COPPER OXHIDE INGOT MARKS:
A DATABASE AND COMPARATIVE ANALYSIS

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by

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ABSTRACT

COPPER OXHIDE INGOT MARKS:

A CATALOGUE AND COMPARATIVE ANALYSIS

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Many objects of international trade from the Late Bronze Age eastern Mediterranean are marked with symbols of undetermined meaning. Of these, copper oxhide ingots have been of particular interest to archaeologists for decades. As the meaning of these marks is currently unknown, my work attempts to analyze patterns of them that are distinguishable through a study of the marked ingots' contextual and geographic distribution. My research resulted in a database composed of all retrievable information regarding the discovery, contextual information, and physical characteristics of all copper oxhide ingot remains and marks. The purpose of this database and distribution analysis is to contribute to the ongoing efforts to understand these artifacts so ubiquitous in Late Bronze Age settlements in the eastern Mediterranean.

BIOGRAPHICAL SKETCH

Alaina Kaiser was graduated from Boston University in 2009 with a Bachelors of Arts degree in Archaeology and a minor in Classical Civilizations. After obtaining her degree, Ms. Kaiser held a research assistant position at the Massachusetts Board of Underwater Archaeological Resources and worked as a field technician in CRM at Public Archaeology Laboratory. While interning with the National Park Service at the Historic Kingsley Plantation in 2010, Ms. Kaiser volunteered with the University of Florida's archaeological field school led by Dr. James Davidson. Although Ms. Kaiser has participated in American archaeology and CRM, the majority of her experience has been on the island of Cyprus. She spent two summer seasons, 2007 and 2008, with the *Athienou Archaeological Project*, digging and studying the multi-era sanctuary under the tutelage of Dr. Michael Toumazou, Dr. Derek Counts, Dr. Nick Kardulias, and Matthew Spigelman. In 2011 Ms.Kaiser studied pottery analysis with Lindy Crewe during her excavation at *Kissonerga*-Skalia. Her research interests in Late Bronze Age eastern Mediterranean trade and social interaction led her to Cornell University, where she has studied with Dr. Sturt Manning and Dr. Christopher Monroe. For information regarding the proceeding database and analysis, email her at alainakaiser@yahoo.com.

For my parents, who have unceasingly supported my pursuit of a life in archaeology.

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This project was greatly facilitated by the assistance and guidance of a large number of people. Among these are my professors, colleagues, and peers, whose consultations and support have helped me through various stages of my research. In particular, invaluable technical support was provided by Andreas Michaelas, David Massey, and Dr. Adam Smith (Cornell University). I would also like to thank the staff and faculty of Cornell University's Graduate School, Archaeology Program, Near Eastern Studies Department, Classics Department, and Library Services for all of their assistance in the production of this paper. In particular, I would like to thank the Hirsch Fund Committee for granting me remuneration for travel to Cyprus and England to conduct research with various library collections that were unavailable to me on campus. A large amount of research was conducted at the library of the Cyprus American Archaeological Research Institute in Nicosia, Cyprus. I would like to thank the staff for all of their help during my stay, and especially to the former director, Dr. Thomas Davis, for his advice on this project and his continual assistance through my undergraduate and graduate studies.

The inspiration for this project came in part from the work of Dr. Nicholle Hirschfeld, who was kind enough to answer many of my questions regarding her research via personal communications. I owe the same gratitude to Michael Rice Jones, who also corresponded with me regarding his 2007 Master's thesis from Texas A & M University. Many other scholars have inspired and motivated me through their research and publications, and I would like to offer gratitude to the expert scholars often referred to in my paper for their continual efforts in the field of Late Bronze Age trade.

To end, I would like to offer my deepest gratitude to my advisors and committee members, Dr. Sturt Manning and Dr. Christopher Monroe. My time at Cornell University and my work in this paper would not have been possible if not for their guidance, patience, and understanding.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF MAPS

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

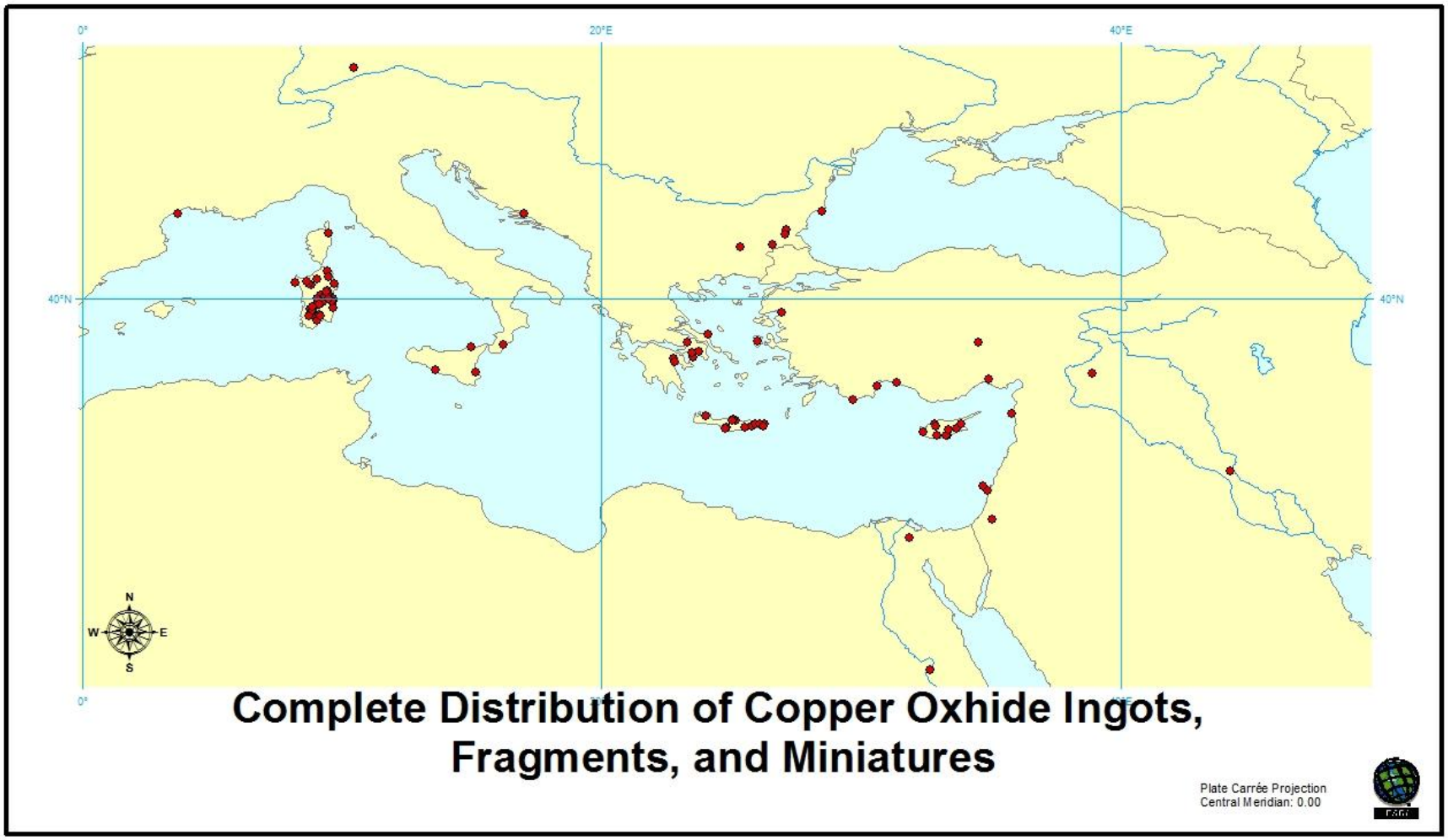
The trade of raw copper between eastern Mediterranean peoples is widely argued to have been integral to the economies and metallurgical industries of several societies during the Late Bronze Age (LBA).[1] Due to their conspicuous status among finds and in ancient representations, copper oxhide ingots are assumed to have been one of the main mediums of the copper trade during this period, and are the basis of this investigation. These ingots appear across the Mediterranean world and beyond in quantities as small as a single fragmentary piece and as large as ship cargoes consisting of several tons of complete and fragmentary ingots.[2] In the large corpus of ingots known, we have the final product of a major industry and a crucial example of the mass production of materials. Considerable research on this material exists, but the important information for the ingots is spread out among many site reports, articles, and books. This project aimed to create a comprehensive database of the physical and contextual information of every published copper oxhide ingot specimen as a research tool available to the public and academic community. To exemplify the usefulness of such a database, I have also conducted a contextual analysis of a questionable aspect of the ingots – the occurance of undeciphered markings found on many of them- within their entire geographic distribution.

1.2 METHODOLOGY AND APPROACH

Previous to my project, there was no in-depth analysis of the spatial distribution of all copper oxhide ingots and the marks that appear on many of them. Numerous scholars have attempted to decipher the meaning of the copper oxhide ingot marks, but most of these studies focus on the marks

[1] Dates for the Late Bronze Age vary slightly for each major culture discussed in this paper, but range from ca. 1550 – 1100 BCE. Refer to Appendix II for comparative chronological chart.

[2] Refers to oxhide ingot cargos found on the Cape Gelidonya and Uluburun shipwrecks. Refer to Bass 1967; Pulak 1998; and Jones 2007.



Map 1: Complete Distribution of Copper Oxhide Ingots, Fragments, and Miniatures

in a smaller sample of the ingots (e.g., the Uluburun cache), provide all known information for a sample, or address what significance they must have had (Hirschfeld 1999; Sibella 1996; Guzzo 2009; Smith & Hirschfeld 1999; Jones 2007: 96-109; Buchholz 1959). Other works include philological comparisons with similar marks in contemporary scripts (Bass 1967: 70). Unfortunately, all of these studies have ended with the same conclusion that they began with – that these marks must have meant something regarding the manufacture or trade of the ingots, but it is not yet certain what that meaning is.[3]

If these marks truly are symbols from the script known as Cypro-Minoan, as is a common belief, then there is no way to decipher their linguistic meaning until Cypro-Minoan itself is deciphered (Guzzo 2009; Woodard 2004: 5-6.). One might ask, how can we truly understand the function of these marks if we cannot ascertain what they actually say? This is arguably the largest set-back in understanding the marks on these and other highly traded objects from the LBA. It is, however, possible to make some inferences based upon thorough studies of all the marks. These inferences are unfortunately limited by the small sample and geographical bias of the preserved marks. A large majority of the marked ingots come from only two sites – the Cape Gelidonya and Uluburun shipwrecks. The remaining marked ingots are spread throughout the entire distribution of the copper oxhide ingots. This study will then be working with information that is likely not entirely representative of the expansiveness of the ingot marking system, as the statistics are skewed by the coincidental preservation of ingot cargos on shipwrecks. It will, however, provide a basis for further comparative research, as well as represent the usefulness of database analyses in trying to better understand the entire situation.

The research involved in this project also attempts to supplement the biased sample with comparisons with similar phenomena studied by other scholars. Makers' marks and other symbols on

[3] Scholars such as Bass (1967:72) postulate associations of the marks with smelting activities. Other scholars have suggested that marks occurred at locations of exchange instead of manufacture (Pulak 2008: 309). Such theories will be detailed further in Chapter 5.

objects such as ceramics and metal artifacts are well known throughout the ancient world, especially within the Mediterranean area. At this time, there are several studies on the marks found on certain types of objects from the LBA Mediterranean. Using my research into these previous studies and personal visual analysis, I shall attempt in this thesis to assist in the understanding of the function of these marks using the physical and contextual information in my database. Such an analysis is important in order to determine if any patterns are present in regards to the marks, their ingots, and the contexts in which those ingots have been found. While my results may or may not support current theories on the subject, such an encompassing study will surely contribute to the ongoing efforts of scholars and archaeologists to better understand these objects and the people who made and traded them.

This spatial distribution analysis will be represented by maps created from data tables composed through my research, and created using the Geographic Information System computer program known as ArcGIS. Visual aids such as these help tremendously with comparisons and the search for patterns of objects. The creation of several maps demonstrating different variables, such as context and ingot type, will allow for comparison and further understanding of the data. The mark distribution map and table can be found in the analysis section (Chapter 3). An abbreviated version of the database created by this project, and other distribution maps will be available in the Appendices and discussed in my interpretations section. The complete database will be made accessible online to all current and future scholars to utilize and build upon.

While my subject requires a working knowledge of several other topics, my actual analysis has five main components regarding every published ingot specimen. These consist of their geographic location, dating, context within their find site, physical information, and any marks that are present on them. These categories appear in my database, along with additional information such as museum or excavation labels, chemical provenience, references, and other relevant notes. This information is gathered from site reports and firsthand accounts of the artifacts. When such accounts

were not available to me due to a lack of data or unpublished materials, as much information as possible was obtained from other sources on the topic. The first three components are discussed in my Site Summaries, which will briefly describe the contextual information regarding all marked and unmarked copper oxhide ingot remains within regional data tables. Information regarding artifact dimensions and marks can be found in the main database in the Appendix. The marks themselves will be analyzed in terms of symbols - both the type of symbols and their frequencies among regions – and their locations on the ingots themselves. By looking at this information in regards to its distribution throughout regions, I hypothesized that some patterns would emerge that would provide insight into how these marks were used. While the resulting patterns were not as revealing as I expected them to be, they are discussed in detail in Chapters 3 and 4 below.

1.3 LITERATURE REVIEW

As a major field of study in Bronze Age eastern Mediterranean archaeology, a comprehensive bibliography for copper oxhide ingots, and the copper trade in general, would be long enough to compose its own book. For this thesis the key foundation text is Buchholz ‘s (1959) publication of the first catalogue of all known copper oxhide ingots up to that time.[4] This paper not only compiled all information on the ingots’ physical properties and locations, but is the first major attempt to analyze them as a group of associated artifacts instead of occurrences at individual sites. The most significant aspects of this analysis were the categories in which he placed the various ingots based on their shape. These categories, labeled Type 1, Type 2, and Type 3, have set guidelines for all subsequent catalogues and analyses. George Bass, whose work was also important for this paper, based much of the analysis in his initial work on the ingots on Buchholz’s contribution (Figure 1).

[4] A few other names stand out due to the scholar’s extensive work, expertise, or their focus on the specific issue of the ingots. A. B. Knapp, J. Muhly, and R. Maddin are all well-known researchers in the field of Late Bronze Age trade and the copper industry. Gale and Stos-Gale performed isotopic analysis of numerous ingots and copper artifacts in attempts to determine provenience of the copper.

The discovery of the ingot cache on the Cape Gelidonya shipwreck off the Turkish coast in the 1960s practically doubled the number of known ingots as of that time. In his 1967 publication of the excavations, Bass not only listed all contextual and physical information concerning the shipwreck's ingots, but also created an updated catalogue and categories. He briefly included all information on all other published ingots and expanded on Buchholz's types by creating subgroups of both Type 1 and Type 2 (Bass 1967). The Uluburun wreck discovered two decades later eventually added another ingot type unique to the wreck. All types will be discussed below, and all references to this typology in this paper shall be in the form of "Buchholz-Bass."

1.3.1 Textual References and Visual Representations

In addition to a large number of physical specimens to analyze, we are fortunate enough to have inherited a generous corpus of textual references and visual representations of Bronze Age copper oxhide ingots from contemporary sources throughout the ancient Mediterranean world. These resources include numerous documents describing the trade of copper and artwork displaying the ingots being stored or carried. They were prominently shown in ancient Egyptian funerary art and on Aegean pedestals, often in some sort of tributary or processional scene.[5] Archaeologists have also found depictions of them at Nimrud in Mesopotamia, where images show bearers presenting what look to be oxhide ingots in tribute scenes (Mallowan 1966: 445-447, Fig. 371a). They appear on such media as seals, bronze stands, statuettes and votive offerings, ceramics, lexicography, and wall paintings. These depictions not only include images of the ingots themselves, but often of what are referred to as "ingot bearers." This is a common theme on wall paintings, seals, and the bronze stands from Cyprus (Papasavvas 2009:84).

The iconography of the oxhide ingots has been crucial in understanding the many texts that detail the trade of copper between elite persons and the way in which societies viewed, presented,

[5] The most commonly referenced example for oxhide ingots in Egyptian funerary art is the tomb of Rekmire from 1475-1450 BCE, where Aegeans or Syrians are shown delivering ingots from a ship. For in-depth analyses on the appearances of ingots and ingot-bearers in Egyptian art, see Waschmann 1987; Muhly 2009; Papasavvas 2009.

and used the ingots. Several LBA texts refer to large quantities of copper exchanging hands, with a few of these texts also connecting copper with the kingdom of Alashiya. While still not unequivocally proven, it is commonly believed that Alashiya was, or was located on, the present day island of Cyprus (Knapp 1996: 1-11; Van de Mieroop 2007: 134). Alashiya's significant role in the copper trade and its increasing importance in the international sphere over the centuries are revealed by the various texts from all over the Ancient Mediterranean and Near Eastern World.[6] They appear in Egypt, Syria, Anatolia, Babylon, and mainland Greece in many of the scripts commonly used at that time. In the 14th and 13th centuries a few of these documents included letters between political entities in Alashiya and abroad, and discuss the exchange of large gifts or tribute in the form of copper. These quantities are referred to in talents and minas, as well as in actual ingots (Ockinga 1996).[7] This association of Alashiya with copper is likely one of the reasons for the desire to attribute the ingot markings to the Cypro-Minoan script.

