pyramid-shaped weight. The majority of the weights originate from Susa, with only a few specimens discovered at Telloh. The latter, however, show more morphological variations than their Susa counterparts: four sphendonoids, two duck-shaped and one pyramid weight. Almost all of the Susa weights are duck-shaped (18 specimens), complemented by four sphendonoids. [1]

The following provides a record of the two oyal weights, the 27 non-royal weights, as well as the provenance and the mass mentioned in the text of each weight.

The inscribed weights fit well into the Mesopotamian metrological system, with no. 2.17 as the only exception due to an unusual placement of the inscription (see below). In the following text, the 'left' and 'right' sides of a weight are defined as if looking at it directly from the front.

1 Royal weights (Telloh and Ur)

1.1 AO 246 (Pl. 27: 814)

This sphendonoid weight from Telloh, made of diorite and dated to the Ur III period, comprises a perfectly preserved five-line inscription from Šū-Sîn (2035-2027 BCE). It was published as RIME E3/2.1.4.22 by D. Frayne (1997, 332-333, with bibliography) and translated by M. A. Powell (2000b, 404 no. 2.150).

Text:
(1) 5 ma-na gi-na
(2) ^{d}*šu*-^{d}en-zu
(3) lugal-kala-ga
(4) lugal Uri$_5$^{ki}-*ma*
(5) lugal-an-ub-da-límmu-ba

Translation: 'Five minas, confirmed: Šū-Sîn, mighty king, king of Ur, king of the four quarters'.

Comment: The Sumerian verb gi-na or gi-in (*cf.* 1.2), which is used in legal contexts to affirm that something has been established as true, may be an early adoption of the Akkadian word *kânu* of the same meaning (Powell 2000b, 404 n. 12). This theory is based on an inscription from the Neo-Babylonian king Nebuchadnezzar II (605-562 BCE)[2], in which gi-na and *kânu* are equivalents.

1.2 AO 22187 (Pl. 30: 887)

This pyramid-shaped weight from Ur is made of diorite and also dates to the Ur III period. It comprises a perfectly preserved eight-line inscription from Šulgi (2092-2045 BCE). First published as RIME E3/2.1.2.50 by D. Frayne (1997, 153-154, with bibliography), it was again translated by M. A. Powell (2000b, 404 no. 2.149). With an inscription dedicated to the Sumerian lunar god Nanna, the weight also sports a lunar crescent, the symbol of the moon god, on its top (Frayne 1997, 153).

Text:
(1) ^{d}Nanna
(2) lugal-a-ni
(3) ^{d}*Šul-gi*
(4) nita-kala-ga
(5) lugal Uri$_5$^{ki}-*ma*
(6) lugal-an-ub-da-límmu-ba-ke$_4$
(7) maš ma-na
(8) [m]u-na-gi-i[n]

Translation: 'For the god Nanna, his lord, Šulgi, mighty man, king of Ur, king of the four quarters, confirm[ed] (this weight stone to be) one-half mina'.

Comment: An interesting parallel can be drawn to the weight of Nebuchadnezzar II, which was produced based on a weight from Šulgi[3]. Its inscription reads: (1) [2][4] ⌜ma⌝.na ⌜gi⌝.[na] (2) níg.ga ^{d}amar.utu-lugal-dingir⌜^{meš}⌝ (3) gaba.ri ⌜ki⌝.lá (4) *šá* ^{d}muati-níg.du-ùru (5) lugal ⌜ká.dingir.ra⌝.ki (6) ⌜dumu ^{d}muati-a⌝-ùru (7) ⌜lugal ká.dingir.ra⌝.ki (8) *a-na* ⌜gaba⌝.ri (9) ki.lá ⌜^{d}šul⌝-*gi* (10) lugal *ma-aḫ-ri* ⌜*ú*⌝-*kin-ni* : '[Two] minas, corr[ect (weight)]. Property of Marduk-šar-ilāni[5]. Copy of a (standard) weight of Nebuchadnezzar, king of Babylon, son of Nabopolassar, king of Babylon, (which) he established following a copy of a (standard) weight of Šulgi, a king of the past'.

The weight described here belongs to a set of three diorite duck-shaped weights of Šulgi, all bearing the same inscription but with different masses: ½ mina (E3/2.1.2.50), two minas (E3/2.1.2.51), and five minas (E3/2.1.2.52).

1 Sincere thanks go to Dominique Charpin, Anne Goddeeris, Walther Sallaberger and Karel van Lerberghe for their useful comments.

2 For this weight (BM 91005), see Soutzo 1911, 29; Berger 1973, 147; Powell 2000a, 325 no. 126O; Da Riva 2008, 123 G1; Nebuchadnezzar II G1 at http://oracc.museum.upenn.edu/ribo/pager (accessed ...).

3 Unfortunately, it is unknown which weight this refers to.

4 The Oracc website records one mina, but with as mass of 978.309 g this is more likely equivalent to two minas (Powell 2000a, 325, n. 31).

5 M. A. Powell (2000a, 325) translates 'Property of Marduk king of gods'.

2 Non-royal weights

2.1 Weights from Telloh

2.1.1 AO 230A (Pl. 29: 854)

Duck-shaped weight made of limestone, probably dated to the Ur III period, with a vertical inscription on the left side of the duck.

Text: ½ ma-na

Translation: 'Half a mina'.

2.1.2 AO 21419 (Pl. 29: 853)

Duck-shaped weight made of limestone, discovered in Telloh and probably dating from the Ur III period. The well-preserved three-line inscription was engraved vertically on the right side of the duck. This weight is also mentioned by A. Thomas (2016, 29).

Text:

(1) 1/3 ma-na

(2) gi-na

(3) *ša sa-am-mu'-um*

Translation: '1/3 of a mina, confirmed, of Sammum'.

Comment: *Sa-am-mu'-um* probably refers to a (possibly Akkadian or Elamite) individual's name. For an Akkadian name, one could use the lexeme *sāmu* 'red, reddish brown', which is also attested as *sammu* (CAD S, 126) and is used as a personal name in Akkadian (Stamm 1939, 266). The name could be a reference to the individual's hair colour. On the other hand, however, the name could be connected to Elamite *sammi/zammi*, possibly meaning 'crown' (Hinz/Koch 1987, 1053) or *zammi* 'labourer' (Hinz/Koch 1987, 1270)[6]. The main objection to both hypotheses is that the name would most likely have been spelled **sa-am-mi-im*.

2.1.3 AO 247 (Pl. 27: 810)

Sphendonoid weight made of diorite, dated to the Ur III period. The inscription is slightly worn.

Text: 10 gín

Translation: '10 shekels'.

2.1.4 AO 248 (Pl. 27: 797)

Sphendonoid weight made of black stone, dated to the Ur III period, with a horizontal inscription.

Text: 5 gín

Translation: '5 shekels'.

2.1.5 AO 22744 (Pl. 27: 796)

Sphendonoid weight with a horizontal inscription in Sumerian. It probably dates to the Ur III period.

Text:

(1) Ur-ad dumu

(2) *Ba-a-a* dam-gàr

Translation: 'Ur-Abu, son of Baya, the merchant'.

2.2 Weights from Susa

2.2.1 A. 6909 (Pl. 18: 616)

Duck-shaped weight made of limestone with a two-line inscription engraved horizontally on the left flank of the duck.

Text:

(1) 1 gun gi-na *ša* ^{m}x-^{d}amar-utu

(2) dumu ^{m}*i-na*-é-sag-íl-numun-*ib-ni*

Translation: 'One talent, confirmed, of PN-Marduk, the son of Ina-Esagil-zēr-ibni'.

Comment: According to J. J. Stamm (1939, 229 n. 6), the name type *ina* + temple name + statement occurs very rarely in the Kassite period and is more frequently attested in the post-Kassite periods. Names belonging to this type, however, already appear in Old Babylonian texts, predominantly dated to the reigns of the later Old Babylonian kings, *i. e.* Ammiditana (1683-1647 BCE), Ammiṣaduqa (1646-1626 BCE), and Samsu-ditana (1625-1595 BCE). Nevertheless, one mention of Ina-Ebabbar-balāṭu can be found in JEOL 46 10, dated to the reign of Sîn-muballit (1812-1793 BCE), and some other examples are attested in texts dated to the reigns of Samsi-iluna (1749-1712 BCE) and Abi-ešuḫ (1711-1684 BCE). The names are: Ina-Ebabbar-balāṭu (one text), Ina-Ekur-rabi (eight texts), Ina-Ekur-magir (one text), Ina-Esagil-abi (one text), Ina-Esagil-balāṭu (one text), Ina-Esagil-lū-zērum (one text[7]), Ina-Esagil-zērum (28 texts), Ina-Eulmaš-banat (one text), and Ina-Eulmaš-zērum (nine texts)[8]. They are also regularly attested in the post-Old Babylonian periods. Assyrian texts, however, rarely contain names belonging to this type. Examples are Ina-Ekur-liš[ir] (KAJ 88 obv. 6; Middle Assyrian[9]), Ina-Ekur-ramât (MARV 57 ii 18'; see Freydank/Saporetti 1979, 65), Ina-Ekur-reṣūssu (MAH 16086 A ii 16'; see Freydank/Saporetti 1979, 65), and Ina-Esagil-gapšat (SAA 11 10:10; Neo-Assyrian), who was probably a Babylonian woman (Weszeli 2000).

2.2.2 SM 23 (Pl. 18: 617)

This duck-shaped weight, currently stored in the Susa Museum, will soon be published by Ascalone/Basello (2022). It provides valuable metrological and lexical data, confirming that the Elamite word for 'talent' (usually written logographically as gú or gun) was in fact *kim*. The weight can securely be dated to the Neo-Elamite period. Its inscription is carved horizontally on the left flank of the duck.

Text: ⸢1⸣ *gi-um*

Translation: '1 talent'.

6 See the tables in J. Tavernier (2010, 1065-1068) for equivalences between Akkadian s and Elamite s/z.

7 CBS 1528 ii 9' (Ferwerda/Woestenburg 1998, 153-154).

8 These examples were found by searching through archibab (www.archibab.fr) and the CDLI (https://cdli.ucla.edu/).

9 C. Saporetti (1970, 254) doubts between Ina-Ekur-lib[ur] or Ina-Ekur-li[šir].

2.2.3 A.6356 (Pl. 18: 615)

This diorite duck-shaped weight, probably to be dated to the Old Babylonian period, was first published by V. Scheil (1908, 96, pl. 6/3). It was then mentioned again by M.-C. Soutzo (1911, 5, no. 6356), and eventually republished by F. H. Weissbach (1916, 51). The text is engraved horizontally in two columns on the right side of the duck.

Text:

Column 1	Column 2
(1) ⸢NA$_4$ 40 MA-NA⸣	(1) [*ni*]-*iš-ku-un* NA$_4$ ^{d}AMAR-UTU
(2) GI-NA	(2) KI NA$_4$ É-SAG-ÍL
(3) *na-rù-ʾu* ^{d}IM-*ba-ni*	(3) É-ZI-⸢DA⸣
(4) GALA MAḪ	(4) É-LUGAL-RI-RI-MÁR-DA-KE$_4$
(5) ^{d}AMAR-UTU	
(6) LÚ TIN-TIR^{ki}-KE$_4$	

Translation: 'Stone weight of 40 minas, confirmed. Stone of Adad-bani, the chief of the *gala*-priests of Marduk, man of Babylon. [We] have established the stone weight of Marduk with the stone weight of the Esagil-temple, the Ezida-temple and the E-Lugal-riri-Marad-temple'.

Comment: According to F. H. Weissbach (1916, 58-59), the verbal form *niškun* may imply two things: either '*wir haben gelegt*' or '*wir haben gemacht*'. It is unusual that NA$_4$ refers to three temples but is not in the plural form. There are two possible explanations for this: 1) the inscription means that the weight has been deposited next to three other weights, or 2) the weight was made based on the other weights, with the other objects serving as templates. Weissbach seems to favour the second explanation, which appears to be the most plausible.

2.2.4 Sb 13747 (Pl. 17: 609)

Duck-shaped weight made of diorite, probably dated to the Old Babylonian period. This objects was briefly mentioned by M.-C. Soutzo (1911, 2) because of its poor state of preservation. The inscription is carved horizontally on the left side of the duck.

Text: 20 MA-NA GI-NA

Translation: '20 minas, confirmed'.

2.2.5 Sb 13750 (Pl. 17: 611)

Duck-shaped weight made of diorite, probably dated to the Old Babylonian period. M. C. Soutzo (1911, 41 no. 15) briefly mentions its poor fractured state. The inscription is engraved horizontally on the left side of the duck.

Text: 20 MA-NA *ša* ^{m}*Ba-ru-tim*

Translation: '20 minas of Barutum'.

Commentary: Barutum could be an individual's name, but to the author's knowledge there is no mention of this name in Akkadian onomastics.

2.2.6 Sb 9343 (Pl. 17: 605)

Duck-shaped weight made of limestone. The inscription is engraved vertically on the right flank of the duck.

Text:

(1) [10] MA-NA ⸢10⸣ GÍN

(2) [*šá*] *ù-ba-ia-ti*

Translation: 'X minas and 10 shekels, [of] Ubayatum'.

Comment: The name Ubayatum existed in Old Babylonian Sippar, but was always spelled with initial Ú (Ferwerda/Woestenburg 1998, 341).

2.2.7 Sb 9344 (Pl. 17: 604)

Duck-shaped weight made of limestone. The inscription is engraved vertically on the right flank of the duck.

Text: 10 MA-NA

Translation: '10 minas'.

2.2.8 Sb 13744 (Pl. 16: 600)

Well-preserved duck-shaped weight made of diorite. It was first published by M.-C. Soutzo (1911, 6, no. 6326, fig. 1). The inscription is carved vertically on the duck's right flank.

Text: 5 MA-NA

Translation: '5 minas'.

2.2.9 Sb 9350 (Pl. 16: 596)

Well-preserved duck-shaped weight made of diorite. The Louvre website dates the object to the Middle Elamite period (https://collections.louvre.fr/en/ark:/53355/cl010182086). It was first published by M.-C. Soutzo (1911, 6, no. 1144, fig. 2). The inscription is carved vertically on the duck's right flank.

Text: 4 MA-NA

Translation: '4 minas'.

2.2.10 Sb 13680 (Pl. 11: 479)

Sphendonoid weight made of diorite with a perfectly preserved horizontal inscription.

Text: 3 MA-NA

Translation: '3 minas'.

2.2.11 Sb 9346 (Pl. 16: 592)

This weight is no. 1245 in Soutzo's list of duck-shaped weights (Soutzo 1911, 6). As it is made from mastic bitumen ('*calcaire noir bitumineux*' according to Soutzo), it was published for a second time in a study on bitumen in Susa (Dechesne in Connan/Dechesne 1996, 271 no. 252). Whilst Dechesne proposed a mid-2nd millennium BC date and the Louvre website mentions the Middle Elamite period (https://collections.louvre.fr/en/ark:/53355/cl010128121), in reality the object most likely dates to the 7th or 6th century BC (Ascalone/Basello 2022, 12).

Text: 3 MA-N[A]

Translation: '3 minas'.

Comment: According to Ascalone and Basello, the inscription is carved horizontally on the left flank of the duck, in contrast to the majority of duck-shaped weights which bear vertical inscriptions on the left or right flank of the duck (Ascalone/Basello 2022, 12). In reality, there are several other specimens from Susa with a similar arrangement (see below). Another similar weight from Susa (SM 23, no. 2.2 in this publication) also dates to the Neo-Elamite period.

2.2.12 Sb 13746 (Pl. 17: 606)

This diorite duck-shaped weight dates to the early 1st millennium BC (Powell 2000a, 324) and was first published by V. Scheil (1905, 48). It also appears in Soutzo's list of Susian duck-shaped weights (Soutzo 1911, 8 no. 6325, fig. 7). The four-line horizontal inscription on the left flank of the duck was later translated into English by M. A. Powell (2000a, 324 no. 126I).

Text:
(1) 2 maš ma-na gi-na
(2) *ša* m*Na-ṣi-ri*
(3) dumu m*Ki-din*-d*Gu-la*
(4) šà-bal-bal mÌr-d*É-a*

Translation: '2.5 minas, confirmed, of Naṣiri, son of Kidin-Gula, descendant of Arad-Ea'.

Comment: The 2.5 minas mentioned in the inscription actually represent ten Babylonian minas or 60 Old Persian *kṛša* (Powell 2000a, 324 n. 17)[10].

2.2.13 Sb 9330 (Pl. 15: 587)

Middle Babylonian duck-shaped weight made of hematite. First mentioned by V. Scheil (1909, 137), it was later published by M.-C. Soutzo (1911, 7, no. 12801, fig. 4). The inscription is carved vertically on the duck's right flank.

Text: 1 ma-na
Translation: '1 mina'.

2.2.14 Sb 9345 (Pl. 15: 589)

Diorite duck-shaped weight, first published by M.-C. Soutzo (1911, 6, no. 7895, fig. 3). The inscription is carved vertically on the duck's right flank.

Text: 1 ma-na
Translation: '1 mina'.

2.2.15 Sb 13469 (Pl. 1: 29)

This hematite sphendonoid weight from Susa was first mentioned by V. Scheil (1909, 137), then later published by M.-C. Soutzo (1911, 11, no. 12994, fig. 13) and M. A. Powell (2000a, 324 no. 126C). The weight can be dated to the Old Akkadian period. It bears a horizontal inscription.

Text: 1 ma-na tur
Translation: 'One small mina'.

10 See J. Tavernier (in press) on the Old Persian *kṛša*.

2.2.16 Sb 6339 (Pl. 15: 582)

Duck-shaped weight made of hematite with an unusual arrangement: the two-line inscription is engraved on both sides of the beak.

Text:
(1) maš ma-na gi$_4$
(2) *ša a-šu-ub-<la>-an*

Translation: 'Half a mina, verified, of Ašublan'.

Comment: The sequence a-šu-ub-an does not yield a plausible name. Yet, if altered to a-šu-ub-<la>-an, a connection could be made with the anthroponym Ašublan, attested five times in Old Babylonian texts (ARM 28 44bis:24, 50:14, 105:21'; BBVO 20 3:24,36; FM 9 7:3'; see www.archibab.fr).

2.2.17 Sb 13298 (Pl. 11: 483)

Sphendonoid weight made of diorite with a horizontal inscription.

Text: Igi-5-gál ma-na
Translation: '1/5 of a mina'.

2.2.18 Sb 13753 (Pl. 16: 602)

This duck-shaped weight, dated to the Kassite period, was first published by V. Scheil (1913, 34) and is also cited by the Chicago Assyrian Dictionary, S, p. 145. The inscription is carved horizontally on the left flank of the duck.

Text:
(1) [x ma-na] gi-na[11]
(2) [m*Ka-šak-t*]*i-šu-gab*
(3) [dumu mš]eš-dù
(4) [*i*]-*na* ma-na[12]
(5) [*is*]-*sa-ni-iq*[13]

Translation: 'x minas, confirmed, of Kašakti-Šugab, the son of Aḫu-bani. (This weight) was tested [wi]th the correct mina'.

Comment: Kašakti-Šugab (Kassite name), son of Aḫu-bani (Akkadian name), is also attested in a kudurru from the Kassite king Nazi-Maruttaš (1307-1282 BCE). In this document (NM 2; Paulus 2014, 325-334), Nazi-Marrutaš donates some plots of land to Kašakti-Šugab. According to an epigraph on the same document, Kašakti-Šugab was a scribe (NM 2 V1-V5).

2.2.19 Sb 13603 (Pl. 8: 374)

This sphendonoid limestone weight was discovered in 1934 (see https://collections.louvre.fr/en/ark:/53355/cl010186169) and dates to the Kassite period. Whilst the weight is incomplete, its inscription is preserved in full.

Text: 10 gín
Translation: '10 shekels'.

11 Scheil prefers [*tak* x ma-na] gi-na '[Stone of x minas], fixed'.

12 Scheil has the following reading: [*a*]-*na* ma-na.

13 Scheil reads [*u*]-*sa-ni-iq*.

2.2.20 Sb 9359 (Pl. 14: 571)

Duck-shaped weight made of hematite with a slightly worn surface. The vertical inscription on the left flank of the duck is well preserved. Discovered 1914 in Susa.

Text: 5 GÍN

Translation: '5 shekels'.

2.2.21 Sb 9146 (Pl. 13: 533)

Perfectly preserved duck-shaped weight made of hematite. It was first mentioned by Oppert (*cf.* DE CLERCQ 1903, 177) and later in a study by D. ARNAUD (1967, 162). Probably due to the small size of the duck, the inscription is engraved on the underside.

Text: 22,5 ŠE

Translation: '22.5 grain'.

2.2.22 Sb 9335 (Pl. 17: 610)

Duck-shaped weight made of basalt, with a three-line inscription engraved horizontally on the left side of the duck. Unfortunately, the inscription is so poorly preserved that it cannot be deciphered.

3 Some remarks on the arrangement of inscriptions on duck-shaped weights

The material studied here comprises 20 duck-shaped and eight sphendonoid weights. As the inscription on the sphendonoid weights are always engraved horizontally, only the inscriptions on duck-shaped weights will be discussed here. There are two main arrangements, which can be found on 15 of the 20 duck-shaped weights.

Eight duck-shaped weights (no. 2.1-2.2, 2.4-2.5, 2.11-2.12, 2.20, 2.27) bear horizontal inscriptions engraved on the left flank of the duck. All of these weights were found in Susa.

Seven duck-shaped weights (no. 2.6-2.9, 2.13-2.14, 2.18) bear vertical inscriptions engraved on the right flank of the duck.

Two further objects (no. 2.16, 2.24) comprise vertical inscriptions on the left flank. Interestingly, these engravings are positioned in a different way than the other vertical inscriptions: in order to read the text, the duck has to be viewed from an angle, whereas in all other cases the duck must be looked at directly from the front.

Finally, there are three exceptional duck-shaped weights. No. 2.3 has a two-column inscription engraved horizontally, but on the right flank of the duck. Again, this inscription is positioned differently than the other horizontal engravings, and this particular inscriptions can only be read from behind the duck. No. 2.17 has a two-line inscription on each side of the beak. No. 2.25 is inscribed on the underside, probably due to its small size.

In conclusion, there are two dominant patterns in the arrangement of the weight inscriptions: 1) engraved horizontally on the left flank of the duck, and 2) engraved vertically on the right flank of the duck. It would be interesting to look if these patterns are also present amongst other inscribed weights from Susa and Mesopotamia, but this lies beyond the scope of this paper.

Bibliography

Adams 1966
Adams, R. M., The Evolution of Urban Society: Early Mesopotamia and Prehispanic Mexico. The Lewis Henry Morgan Lectures 1965 (Chicago 1966).

Agrawal 2000
Agrawal, D. P., Ancient Metal Technology and Archaeology of South Asia: A Pan-Asian Perspective (New Delhi 2000).

Agrawal *et al*. 1981
Agrawal, D. P., Krishnamurthy, R. V., Kusumgar, S., Arsenical coppers in the Indian Bronze Age. In: M. S. Rao (ed.), Madhu: Recent Indian Researches in Archaeology and Art History (New Delhi 1981) 9-18.

Agrawala 1984
Agrawala, R. C., Aravalli, the major source of copper. In: B. B. Lal/S. P. Gupta (eds.), Frontiers of the Indus Civilization (New Delhi 1984) 157-167.

Ajithprasad/Sonawane 1994
Ajithprasad, P., Sonawane, V. H., Harappa culture and Gujarat. Man and Environment 9, 1994, 37-49.

Ajithprasad/Sonawane 2011
Ajithprasad, P., Sonawane, V. H., The Harappa culture in north Gujarat: A regional paradigm. In: T. Osada/H. Endo (eds.), Linguistics, Archaeology and the Human Past. Occasional Paper 12 (Kyoto 2011) 223-269.

Alberti 1995
Alberti, M. E., Ayia Irini: Les poids de balance dans leur contexte. Quaderni Ticinesi di Numismatica e Antichità Classiche 24, 1995, 9-37.

Alberti 1999
Alberti, M. E., Il sistema ponderale egeo tra omogeneità e flessibilità: Continuità e discontinuità tra il mondo minoico e quello miceneo. In: V. La Rosa/D. Palermo/L. Vagnetti (eds.), Atti del Simposio Italiano di Studi Egei, dedicato a L. Bernabò Brea e G. Pugliese Carratelli, Roma 18t-20t febbraio 1998 (Roma 1999) 339-350.

Alberti 2003
Alberti, M. E., I sistemi ponderali dell'Egeo nell'età del Bronzo: Studi, storia, pratica e contatti. Annuario della Scuola Archeologica Italiana di Atene 81, 2003, 597-640.

Alberti 2006
Alberti, M. E., Changing in time: Some aspects of Aegean and Cypriot balance weights. In: Alberti *et al.* 2006a, 315-340.

Alberti *et al.* 2006a
Alberti, M. E., Ascalone, E., Peyronel, L. (eds.), Weights in Context: Bronze Age Weighing Systems of Eastern Mediterranean. Chronology, Typology, Material and Archaeological Contexts. Proceedings of the International Colloquium, Rome 22nd-24th November 2004. Instituto Italiano di Numismatica, Studi e Materiali 13 (Rome 2006).

Alberti *et al.* 2006b
Alberti, M. E., Ascalone, E., Parise, N., Peyronel, L., Current approaches to the study of the ancient weight systems. In: Alberti *et al.* 2006a, 1-8.

Alekshin 1973
Alekshin, B. A., Kamennyie giri s drevnezemledelicheskix pocelenii Yudzinai Tyrkmenii. Sovietskaya Arkheologi 4, 1973, 238-242.

Al-Ghabban/Franke-Vogt 2010
Al-Ghabban, A. I., Franke-Vogt, U., Routes d'Arabie: Archéologie et Histoire du Royaume d'Arabie Saudite (Paris 2010).

Alizadeh 2014
Alizadeh, A., Ancient Settlement Systems and Cultures in the Ram Hormuz Plain, Southwestern Iran: Excavations at Tall-e Geser and Regional Survey of the Ram Hormuz Area. University of Chicago, Oriental Institute Publications 140 (Chicago 2014).

Al-Rawi 2008
Al-Rawi, F. N. H., Inscriptions from the tombs of the queens of Assyria. In: J. E. Curtis/H. Mccall/D. Collon/L. al Gailani Werr (eds.), New Light on Nimrud: Proceedings of Nimrud Conference 11th-13th March (London 2008) 119-138.

Amiet 1966
Amiet, P., Elam (Auvers-sur-Oise 1966).

Amiet 1972
Amiet, P., La Glyptique Susienne, des Origines à l'Epoque des Perses Achéménides: Cachets, Sceaux-Cylindres et Empreintes Antiques Découvertes à Suse, de 1913 à 1967. Mémoires de la Délégation en Perse 43 (Paris 1972).

Amiet 1976
Amiet, P., Antiquités du désert de Lut, II. Revue d'Assyriologie et d'Archéologie Orientale 70, 1976, 1-8.

Amiet 1977
Amiet, P., Bactriane proto-historique. Syria 54, 1977, 89-121.

Amiet 1979
Amiet, P., L'iconographie archaïque de l'Iran: Quelques documents nouveaux. Syria 56, 1979, 333-352.

Amiet 1980
Amiet, P., Antiquités de serpentine. Iranica Antiqua 15, 1980, 155-166.

Amiet 1983
Amiet, P., The Archaic glyptic at Shahr-i Sokhta. In: M. Tosi (ed.), Prehistoric Sistan 1. Reports and Memoirs 19, 1 (Rome 1983) 199-210.

Amiet 1986a
Amiet, P., L'âge des Echanges Inter-Iraniens: 3500-1700 avant J.-C. Notes et Documents des Musées de France 11 (Paris 1986).

Amiet 1986b
Amiet, P., Au delà d'Elam. Archäologische Mitteilungen aus Iran 19, 1986, 11-20.

Amiet 1989
Amiet, P., Elam and Bactria. In: G. Ligabue/S. Salvatori (eds.), Bactria: An Ancient Oasis Civilisation from the Sands of Afghanistan. Studi e Documenti, Centro Studi Ricerche Ligabue 3 (Venice 1989) 157-180.