It is also only on the island of Cyprus where we find evidence of a religious aspect to these objects, as opposed to their export and import as traded or gifted items.[8] The miniature ingots, presumably votive offerings, and divine statuettes found on Cyprus have long been the subject of scholarly discussion (for more information and bibliography, see Papasavvas 2009: 93-104).[9] The intact and fragmentary miniature copper oxhide ingots currently known to us come from the

[6] For details regarding mentions of Alashiya and copper in ancient texts, refer to Knapp 1996. Some early examples of texts referencing copper from Alashiya are from ca. 18th c. BCE Mari (Sasson 1996: 17-19, ARM 25:483, ARM 25:691). A later text from Amarna exemplifies how Alashiya's rise in political and social standing by the inclusion of the Alashiyan king calling the Egyptian king "my brother" (Moran 1996: 22, Text 16 {EA 35}). For a discussion on such hierarchal terms in LBA inter-regional political correspondances, see Cline 1995.

[7] LBA weight and measuring systems are a complex area of study. Some recent tabulations and interpretations regarding the oxhide ingots from Uluburun can be found in Monroe 2010, where his research indicates that copper oxhide ingots had a value of 1 (Ugaritic) talent (28.2kg). Large denominations, such as minas and talents, were relatively the same throughout the Near East. The smaller denominations, such as the shekel, differed more between states (Monroe 2009: 51, f. 16). This difference is reflected in the different weight sets carried on the Uluburun ship.

[8] This refers to an original intent for the ingots as religious or votive objects. The presence of ingot fragments in hoards in or near sacred areas possibly represents a secondary function as dedicated objects, and not as their original purpose.

[9] Appendix II in Jones 2007 lists fragmented and complete "miniature ingots" at sites such as Tell Beit Mirsim and Makarska, however they are larger than the miniature ingots on Cyprus and were likely just a smaller denomination of copper in transport, similar to the smaller bun or plano-convex ingots. They are discussed in this paper as "small" ingots.

archaeological sites of Enkomi, Mathiati, and *Alassa-Pano Mandilari s* (Figure 8).[10] The majority of them have been discovered in Enkomi, in contexts associated with religious activities, which indicate their roles as votive items. They are also special because of the Cypro-Minoan inscriptions on them. Some of the longest Cypro-Minoan inscriptions from Cyprus come from these objects.

Miniature ingots have also been found attached to the bases of religious statuettes. The so-called "Ingot God" from Enkomi is believed to represent an armed and horned deity standing on a miniature oxhide ingot, which was added to the statuette at a time after its initial production. The "Bomford Figurine" is a smaller figure of a female in bronze, also standing on an oxhide ingot. Her style is seen in terracotta figurines on LBA Cyprus, and is likely to have been a votive item. The Ingot God is datable to the late 13th century BCE, and was found in a sacred area in *Quartier 5 Est* of Enkomi.[11] While the details of religion on Bronze Age Cyprus are unclear, the connection between religion and copper production on the island has long been discussed and can be supported by this correlation of divine representations with sacred spaces.[12]

1.3.2 Scientific Studies

In the 1980s and 1990s, science enabled archaeologists to look at the ingots themselves more thoroughly in attempts to better understand their composition and origin. The team of Gale and Stos-Gale took the lead in various forms of isotopic analyses conducted on samples from several areas and compared them with known copper sources (Gale 1991; Gale & Stos-Gale 1999; Stos-Gale et al. 1997). Their results often gave support to the theory that much of the copper ore, and therefore the ingots, originated on the island of Cyprus. Some of their findings and theories, however, have come under scrutiny from members of the archaeological community. In particular, while many are accepting of their evidence supporting Cyprus as the origin of the ingots, there is doubt regarding

[10] For in-depth study on miniature ingots, refer to Giumlia-Mair, Kassianidou, & Papasavvas 2011.
[11] For a thorough discussion on the figurines, see Papasavvas 2009: 93-98.
[12] For introduction to the study of LBA Cypriot religion and copper, refer to: Karageorghis 1973 and Knapp, B. 1986.

Gale and Stos-Gale's speculation that the majority of the copper ingots originated from the Apliki mines when the island is so rich in the natural resource (Gale 2011:218-219).[13]

1.3.3 Summary Works

As mentioned above, there have been many works published that comprise studies or overviews of all the information regarding the ingots from a specific group or region. Hakulin's publication on the bronzework from Crete compiled much of the published information about the ingots discovered at the various sites there, as well as information regarding Crete's metallurgical production sites (Hakulin 2004). Numerous publications are also available regarding the Cape Gelidonya and Uluburun ingot cargoes. The volume, *Oxhide Ingots in the Central Mediterranean* (2009) is a seminal work in the field of copper oxhide ingot research. It contains the contextual information regarding the ingots found in the central Mediterranean area, articles on the ingots in Egypt and Cyprus, an article on the iconography of the ingots, and sections devoted to special topics such as the ingot marks. Not only have the editors provided all information on all ingots found in the Central Mediterranean, but they have put together a digital archive of all known ingots and the contextual information for all Sardinian ingots. This volume proved invaluable to my research, as did Michael Jones's 2007 master's thesis. This work is arguably the most comprehensive source of information today regarding the oxhide ingots as components of the LBA copper trade. His work discussed all topics regarding the ingots and provided a list of all copper oxhide ingot finds then known to him. It is an extensive volume, and one that has been of great assistance in my research.[14]

1.4 THE INGOT MARKS

While not proven or unanimously agreed upon, the common belief that the ingots were made on Cyprus and the similarity of the marks to the island's enigmatic script has led to a general theory

[13] Knapp, B. 2011, and Knapp, B. 2012.
[14] Such recent catalogues occasionally have slightly different information regarding what are believed to be the same ingot remains, due to much ambiguity from old or lacking publications. The catalogue presented in this work attempts to provide the most accurate and updated information available to this scholar.

that the ingot marks are Cypro-minoan (Sibella 1996:10). Even if the marks are Cypro-Minoan, they cannot tell us anything at first glance because Cypro-Minoan remains undeciphered. The only known documents in Cypro-Minoan occur at two sites - Enkomi on Cyprus and Tell Ras Shamra-Ugarit in Northern Syria. Other occurrences of the script are single or double marks on objects such as pottery and copper oxhide ingots (Hirschfeld 1999). While several ingots bear up to three markings, they are not concurrent with one another on the ingots or in the way that they were applied (i.e., incised or impressed). We can then assume that these marks do not represent full inscriptions and therefore must be transmitting succinct or abbreviated pieces of information.

There are several scholars who have been trying to make sense of these marks for the past few decades. Jones discusses the marks on the ingots and their role in the organization of the copper ingot trade (2007: 96-109). Patricia Sibella and the team of the Uluburun shipwreck have greatly added to the pool of information from which to draw, due to the large number of the Uluburun ingots which are marked (Sibella 1996). Sibella and others have been making comparisons of those and other marks for many years, attempting to find philological patterns that will indicate their exact purpose (Figure 4). Many of these scholars believe that the marks represent shipping information – either as signs of the producers, port of departure, or as an address for delivery. Nicolle Hirschfeld is an advocator of this theory, and has also put much effort into understanding the ingot marks in comparison to Cypriot potmarks (Hirschfeld 1999). Her contextual approach re-opens a way of looking at the marks that was somewhat put aside as more scientific forms of analysis developed in popularity. By mixing the more traditional archaeological approaches with new technology such as computer analysis, along with the increasing number of oxhide ingot finds every few years, it is possible that our understanding of the ingots and the ingot marks may improve drastically.

1.5 MAIN PROBLEMS WITH STUDIES

It is unfortunate that such ubiquitous artifacts as copper oxhide ingots still puzzle archaeologists for many reasons. As indicated above, studies on the copper oxhide ingots have taken

many forms over the years and much progress has been made, but many results are inconclusive. Even hard sciences have not been a cure-all to many questions. The first of these problems is the incomplete or lack of documentation from excavations yielding ingots. Some of the specimens have no contextual information whatsoever. As these artifacts have been appearing in excavations and publications for over 150 years, it is understandable that primitive excavation techniques of early archaeologists did not provide the information that would currently benefit us.

In addition, time has not been kind to any of the ingots and most are damaged or diminished in some way. The specimens from underwater sources, which compose the majority of our corpus and provide us with most of our information regardind the ingots, have suffered from severe corrosion that has reduced their original weights and dimensions. Some of the other previously known ingots are currently missing. Due either to post-excavation destruction, loss and misplacement, or antiquities dealing, we currently do not have some of the specimens for new studies and must rely upon the old information provided by the original excavators or analysts.

For many years, studies regarding the transportation of copper oxhide ingots have rested primarily in the realm of archaeometry and scientific chemical analyses. Such investigations focus primarily on the origin of the copper in its final, deposited form. While very important for obtaining a better understanding of technology and narrowing down the origin of a metallic object, scientific analyses are not conclusive in their own right. This is due to various factors such as chemical discrepancies, re-use, and re-melting. Any process that changes the metal changes its chemical composition and therefore creates margins of error when trying to use chemical or isotopic analyses to determine the origin of the metal (Muhly 1988). Several scholars recognize that chemical studies can only determine certain things for sure – such as where the metal from an object did not come from or that certain artifacts are consistent with ores from certain areas- and can then only narrow down possibilities (Knapp 1990: 129-130; Knapp & Muhly 1991:100-101).

These studies have been instrumental in our understanding of the copper trade in the LBA, however a full understanding cannot come from a single approach. Although knowing the origin of raw materials is crucial to our knowledge and understanding of trade relations in general, there is also merit to looking at the status of the materials during their transportation before their final deposition into the archaeological record. For this, we need not turn always to chemical analysis. The archaeological context of the artifacts and the objects themselves provide us with considerable information regarding their final role in trade.

1.6 DESCRIPTION OF MATERIALS

Before continuing in my analysis, it is necessary to provide a description of the copper oxhide ingots themselves and to introduce the classification systems that have been developed to assist in their analysis. Throughout the Bronze Age, raw copper was transported in the form of ingots. There were three main types of ingots from this time period: "oxhide" ingots, "bun" ingots, and "slab" ingots. Slab ingots describe flat, oval bars of copper or other types of raw metal. Bun (a.k.a., plano-convex) ingots, formed in a discoid shape, were another common form of ingot for copper and other materials. The oxhide ingots had a more distinctive shape that is most succinctly described by Bass as:

> "[f]lat, oblong pieces of copper roughly 4 cm thick and averaging 60 by 45 cm in length and width; each has protrusions or handles at its four corners. One side of each ingot is always rough and bubbly, while the other is much smoother; the smoother side does, however, usually contain low mounds and tiny air holes, and is often outlined by a raised rim" (Bass 1967: 52).

The term "oxhide" was first adopted because of the resemblance that early scholars noted that these artifacts bore to dried ox hides. While the resemblance is still noticeable and the exact reason behind this shape is currently unknown, it is now generally believed that the "ox-hide" shape of these

ingots[15] was actually developed over time to facilitate transport (Bass 1967:69). The arms eased the work of carrying these ingots by hand, which usually weighed over 30 kilograms.[16]

As previously stated, Buchholz was the first to categorize these artifacts into a classification system that separated the known ingots into three types – Type 1, Type 2, and Type 3.[17] Type 1 consists of a more "pillow-shape," with a flat oblong slab whose short sides curve inward slightly. The Type 2 category consists of the more common shape where the longer edges curve inward slightly and the shorter edges curve inward more drastically to create the "oxhide" shape with the handles. The Type 3 ingot possesses a more rectangular shape, with less incurving of the long sides and smaller handles. Buchholz believed that an evolution in form over time could be perceived from Type 1 (standard ca. 1500 BCE) to Type 2 (beginning ca. 1400 BCE), and finally to Type 3 (beginning ca. 1200 BCE), due to an initial correlation between ingot types and contexts dating to the stated eras. This theory has not been widely believed since Bass's 1967 publication of the oxhide ingots discovered on the Cape Gelidonya shipwreck, in which Bass expanded upon Buchholz's work. In his catalogue, Bass created two subgroups for Type 1 ("a" and "b") and three subgroups for Type 2 ("a," "b," and "c"). In doing all of this, Bass refined the categorization system that many still refer to today (Figure 1).[18] Speculations about this chronological sequence increased more when all types were discovered together on the Uluburun wreck (Pulak 2008).[19] Bass also identified representations of both types of ingots in Egyptian tombs. These are found in earlier and later contexts than the time

[15] Also described as "four-tongued," "double-axe," and "pillow-shaped" (Bass 1967:69).
[16] The comparison between dried ox-hides and copper oxhide ingots is also discussed in regards to monetary value, as there are indications that the price-value of a copper oxhide ingot was equal to that of a full-grown ox in several societies (Bass 1967: 69). Further investigation into this topic supported the theory, as Monroe analysed the prices of various commodities in the LBA eastern Mediterranean. According to his analyses, the value of a copper oxhide ingot in silver Ugarit shekels was approximately equivalent to the value of an ox in silver Ugarit shekels (2010: 22, 27).
[17] Buchholz's categories include two variations of Type 3, but the examples illustrated are miniature ingots and are not usually adhered to in academic publications.
[18] This categorization does not include the "Type 4," two-handled oxhide ingots from the Uluburun wreck. This is a term used by Patricia Sibella (1996:10), but does not yet seem to be standard in publications.
[19] This excavation was also originally directed by George Bass.

in which Buchholz believed each type was used. This evidence indicates that there was not as great of an evolution as Buchholz once thought. Even though it is likely that the ingots began in the simpler "pillow-shape" and were refined for ease of transport as time went on, it is also likely that all forms may have continued to be used contemporaneously with one another.

While Bass's description above creates a generalized image of many ingots, scholarly debates continue in regards to the possible standardization of the dimensions and weight of the ingots. If the ingots were mass-produced, as is indicated by the huge cargos of them from Cape Gelidonya and Uluburun, it would have been sensible to create or use a standard measure for their dimensions and weight. Many ingots, however, have been found in fragments that have been deliberately cut. This includes many examples from the shipwreck cargos, which were still in transit. This indicates that it was common for only part of an ingot to be sold or used, with that fragment being weighed out specifically for the person's needs.[20] Although averages of all dimensions and weights can be made from recovered specimens, they can only shed some light on the subject. Corrosion has caused many of the ingots to lose significant weight and girth, which slightly skews our knowledge of them. Since there are only a few ingots known to have been cast in the same molds, there is little more we can say about the standardization other than their shipment and technical procedures of production.[21]

Physical analysis and experimentation have allowed us to obtain a better understanding of the way in which the ingots were cast. When cut, it is possible to see layers within the metal of the ingot. From these layers we know that these ingots were cast in several pourings, with each layer being

[20] The LBA societies of the eastern Mediterranean used differing systems of weights and measures; however the larger units of value were relatively the same in name and weight throughout many of the societies. Weights concurrent with the measurement systems of several LBA cultures were found on the Uluburun wreck, which supports this theory (Pulak 2008: 369-370). For a good introduction to these systems, see Weingarten 2008. For an analysis of the value of the Uluburun wreck and its cargo of copper oxhide ingots, see Monroe 2010.

[21] In a recently presented paper (2012), Pulak describes the likelihood of "mold siblings" (ingots cast from the same mold) among the oxhide ingots. He states that this has been undeterminable as of yet due to sufficient permission and space to analyze them.

allowed to cool slightly before the next layer was poured. It is not currently known whether all ingots were produced in permanent molds or poured into sand molds, but only one fullsize limestone oxhide ingot mold has been found, at the site of Ras Ibn Hani in Syria. Every ingot also possesses what is called a "rough" side and a "smooth" side. The rough side is the side of the ingot that was exposed to air during casting. The texture is a result of a phenomenon called "rising," in which the solidifying metal reacts to oxygen and other elements in the open air while cooling (Bass 1967: 70). Incidentally, the rough side was also the larger side since the metal had more room to spread as it solidified. The smooth side was then the one in direct contact with the ingot mold. The difference in these sides becomes more interesting when one considers the marks on them. Occasionally, marks appear impressed on the smooth side, likely caused by deliberate designs on the molds themselves. Marks on the rough sides are sometimes also impressed – probably while the metal was in its last stages of cooling. All impressed signs have come to be termed "primary" marks, as they were made while the metal was still soft after initial casting.[22] The rough sides also often bore incised marks, made after the metal had cooled and termed "secondary." The differences in the marks on the opposing sides will be discussed further in the analysis section.

[22] This most certainly happened at the production site. It is arguable, however, that marks could have been impressed after being broken, as the ingot had to be heated in order to facilitate the break. This is currently unknown, and to my knowledge, untested.