Amiet/Tosi 1978
Amiet, P., Tosi, M., Phase 10 at Shahr-i Sokhta: Excavations in square XDV and the late fourth millennium B.C. assemblage of Sistan. East and West 28, 1978, 1-31.
Arnaud 1967
Arnaud, D., Contribution à l'étude de la métrologie syrienne au IIe millénaire. Revue d'Assyriologie et d'Archéologie Orientale 41, 1967, 151-169.
Arnaud *et al.* 1979
Arnaud, D., Calvet, Y., Huot, J.-L., Ilshu-Ibni-shu orfèvre de l'E.babbar de Larsa, la jarre L. 76-77 et son contenu. Syria 56, 1979, 1-64
Arne 1945
Arne, T. J., Reports from the Scientific Expedition to the North-Western Provinces of China under the Leadership of Dr. Sven Hedin 7, 5: Excavations at Shah Tepé, Iran. The Sino-Swedish Expedition 27 (Stockholm 1945).
Ascalone 1997
Ascalone, E., Nuova proposta di periodizzazione dell'abitato di Susa. Orient Express 3, 1997, 92-95.
Ascalone 2000a
Ascalone, E., Interpretazione stratigrafica e proposta di periodizzazione della città di Susa: Studio comparativo degli scavi effettuati e analisi storica dell'abitato tra la fine del IV e l'inizio del III millennio. Vicino Oriente 12, 2000, 133-173.
Ascalone 2000b
Ascalone, E., Distributive and archaeological analysis of the Susa ceramic assemblage: Typological approach and stratigraphical evidence. In: P. Matthiae/A. Enea/L. Peyronel/F. Pinnock (eds.), Proceedings of the First Congress on the Archaeology of the Ancient Near East, Rome 18th-23rd May 1998 (Rome 2000) 7-33.
Ascalone 2003
Ascalone, E., Modalità, cause e dinamiche dei rapporti tra Siria e Turan durante la seconda metà del III millennio a.C.: Evidenze archeologiche, epigrafiche e storiche di un 'indirect long-distance trade'. Contributi e Materiali di Archeologia Orientale 9, 2003, 139-175.
Ascalone 2005
Ascalone, E., L'indigeno ed il forestiero. Elaborazione di nuovi percorsi culturali integrativi tra seconda metà del III e inizio del II millennio a.C. in Susiana e sul plateau iraniano. Scienze dell'Antichità 11, 2005 (2001-2003), 9-50.
Ascalone 2006a
Ascalone, E., Archeologia dell'Iran Antico: Integrazioni, Interazioni e Discontinuità nell'Iran del III millennio a.C. Nisaba 14 (Messina 2006).
Ascalone 2006b
Ascalone, E., Cultural spheres on Iranian plateau as seen from glyptic evidence: Distribution and development of seals in Iranian regional contexts during Mesopotamian Akkadian and Post-Akkadian periods (2400-2150 BC). In: F. Baffi/R. Dolce/S. Mazzoni (eds.), Ina Kibrat Erbetti: Studies in Honour of Paolo Matthiae, Presented by Colleagues and Friends on the Occasion of his 65th Birthday (Rome 2006) 29-72.
Ascalone 2006c
Ascalone, E., Distribution and archaeological context of the balance weights from Tell es-Sutan/Jericho. In: Alberti *et al.* 2006a, 161-184.
Ascalone 2008a
Ascalone, E., Archaeological links between Syria and Iran: Stratigraphical correlations and regional connections. In: P. Matthiae/L. Nigro/L. Peyronel/F. Pinnock (eds.), From Relative Chronology to Absolute Chronology: The Second Millennium BC in Syria-Palestine. Proceedings of the International Colloquium, Rome 29th November-1st December 2001. Contributi del Centro Linceo Interdisciplinare "Beniamino Segre" 117 (Rome 2008) 33-70.
Ascalone 2008b
Ascalone, E., The Jiroft civilization at Susa. In: Y. Madjidzadeh/M. Mashkour/H. Pittman (eds.), Proceedings of the 1st International Conference on the Halil Roud Archaeological Project: The Halil Rud Civilizations. Discussions on Recent Discoveries, Jiroft, Kerman, 31st January-1st February 2005 (Philadelphia 2008) 342-364.
Ascalone 2008c
Ascalone, E., Cultural interactions among Mesopotamia, Elam, Transelam and Indus Civilization: The evidence of a cylinder-shaped-stamp seal from Jalalabad (Fars) and its significance in the historical dynamics of south-eastern Iran. In: H. Kühne/R. M. Czichon/F. J. Kreppner (eds.), Proceedings of the 4th International Congress on the Archaeology of the Ancient Near East, Berlin 28th March-4th March 2004 (Winona Lake 2008) 255-276.
Ascalone 2011a
Ascalone, E., Glittica Elamita dalla metà del III alla metà del II millennio a.C. Sigilli a stampo, sigilli a cilindro e impronte rinvenute in Iran e provenienti da collezioni private e museali. Studia Archaeologica 182 = Vicino Oriente 1 (Rome 2011).
Ascalone 2011b
Ascalone, E., Mina e doppia mina. In: Ascalone/Peyronel 2011a, 57-64.
Ascalone 2012
Ascalone, E., A new south-eastern Iranian glyptic evidence. In: J. Tavernier/K. De Graef (eds.), Susa and Elam: Archaeological, Philological, Historical and Geographical Perspectives. Proceedings the International Congress held at Ghent University, December 14-17, 2009. Mémoires de la Délégation Archéologique en Iran 58 (Leiden 2012) 3-25.
Ascalone 2013
Ascalone, E., Sealing and weighing: The art of power during Sukkalmakh period. Journal of Iranian Archaeology 4, 2013, 50-57.
Ascalone 2014
Ascalone, E., Intercultural relations between southern Iran and Oxus civilization: The strange case of bifacial seal NMI 1660. Iranian Journal of Archaeological Studies 4, 2014, 1-10.

Ascalone 2015
Ascalone, E., Bastanshenasi Iran Bastan. Gahnegari-e Hezareeh-e Sevvom Pish az Milad (= Archaeology and History of Third Millennium Iran). Studies and Publications Institute, University for Humanities Sciences (= SAMT), Research Center and Development, Pishin Pajouh (Tehran 2015).

Ascalone 2018a
Ascalone, E., Sistemi d'integrazione culturale (= ICS) tra la fine del III e l'inizio del II millennio a.C.: Jiroft e le regioni dell'Oxus tra Simashki e la crescita Sukkalmalkh. In: M. G. Micale/A. Vacca/S. Pizzimenti (eds.), A Oriente del Delta: Scritti sull'Egitto e il Vicino Oriente antico in onore di Gabriella Scandone Matthiae. Contributi e Materiali di Archeologia Orientale (= CMAO) 18 (Roma 2018) 135-159.

Ascalone 2018b
Ascalone, E., Glyptic in the 4th-2nd millennium. In: J. Àlvarez-Mon/G. P. Basello/Y. Wicks (eds.), The Elamite World. Routledge Worlds Series (New York 2018) 623-648.

Ascalone 2018c
Ascalone, E., Weights at Rakhigarhi and in the Ghaggar basin. Annali dell'Istituto Italiano di Numismatica 64, 2018, 9-32.

Ascalone 2019a
Ascalone, E., Jiroft as seen from Susa. Bollettino Telematico dell'Arte 870, 2019, 1-29.

Ascalone 2019b
Ascalone, E., Potential weights at Shahr-i Sokhta. In: L. Rahmstorf/E. Stratford (eds.), Weights and Marketplaces from the Bronze Age to the Early Modern Period. Proceedings of Two Workshops Funded by the European Research Council (ERC). Weight & Value 1 (Göttingen 2019) 35-50.

Ascalone 2019c
Ascalone, E., Il progetto archeologico multidisciplinare internazionale a Shahr-i Sokhta. In: P. F. Callieri/J. Nokandeh/A. Rossi/S. M. S. Sajjadi/R. Shirazi (eds.), Iran and Italy: 60 Years of Collaboration on Cultural Heritage, Tehran, National Museum of Iran, RICHT, ISMEO (Tehran 2019) 59-60.

Ascalone 2019d
Ascalone, E., Rapporto preliminare sugli scavi 2017 in Area 33 a Shahr-i Sokhta. In: Ascalone/Sajjadi 2019, 19-74.

Ascalone 2019e
Ascalone, E., Nota su tre potenziali pesi da bilancia rinvenuti nel Building 33 di Shahr-i Sokhta. In: Ascalone/Sajjadi 2019, 159-164.

Ascalone 2019f
Ascalone, E., Il Progetto Archeologico Multidisciplinare Internazionale a Shahr-i Sokhta (= MAIPS). In: Ascalone/Sajjadi 2019, 13-18.

Ascalone 2019g
Ascalone, E., Gli oggetti dall'Area 33 a Shahr-i Sokhta. In: Ascalone/Sajjadi 2019, 75-114.

Ascalone 2019h
Ascalone, E., La ceramica dell'Area 33 a Shahr-i Sokhta. In: Ascalone/Sajjadi 2019, 115-136.

Ascalone 2019j
Ascalone, E., Prefazione. In: Ascalone/Sajjadi 2019, 9-12.

Ascalone 2020
Ascalone, E., Pesi dall'Iran orientale: La metrologia a Shahr-i Sokhta e Konar Sandal Sud all'interno di un sistema culturale integrato. In: M. Vidale/D. Usai/S. Tuzzato (eds.), Tales of Three Worlds. Archaeology and Beyond: Asia, Italy, Africa. A Tribute to Sandro Salvatori (Padua 2020) 3-16.

Ascalone 2021a
Ascalone, E., Made in Indus, made in Oman and made in Susiana: Meluhha and Makkan in Kish, Telloh and Susa as seen from weights and ingots. In: M. Lebeau (ed.), Identity, Diversity and Contact from the Southern Balkans to Xinjiang, from the Upper Palaeolithic to Alexander. Proceedings of the 1st International Congress "The East" (ICE 1), Brussells, Art & History Museum, April 16-18, 2019 (Turnhout 2021) 93-112.

Ascalone 2021b
Ascalone, E., Excavations 2017-2019 at Shahr-i Sokhta. In: P. F. Callieri/J. Nokandeh/A. V. Rossi/S. M. S. Sajjadi (eds.), Iran and Italy: 60 Years of Collaboration on Cultural Heritage, Tehran, National Museum of Iran, RICHT, ISMEO (Tehran 2021) 35-59.

Ascalone 2022a
Ascalone, E., Preliminary report on the 2017 excavations in Area 33 in Shahr-i Sokhta: Stratigraphy, finds and pottery. In: Ascalone/Sajjadi 2022a, 189-323,

Ascalone 2022b
Ascalone, E., Preliminary report of 2018-2019 excavations in Area 33 at Shahr-i Sokhta. In: Ascalone/Sajjadi 2022b, 143-232.

Ascalone in press
Ascalone, E., Note on new weights from Susa: Further evidence on Susa-Indus commercial transactions and cultural relations. In: E. Gorris/L. De Graef/J. Tavernet (eds.), Proceedings of 2nd Susa and Elam Conference II: History, Language, Religion and Culture (Louvain-la-Neuve, 6-9 July 2015). Mémoires de la Délégation en Perse 60 (Leiden in press).

Ascalone/Azadi 2019
Ascalone, E., Azadi, A., Ricerche a Qaleh Kutchek. In: P. F. Callieri/J. Nokandeh/A. V. Rossi/S. M. S. Sajjadi (eds.), Iran and Italy: 60 Years of Collaboration on Cultural Heritage, Tehran, National Museum of Iran, RICHT, ISMEO (Tehran 2019) 63-64.

Ascalone/Basello 2018
Ascalone, E., Basello, G. P., Science and metrology in Elam. In: J. Àlvarez-Mon/G. P. Basello/Y. Wicks (eds.), The Elamite World. Routledge Worlds Series (New York 2018) 697-728.

Ascalone/Basello 2022
Ascalone, E., Basello, G. P., A note on a duck-shaped weight in the Susa Museum with an Elamite inscription. Orientalia 91/1, 2022, 38-69.

Ascalone/Fabbri 2019
Ascalone, E., Fabbri, P. F., Considerazioni insediamentali sull'abitato e demografiche sulla necropoli di Shahr-i Sokhta. In: Ascalone/Sajjadi 2019, 137-158.

Ascalone/Peyronel 1999
Ascalone, E., Peyronel, L., Typological and quantitative approach to the ancient weight systems: Susa, Persian Gulf and Indus Valley from the end of the III millennium to the beginning of the II millennium BC. Altorientalische Forschungen 26, 1999, 352-376.

Ascalone/Peyronel 2000a
Ascalone, E., Peyronel, L., "...secondo la norma del peso del re". Alalakh e Mari. Contesti archeologici palatini e sistemi ponderali in Siria durante la Media Età del Bronzo. Quaderni Ticinesi di Numismatica ed Antichità Classiche 37, 2000, 1-39.

Ascalone/Peyronel 2000b
Ascalone, E., Peyronel, L., The Eblaite metrology in Middle Bronze Age: Archaeological context and distributive analysis of weights. In: F. M. Fales/G. B. Lanfranchi/L. Milano (eds.), Landscapes: Territories, Frontiers and Horizons in the Ancient Near East. Papers presented to the 44rd Rencontre Assyriologique Internationale, Venezia 7th-11th July 1997. History of the Ancient Near East III, 3 (Padua 2000) 115-132.

Ascalone/Peyronel 2001
Ascalone, E., Peyronel, L., Two weights from Temple N at Tell Mardikh-Ebla, Syria: A link between metrology and cultic activities in the second millennium BC? Journal of Cuneiform Studies 53, 2001, 1-12.

Ascalone/Peyronel 2003
Ascalone, E., Peyronel, L., Meccanismi di scambio commerciale e metrologia pre-monetaria nell'Asia Media, in India e nel Golfo Persico durante l'Età del Bronzo. Spunti per una riflessione sulle sfere d'interazione culturale. Contributi e Materiali di Archeologia Orientale 9, 2003, 321-421.

Ascalone/Peyronel 2006a
Ascalone, E., Peyronel, L., I pesi da bilancia del Bronzo Antico e Bronzo Medio. Materiali e Studi Archeologici di Ebla 7 (Roma 2006).

Ascalone/Peyronel 2006b
Ascalone, E., Peyronel, L., Nota su due pesi da bilancia rinvenuti a Tell Tuqan. In: F. Baffi (ed.), Tell Tuqan. Ricerche archeologiche italiane nella regione del Maath (Siria). Università degli Studi di Lecce Settore Storico-Archeologico, Collana del Dipartimento 13 (Galatina 2006) 285-290.

Ascalone/Peyronel 2006c
Ascalone, E., Peyronel, L., The weighing system at Ebla during the Early Bronze Age: Distributive and functional analysis of Weights. In: Alberti *et al.* 2006a, 49-70.

Ascalone/Peyronel 2006d
Ascalone, E., Peyronel, L., Balance weights from Tell Mardikh/Ebla and the weighing systems in the Levant during the Middle Bronze Age. In: Alberti *et al.* 2006a, 127-160.

Ascalone/Peyronel 2011a
Ascalone, E., Peyronel, L. (eds.), Studi Italiani di Metrologia ed Economia del Vicino Oriente Antico: Dedicati a Nicola Parise in occasione del suo Settantesimo compleanno. Studia Asiana 7 (Roma 2011).

Ascalone/Peyronel 2011b
Ascalone, E., Peyronel, L., Peso ad anatra dal Tempio della Roccia. In: Ascalone/Peyronel 2011a, 65-76.

Ascalone/Sajjadi 2019
Ascalone, E., Sajjadi, S. M. S. (eds.), Scavi e Ricerche a Shahr-i Sokhta 1. Studies and Publications Institute, Iranian Center for Archaeological Research, Pishin Pajouh, Tehran 1 (Tehran 2019).

Ascalone/Sajjadi 2022a
Ascalone, E., Sajjadi, S. M. S. (eds.), Excavations and Researches at Shahr-i Sokhta 2. Studies and Publications Institute, Iranian Centre for Archaeological Research, Pishin Pajouh (Tehran 2022).

Ascalone/Sajjadi 2022b
Ascalone, E., Sajjadi, S. M. S. (eds.), Excavations and Researches at Shahr-i Sokhta 3. Studies and Publications Institute, Iranian Centre for Archaeological Research, Pishin Pajouh (Tehran 2022).

Ascalone/Vecchio in press
Ascalone, E., Vecchio, P., Shahr-i Sokhta new revised sequence. Iranica Antiqua 57, 2022.

Ascalone *et al.* 2012
Ascalone, E., Azadi, A., Peyronel, L., Preliminary report of Iranian-Italian joint expedition at Qaleh Kutchek, Halil Valley (Jiroft, Kerman Province, SE Iran). In: R. Matthews (ed.), Proceedings of the 7th International Congress on the Archaeology of the Ancient Near East: 12th-16th April 2010, the British Museum and UCL, London (London 2012) 277-302.

Banks 1905
Banks, E. J., Senkereh, the ruins of ancient Larsa. The Biblical World 25, 5, 1905, 389-392.

Bartash 2019
Bartash, V., Establishing Value: Weight Measures in Early Mesopotamia Studies in Ancient Near Eastern Records 23 (Berlin 2019).

Basafa/Rezaei 2014
Basafa, H., Rezaei, M. H., A comparative study of chlorite vessels iconography discovered from Halil rud basin. Sociology and Anthropology 2, 5, 2014, 196-200.

Beale 1973
Beale, T. W., Early trade in highland Iran: A view from a source area. World Archaeology 52, 1973, 133-148.

Beale 1986
Beale, T. W., Excavations at Tepe Yahya, Iran, 1967-1973: The Early Periods. American School of Prehistoric Research, Bulletin 38 (Cambridge 1986).

Belaiew 1929
Belaiew, N. T., Au sujet de la valeur probable de la mine sumérienne. Revue d'Assyriologie et d'Archéologie Orientale 26, 1929, 115-132.

Belaiew 1934
Belaiew, N. T., Métrologie Élamite: Eexamen préliminaire des documents pondéraux. Fouilles de Suse 1921-1933. Mémoires de la Délégation en Perse 25, 1934, 134-176.
Belaiew 1943
Belaiew, N. T., Poids en forme de cloche. Mémoires de la Délégation en Perse 29, 1943, 195-207.
Berger 1973
Berger, P.-R., Die neubabylonischen Königsinschriften: Königsinschriften des ausgehenden babylonischen Reiches (626-539 a. Chr.). Alter Orient und Altes Testament 4, 1 (Neukirchen-Vluyn 1973).
Berlinksi 1971
Berlinski, D., On Systems Analysis: An Essay Concerning the Limitations of Some Mathematical Methods in the Social, Political, and Biological Sciences (Cambridge 1971).
Berriman 1953
Berriman, A. E., Historical Metrology: A New Analysis of the Archaeological and the Historical Evidence Relating to Weights and Measures (London 1953).
Berriman 1955
Berriman, A. E., Some marked weights in the Petrie collection. The Journal of Egyptian Archaeology 41, 1, 1955, 48-50.
Berthould *et al.* 1982
Berthould, T. S., Cleuziou, S., Hurtel, L. P., Menu, M., Volfosky, C., Cuivres et alliages en Iran, Afghanistan, Oman au cours des IVe et IIIe millenaires. Paléorient 8, 1982, 39-54.
Besenval 2005
Besenval, R., Chronology of protohistoric Kech-Makran. In: C. Jarrige/V. Lefèvre (eds.), South Asian Archaeology 2001: Proceedings of the Sixteenth International Conference of the European Association of South Asian Archaeologists, Held in Collège de France, Paris, 2-6 July 2001 (Paris 2005) 1-9.
Bhan/Ajithprasad 2008
Bhan, K. K., Ajithprasad, P., Excavations at Shikarpur 2007-2008: A Coastal Port and Craft Production Center of the Indus Civilization in Kutch, India (Delhi 2008).
Bhan/Ajithprasad 2009
Bhan, K. K., Ajithprasad, P., Excavations at Shikarpur, Gujarat 2008-2009 (Delhi 2009).
Bhan/Kenoyer 1980-1981
Bhan, K. K., Kenoyer, J. M., Nageshwar, an industrial centre of the Chalcolithic period. Puratattva 12, 1980-1981, 115-120.
Bhan/Kenoyer 1984
Bhan, K. K., Kenoyer, J. M., Nageshwar: A mature Harappan shell working site on the Gulf of Kutchh. Journal of the Oriental Institute 34, 1-2, 1984, 115-20.
Bhan *et al.* 2004
Bhan, K. K., Sonawane, V. H., Ajithprasad, P., Pratapchandran, S., Excavations of an important Harappan trading and craft production centre at Gola Dhoro (Bagasra), on the Gulf of Kutch, Gujarat, India. Journal of Interdisciplinary Studies in History and Archaeology 1, 2004, 153-158.
Bibby 1970
Bibby, T. G., "...according to the standard of Dilmun". Kuml, Arbog for Jysk Arkaeologisk 1970, 349-353.
Biga 1995
Biga, M. G., I rapporti diplomatici nel periodo Protosiriano. In: P. Matthiae/F. Pinnock/G. Scandone Matthiae (eds.), Ebla: Alle origini della civiltà urbana. Trent'anni di scavi in Siria dell'Università di Roma "La Sapienza" (Milano 1995) 140-147.
Biga 1996
Biga, M. G., Prosopographie et datation relative des textes d'Ebla. Amurru 1, 1996, 29-72.
Biga 2003a
Biga, M. G., Feste e fiere a Ebla. In: A. Giardina/C. Zaccagnini (eds.), Atti del Colloquio Internazionale 'Mercanti e politica nel mondo antico', Roma 23-24 marzo 2000. Saggi di Storia Antica 21 (Roma 2003) 1-19.
Biga 2003b
Biga, M. G., The reconstruction of a relative chronology for the Ebla texts. Orientalia 72, 2003, 345-367.
Biga 2003c
Biga, M. G., Aspetti monetari e finanziari dell'area siro-palestinese nel III e II millennio a.C. In: L. Camilli (ed.), Per una storia del denaro nel Vicino Oriente antico: Atti dell'incontro di studio, Roma, 13 giugno 2001. Instituto Italiano di Numismatica, Studi e Materiali 10 (Roma 2003) 59-78.
Biga/Pomponio 1990
Biga, M. G., Pomponio, F., Elements for a chronological division of the administrative documentation of Ebla. Journal of Cuneiform Studies 42, 1990, 179-201.
Biga/Pomponio 1993
Biga, M. G., Pomponio, F., Critères de rédaction comptable et chronologie relative des textes d'Ebla. Mari 7, 1993, 107-128.
Binford 1962
Binford, L. R., Archaeology as anthropology. American Antiquity 28, 1962, 217-225.
Binford 1965
Binford, L. R., Archaeological systematics and the study of culture process. American Antiquity 31, 1965, 203-210.
Biscione 1973
Biscione, R., Dynamics of an early South Asian urbanization: First period at Shahr-i Sokhta and its connections with southern Turkmenia. In: N. Hammond (ed.), South Asian Archaeology: Papers from the 1st International Conference of South Asian Archaeologists, Held [in July 1971] in the University of Cambridge (London 1973) 105-118.
Biscione 1984
Biscione, R., Baluchistan presence in the ceramic assemblage of Period I at Shahr-i Sokhta. In: B. Allchin (ed.), South Asian Archaeology 1981: Proceedings of the 6th International Conference of

the Association of South Asian Archaeologists in Western Europe, Held in Cambridge University, 5-10 July 1981. Oriental Publications 34 (Cambridge 1984) 69-84.

Biscione *et al.* 1974
Biscione, R., Bulgarelli, G. M., Costantini, L., Piperno, M., Tosi, M., Archaeological discoveries and methodological problems in the excavations of Shahr-i Sokhta, Sistan. In: J. E. van Lohuizen-de Leeuw/J. M. M. Ubaghs (eds.), South Asian Archaeology 1973: Papers from the 2. International Conference of the Association for the Promotion of South Asian Archaeology in Western Europe, Held at the University of Amsterdam (Leiden 1974) 12-52.

Biscione *et al.* 1977
Biscione, R., Salvatore, S., Tosi, M., Shahr-i Sokhta: L'abitato protostorico e la sequenza cronologica. In: G. Tucci (ed.), La città bruciata del deserto salato [The Burnt City in the Salt Desert] (Venezia 1977) 77-112.

Bisht 1989a
Bisht, R. S., A new model of the Harappan town planning as revealed at Dholavira in Kutch: A surface study of its plan and architecture. In: B. Chatterjee (ed.), History and Archaeology: Prof. H. D. Sankalia Felicitation Volume. The Heritage of Ancient India 18 (New Delhi 1989) 397- 408.

Bisht 1989b
Bisht, R. S., The Harappan colonisation of Kutch: An ergonomic study with reference to Dholavira and Surkotada. In: K. Deva/L. Gopal (eds.), History and Art, Culture and Archaeology Presented to Prof. K. D. Bajpai in Honour of his Fifty Years Indological Studies. The Heritage of Ancient India 17 (Delhi 1989) 265-272.

Bisht 1991
Bisht, R. S., Dholavira: A new horizon of the Indus civilization. Puratattva 20, 1991, 71-82.

Bisht 1993
Bisht, R. S., Excavations at Banawali: 1974-77. In: G. L. Possehl (ed.), Harappan Civilization: A Recent Perspective (New Delhi 1993) 113-124.

Bisht 1994
Bisht, R. S., Urban Planning at Dholavira: A Harappan City. Seminar on the City and the Stars: Cosmic Urban Geometrics of India. Indira Gandhi National Centre for the Arts (New Delhi 1994).

Bisht 1997
Bisht, R. S., Dholavira excavations: 1990-94. In: J. P. Joshi (ed.), Facets of Indian Civilization: Recent Perspectives. Essays in Honour of Prof. B. B. Lal. Vol. 1: Prehistory and Rock Art, Protohistory (New Delhi 1997) 107-120.

Bisht 1998-1999
Bisht, R. S., Dholavira and Banawali: Two different paradigms of the urbis forma. Puratattva 29, 1998-1999, 14-37.

Bisht 2000
Bisht, R. S., Urban planning at Dholavira: A Harappan city. In: J. M. Malville/L. M. Gujral (eds.), Ancient Cities, Sacred Skies: Cosmic Geometries and City Planning in Ancient India (New Delhi 2000) 11-23.

Bisht 2004
Bisht, R. S., Dholavira and Kutchh in an integrated tourism development. In: A. Maira (ed.), Heritage Tourism. Exploring the Future (Seminar on Heritage Tourism), Government of Gujarat (Gandhinagar 2004) 35-48.

Bisht 2006
Bisht, R. S., Harappans and the Rigveda. In: D. P. Sharma/M. Sharma (eds.), Early Harappans and Indus-Sarasvati Civilization 2 (New Delhi 2006), 283-338.

Bisht 2006-2007
Bisht, R. S., Recently excavated Harappan site: Dholavira. Jnāna-Pravāha 10, 2006-2007, 79-98.

Bisht 2010
Bisht, R. S., Does Dholavira sheds new light on the antiquity of the Buddhist stupa architecture? In I. A. Khan/R. Barret/R. Trivedi (eds.), Abstracts – International Seminar on Buddhist Heritage, Gujarat, January 15-17, 2010, Maharaja Sayajirao University of Baroda and Government of Gujarat (Vadodara 2010) 75-76.

Bobokhyan 2006
Bobokhyan, A., Identifying balance weights and weight systems in Bronze Age Troia: Preliminary reflections. In: Alberti *et al.* 2006a, 81-126.

Böckh 1838
Böckh, A., Metrologische Untersuchungen über Gewichte, Münzfüsse und Masse des Alterthums in ihrem Zusammenhange (Berlin 1838).

Borofka/Parzinger 2003
Borofka, N., Parzinger, N. H., Research at Karnab-Sichnochi: A metallurgists settlement of the Bronze Age in the Samarkand district of Uzbekistan. In: Problyemy girnichoy archeologii (Alchevk 2003) 7-13.

Borofka/Sava 1998
Borofka, N., Sava, E., Zu den steinernen "Zeptern/Stössen-Zeptern", "Miniatursäulen" und "Phalli" der Bronzezeit Eurasiens. Archäologische Mitteilungen aus Iran und Turan 30, 1998, 17-133.

Braidwood/Braidwood 1960
Braidwood, R. J., Braidwood, L. S., Excavations in the Plain of Antioch. Vol. 1: The Earlier Assemblages Phases A-J. University of Chicago, Oriental Institute Publications 41 (Chicago 1960).

Breglia 1955a
Breglia, L., Le antiche rotte del Mediterraneo documentate da monete e pesi. Rendiconti della Accademia di Napoli 30, 1955, 212-326.

Breglia 1955b
Breglia, L., Storia, numismatica e metrologia. Annali dell'Istituto Italiano di Numismatica 2, 1955, 227-233.

Breglia 1958
Breglia, L., Questioni ponderali. In: H. Ingholt (ed.), Centennial Publication of the American Numismatic Society (New York 1958) 147-166.

Breglia 1958-1959
Breglia, L., Lunga storia di un valore ponderale. Annali dell'Istituto Italiano di Numismatica 5-6, 1958-1959, 9-28.
Breglia 1961
Breglia, L., I precedenti della moneta vera e propria nel bacino del Mediterraneo. In: Congresso Internazionale di Numismatica, Roma, 11-16 Settembre 1961. Vol. 1: Relazioni (Roma 1961) 5-17.
Breglia 1964
Breglia, L., Numismatica Antica: Storia e Metodologia. I Fatti e le Idee 111 (Milano 1964).
Brentjes 1971
Brentjes, B., Ein elamitischer Streufund aus Soch, Fergana (Usbekistan). Iran 9, 1971, 155.
Brinkman/Seidl 1982
Brinkman, J. A., Seidl, U., » Kudurru «. In: Reallexikon der Assyriologie und Vorderasiatischen Archäologie 6, 1982, 267-277.
Burrows 1935
Burrows, E., Archaic Texts. Ur Excavations Texts 2 (London 1935).
Caldwell 1959
Caldwell, J. R., The New American Archaeology. Science 129, 1959, 303-307.
Caldwell 1967a
Caldwell, J. R., Investigations at Tal-i-Iblis. Illinois State Museum Preliminary Reports 9 (Springfield 1967).
Caldwell 1967b
Caldwell, J. R., The setting and results of the Kerman project. In: Caldwell 1967a, 21-40.
Canal 1978a
Canal, D., La haute terrasse de l'Acropole de Suse. Paléorient 4, 1978, 169-176.
Canal 1978b
Canal, D., Travaux a la terrasse haute de l'Acropole de Suse. Délégation Archéologique Française en Iran 9, 1978, 11-55.
de Cardi 1967a
de Cardi, B., Bampur. Iran 5, 1967, 134-135.
de Cardi 1967b
de Cardi, B., The Bampur sequence in the third millennium B.C. Antiquity 41, 1967, 33-41.
de Cardi 1968
de Cardi, B., Excavations at Bampur, S.E. Iran: A brief report. Iran 6, 1968, 135-155.
de Cardi 1970
de Cardi, B., Excavations at Bampur. A Third Millennium Settlement in Persian Baluchistan, 1966. Anthropological Papers of the American Museum of Natural History 51, 3 (New York 1970).
de Cardi 1983
de Cardi, B., Archaeological Surveys in Baluchistan, 1948 and 1957. Institute of Archaeology, Occasional Publication 8 (London 1983).
Carter 1974
Carter, E., Susa: Excavation in the Ville Royale. Iran 12, 1974, 218-220.
Carter 1976
Carter, E., Ville Royale, campagne 1975. In: F. Bagherzadeh (ed.), Proceedings of the 4th Annual Symposium on Archaeological Research in Iran, 3rd-8th November 1975 (Tehran 1976) 232-242.
Carter 1978
Carter, E., Suse, Ville Royale I. Paléorient 4, 1978, 197-212.
Carter 1979
Carter, E., The Susa sequence 3000-2000 B.C., Susa Ville Royale I. American Journal of Archaeology 83, 1979, 451-454.
Carter 1980
Carter, E., Excavations in Ville Royale I at Susa: The third millennium B.C. Délégation Archéologique Française en Iran 11, 1980, 11-134.
Carter 1987
Carter, E., The piedmont and the Pusht-i Kuh in the early third millennium B.C. In: J. -L. Huot (ed.), Préhistoire de la Mésopotamie. La Mésopotamie Préhistorique et l'Exploration Récente du Djebel Hamrin, Colloque International du Centre National de la Recherche Scientifique, Paris, 17-19 Décembre 1984 (Paris 1987) 88-99.
Casal 1961
Casal, J. M., Fouilles de Mundigak. Mémoires de la Délégation Archéologique Française en Afghanistan 17, 1-2 (Paris 1961).
Casal 1964
Casal, J. M., Fouilles d'Amri, 2 vols. Publications de la Commission des Fouilles Archéologiques (Paris 1964).
Chakrabarti/Lahiri 1996
Chakrabarti, D. K., Lahiri, N., Copper and its Alloys in Ancient India (New Delhi 1996).
Chakrabarti/Moghadam 1977
Chakrabarti, D. K., Moghadam, P., Some unpublished Indus beads from Iran. Iran 15, 1977, 166-168.
Chambon 2011
Chambon, G., Normes et Pratiques: l'Homme, la Mesure et l'Écriture en Mésopotamie. Vol. 1: Les Mesures de Capacité et de Poids en Syrie Ancienne, d'Ébla à Émar. Berliner Beiträge zum Vorderen Orient 21 (Gladbeck 2011).
Chase *et al.* 2014
Chase, B., Ajithprasad, P., Rajesh, S. V., Patel, A., Sharma, B., Materializing Harappan identitied: Unity and diversity in the borderlands of the Indus civilization. Journal of Anthropological Archaeology 35, 2014, 63-78.
Chitalwala 1989
Chitalwala, Y., The small finds. In: G. L. Possehl/R. H. Mukundrai (eds.), Harappan Civilization and Rojdi (Leiden 1989) 157-159.
Chitalwala 2004
Chitalwala, Y., The spread of the Harappan civilization in Kutch and Saurashtra. In: D. K. Chakrabarti (ed.), Indus Civilization Sites in India: New Discoveries. Mārg Publications 55, 3 (Mumbai 2004) 89-95.
Ciarla 1979
Ciarla, R., The manufacture of alabaster vessels at Shahr-i Sokhta and Mundigak in the 3rd millennium B.C.: A problem of cultural identity. In: G. Gnoli/A.

V. Rossi (ed.), Iranica. Napoli Istituto Universitario Orientale, Seminario di Studi Asiatici, Series Minor 10 (Napoli 1979) 319-335.

Ciarla 1981
Ciarla, R., A preliminary analysis of the manufacture of alabaster vessels at Shahr-i Sokhta and Mundigak in the 3rd Millennium B.C. In: H. Härtel (ed.), South Asian Archaeology 1979: Papers from the 5th International Conference of the Association of South Asian Archaeologists in Western Europe, Held in the Museum für Indische Kunst der Staatlichen Museen Preussischer Kulturbesitz Berlin (Berlin 1981) 45-63.

Ciarla 1985
Ciarla, R., New material in the study of the manufacture of stone vases at Shahr-i Sokhta. East and West 35, 1985, 418-425.

Ciarla 1990
Ciarla, R., Elaboration of data from Shahr-i Sokhta excavations. East and West 40, 1990, 418-426.

Clarke 1968
Clarke, D. L., Analytical Archaeology (London 1968).

de Clercq 1903
de Clercq, M., Collection de Clercq. Catalogue méthodique et raisonné. Antiquités assyriennes: Cylindres orientaux, cachets, briques, bronzes, bas-reliefs, etc. 2: Cachets, briques, bronzes, bas-reliefs (Paris 1903).

Cleziou/Berthoud 1982
Cleuziou, S., Berthoud, T., Early tin in the Near East: A reassessment in the light of new evidence from western Afghanistan. Expedition 25, 1, 1982, 14-19.

Cohen 1975
Cohen, M. E., ur.sag.me.šár.ur$_4$: A Šimarnamšubba of Ninurta. Die Welt des Orient 8, 1975, 22-36.

Collon 1996
Collon, D., Mesopotamia and the Indus. The evidence of the seals. In: J. Reade (ed.), The Indian Ocean in Antiquity (London 1996) 209-226.

Connan/Deschesne 1996
Connan, J., Deschesne, O., Le Bitume à Suse: Collection du Museé du Louvre. Réunion des Musées Nationaux (Paris 1996).

Cros 1904
Cros, G., Mission française de Chaldée Campagne de 1903: Compte rendu sommaire des fouilles. Revue d'Assyriologie 6, 1904, 5-17.

Cros 1910-1914
Cros, G., Nouvelles Fouilles de Tello. Mission Francaise de Chaldée (Paris 1910-1914).

Curtis 1988
Curtis, J. E., A reconsideration of the cemetery at Khinaman, south-east Iran. Iranica Antiqua 23, 1988, 97-124.

Curtis 2013
Curtis, J. E., An Examination of Late Assyrian Metalwork with Special Reference to Nimrud (Oxford 2013).

Curtis/Reade 1995
Curtis, J. E., Reade, J. E., Art and Empire: Treasures from Assyria in the British Museum (London 1995).

Czichon/Werner 1998
Czichon, R. M., Werner, P., Ausgrabungen in Tall Munbāqa – Ekalte. 1:. Die bronzezeitlichen Kleinfunde. Wissenschaftliche Veröffentlichungen der Deutschen Orient-Gesellschaft 97 (Saarbrücken 1998).

Dales 1966
Dales, G. F., The decline of the Harappans. Scientific American 214, 5, 1966, 93-100.

Dales/Kenoyer 1977
Dales, G. F., Kenoyer, J. M., Shell working at ancient Balakot, Pakistan. Expedition 19, 2, 1977, 13-19.

Dales/Kenoyer 1991
Dales, G. F., Kenoyer, J. M., Summaries of five seasons of research at Harappa (District Sahiwal, Punjab, Pakistan) 1986-1990. In: R. H. Meadow (ed.), Harappa Excavations 1986-1990: A Multidisciplinary Approach to 3rd Millennium Urbanism. Monographs in World Archaeology 3 (Madison 1991) 185-262.

Damerow/Englund 1989
Damerow, P., Englund, R., The Proto-Elamite Texts from Tepe Yahya. The American School of Prehistoric Research Bulletin 39 (Cambridge 1989).

Dangi 2011
Dangi, V., Indus (Harappan) civilization in the Ghaggar basin. In: A. Uesugi (ed.), Current Research on the Indus Archaeology. South Asian Archaeology Series 4 (Kansai 2011) 56-86.

Dani 1970-1971
Dani, A. H., Excavations in the Gomal valley. Ancient Pakistan 5, 1970-1971, 1-177.

Da Riva 2008
Da Riva, R., The Neo-Babylonian Royal Inscriptions: An Introduction. Guides to the Mesopotamian Textual Record 4 (Münster 2008).

Davidović 1984
Davidovič, V., Testi di Ur III concernenti bottino di guerra? Annali 44, 1984, 177-205.

Delougaz 1960
Delougaz, P., Architectural representations on steatite vases. Iraq 22, 1960, 90-95.

Dercksen 1996
Dercksen, J. G., The Old Assyrian Copper Trade in Anatolia. Uitgaven van het Nederlands Historisch-Archeologisch Instituut te Istanbul 75 (Istanbul 1996).

Deshayes 1969
Deshayes, J., New evidence for the Indo-Europeans from Tureng Tepe, Iran. Archaeology 22, 1969, 10-17.

Deshayes 1976a
Deshayes, J., Rapport préliminaire sur la onzième campagne de fouilles à Torang Tappeh. In: F. Bagherzadeh (ed.), Proceedings of the 4th Annual Symposium on Archaeological Research in Iran, 3rd-8th November 1975 (Tehran 1976) 298-321.

Deshayes 1976b
Deshayes, J., Tureng Tépé. Iran 14, 1976, 169-171.

Deshayes 1977
Deshayes, J., A propos des terrasses hautes de la fine du III millenaire en Iran et en Asie Centrale. In: J.

Deshayes (ed.), Le Plateau Iranien et l'Asie Centrale des origines à la conquête islamique: Leurs relations à la lumière des documents archèologiques, Paris 22-24 mars 1976. Colloques Internationaux du Centre National de la Recerche Scientifique 567 (Paris 1977) 95-111.

Desset 2012
Desset, F., Premières Écritures Iraniennes: Les Systèmes Proto-Èlamite et Èlamite Linéaire, avec 49 figures et 12 planches. Università degli Studi di Napoli l'Orientale Dipartimento Asia Africa e Mediterraneo, Series Minor 76 (Napoli 2012).

Desset 2014
Desset, F., A new writing system discovered in 3rd millennium BCE Iran: The Konar Sandal 'geometric' tablets. Iranica Antiqua 49, 2014, 83-109.

Desset/Vidale 2013
Desset, F., Vidale, M., Mahtoutabad (Konar Sandal South, Jiroft): Preliminary evidence of occupation of a Halil Rud site in the early fourth millennium BC. In: C. A. Petrie (ed.), Ancient Iran and its Neighbours: Local Development and Long-Range Interaction in the Fourth Millennium BC. Archaeological Monographs Series 3 (London 2013) 228-245.

Desset *et al.* 2013
Desset, F., Vidale, M., Alidadi Soleimani, N., Mahtoutabad III (Province of Kerman, Iran): An "Uruk-related" material assemblage in eastern Iran. Iran 51, 2013, 1-38.

Desset *et al.* 2016
Desset, F., Marchesi, G., Vidale, M., Pignatti, J., A sculptured dish from Tello made of a rare stone (Louvre-AO 153). Journal of Near Eastern Studies 75, 2016, 71-84.

Dhavalikar *et al.* 1996
Dhavalikar, M. K., Raval, M. R., Chitalwala, Y. M., Kuntasi – A Harappan Emporium on West Coast (Pune 1996).

Dieulafoy, J. 1887
Dieulafoy, J., La Perse, la Chaldée et la Susiane (Paris 1887).

Dieulafoy, J. 1893
Dieulafoy, J., A Suse, Journal des Fouilles 1884-1886 (Paris 1893).

Dieulafoy, M. 1885
Dieulafoy, M., Fouilles à Suse, campagne 1884-1885. Revue Archéologique 1885, 48-69.

Dieulafoy, M. 1886
Dieulafoy, M., Fouilles à Suse, campagne 1885-1886. Revue Archéologique 1886, 194-220.

Dieulafoy, M. 1887
Dieulafoy, M., Fouilles à Suse, campagne 1886. Revue Archéologique 1887, 1-9.

Dieulafoy, M. 1893
Dieulafoy, M., L'Acropole de Suse, d'Après les Fouilles Exécutées en 1884, 1885, 1886, Sous Auspices du Musée du Louvre (Paris 1893).

Dieulafoy, M. 1913
Dieulafoy, M., 1913, Les Antiquités Découvertes et Rapportées par la Mission Dieulafoy (1884-1896) (Paris 1913).

van Dijk 1978
van Dijk, L., Ishbi–Erra, Kindattu, l'homme d'Elam et la chute de la ville d'Ur. Journal of Cuneiform Studies 30, 1978, 189-208.

Dollfus 1971
Dollfus, G., Les fouilles à Djaffarabad de 1969 à 1971. Cahiers de la Délégation Archéologique Française en Iran 1, 1971, 17-161.

Dollfus 1975
Dollfus, G., Les fouilles à Djaffarabad de 1972 à 1974, Djaffarabad périodes I et II. Cahiers de la Délégation Archéologique Française en Iran 5, 1975, 11-220.

Doran/Hodson 1975
Doran, J. E., Hodson, F. R., Mathematics and Computers in Archaeology (Edinburgh 1975).

Dunand 1958
Dunand, M., Fouilles de Byblos II (Paris 1958).

Dupree 1963
Dupree, L., Deh Morasi Ghundai: A Chalcolithic Site in South-Central Afghanistan. Anthropological Papers of the American Museum of Natural History 50 (New York 1963).

Durante 1979a
Durante, S., Marine shells from Balakot, Shahr-i Sokhta and Tepe Yahya: Their significance for trade and technology in ancient Indo-Iran. In: M. Taddei (ed.), South Asian Archaeology 1977: Papers from the Fourth International Conference of the Association of South Asian Archaeologists in Western Europe, Held in the Istituto Universitario Orientale, Naples. Series Minor, Istituto Universitario Orientale, Seminario di Studi Asiatici 6 (Naples 1979) 317-344.

Durante 1979b
Durante, S., The utilization of Xancus Pyrum (L.) at Shahr-i Sokhta. Further evidence for cultural relations between India and Iran in the 4th-3rd millennia BC. In: J. E. van Lohuizen-De Leeuw (ed.), South Asian Archaeology 1975. Papers from the Third International Conference of the Association of South Asian Archaeologists in Western Europe Held in Paris (Leiden 1979) 27-46.

During Caspers 1972
During Caspers, E. C. L., Etched carnelian beads. Bulletin of the Institute of Archaeology 10, 1972, 83-98.

Dyson 1987
Dyson, R. H., The relative and absolute chronology of Hissar II and the Protoelamite horizon of northern Iran. In: O. Aurenche/J. Evin/F. Hours (eds.), Chronologies Near East. BAR International Series 379, vol. 2 (Oxford 1987) 647-678.

Dyson/Howard 1989
Dyson, R. H., Howard, S. M. (eds.), Preliminary Reports of the Tappeh Hesar, Restudy Project 1976. Monografie di Mesopotamia 2 (Florence 1989).

Dyson/Lawn 1989
Dyson, R. H., Lawn, B., Key stratigraphic and radio-carbon elements for the 1976 Hesar sequence. In: Dyson/Howard 1989, 144.

Dyson/Remsen 1989
Dyson, R. H., Remsen, W. C. S., Observations on architecture and stratigraphy at Tappeh Hesar. In: Dyson/Howard 1989, 69-109.

Eby/Kochhar 1990
Eby, G. N., Kochhar, N., Geochemistry and petrogenesis of the Malani igneous suite, North Peninsular India. Journal of the Geological Society of India 36, 1990, 109-130.

Ehrich 1992
Ehrich, R. W., Chronologies in Old World Archaeology, 2 vols. (Chicago 1992).

Englund 1983
Englund, R., Dilmun in the archaic Uruk corpus. In: D. T. Potts (ed.), Dilmun: New Studies in the History of Bahrain. Berliner Beiträge zum Vorderen Orient 2 (Berlin 1983) 35-37.

Eskanderi *et al.* 2021
Eskanderi, N., Desset, F., Hessari, M., Shahsavari, M., Shafiee, M., Vidale, M., A late 4th to early 3rd millennnium BC grave in Hajjiabad-Varamin (Jiroft, South-Eastern Iran): Defining a new period of the Halil rud valley protohistoric sequence. Iranica Antiqua 55, 2021, 1-48.

Fairservis 1961
Fairservis, W. A., Archaeological Studies in the Seistan Basin of Southwestern Afghanistan and Eastern Iran. Anthropological Papers of the American Museum of Natural History 48 (New York 1961).

Fairservis 1967
Fairservis, W. A., The origin, character and decline of an early civilization. Novitates 2302, 1967, 1-48.

Fales 1995
Fales, F. M., Assyro-Aramaica: The Assyrian lion weights. In: K. van Lehrberghe/A. Schoors (eds.), Immigration and Emigration within the Ancient Near East. Festschrift E. Lipiński. Orientalia Lovaniensia Analecta 65 (Leuven 1995) 33-55.

Falkenstein 1936
Falkenstein, A., Archaische Texte aus Uruk. Ausgrabungen der Deutschen Forschungsgemeinschaft in Uruk-Warka 2 (Berlin 1936).

Falkenstein 1959
Falkenstein, A., Sumerische Götterlieder 1. Abhandlungen der Heidelberger Akademie der Wissenschaften, Philosophisch-Historische Klasse 1959,1 (Heidelberg 1959).

Fazeli *et al.* 2005
Fazeli, H., Wong, E. H., Potts, D. T., The Qazvin plain revisited: A re-approisal of the chronology of the northwestern central plateau, Iran, in the 6th to 4th millennium B.C. Ancient Near Eastern Studies 42, 2005, 3-82.

Ferwerda/Woestenburg 1998
Ferwerda, G. T., Woestenburg, E., Index Personal Names Old Babylonian "Sippar" (Leiden 1998).

Festuccia 2019
Festuccia, S., Studio preliminare del vasellame in alabastro dal Building 33 a Shahr-i Sokhta: Tipologia e analisi petrografiche. In: Ascalone/Sajjadi 2019, 165-194.

Festuccia 2022a
Festuccia, S., Preliminary studies of alabaster vessels from Building 33 in Shahr-I Sokhta: Typology and petrographic analyses. In: Ascalone/Sajjadi 2022a, 471-522.

Festuccia 2022b
Festuccia, S., The alabaster vessels of Building 33: Shahr-I Sokhta archaeological campaign 2019. In: Ascalone/Sajjadi 2022b, 519-552.

Feth 2014
Feth, W., HaB-zeitliche Waagewichte? Überlegungen zu Wirtschaft und Handel in den jungbronzezeitlichen Seeufersiedlungen der Schweiz. In: B. Nessel/I. Heske/D. Brandherm (eds.), Ressourcen und Rohstoffe in der Bronzezeit: Nutzung – Distribution -– Kontrolle. Beiträge zur Sitzung der Arbeitsgemeinschaft Bronzezeit auf der Jahrestagung des Mittel- und Ostdeutschen Verbandes für Altertumsforschung in Brandenburg an der Havel, 16. bis 17. April 2012. Arbeitsberichte zur Bodendenkmalpflege in Brandenburg 26 (Wünsdorf 2014) 121-129.

de Fidio 1998-1999
de Fidio, P., On the routes on the Bronze Age Aegean wool and weights. Minos 33-34, 1998-1999, 39-63.

Flannery 1968
Flannery, K. V., Archaeological systems theory and early Mesoamerica. In: B. J. Meggers (ed.), Anthropological Archaeology in the Americas, Anthropological Society of Washington (Washington 1968) 67-87.

Fouache *et al.* 2005
Fouache, É., Garçon, D., Rousset, D., Sénéchal, G., Madjidzadeh, Y., Le Vallée de l'Halil Roud (Region de Jiroft, Iran): Étude géoarchéologique, méthodologie et résultats préliminaires. Paléorient 31, 2, 2005, 197-122.

Francfort 1994
Francfort, H.-P., Fondations de Bactriane et de Margiane protohistoriques. In: S. Mazzoni (ed.), Nuove fondazioni nel Vicino Oriente: Realtà ed ideologia (Pisa 1994) 269-297.

Francfort 2005
Francfort, H.-P., La civilisations de l'Oxus et les Indo-iraniens en Asie Centrale. In: J. Kellens/X. Tremblay/H.-P. Francfort/G. Fussman (eds.), Āryas, Aryens et Iraniens en Asie Centrale. Publications de l'Institut de Civilisation Indienne, Université de Paris 72 (Paris 2005) 253-357.

Francfort/Tremblay 2010
Francfort, H.-P., Tremblay, X., Marhaši et la civilisation de l'Oxus. Iranica Antiqua 45, 2010, 51-224.

Franke/Cortesi 2015
Franke, U., Cortesi, E., Lost and Found: Prehistoric Pottery Treasures from Baluchistan (Berlin 2015).

Franke/Müller-Wiener 2016
Franke, U., Müller-Wiener, G., Herat Through Time: The Collection of the Heart Museum and Archive. Ancient Herat 3 (Berlin 2016).

Franke-Vogt 2005

Franke-Vogt, U., Excavations at Sohr Damb/Nal: Results of the 2002 and 2004 seasons. In: U. Franke-Vogt/H. J. Weishaar (eds.), South Asian Archaeology 2003. Proceedings of the Seventeenth International Conference of the European Association of South Asian Archaeologists, 7-11 July 2003, Bonn. Forschungen zur Archäologie außereuropäischer Kulturen 1 (Aachen 2005) 63-75.

Frankfort 1935

Frankfort, H., Oriental Institute Discoveries in Iraq. Oriental Institute Publications 19 (Chicago 1935).

Frankfort 1936

Frankfort, H., A new site in Mesopotamia: Tell Agrab. London News 1936, 432-436.

Frankfort *et al.* 1940

Frankfort, H., Lloyd, S., Jacobsen, T., The Gimilsin Temple and the Palace of the Rules at Tell Asmar. Oriental Institute Publications 43 (Chicago 1940).

Frayne 1997

Frayne, D., Ur III Period (2112-2004 BC). The Royal Inscriptions of Mesopotamia (RIME) 3/2 (Toronto 1997).

Freydank/Saporetti 1979

Freydank, H., Saporetti, C., Nuove attestazioni dell'onomastica medio-assira. Incunabula Graeca 74 (Roma 1979).

Friberg 1999

Friberg, J., Counting and accounting in the proto-literate Middle East: Examples from two new volumes of proto-cuneiform texts. Journal of Cuneiform Studies 51, 1999, 107-137.

Frifelt 1995

Frifelt, K., The Island of Umm an Nar II: The Third Millennium Settlement. Jutland Archaeological Society Publications 26, 2 (Aarhus 1995).

Gadd/Legrain 1928

Gadd, C. J., Legrain, L., Ur Excavations I, Text (London 1928).

Geinshemer 1984

Geinshemer, T. R., The role of shell in Mesopotamia: Evidence for trade exchange with Oman and the Indus valley. Paléorient 10, 1984, 65-73.

de Genouillac 1924

de Genouillac, H., Premières Recherches Archéologiques à Kich: Mission d'Henri de Genouillac 1911-1912. Rapport sur les Travaux et Inventaires, Fac-similés, Dessins, Photographies et Plans 1 (Paris 1924).

de Genouillac 1930

de Genouillac, H., Rapport sur les travaux dé la mission de Tello. Revue d'Assyriologie 27, 1930, 169-186.

de Genouillac 1934

de Genouillac, H., Fouilles de Telloh: Mission archéologique du Musée du Louvre et du Ministère de l'instruction ublique. 1: Époques résargoniques (Paris 1934).

de Genouillac 1936

de Genouillac, H., Fouilles de Telloh: Mission archéologique du Musée du Louvre et du Ministère de l'instruction publique. 2: Époques d'Ur IIIe dynastie et de Larsa (Paris 1936).

Ghirshman 1938-1939

Ghirshman, R., Fouilles des Sialk prés Kashan, 1933, 1934, 1937, 2 vols. Série Archéologique, Musée du Louvre Département des Antiquités Orientales 4-5 (Paris 1938-1939).

Ghirshman 1939

Ghirshman, R., Recherches préhistorique en Afghanistan, fouilles de Nad-i Ali dans le Seistan (Rapport préliminaire). Revue d'Assyriologie et d'Archéologie Orientale 23, 1939, 10-22.

Ghirshman 1951

Ghirshman, R., Les fouilles de Suse (1946-1951). Revue des Arts 3, 1951, 187-188.

Ghirshman 1952a

Ghirshman, R., Cinq campagnes de fouilles à Suse, 1946-51. Revue d'Assyriologie et d'Archéologie Orientale 46, 1952, 1-18.

Ghirshman 1952b

Ghirshman, R., Fouilles de la mission archéologique Française en Susiane, 1951-52. Acta Archeologica Hungarica 2, 1952, 185-187.

Ghirshman 1953

Ghirshman, R., Fouilles de la mission archéologique Française en Susiane, 1952-53. Acta Archeologica Hungarica 3, 1953, 123-126.

Ghirshman 1954

Ghirshman, R., Travaux de la mission archéologique Française de Susiane. Ars Orientalis 1, 1954, 173-174.

Ghirshman 1963a

Ghirshman, R., Suse. Campagne de fouilles 1962-63: Rapport préliminaire. Arts Asiatiques 10, 1963, 3-20.

Ghirshman 1963b

Ghirshman, R., L'Apadana de Suse. Iranica Antiqua 3, 2, 1963, 148-154.

Ghirshman 1965

Ghirshman, R., Suse du temps des Sukkalmah. Campagne des fouilles 1963-1964: Rapport préliminaire. Arts Asiatiques 11, 2, 1965, 3-21.

Ghirshman 1966a

Ghirshman, R., Campagne de l'hiver 1965-66. Acta Archeologica Hungarica 14, 1966, 249-253.

Ghirshman 1966b

Ghirshman, R., Suse. Campagne de l'hiver 1964-65: Rapport préliminaire. Arts Asiatiques 13, 1966, 3-32.

Ghirshman 1966c

Ghirshman, R., Tchoga Zanbil: Le Ziggurat. Mémoires de la Délégation en Perse 39 (Paris 1966).

Ghirshman 1967a

Ghirshman, R., Suse. Campagne de l'hiver 1965-66: Rapport préliminaire. Arts Asiatiques 15, 1967, 3-27.

Ghirshman 1967b

Ghirshman, R., Suse. Iran 5, 1967, 142-144.

Ghirshman 1968a

Ghirshman, R., Travaux de la Délégation Archéologique Française en Iran. Iran 6, 1968, 164-165.

Ghirshman 1968b

Ghirshman, R., Suse au tournant du III au II millénaire avant notre ère. Arts Asiatiques 17, 1968, 3-44.