CHAPTER 2

SITE SUMMARIES

2.1 OVERVIEW

As this is a contextual study, it is essential to provide some information regarding the sites and the contexts in which the ingots were discovered. Without addressing these data, it would be difficult to discern any patterns in their consumption and impossible to truly understand the role that these artifacts played in ancient times. Therefore this section presents the reader with important information regarding the archaeological contexts of the ingots, which will assist in the perception of the larger picture that was the copper oxhide ingot trade. The sites that have yielded ingots will be discussed within subsections according to geographical regions, with additional subsections for "outliers" and shipwrecks. When possible, summaries and tables are derived from original site reports or first-hand accounts. Many ingots, however, have little or no exact contextual information and are summarized using the main catalogues and edited sources listed above.

2.2 CORSICA

Only one copper oxhide ingot has been discovered here, by accident in 1987 during agricultural work in Borgo (Lo Schiavo 2009a:411). The lack of exact provenience and excavation records unfortunately means that the ingot is only datable by comparison to other ingots (Figure 5).

Table 1: Corsica Context

Site	Object	Date	Context	Associated Finds	Marks	References
Sant' Anastasia	Type 1 ingot	LBA	Reportedly found in the sea.	0	2 impressed/incised marks, concavity	Lo Schiavo 2009b:411-412

2.3 SARDINIA

While far removed from the hub of the Late Bronze Age copper trade of the Eastern Mediterranean, the island of Sardinia is one of the most important regions in regards to the study of copper oxhide ingots. The Nuragic culture thrived on Sardinia between the 17th and 10th centuries BCE and was deeply involved with its contemporaries in the eastern Mediterranean.[23] Their involvement in eastern Mediterranean trade was important and evident by the large presence of imported goods and imitations of foreign items found on the island.[24] As Sardinia is rich in copper and other metal ores, this seems to be the most likely cause for the development of such relations between these two areas that are so far apart.[25] The people of the Nuragic culture built settlements and monuments across all of Sardinia, including their signature tower complexes called Nuraghe. These complexes had various formations and usually underwent periods of reconstruction and change over time. They served several different functions which included protection of the settlements and religious activities, but were also heavily involved in metallurgy (Balmouth & Tylecote 1967:195-196). Fragments have been found in at least thirty-one instances from sites all over the island (Figure 6). Most of the fragments were found dispersed on topsoil, recovered from metal hoards, or sadly have no exact provenance. All, however, were found within or nearby to Nuragic remains. The contextual information of each find is summarized in the table below.[26]

[23] Local Italian archaeology has denoted a different chronology for this area than the Eastern Mediterranean. All of the oxhide ingots are believed to have come from the Recent and Final Bronze Ages, which equate to the Late Bronze Age and early Iron Age (Lo Schiavo 2009: 225-226).
[24] The majority of this foreign presence represents an Aegean or Cypriot influence.
[25] An increase in metal artifacts is noticeable during the rise of the Nuragic culture on Sardinia. These events coincide with an increase in Aegean and other eastern Mediterranean items. Scientific analyses have not been able to determine if the Sardinian ingots were composed of native or foreign copper, however even native copper production could have been influenced or utilized by eastern copper producers. It is also possible that eastern oxhide ingots could have been imported for other reasons, such as currency from foreign visitors (Begemann et al 2001:44, 57-59). For discussion on the copper and bronze metallurgy of Late Bronze Age Sardinia, please refer to Balmouth & Tylecote 1976.
[26] For more detailed summaries and bibliographies for each site, please refer to Lo Schiavo et al. 2009, from where the table has been derived.

Table 2: Sardinian Contexts

Site	Object	Date	Context	Associated Finds	Marks	Other Notes	References
Alghero	Fragment	c.1100	Surface find by Nuraghe.	Bun ingot fragments.	0		Lo Schiavo 2009a: 268-269; Lo Schiavo 1989:36; Lo Schiavo 1998:100
Arzachena	6 Fragments	c.1200 -1150	Hoard in covered bowl under terrace wall floor.	Votive sword fragments, chisel, copper droplets.	0		Lo Schiavo 2009a: 229-233; Lo Schiavo 1990: 19; Begemann et al 2001: 45-46
Abini/Teti	15 Fragments	c.1150 -1100	Unknown - near Nuragic sanctuary.	Bronze artifacts.	Impressed mark	Part of 3 bronze deposits given to Cagliari Museum.	Lo Schiavo 2009a: 308-309; Lo Schiavo 1989: 34; Lo Schiavo 1982: 271
Assemini	Fragments	c.1400 -1100	Unknown	n/a	0	Ingots not preserved.	Lo Schiavo 2009a: 381; Lo Schiavo 1989: 35
Belvi'	Fragment	c.1400 -1100	Unknown	n/a	0		Lo Schiavo 2009a: 321; Lo Schiavo 1989: 35
Capoterra	Fragment	c.1400 -1100	Unknown	Given to Cagliari Museum with other metallic fragments.	Impressed mark		Lo Schiavo 2009a: 382; Lo Schiavo 1989: 35
Fonni	6 Fragments	c.1400 -1100	Between megaron temple & "Round Temple" in nuragic sanctuary.	Fragments of votive swords, dagger, bronze figurine, pins.	0		Lo Schiavo 2009a: 313-315; Lo Schiavo 1998: 100
Dorgali	Fragment	c.1400 -1100	Unknown- near area rich in nuragic remains	n/a	0		Lo Schiavo 2009a: 306-307; Lo Schiavo 1989: 34
Ittereddu	4 Fragments	c.1200 -1150	Probable hoard at foot of right tower of nuraghe.	4 Other ingot fragments.	0	Additional fragments may or may not be oxhide.	Lo Schiavo 2009a: 287-289; Lo Schiavo 1989: 33-34; Begemann et al 2001: 47.
Ittereddu	34 Fragments	c.1200 -1150	Hoard in covered vase in passageway to central tower of nuraghe Funtana.	Copper bun ingot fragments, votive sword fragments.	0	Building used as sanctuary. Metallurgical activity indicated nearby.	Lo Schiavo 2009a: 290-292; Lo Schiavo 1989: 33-34; Begemann et al 2001: 47
Lanusei	1-2 Fragments	c.1400 -1100	Found in area of nuragic village now destroyed.	Mini bronze shield, Nuragic sherds.	0		Lo Schiavo 2009a: 338-339; Lo Schiavo 1982: 272
Nuoro Province	4 ingot Fragments	c.1400 -1100	Near Mt. Gruttas.	n/a	0	Possibly from votive deposit or bronze workshop.	Lo Schiavo 2009a: 304-305; Lo Schiavo 1989: 34
Olbia	25 Fragments	c.1400 -1100	Within carinate cup next to nuragic wall.	n/a	0		Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
Olbia	Fragment	c.1400 -1100	Near a Nuragic sacred temple.	Other copper pieces.	0	Currently untraceable.	Lo Schiavo 2009a: 240-242;
Ortueri	2 Fragments	c.1400 -1100	Unknown	Axe (of earlier production).	0		Lo Schiavo 2009a:318-320; Lo Schiavo 1989:34; Stos-Gale and Gale 1992:333
Oschiri	23 Fragments	c.1400 -1100	Probably hoard near nuraghe S. Giorgio.	n/a	0		Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
Ozieri	Type 2 ingot	c.1400 -1100	Unknown, near S. Antioco di Bisarcio.	Reports of second intact ingot.	Impressed		Lo Schiavo 2009a: 270-281; Lo Schiavo 1989: 33; Bass 1967: 61
Ozieri	Fragment	c.1400 -1100	Hoard	3 Other metal objects.	0	S. Luca	Jones 2007: Appendix II

Ossi	2 Fragments	c.1150 -1000	Surface (excavations revealed nuragic village).	n/a	0		Lo Schiavo 2009a: 246-248; Lo Schiavo 1989: 35-36; Tylecote, Balmuth, & Massoli-Novelli 1984: 141
Pattada	7 Fragments	c.1100 -1000	Hoard in nuragic village, by fountain & nuraghe.	Axes, chisels, blades, awl, impasto potsherds.	0	Sedda Ottinnera	Lo Schiavo 2009a: 296-303; Lo Schiavo 1998:100-104; Begemann et al 2001:48.
Santoni	Fragments	c.1400 -1100	Surface find.	n/a	0		Jones 2007: Appendix II
Sàrdara	15 Fragments	c.1000 -800	Hoard in bowl under floor of hut entrance.	Large amounts of copper ingot fragments.	2 Incised marks		Lo Schiavo 2009a:362-366; Vagnetti & Lo Schiavo 1989: 226
Nuragus	5 Type 2 ingots	c.1400 -1300	Surface, near nuraghe Serra Ilixi.	n/a	7 Marks on 3 ingots	Figure 6	Lo Schiavo 2009a: 345-348; Bass 1967: 61; Lo Schiavo 1989: 35; Buchholz 1959: 38-39
Soleminis	4 Fragments	c.1400 -1100	Surface find.	n/a	0		Lo Schiavo 2009a: 379-380; Vagnetti & Lo Schiavo 1989: 226
Sorgano	17 Fragments	c.1400 -1100	Unknown	n/a	0		Jones 2007: Appendix II; Buchholz 1959: 39
Tertenia	2 Fragments	c.1200 -1150	2nd Level of "east tower b" of nuraghe.	Fragment of bronze figurine, potsherds.	0	Nuraghe Nastasi	Lo Schiavo 2009a: 349; Lo Schiavo 1989: 34
Triei	Fragment	c.1400 -1100	Hoard within bowl below floor of hut.	Metal weapon, metal fragments.	0	Probable building/foundation deposit.	Lo Schiavo 2009a: 325-327; Lo Schiavo 1989: 34
Villagrande Strisaili	12 -13 Fragments	c.1400 -1100	Possibly near lintel of Corti Acca nuraghe.	n/a	0	Several are handle fragments.	Lo Schiavo 2009a:329-331; Lo Schiavo 1989: 34
Villagrande Strisaili	15 Fragments	c.1400 -1100	2 Hoards within same room housing "Temple Repository."	Bun ingot fragments, bronze artifacts.	0	Individual fragments unpublished.	Lo Schiavo 2009a: 336-337; Lo Schiavo 1989: 34
Villagrande Strisaili	2 Fragments	c.1400 -1100	Outside temples/huts of nuragic complex.	Copper fragments, bronze artifacts.	0	Some objects show Cypriot and eastern influences.	Lo Schiavo 2009a: 332-333
Villanova-forru	10 Fragments	c.1200 -1000	Clay container, 30cm beneath surface.	Smelting debris, metal & sword fragments.	0		Lo Schiavo 2009a:360-378; Lo Schiavo 1989:35; Stos-Gale & Gale 1992:330
Baradili	14 Fragments	c.1400 -1100	Hoard in ceramic container.	About 180 fragments of raw copper.	0	Found during roadworks.	Lo Schiavo 2009a: 354-356
Ghiramonte (Siniscola)	2 Fragments	c.1400 -1100	Removed earth from construction.	3 Other ingot fragments.	0	1 of the other fragments may be oxhide.	Lo Schiavo 2009a: 302-303
Give Molas (Villasor)	9 Fragments	c.1400 -1100	Surface	19 Votive sword fragments	0		Lo Schiavo 2009a: 367-368
Nieddiu (Nurallao)	Fragment	c.1400 -1100	Unknown-area rich in Nuragic remains.	n/a	0		Lo Schiavo 2009a:342-344
Talana	Fragment	c.1400 -1100	Unknown - near to nuraghe.	n/a	0		Lo Schiavo 2009a: 323-324
Seulo	Fragment	c.1400 -1100	Unknown	n/a	0		Lo Schiavo 2009a: 340-341
Monastir	Fragments	c.1400 -1100	Surface of structures 34S/ 25 of nuragic settlement.	n/a	0	No ingot catalogue information.	Lo Schiavo 2009a: 377-378

2.4 SICILY

There are currently three sites on the island of Sicily where copper oxhide ingot fragments have definitely been discovered – Cannatello, Thapsos, and Lipari. There is a fragment supposedly found in the area of Modi/Leondari, on which little information is available (Jones 2007: Appendix II). While located in different areas of the island, all three have several things in common. For example, all three sites are located at coastal centers that were likely important trading ports. While these sites were excavated before modern archaeological methods were established, the little archaeological data remaining indicate the validity of this theory because of the presence of eastern cultural material at all of them. Remaining data also informs us that all three sites contain traces of metallurgical activity such as nearby workshops (Lo Schiavo, Procelli, Giumlia-Mair 2009: 135).

Table 3: Sicilian Contexts

Site	Object	Date	Context	Associated Finds	Marks	Reference
Cannetello	Fragment	LBA	LBA Residential area.	n/a	0	Buchholz 1959:37; Bass 1967:61; Lo Schiavo et al 2007: 135-139
Thapsos	Fragment	LBA	Building (later phase of settlement).	n/a	0	Vagnetti 1999; Lo Schiavo et al 2007: 139-144
Lipari	Type 1 fragments	LBA	Lipari Hoard, beneath floor of hut.	Casting debris, mold fragments, ceramic container.	0	Lo Schiavo et al 2007:147-215; Jones 2007: Appendix II
Modi/Leondari	Fragment	Unknown	n/a	n/a	0	Jones 2007: Appendix II

2.5 CRETE

The earliest datable finds of copper oxhide ingots come to us from the island of Crete, even though there are very few copper ores known to us today on Crete (Hakulin 2004:1). Complete and fragmentary oxhide ingots have been discovered within various contexts at twelve important archaeological sites on the island. As of recent publications, there have been thirty intact copper oxhide ingots and thirty-nine fragments identified as copper oxhide ingots found on Crete. Excluding shipwrecks, this is the largest volume of oxhide ingot remains found in one geographical region. Many of these artifacts have not yet been sourced to any specific ore location, but as there are no significant sources of copper on the island it can be postulated that Crete was importing large amounts of this raw material in order to produce its masterful works of art and the tools that were necessary to build its palatial civilization (Hakulin 2004: 1).

While many ingots from other areas do not occur earlier than 1400 BCE, several examples on Crete date to as early as the Late Minoan IA period (c. 1600-1550 BCE). The earliest ingots are in the form of Buchholz-Bass Type 1, but many others also represent Type 2 and Type 3 ingots (Figure 7). Due to incomplete or lost excavation information, some ingots known to have come from Crete are not completely identifiable with a particular site; however, the majority of them have provenance information. These find spots include both palatial and provincial communities, and possibly give support to a redistributive economy throughout the island. The majority of fragmentary and whole oxhide ingots were discovered in areas indicated by other remains to have been metallurgical workshops.

Table 4: Cretan Contexts

Site	Object	Date	Context	Associated Finds	Other Notes	Marks	References
Gournia	4 Fragments	c. 1500-1450	Units Ea & Fg, house Cg. Possible workshop.	Metal fragments; tool molds; metallurgy tools; slag; stone crucible?	Highly industrial area.	0	Betancourt et al. 1978:7-8; Hakulin 2004:39; Gale & Stos-Gale 1999: 273; Muhly 1979: 91
Hagia Triadha	19 Type 1 ingots	c. 1600-1550	Palace storeroom.	n/a	Unmatchable chemical composition.	8 Ingots bear marks.	Buchholz 1959:32-34; Evely 2000:343, 345; Rutter 1999:151, n.18; Stos-Gale and Gale 1990:79-80
Hagia Triadha	½ Type 2 ingot	c. 1600-1550	Palace storeroom.	n/a	Possibly later date.	0	Buchholz 1959:32-34; Evely 2000:343, 345; Rutter 1999:151; Stos-Gale and Gale 1990:79-80
Hagia Triadha	¼ Type 2 ingot	c. 1600-1550	Palace storeroom.	n/a	Possibly later date.	0	Buchholz 1959:32-34; Evely 2000:343, 345; Rutter 1999:151; Stos-Gale and Gale 1990:79-80
Khania	3 Fragments	c.1500-1200	n/a	n/a		0	Gale 1991:202; Jones 2007:Appendix II
Knossos	1 Fragment	c. 1600-1400	"Long Corridor of the magazines," storeroom.	n/a	Possible metallurgy workshop nearby.	0	Buchholz 1959:31; Gale 1991:202; Mangou & Ioanou 2000:208
Kommos	6 Type 2 & 3 fragments	1350-1250	Building N (administrative?); residential areas.	Metallurgical tools and debris.	Sourced to Cyprus.	0	Rutter 1999:140-141; Muhly 1988: 471-472, Pl.A
Mochlos	Intact ingot	c.1500-1450	Buildings A & B, workshop/"ceremonial center."	Bronze objects.		0	Soles & Davaras 1994:414-419, Soles et al 2004:46-47, Fig. 19; Soles & Davaras 1996:175-230
Mochlos	Half ingot, fragments (15 kg)	c. 1500-1450	Hoard/throughout House C.	Bronze objects, metallurgical debris, tools.	Sourced to Cyprus.	Incised	Soles & Davaras 1994:414-419, Soles et al 2004:46-47, Fig. 19; Soles & Davaras 1996:175-230; Whitley 2005:102-103
Palaikastro or Mochlos	2 Ingots	c.1500-1100	n/a	n/a	Heavy metal & craft production.	0	Buchholz 1959:31; Tylecote 1981; Hakulin 2004:45
Poros-Katsambas	Type 1ingot	c.1325-1100	n/a	Crucible fragments.	Industrial activities indicated.	0	Hakulin 2004:42; Dimopolou 1997:433-438
Sitras	Fragment	c.1500-1100	n/a	n/a	No exact information.	0	Buchholz 1959:31; Jones 2007: Appendix II
Syme	Fragment	c.1500-1100	Sanctuary	n/a	Possibly axe fragment.		Mangou & Ioannou 2000:208-210; Muhly et al. 1988:2-20; Gale 1991:202
Tylissos	3 Ingots	c. 1600-1400	Room Pi	n/a		1 Impressed	Buchhol 1959:32; Hazzidakis 1921:57, Fig. 31; Gale 1991: 202-204, Pl. 2b-c
Zakros	6 Ingots	c. 1600-1500	Palace storeroom.	Bronze objects, molds, crucibles.	Several industrial activities present.	0	Bass 1967:61; Buchholz 1959:31; Hakulin 2004:41; Platon 1971
Zakros	Fragment	c.1500-1400	Palace	n/a		0	Bass 1967:61; Buchholz 1959:31; Hakulin 2004:41

2.6 LEVANT

Three terrestrial sites along or near the Levantine coast have evidence of participation with the copper oxhide ingot trade.[27] Tell Ras-Shamra and Ras Ibn Hani were both a part of the massive city-kingdom of Ugarit in Syria during the LBA. Several fragments are said to have come from Tell Ras-Shamra, the capital city of Ugarit and well-known as an important commercial center. The only known mould for copper oxhide ingots was found at one of Ugarit's harbors, the smaller site of Ras Ibn Hani along the Syrian coast. Further south, in the modern area of West Bank, lies the site of Tell Beit Mirsim. Half of a small Type 1 oxhide ingot was found here.