Ghirshman 1968c
Ghirshman, R., Tchoga Zanbil: Temenos, Temples, Palais, Tombes. Mémoires de la Délégation en Perse 40 (Paris 1968).
Ghirshman 1970
Ghirshman, R., The Elamites levels at Susa and their chronological significance. American Journal of Archaeology 74, 1970, 223-225.
Ghirshman *et al.* 1959
Ghirshman, R., Hackin, J. C. M., Meunié, J., Diverses recherches archéologiques en Afghanistan (1933-40). Mémoires de la Délégation Archéologique Française en Afghanistan 8 (Paris 1959) 23-48.
Gibson 1972
Gibson, M., The City and the Area of Kish (Miami 1972).
Görsdof 2005
Görsdof, J., Radiocarbon dates from Sohr Damb/ Nal, Baluchistan. In: U. Franke-Vogt/J. Weishaar (eds.), South Asian Archaeology 2003: Proceedings of the Seventeenth International Conference of the European Association of South Asian Archaeologists, 7-11 July 2003, Bonn. Forschungen zur Archäologie außereuropäischer Kulturen 1 (Aachen 2005) 73-75.
Goldman 1956
Goldman, H., Excavations at Gözlü Kule, Tarsus II. From the Neolithic through the Bronze Age (Princeton 1956).
Gouin 1969
Gouin, P., Figurines de terre cuite d'Afghanistan et du Waziristan. Arts Asiatique 19, 1969, 37-51.
Guichard 2011
Guichard, M., The Oxus civilization and Mesopotamia: A philologist's point of view. In: B. Lyonnet/N. A. Dubova (eds.), The World of the Oxus Civilization (New York 2021) 66-81.
Hafford 2005
Hafford, W. B., Mesopotamian mensuration balance pan weights from Nippur. Journal of the Economic and Social History of the Orient 48, 3, 2005, 345-387.
Hafford 2012
Hafford, W. B., Weighing in Mesopotamia: The balance pan weights from Ur. Akkadica 133, 2012, 21-65.
Hakemi 1972
Hakemi, A., Catalogue de l'Exposition: Lut, Xabis (Shahdad) (Téhéran 1972).
Hakemi 1973
Hakemi, A., Shahdad. Iran 11, 1973, 201-203.
Hakemi 1976
Hakemi, A., Découverte d'une civilisation préhistorique à Shahdad au bord ouest du Lut, Kerman. In: G. Bagherzadeh (ed.), Memorial Volume of the VIth International Congress of Iranian Art and Archaeology, Oxford 10-16th, September 1972 (Tehran 1976) 131-150.
Hakemi 1997a
Hakemi, A., Shahdad: Archaeological Excavations of a Bronze Age Center in Iran. Reports and Memoirs, Centro Scavi e Ricerche Archeologiche Rom 27 (Rome 1997).
Hakemi 1997b
Hakemi, A., Kerman: The original place of production of chlorite stone objects in the 3rd millennium BC. East and West 47, 1997, 11-40.
Hakemi/Sajjadi 1989
Hakemi, A., Sajjadi, S. M. S., Shahdad excavations in the context of the oases civilizations. In: G. Ligabue/S. Salvatori (eds.), Bactria: An Ancient Oasis Civilization from the Sands of Afghanistan. Studi e documenti, Centro studi ricerche Ligabue 3 (Venice 1989) 143-153.
Hall 1943
Hall, A. R., The cube weights in Boston. In: E. J. H. Mackay, Chanhu-daro Excavations 1935-36 (New Haven 1943) 239-247.
Hammer 2019
Hammer, E., The city and landscape of Ur: An aerial, satellite, and ground reassessment. Iraq 81, 2019, 173-206.
Hargreaves 1929
Hargreaves, H., Excavations in Baluchistan 1925, Bampur Mound, Mastung and Sohr Damb, Nal. Memoires of the Archaeological Survey of India 35 (New Delhi 1929).
Hauptman 1980
Hauptman, A., Zur frühbronzezeitlichen Metallurgie von Shahr-i Sokhta (Iran). Der Anschnitt 32, 1980, 55-61.
Hegde/Sonawane 1986
Hegde, K. T. M., Sonawane, V. H., Landscape and settlement pattern of the Harappa culture villages in the Rupen estuary. Man and Environment 10, 1986, 23-31.
Hedge *et al.* 1985
Hedge, K. T. M., Bhan, K. K., Sonawane, M. H., Excavations at Nageswar 1984. Journal of the M. S. University of Baroda 33-34, 1984-1985, 3-20.
Hedge *et al.* 1988
Hegde, K. T. M., Sonawane, V. H., Shah, D. R., Bhan, K. K., Ajithprasad, P., Krishnan, K., Pratapachandran, S., Excavations at Nagwada 1986 & 1987: A preliminary report. Man and Environment 12, 1988, 55-65.
Hedge *et al.* 1990
Hedge, K. T. M., Bhan, K. K., Sonawane, V. S., Krishnan, K., Shah, D. R., Excavations at Nageshwar: A Harappan Shell Working Site on the Gulf of Kutch (Vadodara 1990).
Heimpel 1987
Heimpel, W., » Magan «. In: Reallexikon der Assyriologie und Vorderasiatischen Archäologie 7, 1987, 195-199.
Helwing 2009
Helwing, B., Rethinking the tin mountains: Patterns of usage and circulation of tin in greater Iran from the 4th to the 1st millennium BC. Tüba-Ar 12, 2009, 209-221.
Helwing *et al.* 2019
Helwing, B., Vidale, M., Fazeli Nashli, H., Radiocarbon dates and absolute chronology. In: H. A. Kavosh/M. Vidale/H. Fazeli Nashli (eds.), Prehistoric Sistan. 2: Tappeh Graziani, Sistan, Iran:

Stratigraphy, Formation Processes and Chronology of a Suburban Site of Shahr-i Sokhta. Serie orientale Roma, nuova serie 18 (Rome 2019) 151-156.

Hemmy 1931
Hemmy, A. S., System of weights at Mohenjo-Daro. In: Marshall 1931, 589-598.

Hemmy 1935
Hemmy, A. S., The statistical treatment of ancient weights. Ancient Egypt and the East 1, 1935, 83-93.

Hemmy 1937
Hemmy, A. S., An analysis of the Petrie collection of Egyptian weights. Journal of Egyptian Archaeology 23, 1937, 39-56.

Hemmy 1938a
Hemmy, A. S., System of weights. In: Mackay 1938, 601-612.

Hemmy 1938b
Hemmy, A. S., Relation to Egyptian and Susian weights. In: Mackay 1938, 672-678.

Hemmy 1943
Hemmy, A. S., Weights at Chanhu-daro. In: J. H. Mackay, Chanhu-Daro Excavations 1935-36 (New Haven 1943) 236-243.

Hendrickx-Baudot 1972
Hendrickx-Baudot, M. -P., The weights of the Harappa-culture. Orientalia Lovaniensia Periodica 3, 1972, 5-34.

Herzfeld 1916
Herzfeld, E. E., Reisbericht. Zeitschrift der Deutschen Morgenländischen Gesellschaft 80, 1916, 267-272.

Herzfeld 1931-1932
Herzfeld, E. E., Sakastana. Archaeologische Mitteilungen aus Iran 4, 1931-1932, 1-18.

Heuzey 1884-1912
Heuzey, L., Découvertes en Chaldée par Ernest de Sarzec (Paris 1884-1912).

Hiebert 1994
Hiebert, F. T., Origins of the Bronze Age Oasis Civilization in Central Asia. American School of Prehistoric Research Bulletin 42 (Cambridge 1994).

Hiebert 2003
Hiebert, F. T., A Central Asian Village at the Down of Civilization, Excavations at Anau, Turkmenistan (Philadelphia 2003).

Hiebert/Dyson 2002
Hiebert, F. T., Dyson, R. H., Prehistoric Nishapur and the frontier between Central Asia and Iran. Iranica Antiqua 37, 2002, 113-150.

Hiebert/Lamberg-Karlovsky 1992
Hiebert, F. T., Lamberg-Karlovsky, C. C., Central Asia and the Indo-Iranian borderlands. Iran 30, 1992, 1-15.

Hilton 2014
Hilton, A., Failaka/Dilmun: The Second Millennium Settlements: Danish Archaeological Investigations on Failaka, Kuwait. 4: Failaka Stone Vessels. Jysk Arkaeologisk Selskabs skrifter 17, 4 (Aarhus 2014).

Hinz/Koch 1987
Hinz, W., Koch, H., Elamisches Wörterbuch. Archäologische Mitteilungen aus Iran, Ergänzungsband 17 (Berlin 1987).

Hodder 1978
Hodder, I. (ed.), Simulation Studies in Archaeology (Cambridge 1978).

Hodson *et al.* 1971
Hodson, F. R., Kendall, D. G., Tâutu, P. (eds.), Mathematics in the Archaeological and Historical Sciences: Proceedings of the Anglo-Romanian Conference, Mamaia 1970 (Edinburgh 1971).

Hoffman 2018
Hoffman, B. C., Indus copper and bronze: Traditional perspectives and new interpretations. In: D. Frenez/G. M. Jamison/R. W. Law/M. Vidale/J. M. Kenoyer (eds.), Walking with the Unicorn. Social Organization and Material Culture in Ancient South Asia. Jonathan Mark Kenoyer Felicitation Volume. Serie orientale Roma, nuova serie 15 (Rome 2018) 251-264.

Høilund/Abu-Laban 2016
Højlund, F., Abu-Laban, F., Tell F6 on Failaka Island. Kuwaiti-Danish Excavations 2008-2012 (Aarhus 2016).

Holland 1975
Holland, T. A., An inscribed weight from Tell Sweyhat, Syria. Iraq 37, 1975, 75-77.

Hori 1986
Hori, A., A consideration of the ancient Near Eastern systems of weights. The Ancient Orient Museum 22, 1986, 16-36.

Hornell 1916
Hornell, H., Marine Zoology of Okhamandat (New Delhi 1916).

Horowitz 1992
Horowitz, W., Two Abnu šilkinšu fragments and related materials. Zeitschrift für Assyriologie und Vorderasiatische Archäologie 82, 1992, 112-122.

Hultsch 1864
Hultsch, F., Metrologicorum Scriptorum Reliquiae (Leipzig 1864).

Hultsch 1882
Hultsch, F., Griechische und römische Metrologie (Berlin 1882).

Hultsch 1898
Hultsch, F., Die Gewichte des Alterthums. Abhandlungen der Philologisch-Historischen Klasse der Königlich-Sächsischen Gesellschaft der Wissenschaften 18, 2 = Abhandlungen der Königlich-Sächsischen Gesellschaft der Wissenschaften 41 (Leipzig 1898).

Huot 1978
Huot, J.-L., Larsa: Rapport preliminaire sur la septieme campagne Larsa et la premiere campagne Tell el 'Oueili (1976). Syria 55, 1978, 183-223.

Huot 1983
Huot, J.-L., Larsa et 'Oueili, travaux de 1978-1981. Memoire, Editions Recherche sur les Civilisations 26 = Centre de Recherche d'Archéologie Orientale 4 = Bibliothèque de la Délégation Archéologique Française en Iraq 3 (Paris 1983).

Huot 1987
Huot, J.-L., Larsa (10e campagne, 1983) et Oueili (4e campagne, 1983): Rapport preliminaire.

Mémorie, Editions Recherche sur les Civilisations 73 = Centre de Recherche d'Archéologie Orientale 5 = Bibliothèque de la Délégation Archéologique Française en Iraq 4 (Paris 1987).

Huot 1989
Huot, J.-L., Larsa, Travaux de 1985. Mémorie, Editions Recherche sur les Civilisations 83 = Centre de Recherche d'Archéologie Orientale 7 = Bibliothèque de la Délégation Archéologique Française en Iraq 5 (Paris 1989).

Hussein/Suleiman 2000
Hussein, M. M., Suleiman, A., Nimrud: A City of Golden Treasures (Baghdad 2000).

IAR
Indian Archaeology 1963-1964, 1987-1988, 1988-1989, 1989-1990, 1990-1991, 1991-1992, 1992-1993, 1993, 1993-1994, 1995-1996, 1996-1997, 1997-1998, 1999-2000, 2000-2001, 2007, 2013-2014: A Review (New Delhi).

Inizan 1993
Inizan, M.-L., At the dawn of trade, carnelian from India to Mesopotamia in the third millennium: The example of Tello. In: A. Gail/G. J. R. Mevissen (eds.), South Asian Archaeology 1991: Proceedings of the Eleventh International Conference of the Association of the South Asian Archaeologists in Western Europe, Held in Berlin 1-5 July, 1991 (Stuttgart 1993) 121-134.

Inizan/Lechevallier 1990
Inizan, M.-L., Lechevallier, M., A techno-economic approach to lithics: Some examples of blade pressure debitage in the Indo-Pakistani subcontinent. In: M. Taddei (ed.), South Asian Archaeology 1987: Proceedings of the Ninth International Conference of the Association of South Asian Archaeologists in Western Europe, Held in the Fondazione Giorgio Cini, Island of San Giorgio Maggiore, Venice. Serie orientale Roma 66 (Rome 1990) 43-59.

Isakov 1986
Isakov, A. I., Novii Rannezemledel cheskii pamyatnik Srednei Azii. Sovietskaja Arkeologiya 1 (Moskva 1986).

Jacobsen 1987
Jacobsen, T., The Harps that Once ... Sumerian Poetry in Translation (New Haven 1987).

Jarrige 1985
Jarrige, J.-F., Continuity and change in the north Kachi plain (Baluchistan, Pakistan) at the beginning of the second millennium B.C. In: J. Schotsmans/M. Taddei (eds.), South Asian Archaeology 1983: Papers from the Seventh International Conference of the Association of South Asian Archaeologists in Western Europe, Held in the Musées Royaux d'Art et d'Histoire, Brussels (Naples 1985) 35-68.

Jarrige 1988
Jarrige, J.-F. (ed.), Les Cités Oubliées de l'Indus: Archéologie du Pakistan (Musée National des Arts Asiatiques Guimet, 16 Nov. 1988-30 Jan. 1989) (Paris 1988).

Jarrige 1989
Jarrige, J.-F., Excavations at Nausharo 1987-1988. Pakistan Archaeology 24, 1989, 21-67.

Jarrige/Hassan 1989
Jarrige, J.-F., Hassan, M. U., Funerary complexes in Baluchistan at the end of the third millennium in the light of recent discoveries at Mehrgarh and Quetta. In: K. Frifelt/P. Sørensen (eds.), South Asian Archaeology 1985: Papers from the International Conference of [the Association of] South Asian Archaeologists in Western Europe, Held at Moesgaard Museum, Denmark, 1-5 July 1985. Occasional Papers, Scandinavian Institute of Asian Studies 4 (London 1989) 150-166.

Jarrige *et al.* 2011
Jarrige, J.-F., Didier, A., Quivron, G., Shahr-i Sokhta and the chronology of the Indo-Iranian regions. Paléorient 37, 2, 2011, 7-34.

Jarrige, C./Tosi 1981
Jarrige, C., Tosi, M., The natural sources of Mundigak. Some observations on the location of the site in relation to its economical space. In: H. Härtel (ed.), South Asian Archaeology 1979: Papers from the Fifth International Conference of the Association of South Asian Archaeologists in Western Europe, Held in the Museum für Indische Kunst der Staatlichen Museen Preussischer Kulturbesitz Berlin (Berlin 1981) 115-142.

Jéquier 1900
Jéquier, G., Travaux de l'hiver 1898-99. Mémoires de la Délégation en Perse 1 (Paris 1900) 111-138.

Johnson 1978
Johnson, G. A., Information sources and the development of decision-making organization. In: C. L. Redman/M. J. Berman/E. V. Curtin/W. T. Langhorne Jr./N. M. Versaggl/J. C. Wanser (eds.), Social Archaeology: Beyond Subsistence and Dating. Studies in Archaeology (New York 1978).

Johnson 1981
Johnson, G. A., Monitoring complex system integration and boundary phenomena with settlement size data. In: S. E. van der Leeuw (ed.), Archaeological Approaches to the Study of Complexity. Cingula 6 (Amsterdam 1981) 143-188.

Joshi 1990
Joshi, J. P., Excavations at Surkotada 1971-72 and exploration in Kutch. Memoirs of the Archaeological Survey of India 87 (New Delhi 1990).

Karami *et al.* 2019
Karami, M., Pfälzner, P., Soleimani, N., SOJAS 2015-2018. A resumé of four seasons of archaeological survey south of Jiroft, archaeology. Journal of the Iranian Center for Archaeological Research 2, 2, 2019, 107-124.

Kazmi/Jan 1997
Kazmi, A. H., Jan, Q., Geology and Tectonics of Pakistan (Karachi 1997).

Kendall 1974
Kendal, D. G., Hunting quanta. Philological Transactions of the Royal Society London 276, 1974, 231-266.

Kenoyer 1983
Kenoyer, J. M., Shell Working Industries of the Indus Civilization: An Archaeological and Ethnographic

Perspective (PhD dissertation University of California) (Berkeley 1983).
Kenoyer 1984
Kenoyer, J. M., Shell working industries of the Indus civilization: A summary. Paléorient 10, 1984, 49-63.
Kenoyer 1991
Kenoyer, J. M., The Indus valley tradition of Pakistan and western India. Journal of World Prehistory 5, 4, 1991, 331-385.
Kenoyer 1995
Kenoyer, J. M., Interaction systems, specialized crafts and culture change: The Indus valley tradition and the Indo-Gangetic tradition in South Asia. In: G. Erdosy (ed.), The Indo-Aryans of Ancient South Asia: Language, Material Culture and Ethnicity. Indian Philology and South Asian Studies 1 (Berlin 1995) 213-257.
Kenoyer 1997
Kenoyer, J. M., Trade and technology of the Indus Valley: New insights from Harappa, Pakistan. World Archaeology 29, 1997, 262-280.
Kenoyer 1998
Kenoyer, J. M., Ancient Cities of the Indus Valley Civilization: Dedicated to the Memory of George F. Dales, jr. (1927-1992) and Walter A. Fairservis, jr. (1924-1994) (Karachi 1998).
Kenoyer 2008
Kenoyer, J. M., Indus and Mesopotamian trade networks: New insights from shell and carnelian artifacts. In: E. Olijdam/R. H. Spoor (eds.), Intercultural Relations between South and Southwest Asia: Studies in Commemoration of E. C. L. During Caspers (1934-1996). BAR International Series 1826 = Society for Arabian Studies Monographs 7 (London 2008) 19-28.
Kenoyer 2010
Kenoyer, J. M., Measuring the Harappan world: Insights into the Indus order and cosmology. In: I. Morley/C. Renfrew (eds.), The Archaeology of Measurement: Comprehending Heaven, Earth and Time in Ancient Societies (Cambridge 2010) 9-21.
Kharakwal *et al.* 2007
Kharakwal, A., Singh, J., Rawat, H., Shresthi, R., Toshiki, O., Kanmer: A Harappan site in Kutchh, Gujarat, India. In: O. Toshiki (ed.), Linguistics, Archaeology and the Human Past. Occasional Paper 2 (Kyoto 2007) 21-137.
Khatri/Acharya 1995
Khatri, J. S., Acharya, M., Kunal: A new Indus Saraswati site. Purātattva 25, 1995, 84-86.
Khlopin 1963
Khlopin, I. N., Pamyatniki rannevo eneolita Yudzinoi Turkmenii (Moskva 1963).
Killik/Roaf 1979
Killik, R., Roaf, M., Excavations at Tell Madhhur. Sumer 35, 1979, 539-542.
King 1912
King, L. W., Cuneiform Texts from Babylonian Tablets in the British Museum. Part 33 (London 1912).
Kohl 1971
Kohl, P. C., The Early Bronze Age of Iran as seen from Tepe Yahya. Expedition 13, 1971, 14-21.
Kohl 1974
Kohl, P. C., The Seeds of Upheaval: The Production of Chlorite at Tepe Yahya and an Analysis of Commodity Production and Trade in Southwest Asia in the Third Millennium (PhD dissertation Harvard University, Department of Anthropology) (Boston 1974).
Kohl 1975a
Kohl, P. C., Carved chlorite vessels: A trade in finished commodities in the mid-third-millennium. Expedition 18, 1, 1975, 18-31.
Kohl 1975b
Kohl, P. C., The archaeology of trade. Dialectical Anthropology 1, 1975, 43-50.
Kohl 1976
Kohl, P. C., 'Steatite' carvings of the early third millennium B.C. American Journal of Archaeology 80, 1976, 73-75.
Kohl 1977
Kohl, P. C., A note on chlorite artefacts from Shahr-i Sokhta. East and West 27, 1977, 111-128.
Kohl 1978
Kohl, P. C., The balance of trade in southwestern Asia in the mid-third millennium B.C. Current Anthropology 19, 1978, 463-492.
Kohl 1979
Kohl, P. C., The 'World Economy' of West Asia in the third millennium BC. In: M. Taddei (ed.), South Asian Archaeology 1977: Papers from the Fourth International Conference of the Association of South Asian Archaeologists in Western Europe, Held in the Istituto Universitario Orientale, Naples. Series Minor, Istituto Universitario Orientale, Seminario di Studi Asiatici 6 (Naples 1979) 55-85.
Kohl 1982
Kohl, P. C., The first world economy: External relations and trade in West and Central Asia in the third millennium B.C. In: H.-J. Nissen/J. Renger (eds.), Mesopotamien und seine Nachbarn. Politische und kulturelle Wechselbeziehungen im Alten Vorderasien vom 4. bis 1. Jahrtausend v. Chr. 25. Rencontre Assyriologique Internationale Berlin, 3. bis 7. Juli 1978. Berliner Beiträge zum Vorderen Orient 1 (Berlin 1982) 23-31.
Kohl 2001
Kohl, P. C., Reflections on the production of chlorite at Tepe Yahya: 25 years later. In: D. T. Potts (ed.), Excavations at Tepe Yahya, Iran, 1967-1975: Periods IVC and IVB (3000-2000 BC) (Cambridge 2001) 209-230.
Kohl, P. L. 1984
Kohl, P. L., Central Asia: Palaeolithic Beginnings to the Iron Age. Recherche sur les grandes civilizations – Synthèse 14 (Paris 1984).
Kula 1987
Kula, W., Le misure e gli uomini dall'età antica a oggi [Italian translation of Measures and Men] (Roma 1987).

Kulakoğlu 2017
Kulakoğlu, F., Balance stone weights and scale-pans from Kültepe-Kanesh: On one of the basic elements of the Old Assyrian trading system. In: C. Maner/M. T. Horowits/A. S. Gilbert (eds.), Overturning Certainties in Near Eastern Archaeology: A Festschrift in Honor of K. Aslihan Yener. Culture and History of the Ancient Near East 90 (Leiden 2017) 341-402.

Kutscher 1989
Kutscher, R., Royal Inscriptions: The Brockmon Tablets at the University of Haifa (Haifa 1989).

Lal *et al.* 2003
Lal, B. B., Thapar, B. K., Joshi, J. P., Bala, M., Excavations at Kalibangan: The Early Harappans (1960-1969). Memoirs of the Archaeological Survey of India 98 (New Delhi 2003).

Lamberg-Karlovsky 1968
Lamberg-Karlovsky, C. C., Survey and excavations in the Kerman area. Iran 6, 1968, 167-168.

Lamberg-Karlovsky 1970
Lamberg-Karlovsky, C. C, Excavations at Tepe Yahya, Iran 1967-1969: Progress Report I. Monograph Series of the Asia Institute of Pahlavi University 1 = Bulletin of the American School of Prehistoric Research 27 (Cambridge 1970).

Lamberg-Karlovsky 1971
Lamberg-Karlovsky, C. C., The Protoelamite settlement at Tepe Yahya. Iran 9, 1971, 87-95.

Lamberg-Karlovsky 1972a
Lamberg-Karlovsky, C. C., Tepe Yahya 1971: Mesopotamia and Indo-Iranian borderlands. Iran 10, 1972, 89-100.

Lamberg-Karlovsky 1972b
Lamberg-Karlovsky, C. C., Trade mechanisms in Indus-Mesopotamian interrelations. Journal of the American Oriental Society 92, 1972, 222-229.

Lamberg-Karlovsky 1973
Lamberg-Karlovsky, C. C., Urban interaction in the Iranian plateau: Excavation at Tepe Yahya, 1967-1973. Proceedings of the British Academy 59, 1973, 1-43.

Lamberg-Karlovsky 1976a
Lamberg-Karlovsky, C. C., Tepe Yahya project. Iran 14, 1976, 172.

Lamberg-Karlovsky 1976b
Lamberg-Karlovsky, C. C., The third millennium at Tappeh Yahya: A preliminary statement. In: F. Bagherzadeh (ed.), Proceedings of the IVth Annual Symposium on Archaeological Research in Iran 1975: 3rd-8th November 1975 (Tehran 1976) 71-84.

Lamberg-Karlovsky 1988
Lamberg-Karlovsky, C. C., Comment on Kohl 1978. Current Anthropology 19, 1988, 478-480.

Lamberg-Karlovsky 2001
Lamberg-Karlovsky, C. C., Afterword: Excavations at Tepe Yahya: Reconstructing the past. In: D. T. Potts (ed.), Excavations at Tepe Yahya, Iran, 1967-1975: Periods IVC and IVB (3000-2000 BC) (Cambridge 2001) 269-280.

Lamberg-Karlovsky 2003
Lamberg-Karlovsky, C. C., Premières reactions sur la découverte de Jiroft. Dossiers d'Archéologie 287, 2003, 76-77.

Lamberg-Karlovsky/Tosi 1973
Lamberg-Karlovsky, C. C., Tosi, M., Shahr-i Sokhta and Tepe Yahya: Tracks on the earliest history on the Iranian plateau. East and West 23, 1973, 21-58.

Langdon 1924
Langdon, S., Excavations at Kish: The Herbert Weld and Field Museum of Natural History Expedition to Mesopotamia. Vol. 1: 1923-1924 (Paris 1924).

Langdon/Harden 1934
Langdon, S., Harden, D. B., Excavations at Kish and Barghuthiat 1933. Iraq 1/2, 1934, 113-136.

Langdon/Watelin 1930
Langdon, S., Watelin, L. C., Excavations at Kish: The Herbert Weld and Field Museum of Natural History Expedition to Mesopotamia. Vol. 3: 1925-1927 (Oxford 1930).

Langdon/Watelin 1934
Langdon, S., Watelin, L. C., Excavations at Kish: The Herbert Weld and Field Museum of Natural History Expedition to Mesopotamia. Vol. 4: 1925-1930 (Oxford 1934).

Law 2002
Law, R. W., Potential steatite sources for the Indus civilization. In: M. A. Halim (ed.), Indus Valley Civilization: Collection of Papers Presented in the International Colloquium on Indus Valley Civilization at Islamabad (6th-8th April 2001) (Islamabad 2002) 158-169.

Law 2005
Law, R. W., Regional interaction in the Prehistoric Indus Valley: Initial results of rock and mineral sourcing studies at Harappa. In: C. Jarrige/V. Lefèvre (eds.), South Asian Archaeology 2001: Proceedings of the Sixteenth International Conference of the European Association of South Asian Archaeologists, Held in Collège de France, Paris, 2-6 July 2001 (Paris 2005) 179-190.

Law 2006
Law, R. W., Moving mountains: The trade and transport of rocks and minerals within the Greater Indus Valley region. In: E. C. Roberston/J. D. Seibert/D. C. Fernandez/M. U. Zender (eds.), Space and Spatial Analysis in Archaeology [papers originally presented at the Conference: Space and Spatial Analysis in Archaeology, held at the University of Calgary, Nov. 18th., 2002] (Calgary 2006) 301-313.

Law 2011
Law, R. W., Current Studies on the Indus Civilization. Vol. 8: Inter-Regional Interaction and Urbanism in the Ancient Indus Valley: A Geologic Provenience Study of Harappa's Rock and Mineral Assemblage. RIHN Library, Sōgō-Chikyū-Kankyōgaku-Kenkyūsho 16 (New Delhi 2011).

Law 2013
Law, R. W., The important stone and metal resources of Gujarat during the Harappan period. Journal of

Multidisciplinary Studies in Archaeology 1, 2013, 319-343.
Law *et al.* 2013
Law, R. W., Carter, A., Bhan, K. K., Malik, A., Glascock, M. D., INAA of agate sources and artifacts from the Indus, Helmand and Thailand regions. In: D. Frenez/M. Tosi (eds.), South Asian Archaeology 2007: Proceedings of the 19th International Conference of the European Association of South Asian Archaeologists, Ravenna, Italy, July 2-6, 2007. Vol. 1: Prehistoric Periods. BAR International Series 2454 (Oxford 2013) 177-184.
Layard 1851
Layard, A. H., Inscriptions in the Cuneiform Character from Assyrian Monuments (London 1851).
Layard 1853
Layard, A. H., Discoveries in the Ruins of Nineveh and Babylon, with Travels in Armenia, Kurdistan and the Desert: Being the Result of a Second Expedition Undertaken for the Trustees of the British Museum (London 1853).
Le Breton 1947
Le Breton, L., Note sur la céramique peinte aux environ de Suse (Tépé Djaffarabad, Tépé Djowi, Tépé Bendebal) et à Suse. Mémoires de la Délégation Archéologique en Iran 30, 1947, 124-146.
Le Breton 1957
Le Breton, L., The early periods at Susa: Mesopotamian relations. Iraq 19, 1957, 79-124.
Le Brun 1971
Le Brun, A., Recherches stratigraphiques à l'Acropole de Suse, 1969-1971. Délégation Archéologique Française en Iran 1, 1971, 163-216.
Le Brun 1978a
Le Brun, A., La glyptique du niveau 17B de l'Acropole (campagne 1972). Délégation Archéologique Française en Iran 8, 1978, 61-79.
Le Brun 1978b
Le Brun, A., Le niveau 17B de l'Acropole de Suse (campagne 1972). Délégation Archéologique Française en Iran 8, 1978, 57-154.
Le Brun 1978c
Le Brun, A., Suse, chantier "Acropole 1". Paléorient 4, 1978, 177-192.
Le Brun 1985
Le Brun, A., Le niveau 18 de l'Acropole de Suse: Memories d'argile, Mémoires du temp. Paléorient 11, 2, 1985, 31-36.
Le Brun 1990
Le Brun, A., Le documents économiques du niveau 18 de l'Acropole de Suse et leurs modes de groupement. In: F. Vallat (ed.), Contribution à l'Histoire de l'Iran: Mélanges offerts à Jean Perrot (Paris 1990) 61-66.
Le Brun/Vallat 1978
Le Brun, A., Vallat, F., L'origine de l'écriture à Suse. Délégation Archéologique Française en Iran 8, 1978, 11-56.
Leemans 1960
Leemans, W. F., Foreign Trade in the Old Babylonian Period: As Revealed by Texts from Southern Mesopotamia. Studia et documenta ad iura Orientis antiqui pertinentia 6 (Leiden 1960).
Lehmann 1889a
Lehmann, C. F., Ueber altbabylonisches Mass und Gewicht und deren Wanderung. Verhandlungen der Berliner Gesellschaft für Anthropologie, Ethnologie und Urgeschichte, 1889 (Sitzung vom 16. März), 234-328.
Lehmann 1889b
Lehmann, C. F., Ueber das babylonische metrische System und dessen Verbreitung. Verhandlungen der Physikalischen Gesellschaft zu Berlin 8, 1889, 81-101.
Lehmann 1893
Lehmann, C. F., Das altbabylonische Mass- und Gewichtssystem als Grundlage der antiken Gewichts-, Münz- und Massysteme. Actes du Huitième Congrès International des Orientalistes, tenue en 1889 à Stockholm et à Christiana, Sec. I (Leiden 1893) 167-249.
Lehmann 1895
Lehmann, C. F., Zum Nebucadnezar-Dungi-Gewicht. Zeitschrift für Assyriologie und Vorderasiatische Archäologie 10, 1895, 381-389.
Lehmann-Haupt 1909
Lehmann-Haupt, C. F., Die Sonderformen des „babylonischen" Gewichtssystems. Zeitschrift der Deutschen Morgenländischen Gesellschaft 63, 1909, 701-729.
Lehmann-Haupt 1912
Lehmann-Haupt, C. F., Vergleichende Metrologie und keilinschriftliche Gewichtskunde. Zeitschrift der Deutschen Morgenländischen Gesellschaft 66, 1912, 607-696.
Lehmann-Haupt 1918
Lehmann-Haupt, C. F., » Gewichte «. In: Paulys Realencyclopädie der classischen Altertumswissenschaft, Suppl. 3, 1918, 597-664.
Liverani 1972
Liverani, M., Elementi 'irrazionali' nel commercio amarniano. Oriens Antiquus 11, 1972, 297-317.
Liverani 1979
Liverani, M., Dono, tributo, commercio: Il ruolo dello scambio nella tarda età del Bronzo. Annali dell'Istituto Italiano di Numismatica 26, 1979, 9-28.
Loftus 1857
Loftus, W. K., Travels and Researches in Chaldaea and Susiana in 1848-1852 (London 1857).
van Loon 1978
van Loon, M. N., Korucutepe: Final Report on the Excavations of the Universities of Chicago, California and Amsterdam in the Keban Reservoir, Eastern Anatolia, 1968-1970, vol. 2. Studies in Ancient Cilvilization (Amsterdam 1978).
van Loon 2001
van Loon, M. N., Selenkahiye: Final Report on the University of Chicago and University of Amsterdam Excavations in the Tabqa Reservoir, Northern Syria, 1967-1975. Uitgaven van het Nederlands Historisch-Archeologisch Instituut te Istanbul 91 (Leiden 2001).

Loud/Altman 1938
Loud, G., Altman, C. B., Khorsabad. 2: The Citadel and the Town. Oriental Institute Publications 40 (Chicago 1938).

Lucas 1962
Lucas, A., Ancient Egyptian Materials and Industries (London 1962).

Mackay 1925
Mackay, E. J. H., Report on the Excavations of the 'A' Cemetery at Kish, Mesopotamia, 1. Anthropology Memoirs 1, 1 (Chicago 1925).

Mackay 1929
Mackay, E. J. H., A Sumerian Palace and the 'A' Cemetery at Kish, Mesopotamia, 2. Anthropology Memoirs 1, 2 (Chicago 1929).

Mackay 1931
Mackay, E. J. H., Report on Excavations at Jemdet Nasr, Iraq. Anthropology Memoirs 1, 3 (Chicago 1931).

Mackay 1938
Mackay, E. J. H., Further Excavations at Mohenjo-Daro: Being an Official Account of Archaeological Excavations at Mohenjo-daro, Carried Out by the Government of India between the Years 1927 and 1931 (New Delhi 1938).

Mackay 1943
Mackay, E. J. H., Chanhu-daro Excavations 1935-1936. American Oriental Series 20 (New Haven 1943).

Madjidzadeh 1979
Madjidzadeh, Y., An early prehistoric coppersmith workshop at Tepe Ghabristan. In: Akten des VII. Internationalen Kongresses für Iranische Kunst und Archäologie, München 7.-10. September 1976. Archäologische Mitteilungen aus Iran, Ergänzungsbd. 6 (Berlin 1979) 82-92.

Madjidzadeh 2003a
Madjidzadeh, Y., Jiroft. The Earliest Oriental Civilization (Tehran 2003).

Madjidzadeh 2003b
Madjidzadeh, Y., La découverte de Jiroft. Dossiers d'Archéologie 287, 2003, 18-63.

Madjidzadeh 2008
Madjidzadeh, Y., Excavations at Konar Sandal in the region of Jiroft in the Halil basin. First preliminary report (2002-2008). Iran 46, 2008, 69-104.

Magee 2004
Magee, P., Excavations at Tepe Yahya, Iran 1967-1975: The Iron Age Settlement. Bulletin of the American School of Prehistoric Research 46 (Cambridge 2004).

Margabandhu 1989
Margabandhu, C., Weights and measures. In: A. Ghosh (ed.), An Encyclopaedia of Indian Archaeology (Delhi 1989) 190-191.

Margueron 1970
Margueron, J. -C., Larsa, rapport preliminaire sur la quatrieme campagne. Syria 47, 1970, 261-277.

Margueron 1971
Margueron, J. -C., Larsa, rapport preliminaire sur la cinquieme campagne. Syria 48, 1971, 271-287.

Marshall 1931
Marshall, J. (ed.), Mohenjo-Daro and the Indus Civilization: Being an Official Account of Archaeological Excavations at Mohenjo-daro Carried Out by the Government of India between the Years 1922 and 1927, 3 vols. (London 1931).

Mashkour *et al.* 2013
Mashkour, M., Tengberg, M., Shirazi, Z., Madjidzadeh, Y., Bio-archaeological studies at Konar Sandal, Halil rud basin, southeastern Iran. Journal of Environmental Archaeology 18, 2013, 222-246.

Masson 1960
Masson, V. M., Kara-Depe u Artyika. Trudy Južno-Turkmenistanskoj Archeologičeskoj Kompleksnoj Ėkspedicii 10 (Moskva 1960).

Masson 1981
Masson, V. M., Altyn-Depe. Trudy Južno-Turkmenistanskoj Archeologičeskoj Kompleksnoj Ėkspedicii 18 (Leningrad 1981).

Masson 1988
Masson, V. M., Altyn-Depe. University Museum Monograph 55 (Philadelphia 1988).

Masson/Kiiatkina 1981
Masson, V. M., Kiiatkina, T. P., Man and the dawn of civilization. In: P. L. Kohl (ed.), The Bronze Age Civilization of Central Asia: Recent Soviet Discoveries (Armonk 1981), 107-134.

Matney *et al.* 2011
Matney, T., Greenfield, T., Hartenberg, B., Jalbrzikowski, C., Köroglu, K., MacGinnis, J., Marsh, A., Monroe, M. W., Rosenzweig, M., Sauer, K., Wicke, D., Excavations at Ziyaret Tepe, Diyarbakir province, Turkey, 2009-2010 seasons. Anatolica 37, 2011, 67-114.

Matsumoto/Oguchi 2002
Matsumoto, K., Oguchi, H., Excavations at Kish, 2000. al-Rāfidān 23, 2002, 1-16.

Matsumoto/Oguchi 2004
Matsumoto, K., Oguchi, H., News from Kish: The 2001 Japanese work. al-Rāfidān 25, 2004, 1-8.

Maxwell-Hyslop 1988
Maxwell-Hyslop, K. R., A comment on the finds from Khinaman. Iranica Antiqua 23, 1988, 129-138.

McCown *et al.* 1967
McCown, D. E., Haines, R. C., Hansen, D., Nippur I: Temple of Enlil Scribal Quarter and Soudings. Oriental Institute Publications 78 (Chicago 1967).

Meadow/Kenoyer 1993
Meadow, R. H., Kenoyer, J. M., Excavations at Harappa – 1992-1993. Pakistan Archaeology 28, 1993, 55-102.

de Mecquenem 1911
de Mecquenem, R., Constructions élamites du Tell de l'Acropole de Suse (temple de Inshushinak, temple de Nin-Hur-sag.). Mémoires de la Délégation en Perse 12 (Paris 1911) 65-78.

de Mecquenem 1922
de Mecquenem, R., Fouilles de Suse, campagnes des annes 1914-1922. Revue d'Assyriologie et d'Archéologie Orientale 19, 1922, 105-140.

de Mecquenem 1924
de Mecquenem, R., Fouilles de Suse (campagne 1923-1924). Revue d'Assyriologie et d'Archéologie Orientale 21, 1924, 105-118.

de Mecquenem 1929-1930
de Mecquenem, R., Les dernières résultats des fouilles de Suse. Revue des Arts Asiatiques 6, 1929-1930, 73-88.

de Mecquenem 1931
de Mecquenem, R., Excavations at Suse (Persia) 1930-1931. Antiquity 5, 1931, 330-343.

de Mecquenem 1934
de Mecquenem, R., Fouilles de Suse 1929 à 1933 (sur l'Acropole et la Ville Royale). Mémoires de la Délégation en Perse 25 (Paris 1934) 177-237.

de Mecquenem 1943
de Mecquenem, R., Fouilles de Suse 1933-1938 (Suse, Tépé Bouhallan, Tépé Husseinabad, Tépé Zohab). Mémoires de la Délégation en Perse 29 (Paris 1943) 3-161.

de Mecquenem 1943-1944
de Mecquenem, R., Notes sur les modalités funéraires susiennes et leur chronologie. Vivres et Penser 3, 1943-1944, 133-142.

de Mecquenem 1953a
de Mecquenem, R., Recherches a Tchoga Zembil (1935-1939; 1946). Mémoires de la Délégation en Perse 33 (Paris 1953) 1-13.

de Mecquenem 1953b
de Mecquenem, R., Inventaire des objets trouvés a Tchoga Zembil (1936-1939). Mémoires de la Délégation en Perse 33 (Paris 1953) 41-61.

de Mecquenem 1956
de Mecquenem, R., Notes proto-élamites. Revue d'Assyriologie 50, 1956, 200-204.

Meggers 1960
Meggers, B. J., The law of cultural evolution as a practical research tool. In: G. E. Dole/L. E. Carneiro (eds.), Essays in the Science of Culture: In Honor of Leslie A. White (New York 1960) 302-316.

Meissner 1920
Meissner, F., Babylonien und Assyrien 1. Kulturgeschichtliche Bibliothek 1, 3 (Heidelberg 1920).

Merh 1995
Merh, S. S., Geology of Gujarat (Bangalore 1995).

Michailidou 1999
Michailidou, A., Systems of weight and social relations of "private" production in the Late Bronze Age Aegean. In: A. Chaniotis (ed.), From Minoan Farmers to Roman Traders: Sidelights on the Economy of Ancient Crete. Heidelberger althistorische Beiträge und epigraphische Studien 29 (Stuttgart 1999) 87-114.

Michailidou 2001
Michailidou, A., Recording quantities of metal in Bronze Age societies in the Aegean and the Near East. In: A. Michailidou (ed.), Manufacture and Measurement: Counting, Measuring and Recording Craft Items in Early Aegean Societies. Meletēmata 33 (Athens 2001) 85-119.

Michailidou 2003
Michailidou, A., Measuring weight and value in Bronze Age economies in the Aegean and the Near East: A discussion on metal axes of no practical use. In: K. P. Foster/R. Laffineur (eds.), Metron. Measuring the Aegean Bronze Age: Proceedings of the 9th International Aegean Conference, New Haven, Yale University, 18-21 April 2002. Aegaeum 24 (Liège 2003) 301-314.

Michailidou 2005
Michailidou, A., Weight and Value in Pre-Coinage Societies: An Introduction. Mελethmata 42 (Athens 2005).

Michailidou 2006
Michailidou, A., Stone balance weights? The evidence from Akrotiri on Thera. In: Alberti *et al.* 2006a, 233-264.

Michalon 1953
Michalon, J., Restes de constructions a Tchoga Zembil. Mémoires de la Délégation en Perse 33 (Paris 1953) 14-40.

Micheli/Vidale 2012
Micheli, R., Vidale, M., The function of a chlorite hand-bag of the Halil civilization as inferred from its wear traces. Iranian Journal of Archaeological Studies 2, 2, 2012, 1-11.

Milano 2004
Milano, L., Weight stones from Tell Beydar/Nabada. Kaskal 1, 2004, 1-7.

Mille *et al.* 2004
Mille, B., Besenval, R., Bourgarit, D., Frühes Gießen in verlorener Form in Baluchistan: Das „Leoparden-Gewicht" aus Shahi-Tump. In: Th. Stöllner/R. Slotta/A. Vatandoust (eds.), Persiens Antike Pracht: Bergbau – Handwerk – Archäologie. Katalog der Ausstellung des Deutschen Bergbau Museums, vol. 1. Veröffentlichungen aus dem Deutschen Bergbau-Museum Bochum 128, 1 (Bochum 2004) 274-281.

Miller, H. J. 2000
Miller, H. J., A functional typology for metal objects from Chanhu-daro. In: M. Taddei/G. De Marco (eds.), South Asian Archaeology 1997: Proceedings of the Fourteenth International Conference of the European Association of South Asian Archaeologists, Held in the Istituto Italiano per l'Africa e l'Oriente, Palazzo Brancaccio, Rome, 7-14 July 1997 (Rome 2000) 301-320.

Miller/Sumner 2003
Miller, N. F., Sumner, W. M., The Banesh-Kaftari interface. The view from Operation H5, Malyan. Iran 41, 2003, 7-19.

Miller/Sumner 2004
Miller, N. F., Sumner, W. M., The Banesh-Kaftari interface. The view from Operation H5, Malyan. Iran 42, 2004, 91-102.

de Miroschedji 1973
de Miroschedji, P., Vases et objets en stéatite susiens du Musée du Louvre. Cahiers de la Délégation Archéologique Française en Iran 3, 1973, 9-42.

Moorey 1978
Moorey, P. R. S., Kish Excavations 1923-1933 (Oxford 1978).

Moorey 1985
Moorey, P. R. S., Materials and Manufacture in Ancient Mesopotamia: The Evidence of Archaeology and Art. Metals and Metalworking, Glazed Materials and Glass. BAR International Series 237 (Oxford 1985).

Moorey 1994
Moorey, P. R. S., Ancient Mesopotamian Materials and Industries: The Archaeological Evidence (Oxford 1994).

Moorey/Woolley 1982
Moorey, P. R. S., Woolley, L., Ur of the Chaldees: A Revised and Updated Edition of Sir Leonard Woolley's Excavations at Ur (London 1982).

de Morgan 1900
de Morgan, J., Travaux au Tell de la Citadelle. Mémoires de la Délégation en Perse 1, 1900, 81-110.

Mousavi 1990
Mousavi, A., Tépé Horreeye, le bit akitu de Tchoga Zanbil? In: F. Vallat (ed.), Contribution à l'histoire de l'Iran: Mélanges Jean Perrot (Paris 1990) 143-145.

Mughal 1990
Mughal, M. R., Further evidence of the early Harappa culture in the Greater Indus Valley. South Asian Studies 6, 1990, 175-200.

Muhly 1973
Muhly, J. D., Copper and Tin: The Distribution of Mineral Resources and the Nature of the Metals Trade in the Bronze Age. Transactions of the Connecticut Academy of Arts and Sciences 43 (Hamden 1973).

Muscarella 1994
Muscarella, O. W., Intercultural style weights. Bulletin of the Asia Institute 7, 1994, 143-154.

Muscarella 2001
Muscarella, O. W., Jiroft and "Jiroft-Aratta". A review article of Yousef Madjidzadeh, Jiroft: The earliest oriental civilization. Bulletin of the Asia Institute 15, 2001, 173-198.

Nanavati 1961-1962
Nanavati, J. M., Problems of the chronology of Harappan sites in Gujarat. Journal of the Oriental Institute of Baroda 11, 1961-1962, 421-427.

Nath 1998
Nath, A., Rakhigarhi: A Harappan metropolis in Saraswati-Drishadvati district. Puratattva 28, 1998, 41-43.

Nath 1999
Nath, A., Further excavations at Rakhigarhi. Puratattva 29, 1999, 46-49.

Nath 2001
Nath, A., Rakhigarhi 1999-2000. Puratattva 31, 2001, 43-45

Nath 2014
Nath, A., Excavations at Rakhigarhi (1997-1998 to 1999-2000). Archaeological Survey of India, Copy to the Superintending Archaeologist, ASI Excavation Branch-II, Purana Qila (New Delhi 2014)

Nath 2018
Nath, A., Archaeomalacology of the Harappans at Rakhigarhi, Haryana. Man and Environment 43, 2, 2018, 42-66.

Nath *et al.* 2014
Nath, A., Law, R., Garge, T., Initial geologic provenience studies of stone and metal artefacts Rakhighari. Journal of Multidisciplinary Studies in Archaeology 2, 2014, 74-100.

Nath *et al.* 2015
Nath, A., Walimbe, S. R., Garge, M. T., Mushrif-Tripathy, V., Dehuri, R., Malik, A., Harappan interments at Rakhigarhi, Haryana. Man and Environment 42, 2, 2015, 9-32.

Nicholas 1980
Nicholas, I. M., A Spatial/Functional Analysis of the Banesh Occupation at Malyan: The TUV Operation (Philadelphia 1980).

Nicholson/Shaw 2000
Nicholson, P. T., Shaw, I., Ancient Egyptian Materials and Technology (Cambridge 2000).

Oates *et al.* 2001
Oates, D., Oates, J., McDonald, H., Excavations at Tell Brak. 2: Nagar in the Third Millennium (Cambridge 2001).

Orton 1980
Orton, C., Mathematics in Archaeology (London 1980).

Őzgüç 1986
Őzgüç, T., Kültepe-Kaniş II: New Researches at the Trading Center of the Ancient Near East. Türk Tarih Kurumu yayınları, seri 5, 41 (Ankara 1986).

Pakkanen 2011
Pakkanen, J., Aegean Bronze Age weights, chaines opératoire and the detecting of patterns through statistical analysis. In: A. Brysbaert (ed.), Tracing Prehistoric Social Networks through Technology: A Diachronic Perspective on the Aegean. Routledge Studies in Archaeology 3 (London 2011) 143-166.

Parise 1962-1964
Parise, N., Ricerche ponderali 1. Pesi cretesi riesaminati. Annali dell'Istituto Italiano di Numismatica 9-11, 1962-1964, 9-30.

Parise 1964
Parise, N., Appunti per lo studio del sistema ponderale miceneo. La Parola del Passato 19, 1964, 5-21.

Parise 1970-1971
Parise, N., Per uno studio del sistema ponderale ugaritico. Dialoghi di Archeologia 4, 1970-1971, 3-36.

Parise 1971
Parise, N., Un'unità ponderale egea a Capo Gelidonya. Studies in Mediterranean Archaeology 14, 1971, 163-170.

Parise 1981
Parise, N., Mina di Ugarit, mina di Karkemish, mina di Khatti. Dialoghi di Archeologia NS 3, 1981, 155-160.

Parise 1984
Parise, N., Unità ponderali e rapporti di cambio nella Siria del Nord. In: A. Archi (ed.), Circulation of Goods in Non-Palatial Context in the Ancient Near East: Proceedings of the International Conference Organized by the Istituto per gli Studi Micenei ed Egeo-Anatolici (Rome 1984) 125-138.

Parise 1986
Parise, N., Pesi egei per la lana. Parole del Passato 41, 1986, 81-88.
Parise 1991
Parise, N., Dai pesi egei per la lana alla mina di Dudu. Numismatica ed Antichità Classiche 20, 1991, 13-16.
Parise 1999
Parise, N., Alla ricerca dei fondamenti "micenei" delle misure ponderali greche. In: V. La Rosa/D. Palermo/L. Vagnetti (eds.), Atti del Simposio Italiano di Studi Egei, dedicato a L. Bernabò Brea e G. Pugliese Carratelli, Roma 18-20 febbraio 1998 (Roma 1999) 351-353.
Parise 2001-2003
Parise, N., Misure siriane e misure mesopotamiche nell'età del Bronzo. Scienza dell'Antichità 11, 2001-2003, 443-445.
Parrot 1932
Parrot, A., Fouilles de Tello, campagne 1931-1932. Revue d'Assyriologie 29, 1932, 45-57.
Parrot 1933
Parrot, A., Les fouilles de Tello et de Senkereh-Larsa, campagne 1932-1933. Revue d'Assyriologie 30, 1933, 169-182.
Parrot 1935
Parrot, A., Villes Enfouies: Trois Campagnes de Fouilles en Mésopotamie (Paris 1935).
Parrot 1948
Parrot, A., Tello: Vingt campagnes de Fouilles (1877-1933) (Paris 1948).
Parrot 1956
Parrot, A., Mission Archéologique de Mari. 1: Le Temple d'Ishtar. Bibliothèque archéologique et historique 65 (Paris 1956).
Parrot 1967
Parrot, A., Mission Archéologique de Mari. 3: Les Temples d'Ishtarat et de Ninni-Zaza. Bibliothèque archéologique et historique 86 (Paris 1967).
Parrot 1968
Parrot, A., Les fouilles de Larsa. Syria 45, 3-4, 1968, 205-239.
Parrot 1974
Parrot, A., Mari capitale fabuleuse (Paris 1974).
Patel/Rajesh 2006
Patel, A., Rajesh, S. V., Terracotta animal figurines from Bagasara, Gujarat: An applaud. In: S. V. Paddigar (ed.), A Sundara Felicitation Volume (Dharwad 2006).
Paulus 2014
Paulus, S., Die babylonischen Kudurru-Inschriften von der kassitischen bis zur frühneubabylonischen Zeit. Alter Orient und Altes Testament 51 (Münster 2014).
Peroni 1966
Peroni, R., Considerazioni ed ipotesi sul ripostiglio di Ardea. Bullettino di Paletnologia Italiana 75, 1966, 175-196.
Perrot 1971
Perrot, J., Les recherches à Djaffarabad et dans les couches profondes de l'Acropole de Suse. Cahiers de la Délégation Archéologique Française en Iran 1, 1971, 13-15.
Perrot 2003
Perrot, J., L'iconographie de Jiroft. Dossiers d'Archéologie 287, 2003, 96-113.
Perrot/Madjidzadeh 2003
Perrot, J., Madjidzadeh, Y., Jiroft: Fabuleuse découverte en Iran. Dossiers d'Archéologie 287, 2003.
Petrie 1926
Petrie, W. F. M., Glass Stamps and Weights: Ancient Weights and Measures Illustrated by the Egyptian Collection in University College, London (London 1926).
Petruso 1978
Petruso, K. M., Systems of Weight in the Bronze Age Aegean (PhD dissertation Indiana University) (Ann Arbor 1978).
Petruso 1984
Petruso, K. M., Prolegomena to Late Cypriot metrology. American Journal of Archaeology 88, 1984, 293-304.
Petruso 1992
Petruso, K. M., Keos. Vol. 8: Ayia Irini: The Balance Weights. An Analysis of Weight Measurement in Prehistoric Crete and the Cycladic Islands (Mainz 1992).
Pettinato 1972
Pettinato, G., Il commercio con l'estero della Mesopotamia meridionale nel III millennio a.C. alla luce delle fonti letterarie e lessicali sumeriche. Mesopotamia 7, 1972, 43-149.
Pèzard/Pottier 1926
Pézard, G., Pottier, E., Catalogue des Antiquités de la Susiane (Mission J. de Morgan) (Paris 1926).
Pfälzner/Soleimani 2017
Pfälzner, P., Soleimani, N., The ICAR – University of Tübingen South-of-Jiroft Archaeological Survey (SOJAS): Results of the first season 2015. Archäologische Mitteilungen aus Iran und Turan 47, 2017, 105-141.
Pigott 1989
Pigott, V. C., Archaeometallurgical investigations at Bronze Age Tappeh Hesar. In: R. H. Dyson/S. Howard (eds.), Tappeh Hesār: Reports of the Restudy Project, 1976. Monografie di Mesopotamia 2 (Florence 1989) 25-33.
Pigott/Stech 1986
Pigott, V. C., Stech, T., The metal trade in Southwest Asia in the third millenium BC. Iraq 48, 1986, 39-64.
Pigott *et al.* 1982
Pigott, V. C., Howard, S. M., Epstein, S. M., Pyrotechnology and cultural change at Bronze Age Tepe Hissar (Iran). In: T. A. Wertime/S. F. Wertime (eds.), Early Pyrotechnology: The evolution of the First Fire-Using Industries. Papers Presented at a Seminar on Early Pyrotechnology Held at the Smithsonian Institution, Washington, D. C., and the National Bureau of Standards, Gaithersburg, Maryland, April 19-20, 1979 (Washington 1982) 216-236.
Piperno 1976
Piperno, M., Grave 77 at Shahr-i Sokhta: Further evidence of technological specialization in the 3rd millennium B.C. East and West 26, 1976, 6-15.