Table 5: Levantine Contexts

Site	Object	Date	Context	Associated Finds	Marks	References
Tell Ras-Shamra Ugarit, Syria	2-3 Fragments	LBA	n/a	n/a	0	Bass 1967: 57; Jones 2007: Appendix II
Tell Beit Mirsim, West Bank	1/2 Mini oxhide ingot	1600-1550BC	SE 32 D-2	Metallurgical materials	0	Albright 1938: 54, Pl. 42; Bass 1967: 57; Knapp 1986: 26

2.7 CYPRUS

While relatively few of the ingots have been found on Cyprus, it has often been believed since early publications that the source of the majority of the copper oxhide ingots is located on this island (Catling 1964: 266-277). Many scholars support this supposition with scientific and epigraphic evidence, insisting that Cyprus is the site of ancient Alashiya from LBA textual sources (Knapp 1996: 3-10). Many of the isotopic analyses performed on the ingots yield results falling within the range of Cypriot copper ores – of which there was an abundance of during the LBA. Results often point to an area known as the "Solea Axis" in the north west of the island, with credit usually going to the area of the Apliki mine (Gale 1999:116).

[27] Ras Ibn Hani is not represented in this table because there were no remains of ingots themselves.

Table 6: Cypriot Contexts

Site	Object	Date	Context	Associated Finds	Other Notes	Marks	References
Alassa-Pano Mandilaris	Mini ingot	c. 1275-1200		n/a		0	Hadjisavvas 1986: 62-67; Hadjisavvas 1989: 38-39
Bay of Soli	Ingot	LBA	Recovered from sea.	n/a		0	Bass 1967: 61; Jones 2007: Appendix II
Unknown Provenience	Mini ingot	LBA	Unknown	n/a		0	Jones 2009: Appendix II; Catling 1964: 269; Knapp 1986: 26
Maroni-Vournes	4-7 Fragments	c.1300-1200	Beneath floor of/around large Ashlar Building.	Slag, bronze artifacts, casting debris furnace conglomerates?	Evidence of metal & olive oil production.	0	Kassianidou 2009:46; Cadogan et al 2001:77-78;Cadogan 1984:1-10
Maroni-Tsaroukkas	Fragment	c. 1275-1200	Building 1 - ZW/15, 2.3	Spindle whirls, small pieces of slag, some bronze artifacts.	Metallurgical/ industrially active anchorage.	0	Manning 1998: 42. 45; Manning & De Mita: 1997: 126-128; Kassianidou 2009: 47-48
Kalavasos-Ayias Dhimitrios	Fragments	c.1300-1200	Room A50 of large ashlar masonry building.	Smelting slag, furnace, tuyeres, crucible fragments.	Evidence of minor metallurgical activity.	0	South et al. 1989:123; South 1983:104, fig. 11
Pyla Kokkinokremos	5 Fragments	c. 1275-1200	Bronze hoard in pit in external courtyard of Complex B.	Armour scale, unfinished weight, small figurine, cymbals, scrap metal.	Possible founder's hoard near workshop. Site has short occupation.	0	Muhly & Maddin 1988: 472; Karageorghis & Demas 1984:12, 55-57, 63
Maa-Palaeokastro	1 to 3 Fragments	c. 1275-1200	Area 1, Rooms 1 & 2	Pot bellows, tuyere, copper slage, piece of copper ore.	Small scale metallurgical activity at site.	0	Muhly & Maddin 1988: 471-472, Pl. A; Zwicker 1988: 429
Mathiatis	27 Fragments	c. 1200	Bronze hoard in circular depression.	Large number of bronze artifacts.	Accidental find. Contents currently held in several museums.	0	Bruce 1937: 639-671, Fig. 14; Catling 1964:283; Muhly et al. 1980: 84-95; Knapp 1986:26
Skouriotissa	7 Fragments	LBA	Unknown	n/a	Possibly part of Mathiatis hoard.	0	Gale 1991:201; Stos-Gale et al. 1997:107; Jones 2007: Appendix II
Enkomi	Complete ingot, fragments	c. 1200	"Foundry Hoard"	Bronze objects; tools, weapons, scrap metal.	Possible production site.	1 Impressed	Murray et al. 1900:16-17; Catling 1964:278-271
Enkomi	2 Complete ingots	c. 1200	Unknown	n/a	From antiquities market.	0	Kassianidou: 2009:45
Enkomi	5 Mini ingots	c. 1200	NW part of city, Quartier 6W	Crucible fragments, charcoal, stone tools, ore pieces.	Possible workshop area.	Inscriptions	Schaeffer 1952: 28; Kassianidou 2009:45
Enkomi	Half ingot	c. 1200	NW part of city, Quartier 6W	n/a	Currently lost.	1 Impressed	Lagarce 1971:297
Enkomi	Fragments	c. 1400	Quartier 5W	Metallurgical items.	Workshop	0	Catling 1964:268; Lagarce & Lagarce 1986:66
Enkomi	Fragments	c.1200	Well 212, Quartier 5E	Weapons, tools, scrap metal, bronze artifact.	Hoard	0	Lagarce 1971:405, 415-417
Enkomi	Fragments	c.1300	Quartier 5E	n/a		0	Courtois 1984; Kassianidou 2009: 46; Jones 2007: Appendix II
Enkomi	Fragments	c. 1300-1200	Well 343, Quartier 3W	n/a		0	Courtois 1984:22; Kassianidou 2009: 46; Jones 2007: Appendix II
Enkomi	Fragments	c. 1300-1200	Point Topographic 783, Quartier 3W	Bronze objects and slag.		0	Courtois 1982:166-167; Courtois 1984:37; Kassianidou 2009:46
Enkomi	Fragment	c. 1300-1200	Point Topographic 1458, Quartier 3w	Bronze hoard.		0	Courtois 1984:40; Kassianidou 2009: 46; Jones 2007: Appendix II

2.8 GREECE

Copper oxhide ingots have been excavated from several sites throughout Greece and its islands. Unfortunately, there is often a lack of specific contextual information regarding these finds. Little information regarding context is available for the fragments from Aegina, Emporio on Chios, Salamis, Thebes, or the ingot supposedly found at Athens (Buchholz 1959: 36; Jones 2007: Appendix II). It is also unknown where the ingot currently residing in the Nauplion Museum is from, although Catling believes it could have come from the Mycenae hoards (Catling 1964:260).[28] All of these sites, however, were active in trade during the LBA and all of the ingot remains from them date to that era.

Table 7: Greek Contexts

Site	Object	Date	Context	Associated Finds	Other Notes	Marks	References
Aegina	Fragment	LBA	Unknown	n/a		0	Buchholz 1959: 36; Jones 2007: Appendix II
Athens	Possible ingot fragment	LBA	Unknown	n/a	Buchholz questions existence,	0	Buchholz 1959: 36; Jones 2007: Appendix II
Ayia Irini	2 Fragments, 1/2 ingot	LHII	Unknown	Metallurgical debris		0	Mangou & Ioannou 2000: 208, 213; Wiener 1990: 146; Gale 1991:226
Emporio	Fragment	LH III C	Unknown	n/a		0	Gale 1991: 226; Jones 2007: Appendix II
Mycenae	Complete Type 2 ingot	LH	n/a	n/a	Excavated by Tsountas.	Impressed	Buchholz 1959: 36; Iakovides 1974: 297; Wace 1949: 88
Mycenae	12 Fragments	c. 1340-1200	Bronze hoard in prehistoric cemetery.	Bronze bun ingot, scrap metal.	"Poros Wall Hoard"	0	Mangou & Ioannou 2000: 210-211, 215; Stubbings 1979: 296; Wace 1953: 6-7, Pl. 2a
Mycenae	Fragment	LH IIB-C	Small bronze hoard	Bronze artifacts		0	Bass 1967: 61; Mylonas 1962: 496-408, Pl. 121
Nauplion Museum	Oxhide ingot handle fragment	LBA	Unknown	n/a		0	Gale 1991: 226; Jones 2007: Appendix II; Catling 1964:269
Salamis	Fragments	c.1200	Unknown	n/a		0	Jones 2007: Appendix II
Thebes	3 Fragments	LBA	Unknown	n/a		0	Mangou & Ioannou 2000: 208; Jones 2007: Appendix II
Tiryns	Fragment	LBA	Unknown	2 Slab ingots (1 copper, 1 bronze)		0	Mangou & Ioannou 2000: 207-208, 210, 215-216; Jones 2007: Appendix II

[28] Wace (1953: 296) describes a fragment from the Poros Wall Hoard with incomplete "punch" marks on both sides.

2.9 ANATOLIA (TURKEY)

Turkey was once home to the Hittite Empire of the Late Bronze Age, as well as several other cultures. The area known as Anatolia has a long history of active participation in international trade, which can be seen by imported items and early trading centers (Şahoğlu 2005). The Hittites expanded the Anatolian sphere in the LBA by acquiring important trading centers such as Ugarit as vassal states, and imported items from nearly all major contemporary eastern Mediterranean powers are present in many of the cities (Cline 1991: 2-3).[29] Complete and fragmentary copper oxhide ingots have been found at several sites in and around Turkey (Figure 9*)*. Most of them were recovered from shipwrecks from the coast of Turkey and are detailed in that section. The land finds are summarized below:

Table 8: Anatolian Contexts

Site	Object	Date	Type of deposit	Associated Finds	Other Notes	Marks	References
Boğazköy	Ingot handle	c.1400 -1200	Unknown	n/a	Hittite capital	0	Buchholz 1959:30; Buchholz 1988:194
Göksu Creek (SE Turkey)	2.5 Type 2 ingots	c.1300	Discovered during dredging	n/a	Figure 9	Impressed	Belli 2004:31-32; Jones 2007: Appendix II
Sarköy	Ingot corner with handle	c.1200 -1000	Metal hoard	objects in Mycenaean styles	Evidence of purposeful cutting.	0	Jablonka & Rose 2004: 92;Gale & Stos-Gale 1999:272; Stos-Gale et al 1997: 112
Tarus	Miniature oxhide ingot	LBA	Unknown	n/a	Held in Ashmolean Museum	0	Catling 1964:269, n.3; Knapp 1986:26
Metropolitan Museum (NY)	Type 1 ingot	LBA	Possibly from Side	n/a	n/a	0	Buchholz 1959: 30; Karageorghis et al. 2000:12, n.13

2.10 SHIPWRECKS

Cargoes recovered from ancient shipwrecks provide some of the most important information regarding Late Bronze Age interregional trade. They are summarized here, instead of in the sections for their respective regions because they represent goods in transit. While we can offer educated

[29] There is a notable lack of Mycenaean artifacts in central Anatolian sites. Refer to Cline 1991 for overview.

theories regarding these cargoes, we cannot know for sure where they originated or to where they were destined. Ironically, they have given us more data than many land finds. Not only do they tell us a great deal regarding what was being traded, but they can also help us recreate the routes that ancient sailors and tradesmen used.

In regards to the sea-based trade of copper oxhide ingots, most of our sites have come from the southern coast of Turkey, the coast of Greece, and the Carmel coast of the Levant. Two wrecks have been found off the coast of Israel, but the largest finds of copper oxhide ingots come from two underwater excavations of shipwrecks off the coast of Turkey – Uluburun and Cape Gelidonya (Figures 2, 11). These shipwrecks date to different parts of the LBA and are crucial sources of information regarding intercultural trade during that time. They provide evidence for the common items of trade, the sea-oriented trade routes, and contain a greater number of marked copper oxhide ingots than any land discovery.

Table 9: Shipwreck Contexts[30]

Site	Object	Date	Associated Finds	Marks	References
Ha Hotrim, Israeli Coast	Fragments	c. 1200	Section of lead ingots.	0	Wachsmann & Raveh 1984:169-176; Gale 1999:111
Kefar Samir, Israeli Coast	1 Complete ingot	c.1400-1200	5 Tin ingots; nearby finds of tin bar & ovoid ingots, bun ingots, & lead ingots.	Impressed	Galili et al 1986:25, 32-34; Kassianidou 2003: 109-120; Misch-Brandle et al 1985:7-11
Cape Gelidonya, Anatolian Coast	34 Ingots, 5 half ingots, 12 ingot corners	c. 1200	9 Almost complete bun ingots & fragments, 19 slab ingots.	At least 38 marks.	Bass 1967:52-83
Side, Anatolian Coast	2 Ingots	c.1500-1400	n/a	0	Pulak 1997:235; Gale 1991: 201
Uluburun, Anatolian Coast	354 Complete 2 & 4 handled oxhide ingots, ingot fragments	c.1350-1300	121 Complete bun ingots, approx 1 ton of tin ingots/fragments.	At least 160 ingots are incised.	Bass 1991:69-82; Sibella 1996:9-11; Pulak 2008:289-371
Kyme, Grecian Coast (Euboea)	19 Type 1 oxhide ingots	c.1600-1400	Weights	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61

[30] Jones (2007) notes 3 ingots from Side and one from Turkey in the Metropolitan Museum. Cross-referencing this catalogue with Bass (1967:61) and Buchholz (1959:30) indicates that the Metropolitan Museum ingot is one of the three ingots from Side. All data and interpretations in this paper shall reflect this.

2.11 EGYPT & MESOPOTAMIA

While there are several representations of oxhide ingots in Mesopotamian art (see above), there is only one actual copper oxhide ingot found from that region. The ingot was found in a storage area of Dur-Kurigalzu in Iraq, but is currently misplaced. The examples from Egypt include a fragment from a workshop in the Delta site of Qantir, and four miniature ingots from separate foundation deposits underneath floor levels of two temples in Thebes.

Table 10: Egyptian & Mesopotamian Contexts

Site	Object	Date	Context	Associated Finds	Marks	References
Qantir, Egypt	Fragment	13th c. BC	Level B-3, industrial area.	Metallurgical tools/debris.	0	Gale & Stos-Gale 1999: 272; Pasch 1995: 123
Thebes, Egypt	4 Miniature ingots	13th-12th c. BC	4 Separate foundation deposits.	Bronze and votive objects.	Hieroglyph inscriptions	Bass 1967: 62; O'Conner 1967: 172-174
Dur-Kurigalzu, Iraq	1 Ingot	12th c. BC	Possible storeroom/ treasury.	Clay figurines, metal objects, 6 inscribed tablets.	0	Brinkman 1987:35; Gale 1991: 200; Baqir 1946:88-91

2.12 OUTLIERS

While the great majority of copper oxhide ingots have been found on Mediterranean islands or within a reasonable distance of the coast of the eastern Mediterranean Sea, there are several outliers to note. Most of these outliers constitute isolated finds of ingots or ingot fragments both east and west of the central radius (i.e., eastern Mediterranean and Aegean areas) of the majority of ingot finds. The biggest outliers are the ingot fragments found in France, Croatia, Bulgaria (Figure 10), and Germany. In regards to the geographical distance from what can be considered the center of the oxhide ingot trade (ie, the Eastern Mediterranean), the ingots found in Corsica, Sardinia, and Sicily could also be considered outliers. The multiple examples found in these regions, however, indicate that – while they may have been on the tail-end of the trade network- they were still active participants and therefore constituted their own section.

Table 11: Outlier Contexts

Site	Object	Date	Context	Associated Finds	Marks	References
Oberwilflingen, Germany	4 Fragments	14th-13th c. BC	Scrap metal hoard.	Scrap metal, bun ingot fragments, tools.	0	Primas & Pernicka 1998:25-65; Primas 2005: 389
Sète Hérault, France	2 Ingots	LBA	Recovered from sea.	n/a	0	Domergue & Rico 2002: 141-152; Lo Schiavo 2007b: 421-425
Makarska, Croatia	Small Type 3 ingot	LBA	n/a	n/a	0	Buchholz 1959: 37; Catling 1964: 269, n.3; Bass 1967:61; Forenbaher 1995: 272
Tcherkovo (Cerkovo), Bulgaria	1 Ingot	LBA	n/a	Stone anchors, weights.	1 Incised	Leshtakov 2005: 449, PL. CIX; Kolb 2004; Dimitrov 1979:70-79; Stos-Gale et al. 1997:112
Cernozem, Bulgaria	1 Ingot	LBA	n/a	n/a	2 Incised	Buchholz 2005:152; Jones 2007: Appendix II; Leshtakov 2005: 449, PL. CIX
Cape Kalliakra, Bulgaria	Small ingot, 50% Copper	LBA	Off coast	Stone anchors	0	Leshtakov 2005: 449, PL. CIX; Lichardus et al. 2002: 165; Hiller 1991:209-210; Kolb 2004: 577-614
Yabalkovo, Bulgaria	Miniature ingot	LBA	n/a	n/a	4 "X" marks on corners	Leshtakov 2005: 450, PL. CIX
Kameno/Pobit-kamak, Bulgaria	2 Ingots	LBA	n/a	n/a	1 Incised mark	Leshtakov 2005: 449, PL. CIX
Metropolitan Museum (NY), Anatolia (?)	Ingot handle	LBA	n/a	n/a	0	Buchholz 1959: 30; Jones 2007: Appendix II

CHAPTER 3

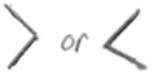
INGOT MARKS

3.1 PREFACE

This section is composed of four tables illustrating the four types of marks found on the copper oxhide ingots: impressed marks, incised marks, side-chisel marks, and concavities. Several marks that are repeated on multiple ingots have slight variations due to preservation, orientation, and different inscribers. While all published ingot marks will be addressed, the variations will not be included, unless the differences are significant.

3.2 IMPRESSED MARKS

Table 12: Impressed Marks

	1	2	3	4	5	6
A						
B						
C						

-Some signs are incomplete. Twice on Sardinia, the remnants of an impressed signed indicate a "Double T" mark by its shape and location on the ingot.

3.3 INCISED MARKS

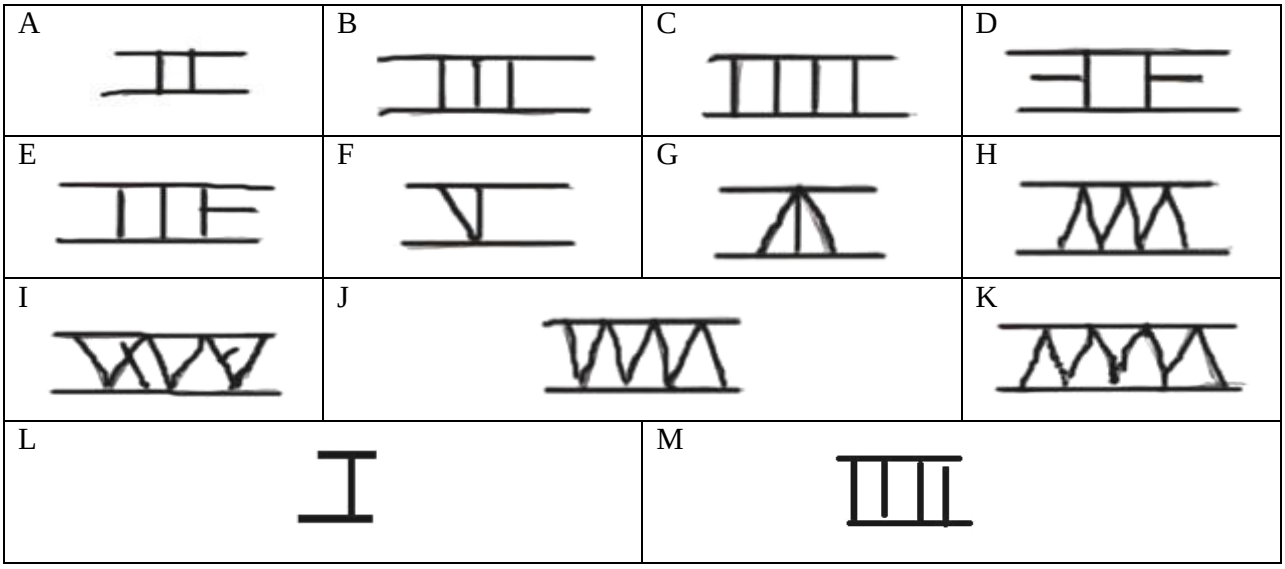
Table 13: Incised Marks

	1	2	3	4	5	6
D						
E						
F						
G						
H						
I						
J						
K						
J						

-Two fragments from Sàrdara on Sardinia show remnants of incised linear marks.

3.4 CHISEL MARKS ALONG SHORT SIDES

Table 14: Chisel Marks



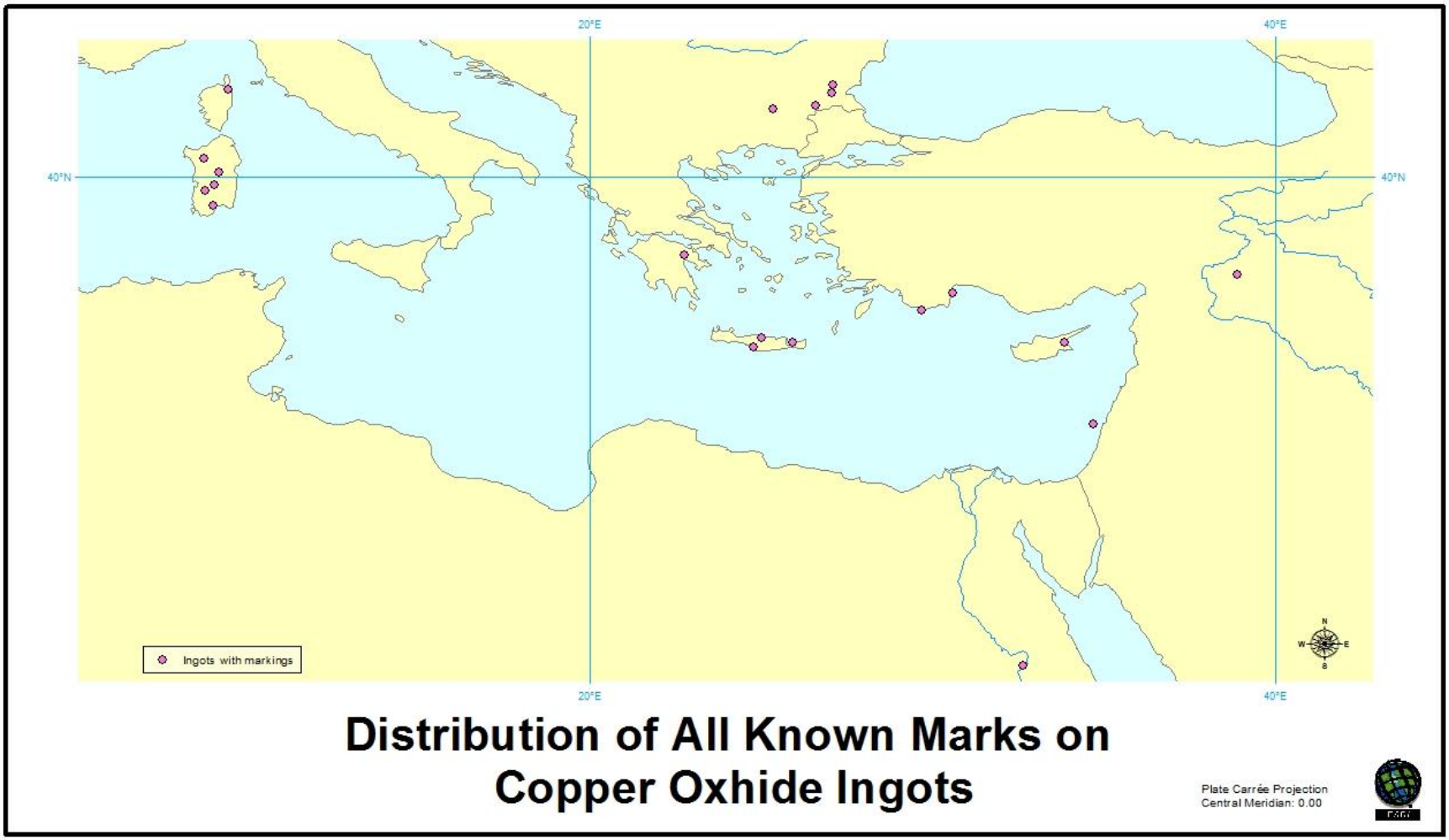
-Chisel marks are found on the sides of ingots from Uluburun, Nuragus in Sardinia, and Sant' Anastasia in Corsica.

3.5 CONCAVITY

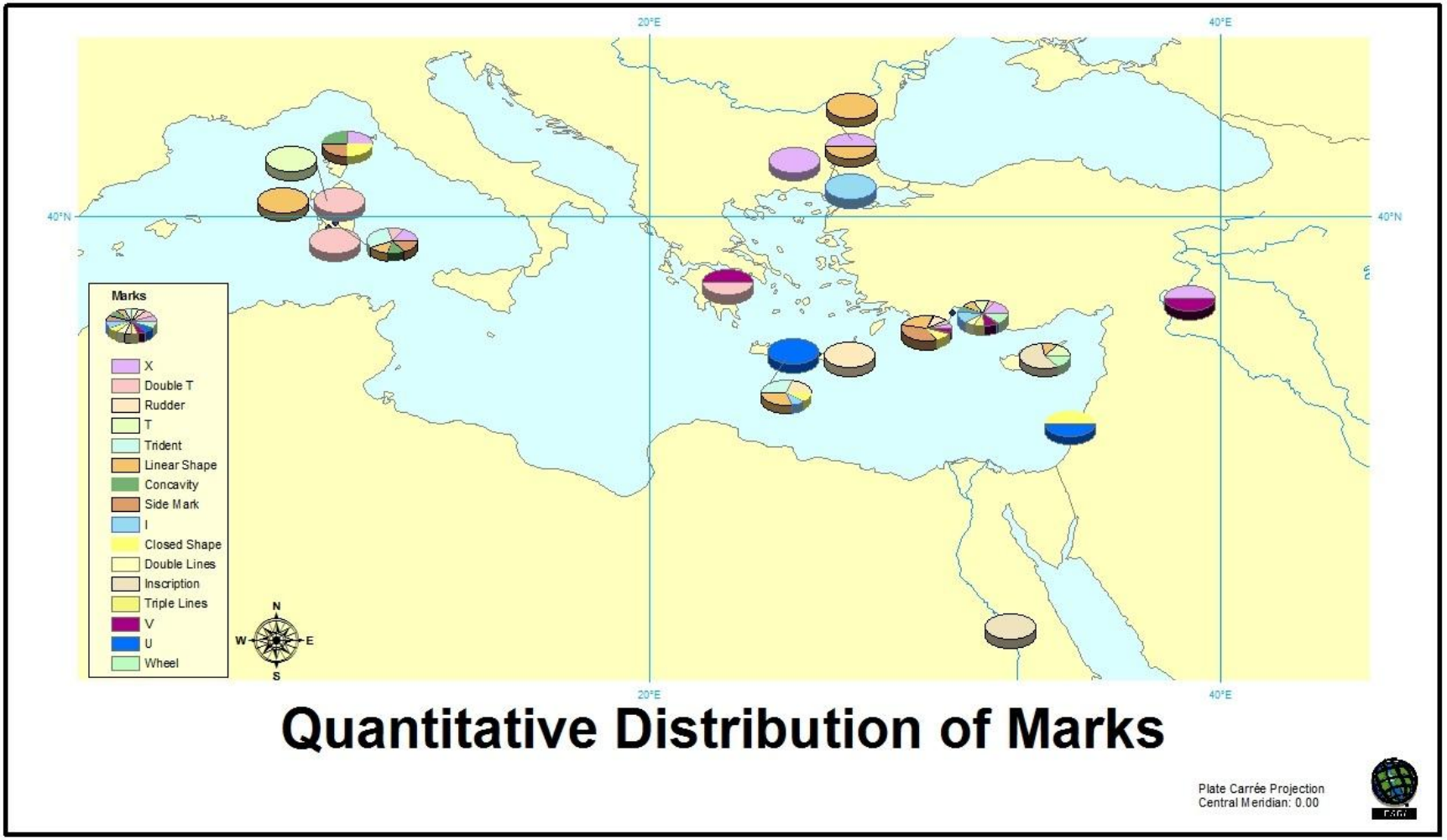
Surface concavities appear on six ingots (described in table below). They vary in size and depth, and their purpose is currently unknown. Four of these ingots have at least one other mark, with a cross or "X" mark appearing more than once.

Table 15: Concavities

Site	Type	Side	Location on Ingot	Associated Signs	References
Nuragus	2c	Smooth	Top center	"X" and double-axe incised on opposite side	Lo Schiavo 2007a: 345-348; Bass 1967: 61; Lo Schiavo 1989: 35; Buchholz 1959: 38-39
Sant' Anastasia	1	Rough	Center	"X" and triangle with line on same side.	Lo Schiavo 2007b:411-412
Cernozem	2	Rough	Center	"I" incised on same side	Buchholz 2005:152; Jones 2007: Appendix II; Leshtakov 2005: 449, PL. CIX
Cape Gelidonya	2b	Smooth	Base of handle	Impressed "Double T" on opposite side, "W" shape and "triple T" inscribed on same side.	Bass 1967:53, In. 1
Cape Gelidonya	2a	Rough	Base of handle	0	Bass 1967:52, In. 13
Cape Gelidonya	2c	Rough	Base of handle	0	Bass 1967:53, In. 15



Map 2: Distribution of All Known Marks on Copper Oxhide Ingots



Map 3: Quantitative Distribution of Marks on Copper Oxhide Ingots

Table 16: Distribution of Most Common Marks on Copper Oxhide Ingots

Site	X	Double T	Rudder	T	Double lines	V	Triple lines	Wheel	Trident	Linear	U	Depression	Side Chisel Marks	I	Closed Shape	Inscription
Ozieri				1												
Teti		1														
Nuragus	1	1							2	1		1	1			
Sardara										2						
Capoterra		1														
Sant' Anastasia	1											1	1		1	
Hagia Triada			2						3	3				1	1	
Mochlos			1													
Tylissos											2					
Enkomi				1				1		1						4
Mycenae		1				1										
Kefar Samir											1				1	
Cernozem														1		
Yabalkovo	4															
Kameno/Pobit kamak										1						
Cerkovo	1									1						
Göksu Creek	1					1										
Cape Gelidonya	7	2		6	3	5	4	5		4	1	3		5		
Uluburun	3	3	7	1	1	3				21			27		8	
Thebes																4

CHAPTER 4

ANALYSIS OF MARKS

4.1 PATTERNS AMONG MARKS

Of the approximately 89 sites known to have yielded copper oxhide ingot remains, only twenty have ingots that bear some form of observable marking.[31] This small percent (22.5%) should not lead to an interpretation that ingot markings were uncommon. The statistic is skewed by the fact that the majority of oxhide ingot remains found are only fragments. Only 30 sites – not including the unprovenienced artifacts in museums – contained half or complete ingots. The remaining 59 sites only contained fragments too small to bear marks. This means that approximately 67% of sites known to have yielded half or complete oxhide ingots also have ingot marks. Altogether, these sites yield at least 421 half or whole oxhide ingots, with at least 245 of these ingots bearing marks (approximately 58%).[32] The following examples may further illustrate that marking ingots was likely a habitual practice, especially in regards to larger shipments. The Cape Gelidonya and Uluburun wrecks provide by far the greatest number of marked ingots (80% and 45% of their respective cargoes).[33] On land, we have a similar example in the Hagia Triada cache, where 8 out of 19 of the complete ingots bore at least one mark (42.1%).

The lack of published specifications for the Uluburn ingots creates some confusion regarding the statistics of their marks. Jones' section (2007:96-109) on the marks includes much of the

[31] This does not include the three ingots with no provenience found in the Nicosia, the Metropolitan, and the Nauplion museums. It does, however, include miniature ingots.
[32] This statistic does not include the marks on Uluburun ingots believed by Jones (2007:104-106) to have been "score" marks to delineate areas of the ingots to be cut. These marks will not be discussed in this work.
[33] The statistic of 45% has been taken from a recent presentation by C. Pulak (Pulak, C. 2012). In Jones 2009, marked ingots constitute 53% (97-98). However, as publications of the Uluburun ingots do not include a complete catalogue, the rest of this work will reflect the published numbers supported by Pulak 2012. In the same section, Jones states that 70% of the Cape Gelidonya ingots bear markings. My percentage is higher because I have included ingots with concavities as "marked," due to the occurrence of such concavities at other sites and their common association with other signs. 32 out of the 39 complete and half ingots of Cape Gelidonya were therefore marked. The 12 ingot corners were not included in this statistic.

previously published material,[34] but also discusses additional marked ingots and marks identified since 1996. No exact information or illustrations of the new marks are included, but this section does provide the first in-depth report of the chisel marks made on the sides of the ingots. As the specifics of these ingots and marks are currently unpublished, my analysis from here on will primarily reflect the well-known numbers of 32 different marks appearing repeatedly on 160 Uluburun ingots. I will, however, include the 11 side-chisel marks discussed by Jones (2007), as he includes a great amount of detail regarding the number and shape of these marks.