Piperno 1977
Piperno, M., La necropoli. In: M. Tucci (ed.), La Città Bruciata del Deserto Salato (Venezia 1977) 113-148.
Piperno 1978
Piperno, M., Shahr-i Sokhta. Iran 16, 1978, 192-193.
Piperno 1979
Piperno, M., Socio-economic implications from the graveyard of Shahr-i Sokhta. In: M. Taddei (ed.), South Asian Archaeology 1977: Papers from the Fourth International Conference of the Association of South Asian Archaeologists in Western Europe, Held in the Istituto Universitario Orientale, Naples. Series Minor, Istituto Universitario Orientale, Seminario di Studi Asiatici 6 (Naples 1979) 123-139.
Piperno 1983
Piperno, M., Bead-making and boring techniques in 3rd millennium Indo-Iran. In: M. Tosi (ed.), Prehistoric Sistan. Reports and Memoirs, Centro Studi e Scavi Archeologici in Asia 19 (Rome 1983) 319-321.
Piperno/Salvatori 1982
Piperno, M., Salvatori, S., Evidence of western cultural connections from a Phase 3 group of graves at Shahr-i Sokhta. In: H. J. Nissen/J. Renger (eds.), Mesopotamien und seine Nachbarn. Politische und kulturelle Wechselbeziehungen im Alten Vorderasien vom 4. bis 1. Jahrtausend v. Chr. Berliner Beiträge zum Vorderen Orient 1 (Berlin 1982) 79-85.
Piperno/Salvatori 1983
Piperno, M., Salvatori, S., Recent results and new perspectives from the research at the graveyard of Shahr-i Sokhta, Seistan, Iran. Annali dell'Istituto Orientale di Napoli 43, 1983, 173-191.
Piperno/Salvatori 2007
Piperno, M., Salvatori, S., The Shahr-i Sokhta Graveyard (Sistan, Iran): Excavations Campaigns 1972-1978 (Rome 2007).
Piperno/Tosi 1975a
Piperno, M., Tosi, M., The graveyard of Shahr-e Shuxteh. In: F. Bagherzadeh (ed.), Proceedings of the IIIrd Annual Symposium on Archaeological Research in Iran, 23th October-1st November 1974 (Tehran 1975).
Piperno/Tosi 1975b
Piperno, M., Tosi, M., The graveyard at Shahr-i Sokhta, Iran. Archaeology 28, 3, 1975, 186-197.
Piran 2012
Piran, S., Objects from the Jiroft Treasury: Soft Stone and Alabaster Objects (Recovered Collection) from the Halil River Basin in National Museum Iran (Tehran 2012).
Pittman 2001
Pittman, H., Glyptic art of Period IV. In: Potts 2001, 231-268.
Pittman 2003
Pittman, H., La culture du Halil Roud. Dossiers d'Archéologie 287, 2003, 78-87.
Pittman 2008
Pittman, H., Glyptic art. Iran 46, 2008, 95-103.
Pittman 2013
Pittman, H., New evidence for interaction between the Iranian plateau and the Indus Valley: Seals and sealings from Konar Sandal South. In: S. A. Abraham/P. Gullapalli/T. P. Raczek/U. Z. Rizvi (eds.), Connections and Complexity: New Approaches to the Archaeology of South Asia (London 2013) 63-91.
Pons 1994
Pons, N., Tchoga Zanbil après Untas-Napirisa. In: H. Gasche/M. Tanret/C. Janssen (eds.), Cinquante-deux réflexions sur le Proche-Orient ancien: Offertes en hommage à Léon de Meyer. Mesopotamian History and Environment, Occasional Publications 2 (Leuven 1994) 43-51.
Porada 1970
Porada, E., Tchoga Zanbil. 4: La Glyptique. Mémoires de la Délégation en Perse 42 (Paris 1970).
Possehl 1996
Possehl, G. L., Meluhha. In: J. Reade (ed.), The Indian Ocean in Antiquity (London 1996).
Possehl/Herman 1990
Possehl, G. L., Herman, C. F., The Sorath Harappan: A new regional manifestation of the Indus urban phase. In: M. Taddei (ed.), South Asian Archaeology 1987: Proceedings of the Ninth International Conference of the Association of South Asian Archaeologists in Western Europe, Held in the Fondazione Giorgio Cini, Island of San Giorgio Maggiore, Venice. Serie orientale Roma 66 (Rome 1990) 295-319.
Pottier 1984
Pottier, M.-H., Matériel Funéraire de la Bactriane Méridionale de l'Âge du Bronze. Mémoire, Editions Recherche sur les Civilisations 36 (Paris 1984).
Potts 1980
Potts, D. T., Tradition and Transformation: Tepe Yahya and the Iranian Plateau during the Third Millennium B.C. (PhD dissertation Harvard University, Department of Anthropology 1980).
Potts 1981
Potts, D. T., Echoes of Mesopotamian divinity on a cylinder seal from South-eastern Iran. Revue d'Assyriologie et d'Archéologie Orientale 75, 1981, 135-142.
Potts 1990
Potts, D. T., The Arabian Gulf in Antiquity. Vol. 1: From Prehistory to the Fall of the Achaemenid Empire (Oxford 1990).
Potts 1999
Potts, D. T., The Archaeology of Elam: Formation and Transformation of an Ancient Iranian State. Cambridge World Archaeology (Cambridge 1999).
Potts 2001
Potts, D. T., Excavations at Tepe Yahya, Iran, 1967-1975: Periods IVC and IVB (3000-2000 BC). Bulletin of the American School of Prehistoric Research 45 (Cambridge 2001).
Potts 2002
Potts, D. T., Total prestation in Markhashi-Ur relations. Iranica Antiqua 37, 2002, 343-357.
Potts 2008
Potts, D. T., Puzur-Inshushinak and the Oxus civilization (BMAC): Reflections on Shimashki and the geo-political landscape of Iran and Central Asia

in the Ur III period. Zeitschrift für Assyriologie 98, 2008, 165-194.

Potts, T. F. 1989
Potts, T. F., Foreign vessels of the late third millennium B.C. from southern Mesopotamia: Their origins and mechanisms of exchange. Iraq 51, 1989, 123-163.

Potts, T. F. 1994
Potts, T. F., Mesopotamia and the East: An Archaeological and Historical Study of Foreign Relations ca. 3400-2000 BC. Monograph of Oxford University Committee for Archaeology 37 (Oxford 1994).

Powell 1979
Powell, M. A., Ancient Mesopotamian weight metrology: Methods, problems and perspectives. In: M. A. Powell/R. H. Sack (eds.), Studies in Honor of Tom B. Jones. Alter Orient und Altes Testament 203 (Neukirchen-Vluyn 1979) 71-109.

Powell 1990
Powell, M. A., » Masse und Gewichte «. In: Reallexikon der Assyriologie und Vorderasiatischen Archäologie 7, 5-8, 1990, 457-517.

Powell 2000a
Powell, M. A., "Weight Inscriptions" (Akkadian). In: W. W. Hallo (ed.), The Context of Scripture. Vol. 2: Monumental Inscriptions from the Biblical World (Leiden 2000) 321-325.

Powell 2000b
Powell, M. A., "Weight Inscriptions" (Sumerian). In: W. W. Hallo (ed.), The Context of Scripture. Vol. 2: Monumental Inscriptions from the Biblical World (Leiden 2000) 401-404.

Pulak 2000
Pulak, C., The balance weights from the Late Bronze Age shipwreck at Uluburun. In: C. F. E. Pare (ed.), Metals Make the World Go Round: The Supply and Circulation of Metals in Bronze Age Europe. Proceedings of a Conference Held at University of Birmingham in June 1997 (Oxford 2000) 247-266.

Pulak 2001
Pulak, C., The cargo of the Uluburun ship and evidence for trade with the Aegean and beyond. In: L. Bonfante/V. Karageorghis (eds.), Italy and Cyprus in Antiquity 1500-450 BC: Proceedings of an International Symposium Held at the Italian Academy for Advanced Studies in America at Columbia University, November 16-18, 2000 (Nicosia 2001) 13-61.

Rahbar 1991
Rahbar, M., 'Kenarou' dar peyvand bā tamaddonha-ye Ǧonub-e šarqi-ye Irān. Verbindung mit den Kulturen des Südost-Iran. Mirat-e Farhangi 3-4, 1991, 60-74.

Rahmstorf 2003
Rahmstorf, L., The identification of early Helladic weights and their wider implications. In: K. P. Foster/R. Laffineur (eds.), Metron. Measuring the Aegean Bronze Age: Proceedings of the 9th International Aegean Conference, New Haven, Yale University, 18-21 April 2002. Aegaeum 24 (Liège 2003) 293-299.

Rahmstorf 2006a
Rahmstorf, L., Zur Ausbreitung vorderasiatischer Innovationen in die frühbronzezeitliche Ägäis. Praehistorische Zeitschrift 81, 2006, 49-96.

Rahmstorf 2006b
Rahmstorf, L., In search of the earliest balance weights, scales and weighing systems from the East Mediterranean, the Near and Middle East. In: Alberti 2006a, 9-48.

Rahmstorf 2010
Rahmstorf, L., The concept of weighing during the Bronze Age in the Aegean, the Near East and Europe. In: I. Morley/C. Renfrew (eds.), The Archaeology of Measurement: Comprehending Heaven, Earth and Time in Ancient Societies (Cambridge 2010) 88-105.

Rahmstorf 2014
Rahmstorf, L., „Pebble weights" aus Mitteleuropa und Waagebalken aus der jüngeren Bronzezeit (14.-12. Jh. v. Chr.). In: B. Nessel/I. Heske/D. Brandherm (eds.), Ressourcen und Rohstoffe in der Bronzezeit: Nutzung – Distribution – Kontrolle. Beiträge zur Sitzung der Arbeitsgemeinschaft Bronzezeit auf der Jahrestagung des Mittel- und Ostdeutschen Verbandes für Altertumsforschung in Brandenburg an der Havel, 16. bis 17. April 2012. Arbeitsberichte zur Bodendenkmalpflege in Brandenburg 26 (Wünsdorf 2014) 109-120.

Rahmstorf 2020
Rahmstorf, L., Weight metrology in the Harappan civilization. In: E. Myrdal (ed.), South Asian Archaeology and Art 2014: Papers Presented at the Twenty-Second International Conference of the European Association for South Asian Archaeology and Art Held at the Museum of Far Eastern Antiquities/National Museums of World Culture, Stockholm, Sweden, 30th of June to 4th of July 2014 (New Delhi 2020) 77-96.

Rajesh 2018
Rajesh, S. V., Indus archaeology in Gujarat: An expedition through space, time, materials and methods. In: A. Uesugi (ed.), Current Research on Indus Archaeology. South Asian Archaeology 4 (Osaka 2018) 87-168.

Rao 1962
Rao, S. R., Further excavations at Lothal. Lalit Kala 11, 1962, 14-30.

Rao 1962-1963
Rao, S. R., Excavations at Rangpur and the other explorations in Gujarat. Ancient India 18-19, 1962-1963, 5-207.

Rao 1963
Rao, S. R., A Persian Gulf seal from Lothal. Antiquity 37, 1963, 96-99.

Rao 1979
Rao, S. R., Contacts between Lothal and Susa. In: G. L. Possehl (ed.), Ancient Cities of the Indus (New Delhi 1979) 174-179.

Rao 1985
Rao, S. R., Lothal: A Harappan Port Town (1955-1962). Memoirs of the Archaeological Survey of India 78 (New Delhi 1985).

Rao *et al.* 2005
Rao, S. R., Sahu, P., Sahu, J., Diwan, S., Shastry, U. A., New light on the excavation of the Harappan settlement at Bhirrana. Puratattva 35, 2005, 60-68.

Ratnagar 1981
Ratnagar, S., Encounters: The Westerly Trade of the Harappa Civilization (Delhi 1981).

Ratnagar 2003
Ratnagar, S., Theorizing Bronze-Age intercultural trade: The evidence of the weights. Paléorient 29, 1, 2003, 79-92.

Ratnagar 2004
Ratnagar, S., Trading Encounters: From Euphrates to the Indus in the Bronze Age (New Delhi 2004).

Rawat 2015
Rawat, R. S., Coastal sites: Possible port town of Harappan time in Gujarat. In: S. Keller/M. Pearson (eds.), Port Towns of Gujarat (Kundli 2015) 187-215.

Reade 1979
Reade, J., Early Etched Beads and the Indus-Mesopotamian Trade. British Museum Occasional Papers 2 (London 1979).

Reade 2012
Reade, J., The early Iranian stone "weights" and on unpublished Sumerian foundation deposit. Iran 40, 2012, 249-256.

Reade 2018
Reade, J., Assyrian weights and money. State Archives of Assyrian Bulletin 24, 2018, 125-193.

Renfrew 1978
Renfrew, A. C., Trajectory discontinuity and morphogenesis. American Antiquity 43, 1978, 203-222.

Renfrew 1979
Renfrew, A. C., Problems in European Prehistory: A Collection of 18 Papers, each with a New Introduction and Bibliography, and an Original Introductory Essay (Edinburgh 1979).

Renfrew 1984
Renfrew, A. C., Approaches to the Social Archaeology (Edinburgh 1984).

Renfrew/Cooke 1979
Renfrew, A. C., Cooke, K. L. (eds.), Transformations: Mathematical Approaches to Culture Change (New York 1979).

Rivoltella 2022
Rivoltella, R., The artefacts of Area 33 at Shahr-i Sokhta: 2018 and 2019 excavation. In: Ascalone/Sajjadi 2022b, 347-432.

Roaf 1982
Roaf, M., Weights on the Dilmun standard. Iraq 44, 1982, 137-141.

Röllig 1983
Röllig, W., » Lapislazuli «. In: Reallexikon der Assyriologie und Vorderasiatischen Archäologie 6, 1983, 488-490.

Ross 1930
Ross, S. D., The excavations at Kish (with special reference to the conclusions reached in 1928-29). Journal of the Royal Central Asian Society 17, 3, 1930, 291-300.

Rossi Osmida 2002
Rossi Osmida, G., Margiana: Gonur-depe Necropolis. 10 Years of Excavations by Ligabue Study and Research Centre (Venice 2002).

Ruikar *et al.* 2015
Ruikar, T., Shirvalkar, P., Rawat, Y. S, Exchange and economy as reflected from the weights at the Harappan site of Kotada Bhadli, Kutchh, Gujarat. Journal of Multidisciplinary Studies in Archaeology 3, 2015, 724-737.

Rutten 1953
Rutten, M., Les documents epigraphiques de Cogha Zembil (textes sémitiques et élamites d'Untash Gal). Mémoires de la Délégation en Perse 33 (Paris 1953).

Sabloff 1981
Sabloff, J. A., Simulations in Archaeology. School of American Research Advanced Seminar Series (Albuquerque 1981).

Sacconi 2005
Sacconi, A., La "monnaie" dans l'économie mycénienne: Le témoignage des textes. In: R. Laffineur/E. Greco (eds.), Emporia: Aegeans in the Central and Eastern Mediterranean. Proceedings of the 10th International Aegean Conference, Athens, Italian School of Archaeology, 14-18 April 2004. Aegeum 25 (Liège 2005) 69-74.

Sajjadi 1987
Sajjadi, S. M. S., Prehistoric settlements in the Bardsir plain, South-Eastern Iran 1976-1977. East and West 37, 1-4, 1987, 11-130.

Sajjadi 1989
Sajjadi, S. M. S., A class of Sasanian ceramics from southeastern Iran. Rivista di archeologia 13, 1989, 31-40.

Sajjadi 2003
Sajjadi, S. M. S., Excavations at Shahr-i Sokhta: First preliminary report on the excavations of the graveyard 1997-2000. Iran 41, 2003, 21-98.

Sajjadi 2005
Sajjadi, S. M. S., Sistan and Baluchistan Project. Iran 43, 2005, 87-92.

Sajjadi 2014
Sajjadi, S. M. S., Some preliminary observations from the new excavations at the graveyard of Shahr-i Sokhta. In: B. Cerasetti/B. Genito/C. C. Lamberg-Karlovsky (eds.), "My Life is like the Summer Rose": Maurizio Tosi e l'archeologia come modo di vivere. Papers in Honours of Maurizio Tosi for His 70th Birthday. BAR International Series 2690 (Oxford 2014) 665-676.

Sajjadi/Moradi 2012
Sajjadi, S. M. S., Moradi, H., Excavations in Square O at Shahr-e Sokhteh. In: H. Fahimi/K. Alizadeh (eds.), Papers in Honour of Massoud Azarnoush (Tehran 2012) 556-565

Sajjadi/Moradi 2014
Sajjadi, S. M. S., Moradi, H., Excavation at Buildings Nos. 1 and 20 at Shahr-i Sokhta. International Journal of the Society of Iranian Archaeologists 1, 1, 2014, 77-90.

Sajjadi/Moradi 2017
Sajjadi, S. M. S, Moradi, H., Shahr-i Sokhta 2014-2015 excavations: The new results in areas 1, 20, 26 and 28. Archeologia Aerea 8, 15, 2017, 149-167.

Sajjadi/Moradi 2022
Sajjadi, S. M. S., Moradi, H., The preliminary report on excavations at Eastern Residential Area of Shahr-i Sokhta: Rooms 27 and 28. Persica Antiqua 2, 3, 2022, 101-109.

Salvatori 1979
Salvatori, S., Sequential analysis and architectural reminds in the Central Quarters of Shahr-i Sokhta. In: M. Taddei (ed.), South Asian Archaeology 1977: Papers from the Fourth International Conference of the Association of South Asian Archaeologists in Western Europe, Held in the Istituto Universitario Orientale, Naples. Series Minor, Istituto Universitario Orientale, Seminario di Studi Asiatici 6 (Naples 1979) 141-148.

Salvatori/Tosi 2005
Salvatori, S., Tosi, M., Shahr-i Sokhta revised sequence. In: C. Jarrige/V. Lefèvre (eds.), South Asian Archaeology 2001: Proceedings of the Sixteenth International Conference of the European Association of South Asian Archaeologists, Held in Collège de France, Paris, 2-6 July 2001, 2 vols. (Paris 2005) 281-292.

Salvatori/Vidale 1982
Salvatori, S., Vidale, M., A brief surface survey of the Protohistoric site of Shahdad, Iran: Preliminary report. Rivista di Archeologia 6, 1982, 5-10.

Salvatori/Vidale 1997
Salvatori, S., Vidale, M., Shahr-i Sokhta 1975-1978: Central Quarters Excavations. Preliminary Report. Reports and Memoirs, Series Minor, Centro scavi e Ricerche Archeologiche 1 (Rome 1997).

Santoni 1997
Santoni, M., Sibri and the South Cemetery of Mehrgarh: Third millennium connections between the northern Katchi plain (Pakistan) and Central Asia. In: R. Allchin/B. Allchin (eds.), South Asian Archaeology 1995: Proceedings of the 13th Conference of the European Association of South Asian Archaeologists, Cambridge, 5-9 July, 1995 (Cambridge 1997) 52-60.

Santoni 1998
Santoni, M., Aspects matériels des cultures de Sibri et de Merhgarh VIII (plaine de Kachi, Baluchistan, Pakistan) à la fin du troisième et au début du deuxième millénaire. In: J. C. Gardin (ed.), L'Asie Centrale et ses rapports avec le civilisations orientales des origines à l'âge du Fer: Actes du colloque franco-soviétique, Paris, 19-26 novembre 1985. Mémoires de la Mission archéologique française en Asie Centrale 1 (Paris 1998) 135-141.

Saporetti 1970
Saporetti, C., Onomastica medio-assira. Vol. 1: I nomi di persona. Studia Pohl 6, 1 (Roma 1970).

Sarianidi 1977
Sarianidi, V. I., Ancient Horasan and Bactria. In: J. Deshayes (ed.), Le Plateau Iranien et l'Asie Centrale des origines à la conquête islamique: Leurs relations à la lumière des documents archèologiques, Paris 22-24 mars 1976. Colloques Internationaux du Centre National de la Recerche Scientifique 567 (Paris 1977) 129-142.

Sarianidi 1983
Sarianidi, V. I., The pottery of Shahr-i Sokhta I and its Turkmenistan connection. In: M. Tosi (ed.), Prehistoric Sistan 1. Reports and Memoirs 19, 1 (Rome 1983) 187-198.

Sarianidi 1986
Sarianidi, V. I., Die Kunst des alten Afghanistan (Leipzig 1986).

Sarianidi 1994
Sarianidi, V. I., Temples of Bronze Age Margiana: Traditions of ritual architecture. Antiquity 68, 1994, 388-397.

Saunders 1980
Saunders, P. T., An Introduction to Catastrophe Theory (Cambridge 1980).

Scheil 1905
Scheil, V., Mémoires de la Mission Archéologique de Perse 6. Série 3: Textes élamites-sémitiques (Paris 1905).

Scheil 1908
Scheil, V., Mémoires de la Mission Archéologique de Perse 10. Série 4: Textes élamites-sémitiques (Paris 1908).

Scheil 1909
Scheil, V., "Nouvelles notes d'épigraphie et d'archéologie assyriennes". Recueil de travaux relatifs à la philologie et à l'archéologie égyptiennes et assyriennes 31, 1908, 132-137.

Scheil 1913
Scheil, V., Mémoires de la Mission Archéologique de Perse 14. Série 5: Textes élamites-sémitiques (Paris 1913).

Scheil/Legrain 1913
Scheil, V., Legrain, L., Textes élamites-sémitiques (Manishtusu, statue et inscription de Karibu Sha Shushinak, inscriptions d'Assarhaddon, poème du "juste souffrant", tablette de présages, textes de comptabilité). Mémoires de la Mission archéologique de Susiane 14, 1913.

Schmidt 1933
Schmidt, E. F., Tepe Hissar excavations 1931. The Museum Journal 23, 1933, 323-483.

Schmidt 1937a
Schmidt, E. F., Excavations at Tepe Hissar, Damghan. Publication of the Iranian Section of the University Museum (Philadelphia 1937).

Schmidt 1937b
Schmidt, E. F., Excavations at Tepe Hissar. Bulletin of the American Institute for Iranian Art and Archaeology 5, 2 (Pennsylvania 1937).

Schmidt, H. 1902
Schmidt, H., Heinrich Schliemann's Sammlung trojanischer Altertümer (Berlin 1902).

Sefidkhani 2019
Sefidkhani, R. M., Il vasellame in alabastro di Shahr-i Sokhta e la sua relazione con Shahdad e Tepe Yahya. In: Ascalone/Sajjadi 2019, 137-150.

Shah *et al.* 1985
Shah, A. N., Karanth, R. V., Barot, S. A., Geology of the area around Khandia with special reference to the lead mineralization, Distt., Baroda, Gujarat. In: B. B. Rao (ed.), Indian Geological Congress: Proceedings of the Fifth Session I.G.C., Bombay, December, 19-21, 1984 (New Delhi 1985) 127-134.

Shekar/Mukul 1969
Shekar, N. C., Mukul, S. S., Lead-copper mineralisation in Deccan traps near Banejnes, Gir Forest, Junagadh, Gujarat. Mineral Wealth 5, 2-3, 1969, 37-39.

Shinde *et al.* 2008
Shinde, V. S., Osada, T., Sharma, M. M., Uesugi, A., Uno, T., Maemoku, H., Shirvalkar, P., Deshpande, S. S., Kulkarni, A., Sarkar, A., Reddy, A., Rao, R. S., Dangi, V., Explorations Ghaggar basin and excavations at Girawad, Farmana (Rohtak District) and Mithathal (Bhiwani District), Haryana, India. In: T. Osada/A. Uesugi (eds.), Linguistics, Archaeology and the Human Past. Occasional Paper 3 (Kyoto 2008) 77-158.

Shinde *et al.* 2018
Shinde, V. S., Kim, Y. J., Woo, E. J., Jadhav, N., Waghmare, P., Yadav, Y., Munshi, A., Hong, J. H., Oh, C. S., Shin, D. H., Archaeological and anthropological studies on the Harappan cemetery of Rakhigarhi, India. Plos One 13, 2, 2018, 1-30.

Shirvalkar 2013
Shirvalkar, P., Harappan migrations: A perspective about the Gujarat Harappans. Journal of Multidisciplinary Studies in Archaeology 1, 2013, 301-318.

Sollberger 1965
Sollberger, E., Ur Excavations. Texts 8: Royal Inscriptions. Part 2 (London 1965).

Sommerfeld 1994
Sommerfeld, C., Gerätegeld Sichel. Studien zur monetären Struktur bronzezeitlicher Horte im nördlichen Mitteleuropa. Vorgeschichtliche Forschungen 19 (Berlin 1994).

Sonawane *et al.* 2003
Sonawane, V. H., Ajithprasad, P., Bhan, K. K., Krishnan, K., Prathapachandran, S., Majumdar, A., Patel, A. K., Menon, J., Excavation at Bagasara – 1996-2003: A preliminary report. Man and Environment 28, 2, 2003, 21-50.

Soutzo 1911
Soutzo, M. -C., Études des monuments pondéraux de Souse. Mémoires de la Délégation en Perse 12, 1911, 1-50.

Speiser 1935
Speiser, E. A., Excavations at Tepe Gawra. Vol. 1: Levels I to VIII. Publications of the American School of Oriental Research 1 (Philadelphia 1935).

Spycket 1992
Spycket, A., Ville royale de Suse 6: Les figurines de Suse. Vol. 1: Les figurines humaines, IVe-IIe millenaires av. J.-C. Mémoires de la Délégation Archeologique en Iran 52 (Paris 1992).

Stamm 1939
Stamm, J. J., Die akkadische Namengebung. Mitteilungen der Vorderasiatisch-Ägyptischen Gesellschaft 44 (Leipzig 1939).

Steiger 1971
Steiger, W. L., Analytical archaeology? Mankind 8, 1971, 67-70.

Stein 1928
Stein, A., Innermost Asia: Detailed Report of Explorations in Central Asia, Kan-Su and Eastern Iran (London 1928).

Stein 1931
Stein, A., An Archaeological Tour in Geodrosia. Memoirs of the Archaeological Survey of India 43 (Calcutta 1931).

Stein 1937
Stein, A., Archaeological Reconnaissances in North-Western India and South-Eastern Iran (London 1937).

Steinkeller 1982
Steinkeller, P., The question of Marhaši: A contribution to the historical geography of Iran in the third millennium B.C. Zeitschrift für Assyriologie und Vorderasiatische Archäologie 72, 1982, 237-265.

Steinkeller 1989
Steinkeller, P., » Markhaši «. In: Reallexikon der Assyriologie und Vorderasiatische Archäologie 7, 1989, 381-382.

Steinkeller 2013
Steinkeller, P., Trade routes and commercial networks in the Persian Gulf during the third millennium BC. In: D. Faizee (ed.), Collection of Papers Presented at the Third International Biennial Conference of the Persian Gulf (History, Culture, and Civilization) (Tehran 2013) 414-431.

Steinkeller 2014
Steinkeller, P., Marhasi and beyond: The Jiroft civilization in a historical perspective. In: B. Cerasetti/B. Genito/C. C. Lamberg-Karlovsky (eds.), “My Life is like the Summer Rose”: Maurizio Tosi e l’archeologia come modo di vivere. Papers in Honour of Maurizio Tosi for His 70th Birthday. BAR International Series 2690 (Oxford 2014) 691-707.

Steinkeller 2016
Steinkeller, P., The role of Iran in the inter-regional exchange of metal: Tin, copper, silver and gold in the second half of the third millennium BC. In: K. Maekawa (ed.), Ancient Iran: New Perspectives from Archaeology and Cuneiform Studies. Proceedings of the International Colloquium Held at the Center for Eurasian Cultural Studies, Kyoto University, December 6-7, 2014. Ancient Text Studies in the National Museum 2 (Kyoto 2016) 127-150.

Stève 1967
Stève, M.-J., Tchoga Zanbil: Textes élamite et accadiens de Tchoga Zanbil. Mémoires de la Délégation en Perse 41 (Paris 1967).

Stève 1994
Stève, M.-J., Suse: La couche XII du chantier ‘A’ de la ‘Ville Royale’ et la fin de l’époque des Sukkalmah. In: H. Gasche/M. Tanret/C. Janssen/A. Degraeve

(eds.), Cinquante-deux reflexions sur le proche-orient ancien: Offertes en hommage à Léon de Meyer. Mesopotamian History and Environment, Occasional Publications 2 (Leuven 1994) 23-30.

Stève/Gasche 1968
Stève, M.-J., Gasche, H., Récentes découvertes sur l'Acropole de Suse. Archéologia Vivante 1, 1968, 130-142.

Stève/Gasche 1971
Stève, M.-J., Gasche, H., L'Acropole de Suse. Nouvelles Fouilles. Mémoires de la Délégation Archeologique en Iran 46 (Paris 1971).

Stève/Gasche 1990
Stève, M.-J., Gasche, H., Le tell de l'Apadana avant les Achéménides. In: F. Vallat (ed.), Contribution a l'histoire de l'Iran: Mélanges offerts à Jean Perrot (Paris 1990) 16-60.

Sumner 1974
Sumner, W. M., Excavations at Tall-i Malyan 1971-1972. Iran 12, 1974, 155-180.

Tadmor/Yamada 2011
Tadmor, H., Yamada, S., The Royal Inscriptions of the Neo-Assyrian Period. Vol. 1: The Royal Inscriptions of Tiglath-pileser III (744-727 BC) and Shalmaneser V (726-722 BC), Kings of Assyria (Winona Lake 2011).

Tallon 1987
Tallon, F., Métallurgie Susienne 1-2: De la fondation de Suse au XVIII siècle avant J.-C. Notes et documents de Musées de France 15 (Paris 1987).

Tavernier 2010
Tavernier, J., On the sounds rendered by the *s*-, *š*- and *ṣ/z*-series in Elamite. In: L. Kogan (ed.), Proceedings of the 53e Rencontre Assyriologique Internationale. Vol. 1: Language in the Ancient Near East. Babel und Bibel 4, 1 = Orientalia et classica 30, 1 (Winona Lake 2010) 1059-1078.

Tavernier in press
Tavernier, J., Le poids du 'Rois des rois'. Quelques observations sur le *kṛša*. In: É. Bordreuil/V. Matoïan/J. Tavernier (eds.), Administrations et pratiques comptables au Proche-Orient ancien.

Thapar 1975
Thapar, B., Kalibangan a Harappan metropolis beyond the Indus Valley. Expedition 17, 2, 1975, 28.

Thom 1975
Thom, R., Structural Stability and Morphogenesis: An Outline of a General Theory of Models (Reading 1975).

Thomas 2016a
Thomas, A., La Mésopotamie au Louvre: De Sumer à Babylone (Paris 2016).

Thomas 2016b
Thomas, A., L'histoire commence en Mésopotamie (Lens 2016).

Thompson 1981
Thompson, R. C., A Dictionary of Assyrian Chemistry and Geology (London 1981).

Thureau-Dangin 1907
Thureau-Dangin, F., L'U, le Qa et la Mine, leur mesure et leur rapport. Journal Asiatique 10, 1907, 79-111.