I will then be working with the following parameters: at least 264 instances of marks on at least 220 ingots.[35] This corpus consists of 72 different symbols.[36] Of these symbols 17 are impressed marks and 62 are incised marks, with seven symbols appearing as both impressed and incised marks. There are also five instances of a concavity or depression on ingots.[37] The most common marks fall under the descriptions of: X or a cross, a T, a "Double T," a boat's rudder, an I, a V, a U, double intersected lines, triple intersected lines, a wheel, a trident, a concavity, linear marks, closed marks, side-chisel marks, and inscriptions.[38] Inscriptions occur only on miniature ingots from religious contexts at Thebes in Egypt and Enkomi in Cyprus. The four miniature ingots from Thebes are part of temple foundation deposits and are inscribed with the temple deities' names in Egyptian hieratic. The inscriptions from Enkomi are in Cypro-Minoan. The inscriptions on the four miniature ingots from Enkomi likely served a different function than the singular marks. These miniature ingots are

[34] Specifically, Jones references Sibella's 1996 publication.
[35] To clarify, the number of 240 refers to a count of marks, regardless of the symbol and occurrence of other marks on the same ingot.
[36] Number of ingot marks and symbols based upon published information. Conservation and publication on all ingots from Uluburun is ongoing.
[37] Evely (2000:343) lists two ingots with a "hollow" from Hagia Triadha. This could possibly refer to similar concavities.
[38] All mark designations are based on common perceptions of the symbols' similarities to modern references. Marks composed of linear shapes and not appearing at more than 1 location have been designated "Linear Marks." "Closed Marks" refer to symbols with circular or block shapes, or bear a resemblance to other objects. Several seem to be ideograms for such things as sailboats; however the term "ideogram" shall not be used in order to avoid bias. Inscriptions represent "…two or more marks located adjacent to one another, in alignment, and made using the same tool" (Hirschfeld 1999:60).

included in the distribution tables and maps, but not in the bulk of my analysis in order to avoid stepping into the realm of epigraphy.

The main concern of this chapter is to report on any observable pattern in the distribution of the ingot marks. While the percentage of ingot remains with marks is smaller than I first realized, careful analysis has revealed that there are indeed several possible patterns. I originally hypothesized that there might be an association between certain marks and their ingot's context. This has proven not to be the case. A dominant number of ingot fragments, as well as several complete ingots, have no provenience or have been surface finds turned into authorities during agriculture or construction. There are three context-types in which most of the remaining ingots and ingot fragments have been found: shipwreck cargos, hoards, and workshop debris (Map 8 in Appendix I). All of these can be expected to have been natural places for raw metallurgical materials to reach a final deposition. The metal hoards were themselves found in various contexts, including in or near workshops and cultic areas. Most hoards contained fragments of oxhide ingots, other ingot fragments, metallurgical scrap, and various tools. Foundry hoards found within areas for metallurgical activity were common on Cyprus and Crete (Map 9; Map 11 in Appendix I). On Sardinia, however, it is not easily determined which type of context a hoard was found in (Map 10 in Appendix I). These hoards were usually found near or within nuraghes, which contained many different areas and performed multiple functions including metallurgic and cultic activities. Due to this, and the sometimes weak records regarding the artifacts' exact contexts, it is hard to attribute any function to the hoards other than the obvious one of storage.

The distribution of the marks is also greatly skewed, as approximately 73% of the marked ingots come from the Uluburun wreck. At the current time, this creates a notable disproportion in the distribution. The discovery of more marked ingots would likely help in the understanding of these patterns in the future. Continued excavation of LBA industrial areas, such as Gournia, or perhaps new finds of Bronze Age shipwrecks, may yield new specimens. As new finds increase our

knowledge, Uluburun and Cape Gelidonya may someday be used as possible control samples by which patterns might be better tested. Unfortunately, no patterns have appeared that link certain contexts within sites with particular markings.[39] The patterns that have emerged actually demonstrate correlations between marks and regional distributions. For now, the patterns distinguishable by this investigation are preliminary. Many of them also have an exception or two, but these do not necessarily refute my observations. Occasional variations in certain aspects of signs do not necessarily make it exempt from a marking system (Hirschfeld 1999:26). I shall hereby discuss each pattern I have observed.

4.2 OBSERVATIONS OF SPECIFIC MARKS

4.2.1 T and Double T[40]

The T and Double T symbols are usually impressed and most often appear on the rough side of Type 2 ingots. These marks were then made during the cooling of the metal with some form of stamp or brand in these shapes. The traditional place for these two marks seems to have been between two handles near one of the shorter sides, although at least one ingot bares a T mark closer to one of the handle bases. The similarities between these aspects of the T and Double T marks are only part of the reason that I group them together here. Geographical distribution analysis places these two marks predominantly in the same regions. The majority of both T and Double T marks are from the Uluburun and Cape Gelidonya shipwrecks. On land, T marks appear at Enkomi (Cyprus) and Ozieri (Sardinia); Double T marks appear at Mycenae (Greece) and three sites on Sardinia (Teti, Nuragus, and Capoterra). This data, especially the prominence of these marks on Sardinia, indicates a possible connection between these symbols and ingots sent to the western areas of the Mediterranean.

[39] Nicolle Hirschfeld came to the same conclusion with the potmarks – the only correlations she found were with the marks and the vases themselves. (Hirschfeld 2002: viii).
[40] Refer to Table 12. T marks include those similar to A1. Double T marks are those similar to A2 (Table 12) and D6 (Table 13).

4.2.2 X or "Cross"[41]

This symbol is possibly the most common mark on the ingots, and so bares no significant observable pattern. It appears as both incised and impressed, although it is more often impressed. It is a common mark at Cape Gelidonya, appearing on seven ingots and composing the greatest number of all the marks on Cape Gelidonya ingots (about 18%). It is also present on the ingots from Cerkovo (Bulgaria), Yabalkovo (Bulgaria), Goksu Creek (Anatolia), Nuragus (Sardinia), Sant' Anastasia (Corsica), and several from Uluburun. The miniature ingot from Yabalkovo possesses four of these marks, one on each handle. While it would seem that this symbol corresponds deliberately to sites outlying the hub of LBA copper trade, this would be an over-arching hypothesis as it is a common sign on ingots in transit as cargo (i.e., the shipwrecks). The use of two terms to describe this sign is due to the numerous variations of it, likely caused by application by different individuals or items. Slight alterations in length of strokes or orientation of the sign are common, and I attribute anything that looks like an X, a cross, or a + to this category. With the exception of the mark on the Sant' Anastasia type 1 ingot, this mark is otherwise found on the rough side of Type 2 ingots. Placement is often between handles along a short side, but there is too much variation in placement to designate this as a pattern. A variation of this mark often has at least one accompanying mark.[42] On three published ingots, the X mark is found along with a feature called a concavity or depression.

4.2.3 Concavity[43]

The term "concavity" refers to a circular depression found on the surface of six published ingots from Nuragus (Sardinia), Sant' Anastasia (Corsica), and Cape Gelidonya. The function of these depressions is unknown, but they appear in central positions on the ingot or near a handle base.

[41] Refers to signs similar to A3, A4 (Table 12), and D1, G1, K3 (Table 13).
[42] According to published materials, this mark is incised on several ingots. There is no publication, however, that displays an image of the ingot or describes the exact placement of marks on each conserved ingot. It is therefore uncertain if there are accompanying marks on the ingots with an X or cross. It is known that many of the ingots have at least two marks, so it is a likely supposition that they do.
[43] Table 15 lists site specifics of ingots with concavities.

On four of the ingots, there is at least one other mark on the ingot, usually on the same side as the depression. With the exception of the ingot from Sant' Anastasia, all other ingots with depressions are Type 2. The repeated occurrence of these depressions indicate that there must have been some reason to place them on the surface, yet no pattern has appeared that may assist us in understanding that purpose.

4.2.4 Chisel Marks[44]

"Chisel marks," as designated by Jones (2007: 100-102), refer to marks incised on the short sides of some ingots. They appear at only three sites. One ingot each from Nuragus (Sardinia) and Sant' Anastasia (Corsica) bear a score mark.[45] At Uluburun, however, at least 27 ingots have one of ten different chisel marks etched into their short sides. It is possible that the marks denoted above as C and M represent the same mark, but they have been listed separately due to a slight variation in the length of two lines in each. It has been suggested that these marks may be some sort of count or tally, likely due to their similarity to common numeral schemes, but nothing definite has been discovered to prove this (Jones 2007: 100).

4.2.5 Trident[46]

"Trident" is an arbitrary term given to several marks that resemble tridents or pitchforks. There are four or five variations of this shape that occur on Type 2 ingots on Sardinia at Nuragus, and on Type 1 ingots on Crete at Hagia Triada.[47] They are usually incised on the rough sides of the ingots. None of these signs are exactly like any other, but it is possible that the occurrence of such similar signs, found only on large islands closer to the central Mediterranean Sea, may have some meaning. Some authors speculate that the "trident" symbols and others with a nautical nature may

[44] Refer to Table 14 for all known side-chisel marks. It is a continuation of Jones typology (2007: 101).
[45] Nuragus ingot bears mark M. Sant' Anastasia ingot bears mark L.
[46] Refers to B1 (Table 12), D2, E1, and F2 (Table 13)
[47] There is one mark that may or may not be similar to the trident shape. There is also one mark that is sometimes shown with two additional incised lines that make the mark resemble the "double-axe" symbol prevalent in Minoan culture. Other representations of the mark show it as an open symbol that resembles a trident. All marks are subject to differing interpretations, but I chose to include these marks within the arbitrary category of Trident.

represent the maritime location of their origins or destinations, but this has yet to be proven (Pulak 1998:194-196).

4.2.6 Wheel[48]

The term "wheel" is given to any of the circular ingot marks. As of now, these wheels either have four, six, or no radii extending from a center point. Currently, these marks appear only on the Cape Gelidonya ingots and are always impressed on the center of the smooth side. Five ingots bear one of these three signs, twice appearing with a V sign and once with a Double T. The V signs are both impressed on the opposite side of the wheel (the rough side), but the Double T is incised on the same side. This symbol, when it has four radii, is common among the scripts of the eastern Mediterranean area during the LBA (Figure 3). It appears in Linear B, Egyptian Hieroglyphic, and the burgeoning Phoenician scripts (Schofield 2007: 24, fig. 10; Lo 2012; Davies 1997: 31-34).[49]

4.2.7 Rudder[50]

The "rudder" is another nautical term used to describe several ingot marks that are composed of a line extending out from a trapezoid. They appear at least seven times on Uluburun ingots, always incised on the rough side. Other than Uluburun, these "rudder" symbols appear only on ingots from Crete at Mochlos and Hagia Triada. All three sites have contexts dateable to before the 13th century BCE.

4.2.8 Double and Triple Intersecting Lines[51]

Two similar symbols currently appear exclusively on the Cape Gelidonya ingots. These similar marks consist of double or triple intersecting lines. For these symbols, one straight line is intersected perpendicularly by two or three other straight lines. The parallel lines usually have equidistant space between them along the perpendicular line. These signs are almost always

[48] Refers to C1, C2, and C3 of Table 12.
[49] See Bass 1967: 72for more comparison. Parallels: (Schofield 2007: 24, fig. 10);
[50] Refers to E4, F1, F6, and J3 (Table 13).
[51] Refer to B4, B5 (Table 12) and H2 (Table 13).

impressed on the rough side. There is at least one sign on Uluburun that is similar to the double-lined symbol from Gelidonya, but the placement of the lines concentrate on one end making it akin to a Double T. Because the Double T seems to be a concise and specific symbol on the ingots, I have attributed that mark with the double-intersecting lines symbol. These marks also have parallels in several scripts.

4.2.9 I, V, U[52]

These three marks are designated as such due to their similarities to modern Latin letters "I," "V," and "U." The "I" symbol appears at Cernozem, Hagia Triada, and Cape Gelidonya and is normally placed horizontally. The "U" is usually upside-down like a horseshoe, and can be found at Cape Gelidonya, Kefar Samir, and possibly Tylissos.[53] The "V" mark is found on both the Uluburun and Cape Gelidonya wrecks, although it is found on its side instead of straight up on the Uluburun ingots. It is also one of the two marks that are found on the same ingots as a wheel mark. A "V" mark also appears on a Type 2 ingot from Göksu Creek in the southwestern area of Turkey, and is said to have been on an ingot from Mycenae (Wace & French 1980:295-296).

4.2.10 Closed and Linear shapes[54]

Many impressed and incised marks do not fall under any specific description. As explained above, several of the "closed marks" seem to be ideograms (such as a sailboat or a tree), but they are predominantly signs that have a closed shape. Several of them can be found among eastern Mediterranean scripts, but for brevity and to avoid bias they are termed "closed." These mostly come from Uluburun, but also appear at Sant' Anastais (Corsica), Hagia Triada (Crete), and Nuragus

[52] I marks include C4 (Table 12), F3, and K6 (Table 13). V marks include B2, B6 (Table 12) and K4 (Table 13). U marks include those similar to B3 (Table 12).
[53] The Tylissos ingot is reported to have an impressed mark; however the published photographs show no traditional markings. Instead, they show what seem to be eroded concavities on each handle. When looked at closely, two of the concavities are in a "U" shape. It is uncertain whether or not this was intentional.
[54] Closed marks include A6 (Table 12), and D3, E6, F4, F6, G2, G4, G6, H1, I4, I6, J1, K2 (Table 13). Linear marks include A5, C5 (Table 12) and D4, D5, E2, E3, E5, G3, G5, H3, H4, H5, H6, I1, I2, I3, I5, J2, J4, J5, J6, K1, K5 (Table 13).

(Sardinia). “Linear” describe shapes formed by linear lines.[55] Many of the Uluburun marks fall in this category, as well as marks from Cape Gelidonya, the mark on the Kameno/Pobit kamak (Bulgaria) ingot, Hagia Triada ingots, an ingot from Enkomi, and probably Sardara (Sardinia) where two ingot fragments bear traces of linear markings.[56] Many of these symbols have parallels in several of the scripts from the Mediterranean.

[55] An exception being the “C” shaped mark from Uluburun.
[56] The mark from Enkomi is similar to a Double T, except that there is a half-circle line at the bottom of it.

CHAPTER 5

INTERPRETATIONS AND CONCLUSIONS

5.1 INTERPRETATIONS

Most scholars agree that the ingot marks and similar signs on other marked objects seem to reflect the Cypro-Minoan script more than any others, but there has always been something not quite right about this assertion (Sibella 1996: 10). As Hirschfeld points out, this theory is actually circular in logic because a large number of the marks in the Cypro-Minoan lexicon actually come from other similarly marked objects (Hirschfeld 1999:31). It was with this understanding that Hirschfeld began her arduous task of attempting to find patterns among the marks on ceramics from several LBA cities throughout the Mediterranean, and which shall be the starting point for my interpretations.

Hirschfeld's work has given archaeology much useful information, even though she herself remarks that few definitive answers were uncovered. The two most important contributions that her work has made are the cataloguing of minute details regarding an enormous number of marked ceramics, and an example of a contextual analysis that is made possible by such a catalogue which other scholars might model similar projects after. It has also placed supporting evidence behind the already established belief that these marks belonged to a specific marking system. In fact, Hirshfeld believes that there were at least three different marking systems on these ceramics that drew from a common corpus of signs used on specific wares, at least at Enkomi (1999:110).[57] In her definition, a marking system:

> "…may have preferred signs, preferred mode(s) of sign application, and definite ranges of sizes and colors, preferred locations for the signs, preferred wares and types, and may characteristically be found in certain kinds of deposits or locations" (1999:26).

Hirschfeld's work not only discusses her chosen medium of study – ceramics – it also comments on several other types of marked objects. Primarily, she believes that the markings on copper oxhide ingots also provide evidence for the use of different marking systems using different corpora of signs for different commodities. While she observes that both systems place large and incised signs into highly visible areas, she believes that they are not the same system (1999:29). More importantly, she states rather firmly that the oxhide ingot marking system is unrelated to the

[57] Her evidence at other sites, such as Tell Ras Shamra, indicates a similar pattern.

Cypro-Minoan script (1999:249-250). This is an admirably bold statement, given that most publications mention the resemblance of the ingot marks to Cypro-Minoan signs. She goes on to express, however, that the use of a few similar simple marks on both ingots and ceramics indicates that they were both representative of Cypriot activity with the objects – perhaps even that there were several marking systems at that time drawing from a similar corpus of signs in a way that we do not yet understand. Complementary to this is information from a new publication by Silvia Ferrara. This volume is the most comprehensive study of Cypro-Minoan yet produced, and demonstrates that there are possibly three types of Cypro-Minoan script (CM1, CM2, and CM3) (Ferrara 2012:255, Table 5.10). This does not necessarily correlate to the three forms of marking systems proposed by Hirschfeld, but it supports the theory of different marking systems associated with, or existing on Cyprus that tradesmen may have drawn from.