Thureau-Dangin 1921
Thureau-Dangin, F., Numération et métrologie Sumérienne. Revue d'Assyriologie et d'Archéologie Orientale 18, 1921, 123-135.

Thureau-Dangin 1927
Thureau-Dangin, F., Poids en hématite conservés au Musée Britannique. Revue d'Assyriologie et d'Archéologie Orientale 24, 1927, 69-73.

Tosi 1968
Tosi, M., Excavations at Shahr-i Sokhta, a Chalcolitic settlement in the Iranian Sistan: Preliminary of first campaign. East and West 18, 1968, 9-66.

Tosi 1969a
Tosi, M., Excavations at Shahr-i Sokhta: Preliminary report on the cecond campaign, 1968. East and West 19, 1969, 283-386.

Tosi 1969b
Tosi, M., Shahr-i Sokhte. Iran 7, 1969, 181-182.

Tosi 1970a
Tosi, M., Shahr-i Sokhta. Iran 8, 1970, 188-189.

Tosi 1970b
Tosi, M., A tomb from Damin and the problem of the Bampur sequence in the third millennium BC. East and West 20, 1970, 9-50.

Tosi 1971
Tosi, M., Shahr-i Sokhta: Un insediamento protourbano nel Sistan iraniano. Accademia Nazionale dei Lincei 160, 1971, 405-417.

Tosi 1972a
Tosi, M., Shahr-i Sokhta: A charge and a chance for urban archaeology. In: F. Bagherzadeh (ed.), Proceedings of the 1st Annual Symposium of Archaeological Research in Iran, Tehran, 1972 (Tehran 1972) Off-Print.

Tosi 1972b
Tosi, M., Shahr-i Sokhta. Iran 10, 1972, 174-175.

Tosi 1972c
Tosi, M., Shahr-i Sokhta: Un contributo degli archeologi italiani allo studio delle più antiche civiltà urbane ad oriente della Mesopotamia. La parola del passato 142-144, 1972, 186-208.

Tosi 1974a
Tosi, M., Bampur: A problem of isolation. East and West 24, 1974, 29-50.

Tosi 1974b
Tosi, M., The northeastern frontier of the ancient Near East. Mesopotamia 8-9, 1974, 21-76.

Tosi 1975
Tosi, M., Hasanlu project 1974: Palaeobotanical survey. Iran 13, 1975, 185.

Tosi 1976a
Tosi, M., Shahr-i Sokhta. Iran 14, 1976, 167-168.

Tosi 1976b
Tosi, M., A topographical and stratigraphical periplus of Shahr-e Suxthe. In: F. Bagherzadeh (ed.), Proceedings of the 4th Annual Symposium on Archaeological Research in Iran 1975 (Tehran 1976) 130-158.

Tosi 1983
Tosi, M., Excavations at Shahr-i Sokhta, season 1969-1970. In: M. Tosi (ed.), Prehistoric Sistan 1. Reports and Memoirs 19, 1 (Rome 1983) 73-126.

Trigger 1996
Trigger, B. W., Storia del pensiero archeologico [Italian translation of A History of Archaeological Thought] (Firenze 1996).

Tsevat 1958
Tsevat, M., Alalakhiana. Huca 24, 1958, 8-24.

Tusa 1977
Tusa, S., I sigilli e le impronte. In: G. Tucci (ed.), La città bruciata del deserto salato [The Burnt City in the Salt Desert] (Venezia 1977) 251-262.

Unger 1918
Unger, E., Katalog der babylonischen und assyrischen Sammlung. III, 1: Gewichte und gewichtsähnliche Stücke (Konstantinopel 1918).

Vaiman 1974
Vaiman, A. A., Über die protosumerische Schrift. Acta Antiqua Academiae Scientiarum Hungaricae 22, 1974, 17-22.

Vaiman 1989
Vaiman, A. A., Protosumerische Mass und Zählsysteme. Baghdader Mitteilungen 20, 1989, 114-120.

Vallat 1971
Vallat, F., Les documents épigraphiques de l'Acropole (1969-1971). Délégation Archeologique Française en Iran 1, 1971, 235-245.

Vallat 1985
Vallat, F., Eléments de géographie élamite. Paléorient 11, 2, 1985, 49-54.

Vallat 1990
Vallat, F., Une iscription élamite de Tépé Horreeye. In: F. Vallat (ed.), Contribution à l'histoire de l'Iran: Mélanges Jean Perrot (Paris 1990) 147-149.

Vanden Berghe 1968
Vanden Berghe, L., La nécropole de Bani Surmah. Archéologia 23, 1968, 52-63.

Vanden Berghe 1970
Vanden Berghe, L., La nécropole de Kalleh Nisar. Archéologia 32, 1970, 64-73.

Vanden Berghe 1972
Vanden Berghe, L., Recherches archéologiques dans le Luristan. Cinquième campagne: 1969. Prospections dans le Pusht-i Kooh central (Rapport préliminaire). Iranica Antiqua 9, 1972, 1-48.

Vanden Berghe 1973
Vanden Berghe, L., Le Luristan à l'Age du Bronze. Archéologia 63, 1973, 25-36.

Vargyas 1996
Vargyas, P., The mina of Karkemiš in the Neo-Assyrian sources. States Archives of Assyria Bulletin 6, 1996, 9-14.

Vats 1940
Vats, M. S., Excavations at Harappa: Being an Account of Archaeological Excavations at Harappa Carried Out between the Years 1920-21 and 1933-34 (Delhi 1940).

Vecchio 2022
Vecchio, P. F., The pottery assemblage from Area 33 (2019 excavations). In: Ascalone/Sajjadi 2022b, 309-346.

Veenhof 1972
Veenhof, K. R., Aspects of Old Assyrian Trade and its Terminology. Studia et documenta ad iura Orientis antiqui pertinentia 10 (Leiden 1972).

Verstandig 2016
Verstandig, A., Les "Sacs à Main" de Chlorite du IIIe millénaire avant J.-C. Origines et Interprétations (Paris 2016).

Vidale 2000
Vidale, M., The Archaeology of Indus Crafts: Indus Craftspeople and Why We Study Them. Reports and Memoirs, Series Minor, Centro Scavi e Ricerche Archeologiche 4 (Rome 2000).

Vidale 2015
Vidale, M., Searching from mythological themes on the "Jiroft" chlorite artefacts. Iranica Antiqua 50, 2015, 15-58.

Vidale 2017
Vidale, M., Treasures from the Oxus: The Art and Civilization of Central Asia (London 2017).

Vidale/Bianchetti 1997
Vidale, M., Bianchetti, P., Green stones from Pakistan: XRD identification of ethnographic and archaeological samples of "steatite" and other rocks. In: R. Allchin/B. Allchin (eds.), South Asian Archaeology 1995: Proceedings of the 13th Conference of the European Association of South Asian Archaeologists, Cambridge, 5-9 July, 1995 (New Delhi 1997) 947-953.

Vidale/Frenez 2015
Vidale, M., Frenez, D., Indus components in the iconography of a white marble cylinder-shaped seals from Konar Sandal South (Kerman, Iran). South Asia Studies 31, 2015, 144-154.

Viedebantt 1917
Viedebantt, O., Forschungen zur Metrologie des Altertums (Berlin 1917).

Viedebantt 1923
Viedebantt, O., Antike Gewichtsnormen und Münzfüsse (Berlin 1923).

Voigt/Dyson 1992
Voigt, M., Dyson Jr., R. H., The chronology of Iran, 8000-2000 B.C. In: Ehrich 1992, 122-178 (vol. 1); 125-153 (vol. 2).

Wäfler 2003
Wäfler, M., Tall al-ḥamīdīya. Vol. 4: Vorbericht 1988-2001. Orbis Biblicus et Orientalis, Series Archaeologica 23 (Fribourg 2003).

Warner 1908
Warner, L., Stone implements and skeletons excavated in Anau. In: R. Pumpelly (ed.), Explorations in Turkestan, Expedition of 1904: Prehistoric Civilizations of Anau. Origins, Growth and Influence of Environment, 2 vols. Carnegie Institution of Washington, Publication 73, 2 (Washington 1908) 477-484.

Weeks *et al.* 2019
Weeks, L. V., David-Cuny, H., Avanzini, A., Lischi, S., Genchi, F., Caputo, F., Al Ali, Y. Y., Boraik, M., Worked and decorated shell discs from southern Arabia and the wider Near East. Arabian Archaeology and Epigraphy 2019, 1-26.

WEISGERBER/CIERNY 2002
Weisgerber, G., Cierny, J., Tin for ancient Anatolia? In: Ü. Yalçin (ed.), Anatolian Metal 2. Der Anschnitt, Beiheft 15 = Veröffentlichungen aus dem Deutschen Bergbau-Museum Bochum 109 (Bochum 2002) 179-186.

WEISGERBER/CIERNY 2003
Weisgerber, G., Cierny, J., Bronze Age tin mines in Central Asia. In: A. Giumlia-Mair/F. Lo Schiavo (eds.), Le probléme de l'étain à l'origine de la métallurgie: Actes du XIVème congrès UISPP, Université de Liège, Belgique, 2-8 septembre 2001. The Problem of Early Tin. BAR International Series 1199 (Oxford 2003) 23-31.

WEISSBACH 1907
Weissbach, F. H., Über die babylonischen, assyrischen und alt-persischen Gewichte. Zeitschrift der Deutschen Morgenländischen Gesellschaft 61, 1907, 379-402, 948-950.

WEISSBACH 1911
Weissbach, F. H., Zur keilinschriftlichen Gewichtskunde. Zeitschrift der Deutschen Morgenländischen Gesellschaft 65, 1911, 625-696.

WEISSBACH 1916
Weissbach, F. H., Neue Beiträge zur keilinschriftlichen Gewichtskunde. Zeitschrift der Deutschen Morgenländischen Gesellschaft 70, 1916, 49-91.

WESTENHOLZ 1987
Westenholz, A., Old Sumerian and Old Akkadian Texts in Philadelphia. Carsten Niebhur Institute (CNI) Publications 3 (Copenhagen 1987).

WESZELI 2000
Weszeli, M., Ina-Esaggil-gapšat. In: H. D. Baker (ed.), The Prosopography of the Neo-Assyrian Empire 2, 1 (Helsinki 2000) 540.

WHEELER 1947
Wheeler, M., Harappa: The defenses and cemetery R37. Ancient India 3, 1947, 58-130.

WHEELER 1968
Wheeler, M., The Indus Civilization: Supplementary Volume to the Cambridge History of India (Cambridge 1968).

WHITE 1949
White, L. A., The Science of Culture: A Study of Man and Civilization. Evergreen Books E-105 (New York 1949).

WILCKE 1969
Wilcke, C., Das Lugalbandaepos (Wiesbaden 1969).

WINKELMANN 2005
Winkelmann, S., Deciphering the intercultural style? In: U. Franke-Vogt/H. -J. Weisshaar (eds.), South Asian Archaeology 2003: Proceedings of the Seventeenth International Conference of the European Association of South Asian Archaeologists, 7-11 July 2003, Bonn. Forschungen zur Archäologie außereuropäischer Kulturen 1 (Aachen 2005) 185-197.

WISEMAN 1953
Wiseman, D. J., The Alalakh Tablets. Occasional Publications of the British Institute of Archaeology in Ankara 2 (London 1953).

WOOLLEY 1927a
Woolley, L., Ur Excavations. Vol. 4: The Early Periods (London 1927).

WOOLLEY 1927b
Woolley, L., Ur Excavations. Vol. 5: The Ziggurat and Its Surroundings (London 1927).

WOOLLEY 1927c
Woolley, L., Ur Excavations. Vol. 7: The Old Babylonian Period (London 1927).

WOOLLEY 1927d
Woolley, L., Ur Excavations. Vol. 8: The Kassite Period (London 1927).

WOOLLEY 1927e
Woolley, L., Ur Excavations. Vol. 9: The Neo-Babylonian and Persian Periods (London 1927).

WOOLLEY 1934
Woolley, L., Ur Excavations 2. The Royal Cemetery: A Report on the Predynastic and Sargonid Graves Excavated between 1926 and 1931 (London 1934).

WOOLLEY 1946
Woolley, L., Ur: The First Phases. The King Penguin Books 25 (London 1946).

WOOLLEY 1955
Woolley, L., Ur Excavations 4. The Early Periods: A Report on the Sites and Objects Prior in Date to the Third Dynasty of Ur Discovered in the Course of the Excavations (Philadelphia 1955).

WOOLLEY 1965
Woolley, L., Ur Excavations 8. The Kassite Period and the Period of the Assyrian Kings (London 1965).

WOOLLEY 1974
Woolley, L., Ur Excavations 6. The Buildings of the Third Dynasty (London 1974).

WOOLLEY 1976
Woolley, L., Ur Excavations 7. The Old Babylonian Period (London 1976).

WRIGHT 1981
Wright, H. T., An Early Town on the Deh Luran Plain: Excavations at Tepe Farukhabad. Memoirs of the Museum of Anthropology, University of Michigan 13 (Ann Arbor 1981).

WRIGHT, R. P. 2016
Wright, R. P., Konar Sandal South, Nindowari, and Lakhan Jo Daro beyond the limits of a known world. In: V. Widorn/U. Franke/P. Latschenberger (eds.), South Asian Archaeology and Art. Contextualizing Material Culture in South and Central Asia in Pre-Modern Times: Papers from the 20th Conference of the European Association for South Asian Archaeology and Art Held in Vienna from 4th to 9th of July 2010 (Turnhout 2016) 25-35.

ZACCAGNINI 1978
Zaccagnini, C., Note on the Talent of Alalah (AT 401). Iraq 40, 1978, 67-69.

ZACCAGNINI 1979a
Zaccagnini, C., Materiali per uno studio sulla "moneta primitiva": Le coppe d'oro e d'argento nel Vicino Oriente durante il II millennio. Annali dell'Istituto Italiano di Numismatica 26, 1979, 29-49.

Zaccagnini 1979b
Zaccagnini, C., Notes on the weight system at Alalah VII. Orientalia 48, 1979, 472-475.
Zaccagnini 1986
Zaccagnini, C., The Dilmun standard and its relationship with Indus and Near Eastern weight systems. Iraq 48, 1986, 19-23.
Zaccagnini 1999
Zaccagnini, C., The Assyrian lion weights from Nimrud and the "mina of the land". In: Y. Avishur/R. Deutsch (eds.), Michael: Historical, Epigraphical, and Biblical Studies. In Honor of Prof. Michael Heltzer (Tel Aviv 1999) 259-265.
Zaccagnini 1999-2001
Zaccagnini, C., The mina of Karkemiš and other minas. States Archives of Assyria Bulletin 13, 1999-2001, 39-56.
Zaccagnini 2000
Zaccagnini, C., A note on Old Assyrian weight stones and weight systems. In: S. Graziani (ed.), Studi sul Vicino Oriente antico: Dedicati alla memoria di Luigi Cagni, 4 vols. Istituto Universitario Orientale, Dipartimento di Studi Asiatici, Series minor 61 (Napoli 2000) 1202-1213.
Zaccagnini 2005
Zaccagnini, C., The weights of Tell Shiukh Fawqani – Burmarina. In: L. Bachelot/F. M. Fales (eds.), Tell Shioukh Fawqâni 1994-1998 (Padova 2005) 581-584.
Zaccagnini 2019
Zaccagnini, C., Duck weights from Karkemish: A historical analysis. Orientalia 88, 1, 2019, 37-77.
Zettler/Horne 1998
Zettler, R. L., Horne, L. (eds.), Treasures from the Royal Tombs of Ur (Philadelphia 1998).

Plates

Plate 1

Susiana and Lower Mesopotamia

Susa: Type 1a (1)

1 - 57 M. 1:1; 58 is missing

Susa: Type 1a (2)

59 - 100 M. 1:1

Susa: Type 1a (3)

101 - 169 M. 1:2

Susa: Type 1a (4)

170 - 199 M. 1:2

Susa: Type 1a (5)

200 - 238 M. 1:4

Susa: Type 1a (6)

239

240


241


242

243

Type 1b (1)

245


246

247

248


249


250

251

252


253


254


255

239 - 243 M. 1:4; 244 is missing; 245 - 255 M. 1:1

Susa: Type 1b (2)

Type 1c (1)

256 - 263 M. 1:4; 264 - 323 M. 1:1

Susa: Type 1c (2)

324 - 377 M. 1:1

Susa: Type 1c (3)

378 - 413 M. 1:1

Susa: Type 1c (4)

414 - 464 M. 1:2; 453 and 459 are missing

Susa: Type 1c (5)

Type 1d (1)

465 - 482 M. 1:4; 483 - 494 M. 1:1

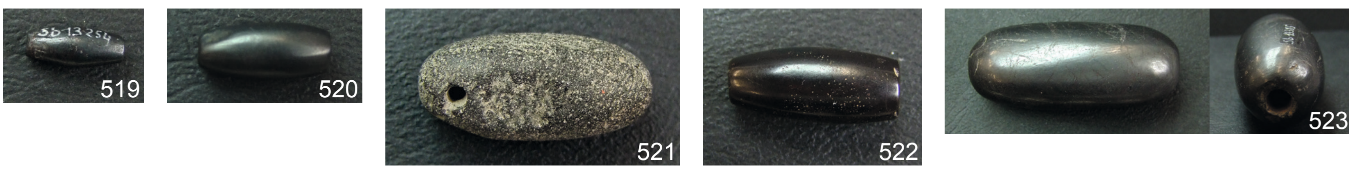
Susa: Type 1d (2)

Type 1e (1)

Type 1g (1)

Type 1h (1)

Type 1i (1)



495 - 501 M. 1:2; 502 - 508 M. 1:4; 509 - 522 M. 1:1; 523 M. 1:2

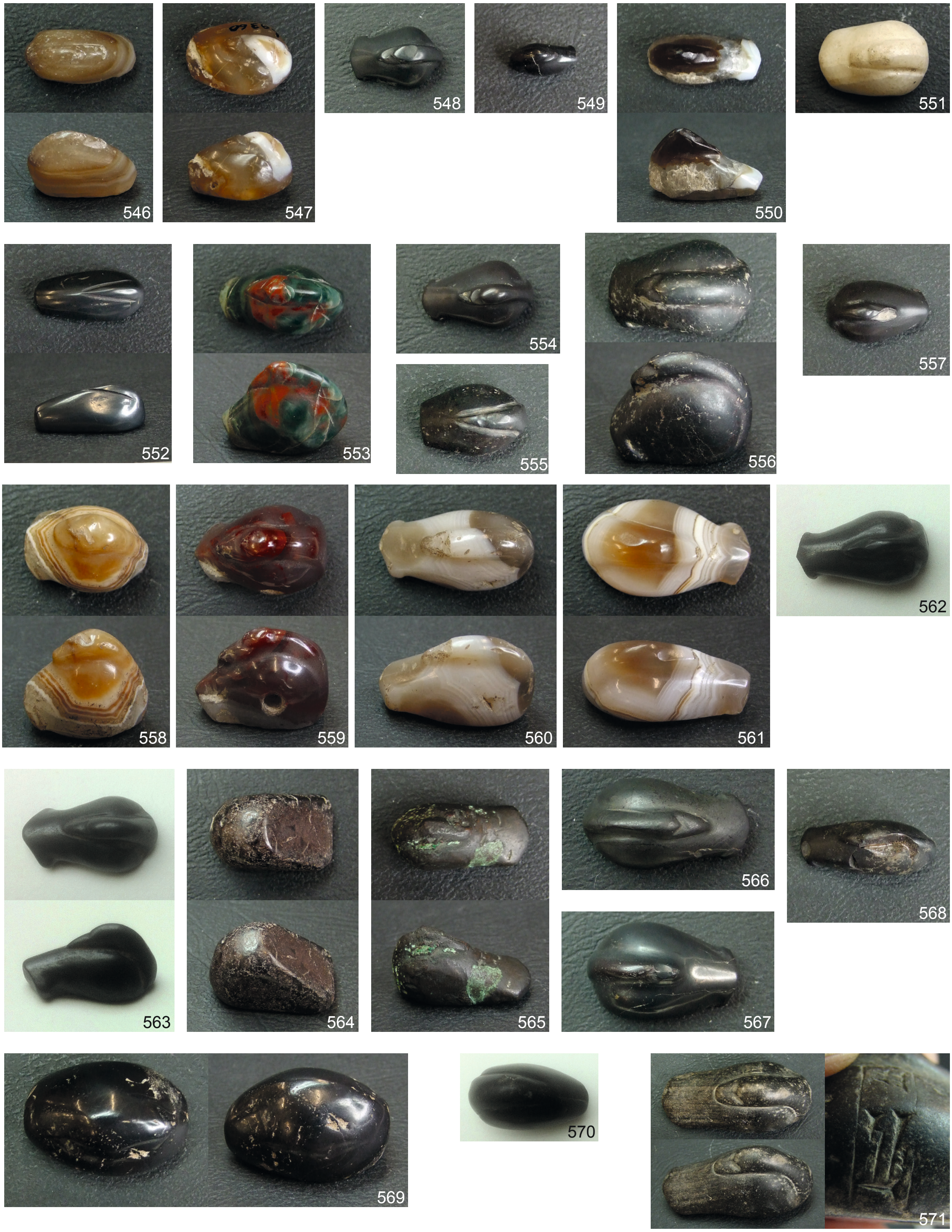
Susa: Type 1i (2)

Type 1k (1)

Type 2 (1)

524 - 527 M. 1:2; 528 - 545 M. 1:1; 536 is missing

Susa: Type 2 (2)



546 - 569 M. 1:1; 570 - 571 M. 1:2

Susa: Type 2 (3)

572 - 583 M. 1:2; 584 - 589 M. 1:4

Susa: Type 2 (4)

590 - 595 M. 1:4; 596 - 602 M. 1:8

Susa: Type 2 (5)


603


604

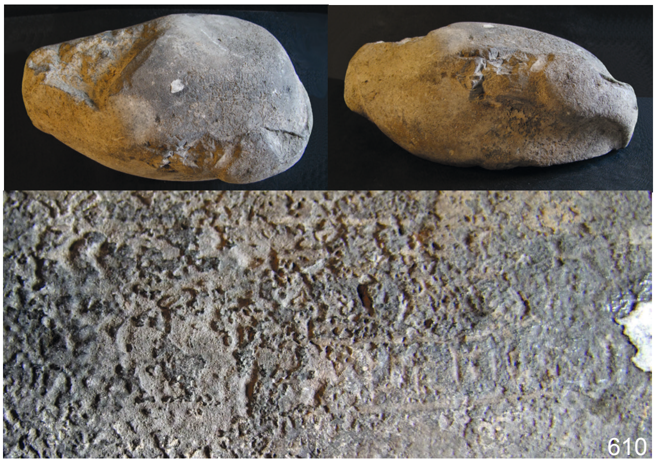

605

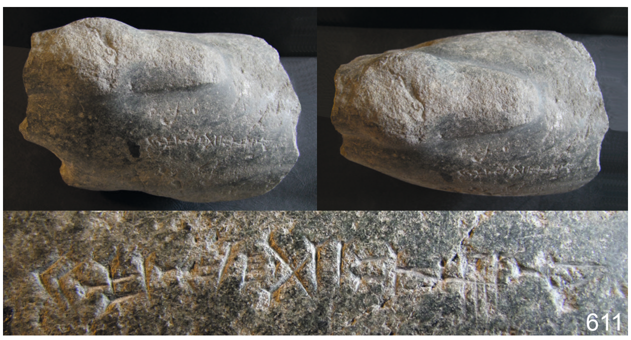

606


607


608


609


610


611


612


613


614

603 - 614 M. 1:8

Susa: Type 2 (6)

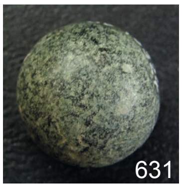
Type 3

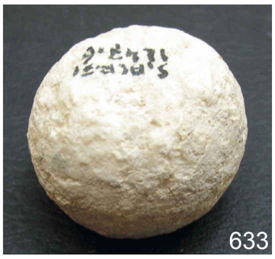
Type 4

615-616 M. 1:8; 617 M. 1:10; 618 - 627 M. 1:1

Susa: Type 6

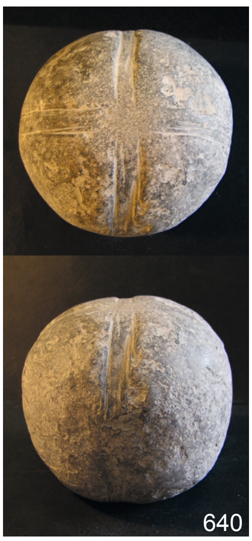
Type 7a





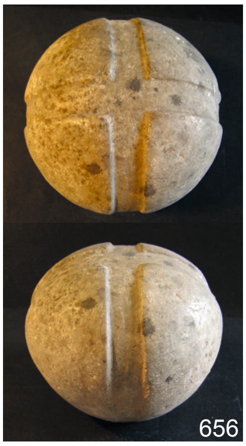
Type 7b

Type 8 (1)



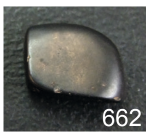
628 - 638 M. 1:1; 639 - 644 M. 1:4

Susa: Type 8 (2)



Type 9a

Type 9c (1)



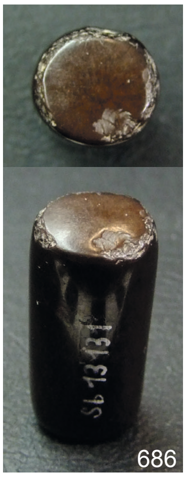
645 - 659 M. 1:4; 660 - 664 M. 1:1

Susa: Type 9 (2)

Type 11a (1)

665 - 684 M. 1:1; 685 is missing

Susa: Type 11a (2)



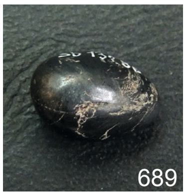
686


687

Type 12


688

Type 15


689

Type 16


690

691

Type 17a


692


693


694

Type 17b


695

Type 17c


696

Type 17d


697

Type 18

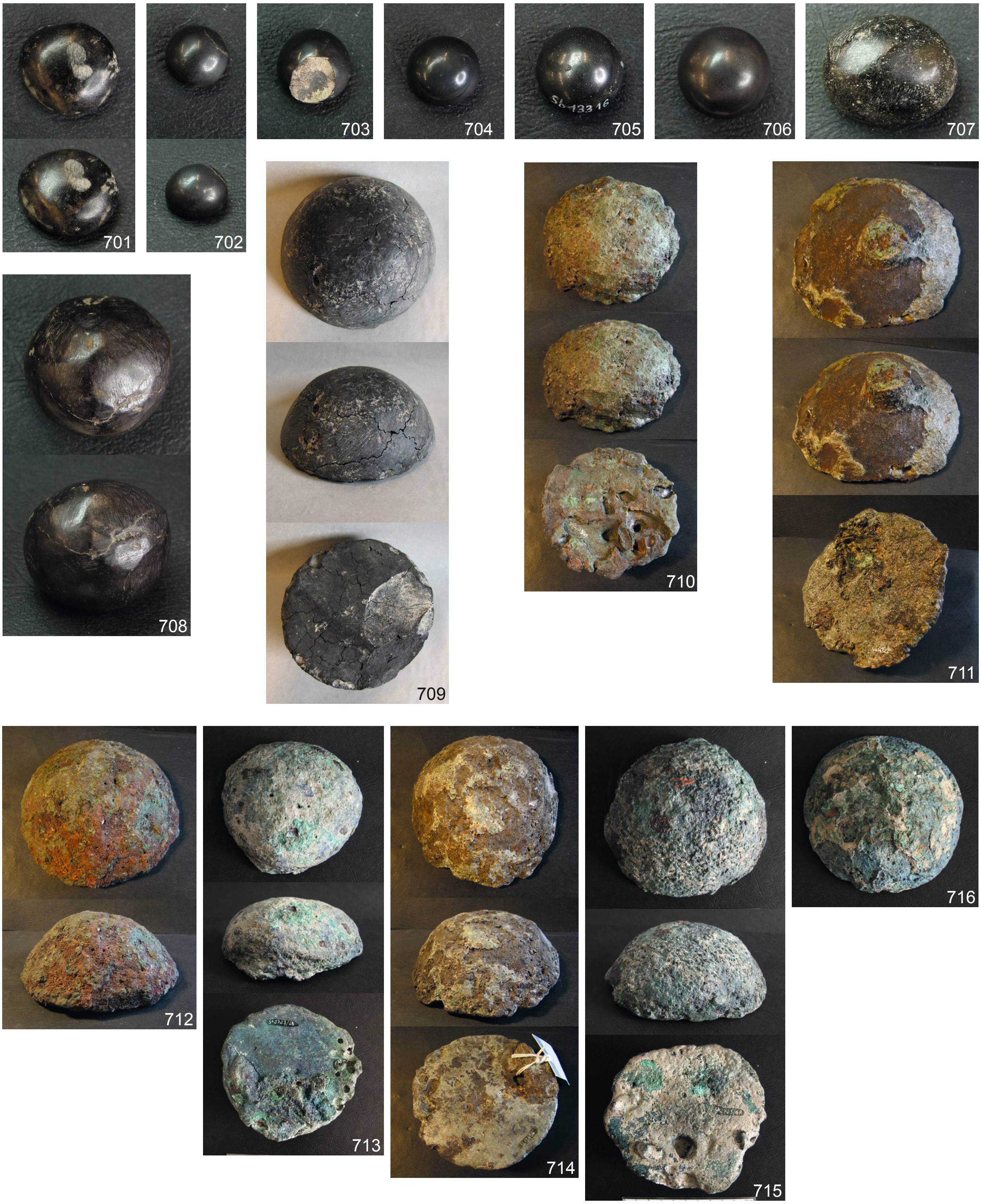

698


699


700

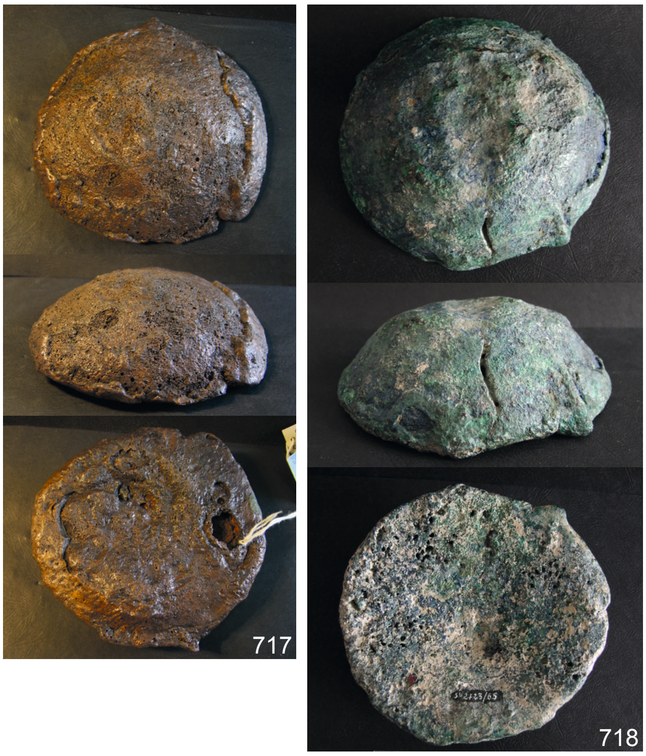
686 M. 1:1; 687 - 688 M. 1:2; 689 - 694 M. 1:1; 695 M. 1:4; 696 - 698 M. 1:1; 699 - 700 M. 1:4

Susa: Type 20a (1)



701 - 708 M. 1:1; 709 - 716 M. 1:4

Susa: Type 20a (2)



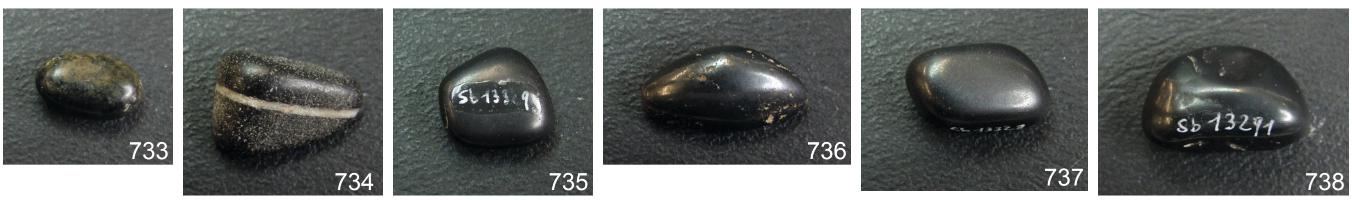
Type 21a (1)

Type 21a (2)

Type 21b

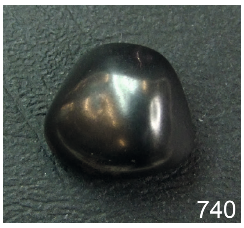
Type 22

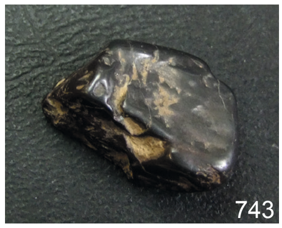
Type 23 (1)



717 - 718 M. 1:4; 719 is missing; 720 - 724 M. 1:1; 725 - 727 M. 1:2; 728 M. 1:8; 729 - 738 M. 1:1

Susa: Type 23 (2)





Choga Zanbil: Type 1b

Type 1c

Type 1d

Djaffarabad: Type 7a

Larsa: Type 1c

Larsa: Type2

739 - 759 M. 1:1

Telloh: Type 1a (1)

760 - 795 M. 1:1

Telloh: Type 1a (2)

Type 1b

796 - 822 M. 1:2

Telloh: Type 1c

Type 1d

Type 1f

Type 2 (1)

823 - 830 M. 1:1; 831 M. 1:2; 832 - 839 M. 1:1; 840 - 842 M. 1:2; 843 M. 1:4; 844 M. 1:1; 845 M. 1:2; 846 - 850 M. 1:1; 851 M. 1:2; 852 M. 1:4

Telloh: Type 2 (2)

Type 7a

Type 11a

Type 15

Type 16

Type 20a

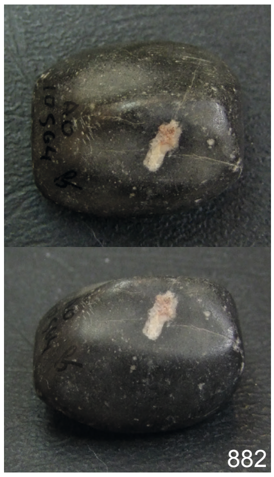
Type 21a

Type 21b

853 - 855 M. 1:4; 856 - 861 M. 1:1; 862 M. 1:1; 863 - 868 M. 1:2; 869 - 870 M. 1:1; 871 M. 1:2; 872 - 873 M. 1:1

Kish: Type 1c

Type 2



Type 3

Type 4

Type 5

Ur: Type 19

874 - 878 M. 1:1; 879 M. 1:4; 880 - 882 M. 1:1; 883 M. 1:4; 884 - 886 M. 1:1; 887 M. 1:2

Iranian Highlands

Jiroft valley: Type 10 (1)


888


889


890


892


891


893


894


897


898

888 - 894 M. 1:4, 895 - 896 are missing; 897 - 898 M. 1:4

Jiroft valley: Type 10 (2)


899


900


901


902


903

899 - 903 M. 1:4

Jiroft valley: Type 10 (3)

904 - 907 M. 1:4

Jiroft valley: Type 10 (4)


908


909


910


911

908 - 911 M. 1:4

Jiroft valley: Type 10 (5)

912 - 914 M. 1:4

Jiroft valley: Type 10 (6)

915 - 917 M. 1:4

Jiroft valley: Type 10 (7)

918 - 919 M. 1:4

Jiroft valley: Type 10 (8)

920

922

921

920 - 922 M. 1:4

Jiroft valley: Type 10 (9)

923 - 925 M. 1:4

Jiroft valley: Type 10 (10)

Type 13

Type 14

Konar Sandal: Type 7a

Konar Sandal: Type 7b

926 - 929 M. 1:8; 930 - 932 M. 1:4; 933 M. 1:1; 934 M. 1:2

Konar Sandal: Type 11a

Type 17 a

Type 20a

Tepe Yahya: Type 1a

Type 1b

Type 7a

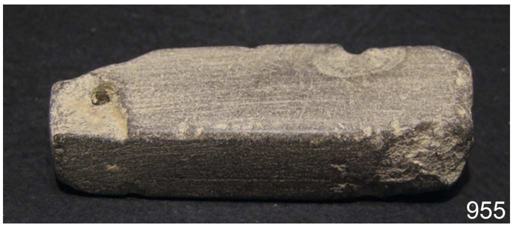
Type 7b

935 - 941 M. 1:2; 942 - 945 M. 1:1; 946 M. 1:2; 947 - 949 M. 1:1; 950 M. 1:2; 951 M. 1:1

Tepe Yahya: Type 7c

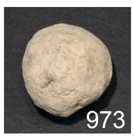
Type 9a

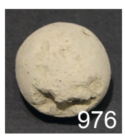
Type 16b



Type 27

Type 9d (1)

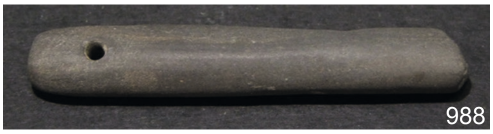




952 M. 1:1; 953 - 954 M. 1:2; 955 - 957 M. 1:1; 958 - 959 M. 1:2; 960 - 961 M. 1:4; 962 - 971 M. 1:1; 972 - 976 M. 1:2

Tepe Yahya: Type 9d (2)

Type 11b



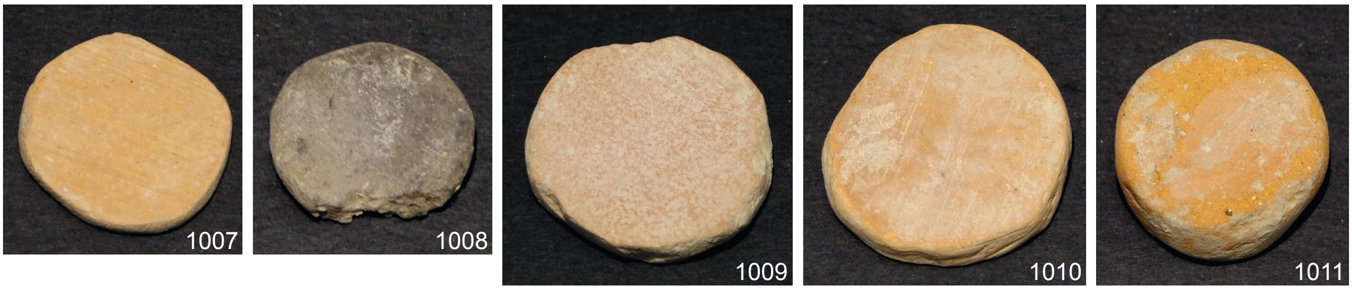
Type 15

Type 16

Type 17a

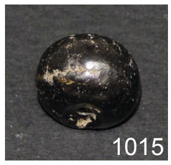
977 - 987 M. 1:2; 988 - 990 M. 1:1; 991 M. 1:2; 992 - 1004 M. 1:1; 1005 - 1006 M. 1:4

Tepe Yahya: Type 17e



Type 18a

Type 20a



Type 21a

Type 21b

Type 24 (1)

1007 - 1018 M. 1:1; 1019 - 1031 M. 1:2

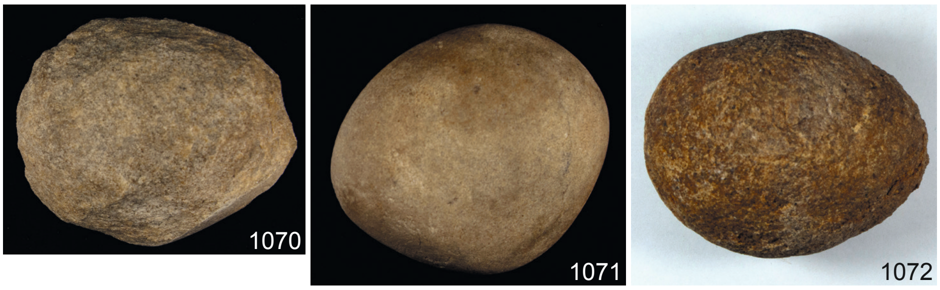
Tepe Yahya: Type 24 (2)

Type 25

Shahr-i Sokhta: Type 1a (1)

1032 - 1063 M. 1:2; 1064 M. 1:4; 1065 - 1069 M. 1:2

Shahr-i Sokhta: Type 1a (2)



Type 1b

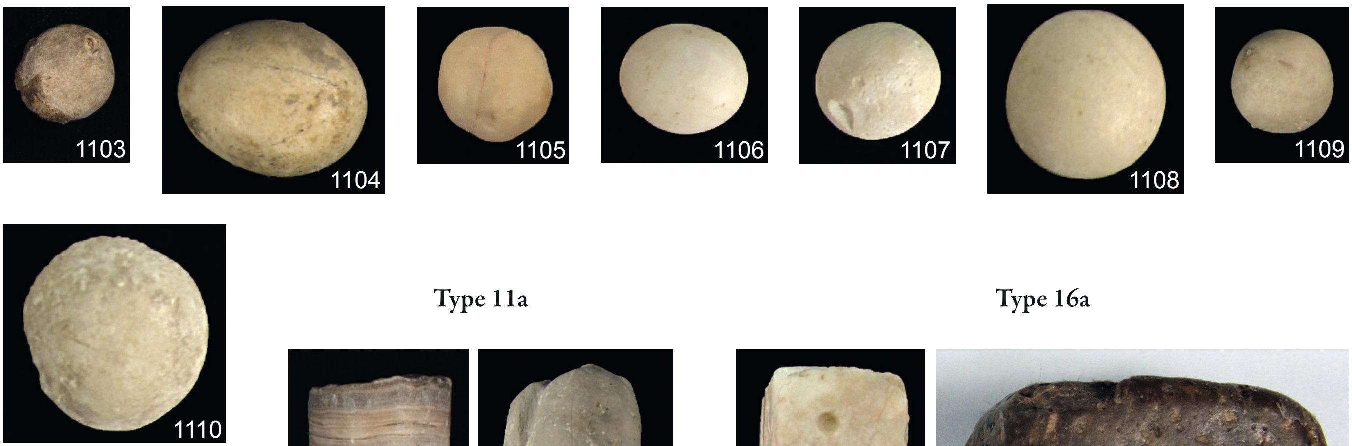
Type 1d

Type 7a

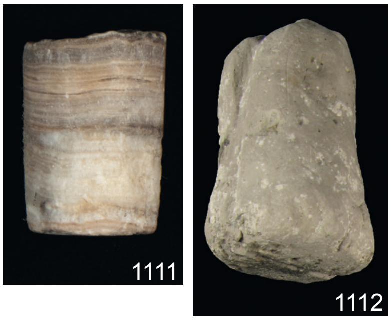
Type 9a

1070 - 1072 M. 1:2; 1073 M. 1:1; 1074 M. 1:2; 1075 M. 1:1; 1076 M. 1:2; 1077 M. 1:1; 1078 - 1082 M. 1:2; 1083 - 1102 M. 1:4

Shahr-i Sokhta: Type 9d



Type 11a



Type 16a

Type 17a

Type 23

Gorgan Plain: Type 1k

Shahr-i Sokhta: Type 13

1103 - 1111 M. 1:1; 1112 M. 1:2; 1113 - 1114 M. 1:1; 1115 - 1116 M. 1:2; 1117 M. 1:1; 1118 - 1120 M. 1:4

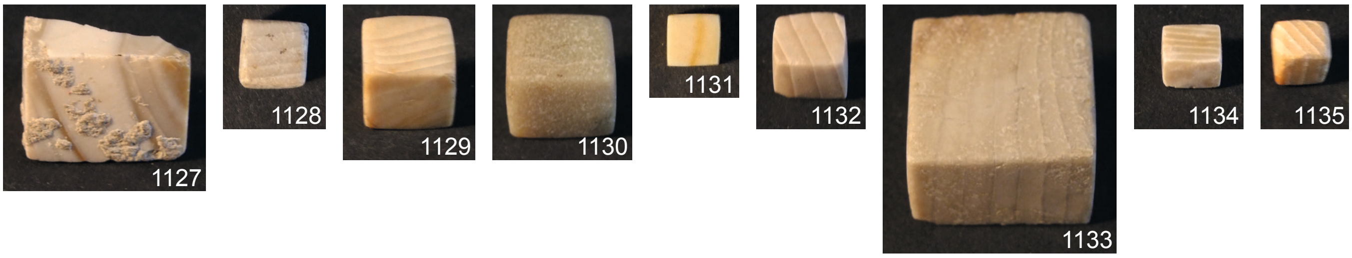
Greater Indus Valley

Rakhigarhi: Type 9d

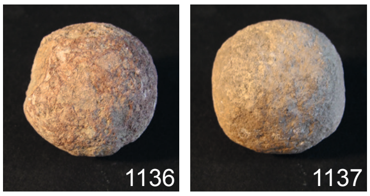
Type 16

Type 17a

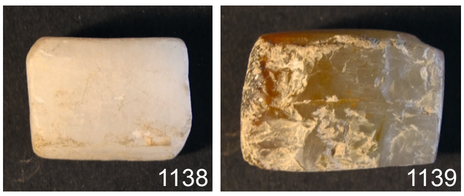
Type 18a



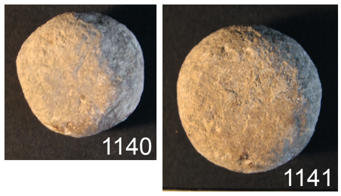
Farmana: Type 7b



Type 16



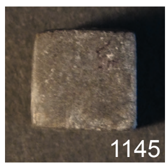
Type 17a



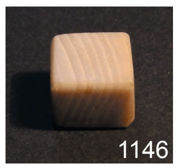
Type 18a

Kuntasi: Type 17e

Type 18a



Nageshwar: Type 18a



Nagwada: Type 7b

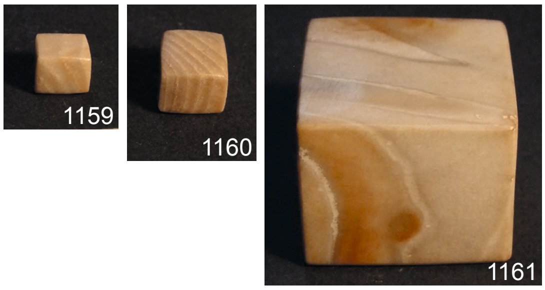
Type 9d

1121 - 1124 M. 1:2; 1125 M. 1:1; 1126 M. 1:2; 1127 - 1135 M. 1:1; 1136 - 1137 M. 1:2; 1138 - 1139 M. 1:1; 1140 - 1141 M. 1:2; 1142 - 1156 M. 1:1

Nagwada: Type 16

Type 17a

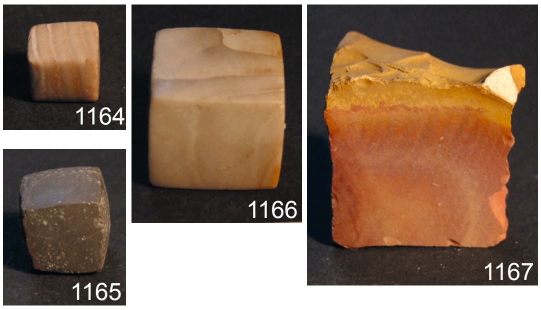
Type 18a



Type 18b

Shikarpur: Type 16

Type 18a

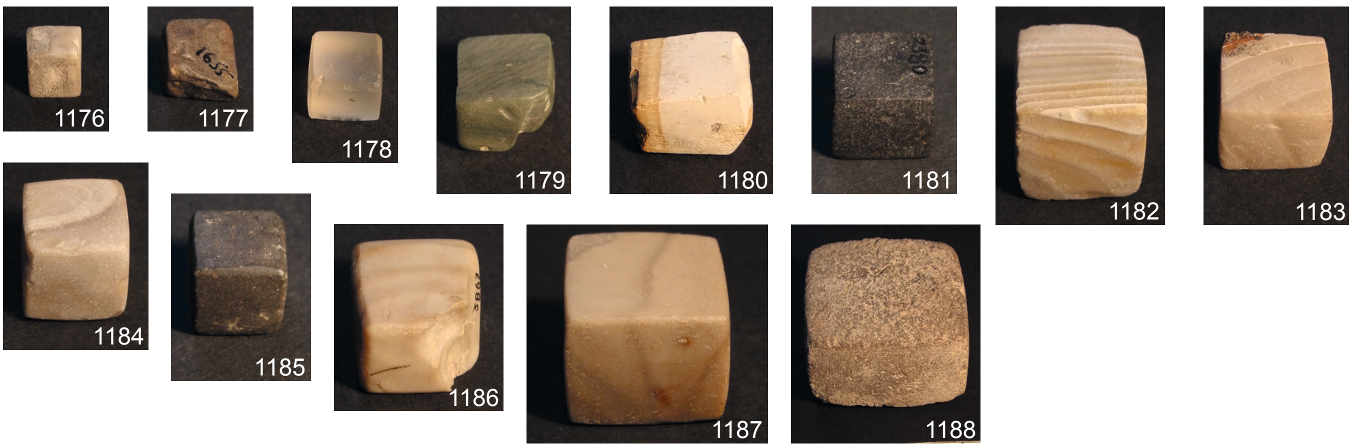


Type 18b

Bagasra: Type 12

Type 16a

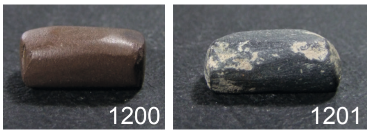
Type 16



1157 - 1161 M. 1:1; 1162 M. 1:2; 1163 - 1171 M. 1:1; 1172 M. 1:2; 1173 - 1187 M. 1:1; 1188 M. 1:2

Dholavira: Type 1c

Type 1d

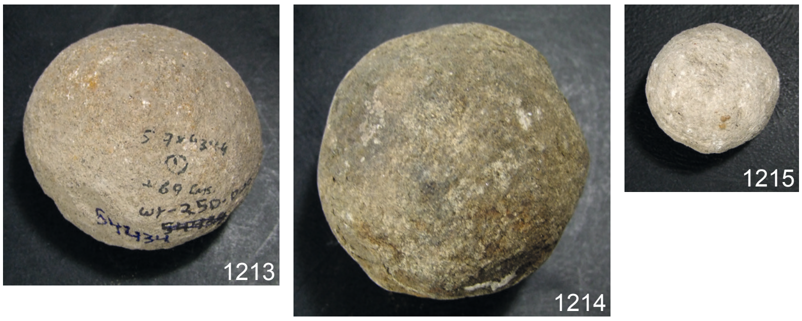


Type 1g

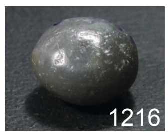
Type 4

Type 7a

Type 7b



Type 9d



Type 11a (1)

1189 - 1206 M. 1:1; 1207 - 1215 M. 1:2; 1216 M. 1:1; 1217 is missing; 1218 - 1259 M. 1:1

Dholavira: Type 11a (2)

Type 11c

Type 12 (1)

1260 - 1283 M. 1:1; 1284 M. 1:8; 1285 - 1329 M. 1:1

Dholavira: Type 12 (2)

Type 16 (1)

1330 - 1349 M. 1:1; 1350 - 1354 M. 1:4; 1355 M. 1:8; 1356 - 1416 M. 1:1; 1407 is missing

Dholavira: Type 16 (2)

1417 - 1469 M. 1:1

Dholavira: Type 16 (3)

Type 17a (1)

1470 - 1503 M. 1:2; 1504 - 1505 1:4; 1506 - 1536 M. 1:1

Dholavira: Type 17a (2)

Type 17c

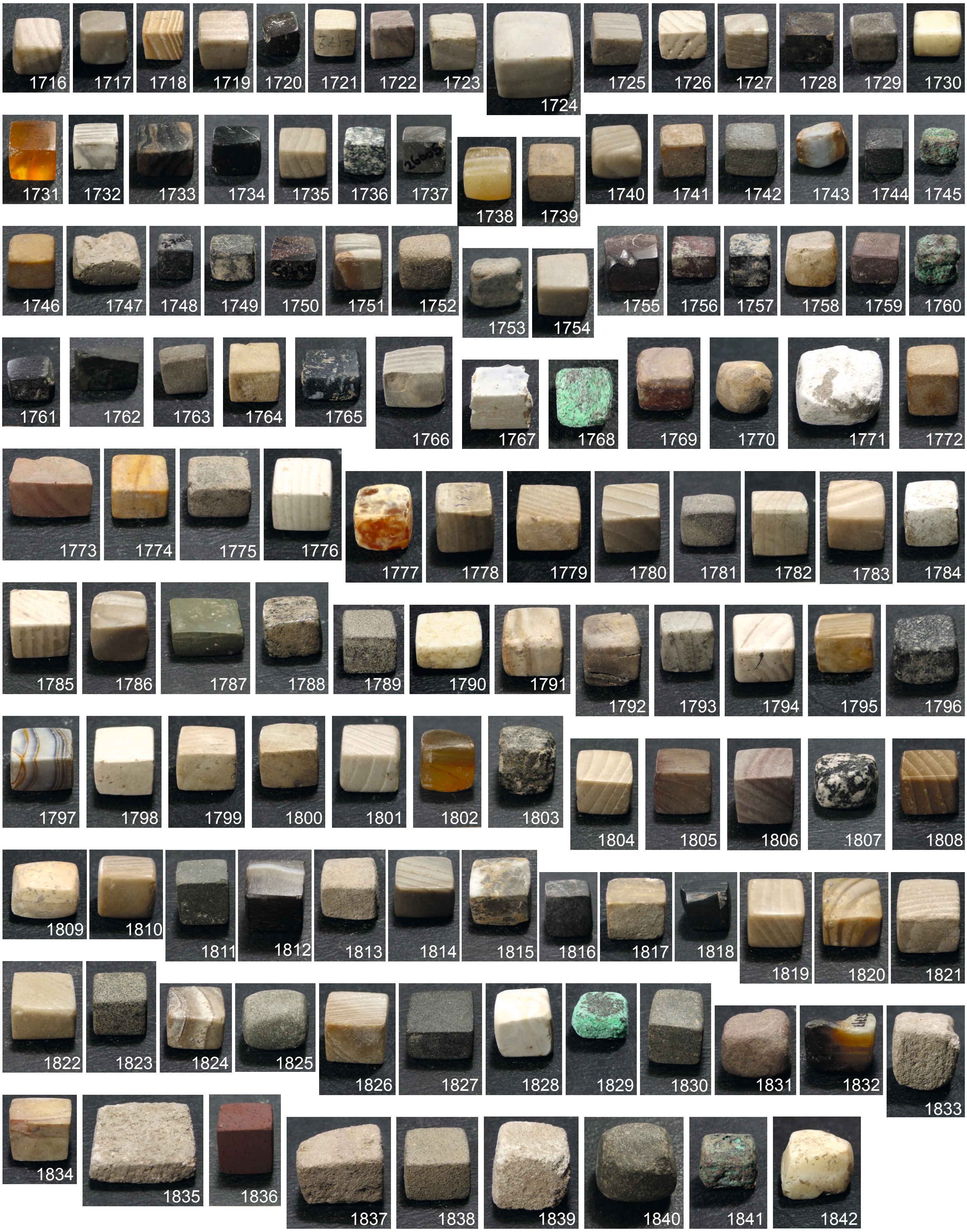
1537 - 1584 M. 1:1; 1585 - 1597 M. 1:2; 1598 - 1603 M. 1:4; 1604 - 1607 M. 1:8; 1608 M. 1:1

Dholavira: Type 17e

Type 18a (1)

1609 - 1634 M. 1:1; 1635 - 1649 M. 1:2; 1650 - 1715 M. 1:1; 1616 is missing

Dholavira: Type 18a (2)



1716 - 1842 M. 1:1

Dholavira: Type 18a (3)

1843 - 1916 M. 1:1

Dholavira: Type 18a (4)

1917 - 1955 M. 1:1

Dholavira: Type 18a (5)

Type 18b

1956 - 1979 M. 1:2; 1980 - 1984 M. 1:4; 1985 - 1986 M. 1:8; 1987 - 1996 M. 1:1

Dholavira: Type 20a

Type 20b

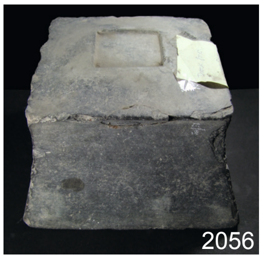
Type 21a

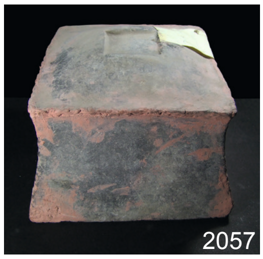
Type 21b

Type 22

1997 - 2003 M. 1:1; 2004 - 2005 M. 1:2; 2006 - 2010 M. 1:1; 2011 M. 1:2; 2012 M. 1:1; 2013 - 2014 M. 1:4; 2015 - 2050 M. 1:1

Dholavira: Type 25





Type 26

2051 - 2052 M. 1:1; 2053 - 2055 M. 1:2; 2056 - 2057 M. 1:8; 2058 M. 1:1