My own research has led me to generally agree with Hirschfeld in that the marking systems are different between ceramics and ingots, although I have found some counterpoints to this assertion that I shall mention now. This conclusion seems to come predominantly from her observations of the Uluburun oxhide ingots. However, when the majority of ingot signs from other sites are considered, the number of marks that are similar to many of those on ceramics analyzed by Hirschfeld is increased. This indicates that the two marking systems may have indeed drawn from the same corpus of signs after all. This certainly does not disprove Hirschfeld's interpretations. As the largest corpus of ingot marks does come from the extraordinarily large number of intact ingots from Uluburun, it is possible that the types of marks found at other sites are merely accidental acts of preservation. However, there may have been many more signs applied to the hundreds or thousands of ingots that surely traveled around the area over three thousand years ago.[58]

The most obvious distinction among the marks is between the methods of application – incised versus impressed. My observations of them harken back to several current theories regarding these different kinds of marks. The first is that there may have been maturation and standardization of the marking system over time from incised to impressed – which would also indicate an overall standardization of the copper trade itself.[59] This is supported by the fact that all of the earlier ingots

[58] However, the likelihood of certain signs repeatedly being preserved indicates that those marks were used more often than others. These speculations cannot currently be proven or disproven. It is simply important to acknowledge all possibilities.

[59] A process already indicated by the continued development of the different types of ingots (refer to discuss of Buchholz-Bass typology above).

with marks (i.e., Uluburun, Hagia Triada, and possibly Sant' Anastasia) all have incised marks.[60] The majority of later ingots bear mostly impressed signs (i.e., Cape Gelidonya, Sardinia). Such standardization would not be surprising for such a long-running and mass-producing industry;[61] however we must remember that many of the ingots bear both impressed and incised marks. These anomalies do not necessarily disprove this first theory. Since we are discussing an industry that lasted for several hundred years, it is likely that several changes were made to the marking system.

A plausible solution to this issue is that incised marks began to be used for a different function once impressed marks became standard. This supposition actually corroborates another popular theory about the different types of marks. This theory supposes that incised and impressed marks actually formed two different marking systems.[62] In fact, there are at least two, if not three marking systems implied on the ingots.[63] The incised or chiseled marks along the short sides of the Uluburun ingots, first discussed in-depth by Jones, are starkly different than the conspicuous signs on the rough and smooth sides and therefore constitute their own marking system (Jones 2007: 100-102). The main supposition regarding these marks is that they may be some sort of tally system for individual or groups of ingots (Jones 2007: 100). The presence of them at two other sites shows that these marks are not unique to the Uluburun cargo and likely reflect a different function in production, transport, or sale than the other marks. Both of the other ingots with score marks come from the central Mediterranean – from Nuragus on Sardinia and Sant' Anastasia on Corsica. Neither site can be exactly dated, although an earlier date could be postulated for the Corsica ingot as it is the earlier Type 1. Buchholz supposed that the Type 1 ingots were used between the 16th and 15th centuries BCE, but Uluburun proves that they were at least still in circulation in the later 14th century when Type 2 ingots seem to have been the dominant form of copper oxhide ingot. It is then entirely possible that all of the ingots came from the same time period when these types of marks were in use.

Coming back to the incised and impressed markings, there are several other possible explanations for their uses. There are two basic facts regarding these marks that have been generally accepted for many years: impressed marks were made at the time of production, while the metal was

[60] If the Sant' Anastasia ingot has impressed, and not incised marks as stated by Jones, this theory could possibly be weakened.

[61] As the Uluburun and Cape Gelidonya shipwrecks have been dated at about approximately 100 years apart, with Uluburun the earlier wreck, the appearance of impressed marks only on Cape Gelidonya ingots lends support to this theory.

[62] This supposition can be investigated further when the conservation and publication of the full catalogue of Uluburun ingots becomes available in the future.

[63] As discussed above, it is uncertain whether or not the occasional appearance of concavities was intentional or meaningful. If more information is ever recovered about these depressions, it may or may not indicate yet another possible marking system. At the current time, however, this is undeterminable.

cooling, and incised marks were made any time after casting when the metal had cooled. The starkest pattern among the impressed marks is that they are almost always placed between two handles along a short side. The major exceptions to this are five ingots from Cape Gelidonya that have an impressed mark on the center of the ingot instead of the top. Four of these five marks are "wheel" marks (Table 12: C1, C2, C3). These wheels are also only found on the "smooth" or mold side of the ingot, which almost certainly means that these marks had to have been impressed into the ingot by the mold itself at the time of casting. The rest of the corpus of impressed marks consists of repeated signs such as the Double T (Table 12:A2), the V (Table 12:B2), the X or cross (Table 12:A3, A4), and the double and triple intersecting lines (Table 12:B4, B5). Occasionally on Uluburun and Sardinia, the T, double, or triple intersecting lines appear closer to one handle base than the normal center location, although whether or not this was intentional or meaningful is unknown. It may be an important characteristic, as incised double intersecting marks (Table 13:F3) were placed at the base of handles as well. This is currently undeterminable, but we do here have indications that impressed marks in general were intentionally visible and methodically placed during the casting of the ingots.

The most common belief is that impressed marks are likely signifiers of the ingots' producers or origins; however it is possible that they may also signify where or to whom the ingots were intended to travel. Cape Gelidonya ingots, for example, bear several different marks that are placed in the same area and appear similar in size and depth (refer to observations above). Perhaps the impressed marks may have then signified where these ingots were to be shipped to instead of where they came from. While my research can neither defend nor refute either theory, both are still plausible and should continue to be investigated.

The theory that the marks might represent some sort of "shipping address" is usually discussed in regards to the incised markings. Of course the symbols on the earlier ingots, which are only incised, would likely have taken on all of the theorized functions for both types of markings. For later finds, however, this theory would seem to offer a logical explanation for the existence of both impressed and incised marks on ingots as it would account for different functions for both kinds. It also offers some explanation for the presence of multiple incised marks on ingots – they could perhaps indicate a re-direction of the ingots. These are all valid theories that I feel my research supports by showing some regional associations with certain symbols (refer to Chapter 4).

We must not, however, ignore the possibility that the marks were indicators by the merchants to designate each ingot for a particular type of trade (e.g., royal trade such as tribute or gifts versus smaller scale or personal trade) or an indication of receipt by the acquiring parties. Perhaps a particular mark denoted certain ingots on a ship with several ports of call to specific areas. This is an

interesting suggestion, and one that further ingot-bearing shipwreck discoveries might illuminate. The reconstructive drawing of the Cape Gelidonya ingots in their original packing stacks is informative, but unfortunately does not indicate that the ingots were separated when stored or shipped by their marks for that ship (Bass 1967: 73, Fig. 91). Cape Gelidonya, however, was a smaller vessel carrying a much smaller cargo at a later date than the Uluburun ship. A similar reconstruction of the Uluburun ingots may reveal a different and more direct organization of the markings. This will hopefully be made possible with continued publication of the Uluburun ingots.

There are also reasons to associate the incised markings with the receipt of the ingots by their importers. It is well known that Bronze Age cultures kept documentation regarding trade, often including very specific details such as inventory lists and responses to the senders regarding what was received. We even have correspondences between kings regarding shipments that do not reflect the agreed upon amount or quality.[64] These and other documents demonstrate that the merchants or servants accepting shipment inspected incoming items and kept thorough records of them.[65] The incised markings could then be an indication of receipt, letting others know whether the product had passed inspection or transmitting other information regarding the item to whoever would next be receiving it.

All of these theories will continue under scrutiny until more marked ingots or historical records of the LBA copper industry are recovered and analyzed. My discussion shall now briefly turn to an even more elusive topic – the symbols of the marks themselves.[66] Once again, a majority of the marks appear as Cypro-Minoan. We must then remember that many of the Cypro-Minoan signs come from earlier marked objects. This cycle begs the question – where did the marks come from? It is entirely possible that the script developed of its own accord on the island, but historically Cypro-Minoan has been believed to have been adapted from Linear A or Linear B (Ferrara 2012: 9-10). This was based upon early observations of a small corpus of marks during a time when the focus of Old World archaeology was on the Minoan civilization. It is still a completely valid path of investigation, and one that is certainly not refuted here. However, my own personal observations of the ingot marks have actually shown more parallels with Canaanite scripts. Canaanite scripts such as

[64] Examples include an Amarna letter from the king of Karaduniyaš to the king of Egypt, complaining of a shipment of gold that looked like silver (Moran 1992: 7, EA3, Text C 4743).

[65] An example can be found in the Egyptian tomb of Rekmire in Karnak, where a vizier is receiving tribute shipments from foreigners (Wachsmann 1987: 35-36)

[66] This author would like to state that she has only preliminary understanding of the LBA eastern Mediterranean scripts, and all assertions regarding the ingot marks and those scripts are based on basic observations of the scripts themselves and the work of other scholars known to her at the time of composition. She puts these observations forward in this work in the hopes that they may prove as useful avenues of investigation for those scholars more familiar in the topic.

Proto-Siniatic, Byblian, and especially Phoenician[67] scripts have a greater number of the ingot marks in their known corpus of alphabetic signs than either Linear A or Linear B.[68] I do not mean to imply that Cypro-Minoan stems from Canaanite scripts, although the idea merits discussion in another forum. However, it is worth considering that the marking systems associated with Cyprus by evidence or speculations do have some connection to Canaanite scripts of the era. I will here now humbly state some observations that have led me to this postulation.

- Nicolle Hirschfeld believes that the ingot marks are not related to Cypro-Minoan, although they bear similar marks as the ceramics with possible Cypro-Minoan symbols (1999:249-250).
    - Many of the prevalent marks noted by Hirschfeld throughout her 1999 dissertation are similar to the following marks on the copper oxhide ingots (refer to Chapter 3):
        - Table 11: A1, A2, A3, A4, B2, B4, B5, C1, C2, C3, C4
        - Table 12: D1, D3, D6, E2, E3, E5, F1, F3, G1, G5, H1, H2, H3, H5, H6, I1
- Original interpretations of the Uluburun wreck wanted to place its origin at Ugarit. This was influenced by the common association seen between Enkomi/Cyprus and the archaeological remains of sites within the kingdom of Ugaritic. This association is still apparent and will certainly continue as the topic of further study. In the past few years, however, interpretations by Uluburun excavators have expressed a belief that the ship began its voyage from a more southern port (Pulak 2012). If the ingots were marked at their home port, which is sometimes speculated, would it not be safe to assume they would be marked with symbols from that center's major script? While documents containing various scripts from all over the ancient Near East have been found at Tell Ras Shamra, the Ugaritic language itself was written in simplified cuneiform. No markings on the ingots resemble any kind of cuneiform. However, more southern alphabetic scripts, (e.g., the Byblian script) has several parallels with the ingot markings.

[67] While the Phoenician culture and alphabetic script matured in the early Iron Age, they both have long histories of development that spans further back than the Late Bronze Age. Research has indicated that it may have anticedents in the Proto-Siniatic scrips of the early 2nd millennium (Markoe 2000: 14-18,109-114). Different stages of this development can be seen throughout the Syro-Palestinian region and beyond, and could easily have been an influence to the symbols on the copper oxhide ingots. The active participation of Phoenicians in the LBA copper trade offers some support to this postulation (Markoe 2000: 17-18).

[68] There are ten signs that have parallels in Linear A, Linear B, Byblian, Proto-Siniatic, and Phoenician scripts. There are eighteen signs that appear in the Canaanite scripts and not the Linear scripts, and only seven that appear in the Linear scripts and not the Canaanite scripts (Schofield 2007: 24, Fig. 10; Lo 2012).

- Throughout her dissertation, Dr. Hirschfeld repeatedly refers to "simple marks that cross cultural boundaries" appearing in all of the marking systems (1999:109, 249).[69] This implies that there is a pattern of certain symbols across all these object marking systems. These LBA trading systems involved several different geographical regions and cultures. These cultures did indeed occasionally use similar markings in their writing systems, regardless of whether or not this was the result of accident or influence. Many of these repeated symbols have parallels in Canaanite scripts, as well as some in Linear A and B.[70]

5.2 CONCLUDING STATEMENTS

Like Hirschfeld's ceramic markings, the exact function or functions of the copper oxhide ingot marks remain unclear. The statistics tabulated within this paper do, however, demonstrate that there was standardization in the marks and indicate possible patterns in their geographic distribution and with other marks. Future work may strengthen or weaken the observations listed above, but any new data will only increase our understanding and are welcome contributions to the database assembled in this work.

In regards to ongoing inquiries, it seems that the three best paths to follow regarding these marks are (1) the observations of the marks discussed in the earlier chapter of this work, (2) similar studies conducted on the markings present on copper bun ingots and tin ingots from LBA eastern Mediterranean contexts, and (3) the "simple signs crossing cultural boundaries" discussed by Hirschfeld and elaborated on here. As always, further studies are needed with particular emphasis on marked objects. The work presented here is merely an attempt to add to the corpus of growing information and data for the marked objects. When more object marking "systems" have been investigated and documented, we may then begin looking at the larger picture by comparing and contrasting them.

For the present time, I have endeavored to gather and present here an extensive amount of information about the copper oxhide ingots in order to lay a foundation (i.e., my database) for future research on these artifacts. An artifact such as this requires multifaceted research methods in order to investigate its cultural, political, economical, and possible religious significance to the peoples of the

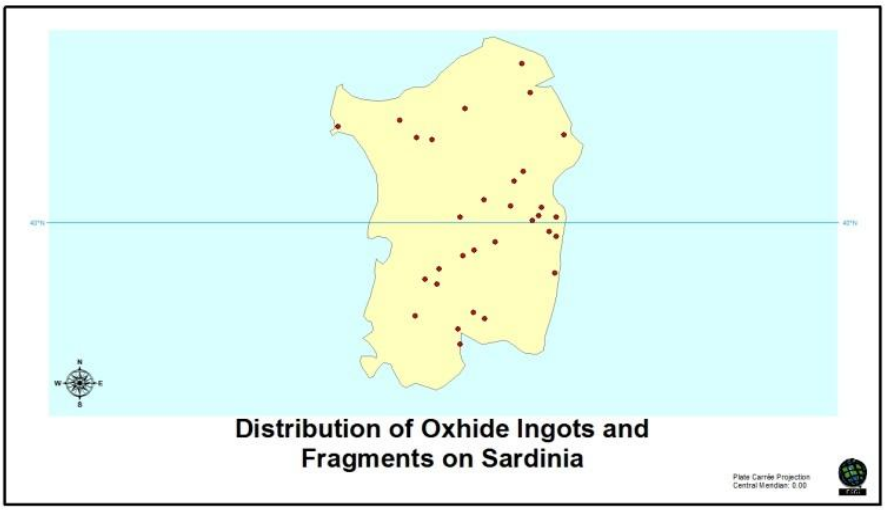
[69] Hirschfeld does not specify which marks she is referring to, but it can be deduced through her text that several of them were the cross or "X," the "I," the wheel symbols, the "T," and intersecting lines. Others are likely included in the symbol list above.

[70] It could be questioned as to whether these marks may have been chosen specifically because of their ubiquitous nature? The use of these similar symbols in LBA interregional trade may not necessarily be in the meaning of them – as they often had different meanings – but rather in the simple fact that they were easily recognizable. It then becomes possible to suggest that certain markings – recognizable in many different areas – may have been incorporated into these marking systems as a way to facilitate trade.

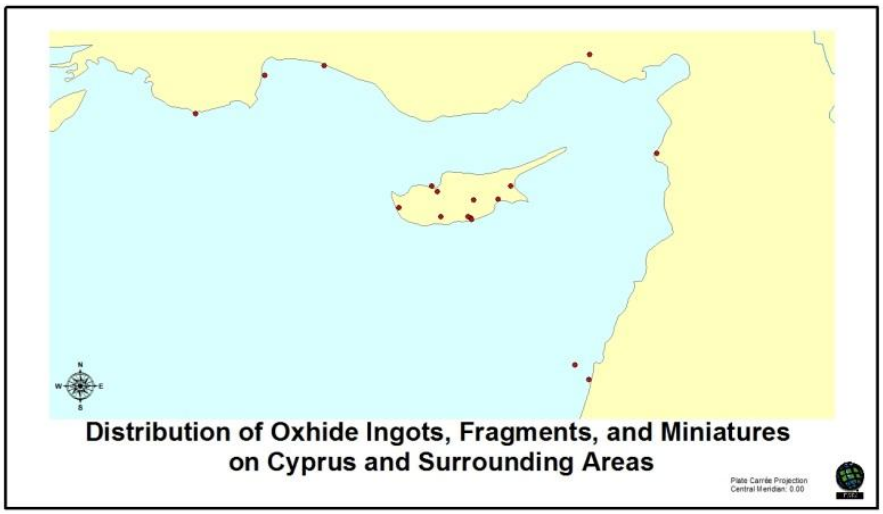
LBA Mediterranean world. Collecting all of the contextual and physical data for these artifacts, however, is an arduous task. The database is explained and presented in part in Appendix IV, but is now also available online for public use (see Appendix IV for information). For researchers who also wish to analyze the oxhide ingots in regards to their entire spatial distribution, this database will prove a time-saving reference tool that will hopefully assist in answering some of the remaining questions about the copper oxhide ingots.

APPENDIX I

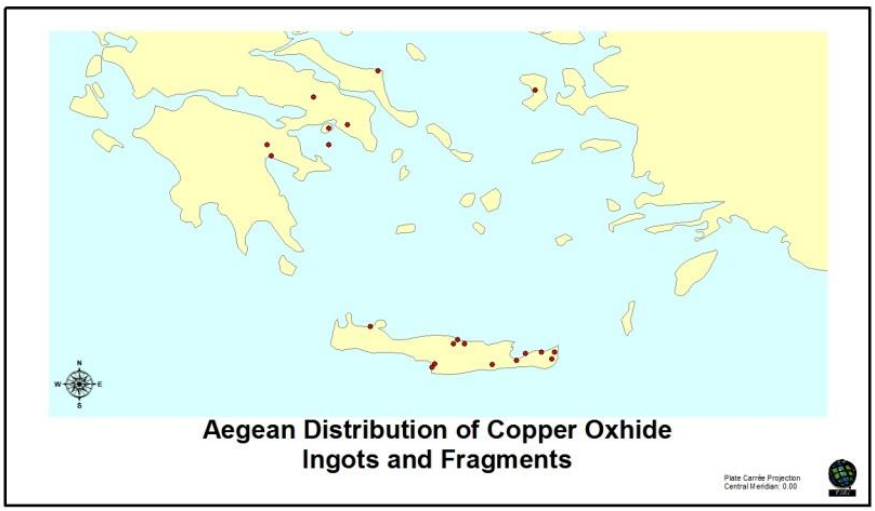
DISTRIBUTION MAPS



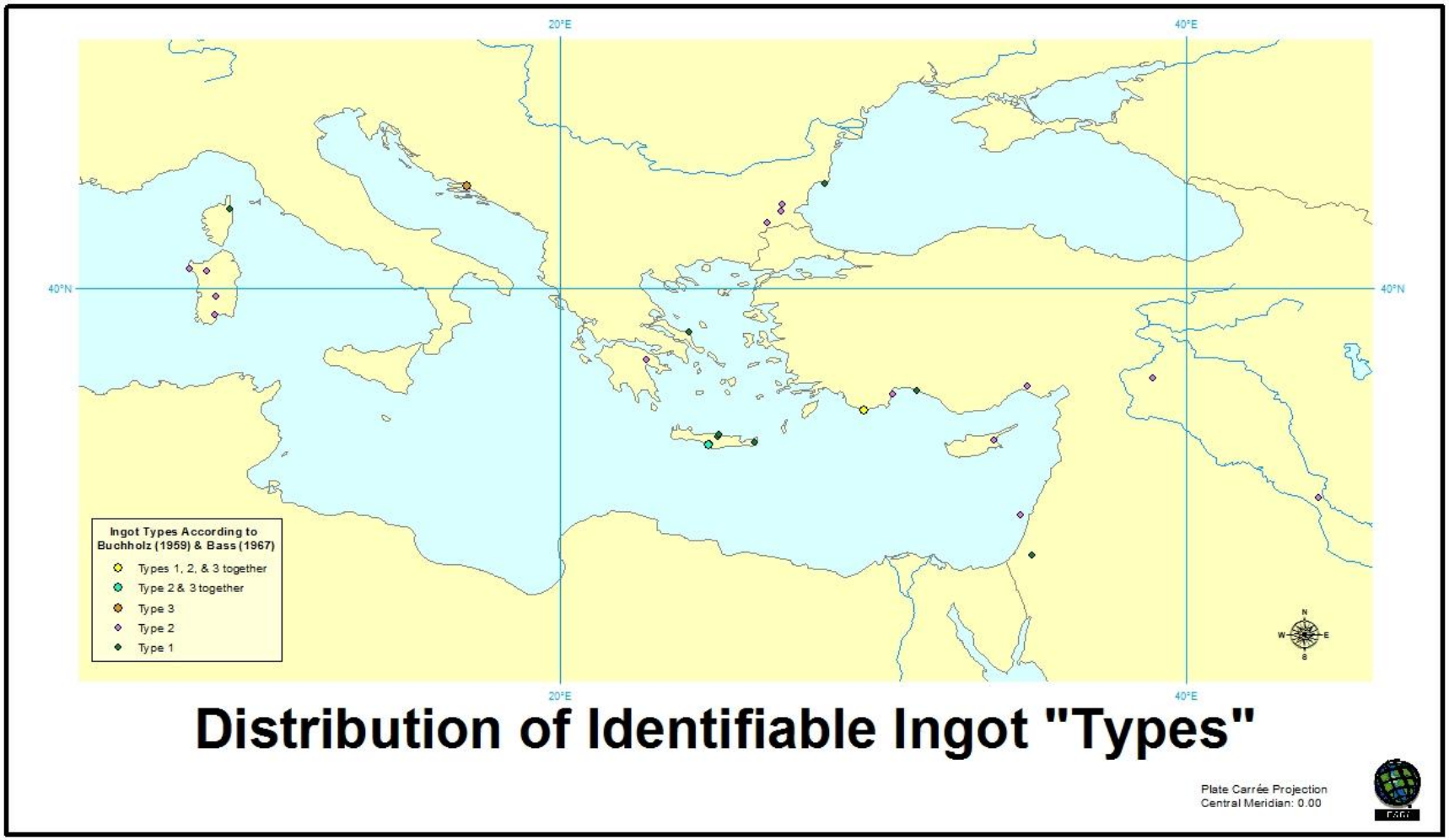
Map 4: Distribution of Oxhide Ingot Remains on Sardinia



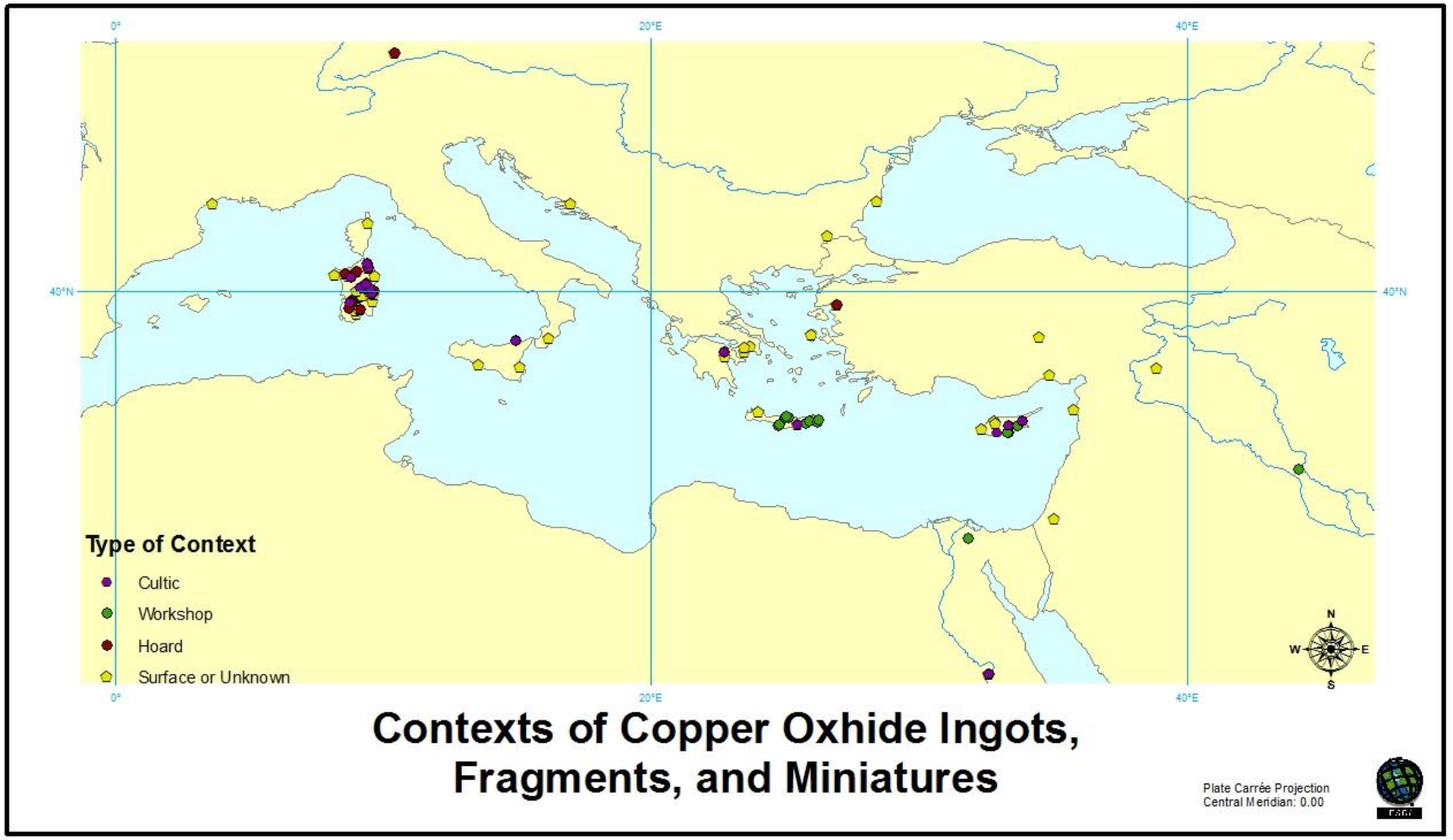
Map 5: Distribution of Oxhide Ingots, Fragments, and Miniatures on Cyprus and Surrounding Areas



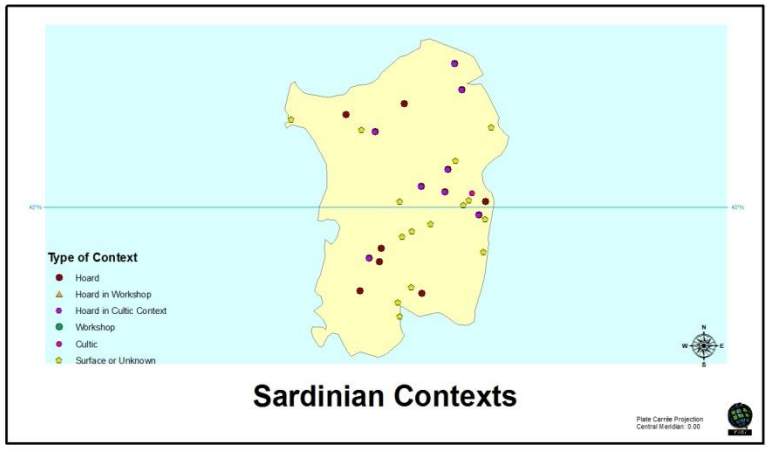
Map 6: Aegean Distribution of Copper Oxhide Ingots and Fragments



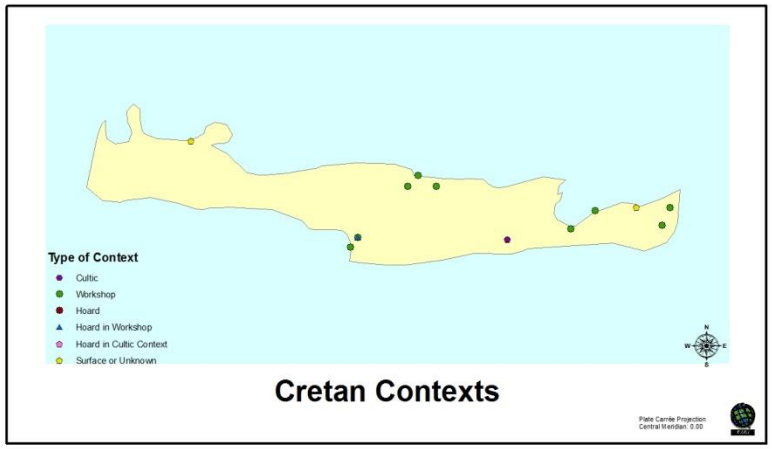
Map 7: Distribution of Identifiable Ingot “Types” (Buchholz-Bass Categorization)



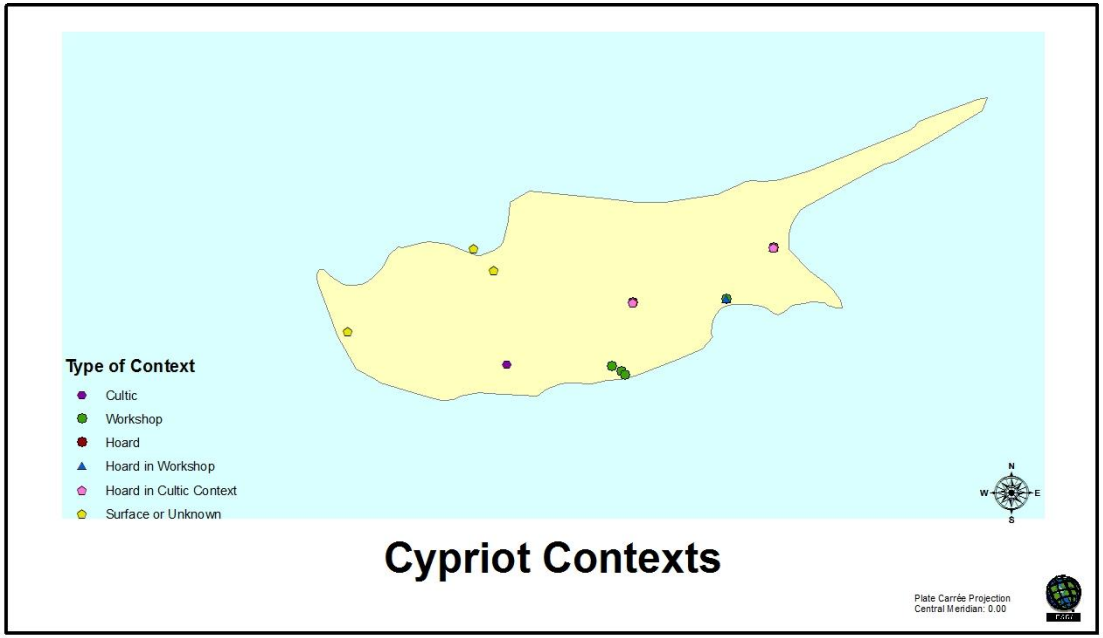
Map 8: Contexts of Copper Oxhide Ingots, Fragments, and Miniatures



Map 9: Sardinian Contexts of Copper Oxhide Ingots



Map 10: Cretan Contexts of Copper Oxhide Ingots



Map 11: Cypriot Contexts of Copper Oxhide Ingots

APPENDIX II

CHRONOLOGY[71]

	Crete	Greece	Cyprus	Egypt	Sardinia
2000	MM IA	MH I	EC III (2100-1950)	Middle Kingdom	Neolithic
			MC I		
1900	MM IB	MH II			
			MC II		
1800	MM II			2nd Intermediate Period	EBA 1
			MC III		
1700	MM III	MH III			EBA 2
			LC IA		
1600	LM IA				MBA 1
		LH I	LC IB	New Kingdom	
1500	LM IB	LH IIA			MBA 2
		LH IIB			
	LM II		LC IIA		
1400	LM IIIA1	LH IIIA1			MBA 3
	LM IIIA2	LH IIIA2	LC IIB		
			LC IIC		
1300	LM IIIB	LH IIIB			RBA
1200	LM IIIC		LC IIIA		
		LH IIIC			FBA 1
1100			LC IIIB		FBA 2
	Subminoan	Submycenaean	CG I		
1000					FBA 3
900					Early Iron Age

[71] Chronologies derived from Crewe 2007:5,Table 1.1; Lo Schiavo, Proecelli, Giumlia-Mair 2009:156,Fig. 10.

APPENDIX III

FIGURES

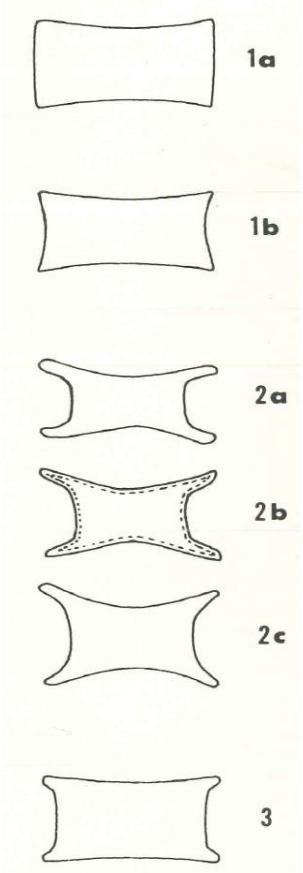


Figure 1. Bass's Oxhide Ingot Types, derived from Buchholz's 1959 analysis; Bass 1967: 53, fig. 55.

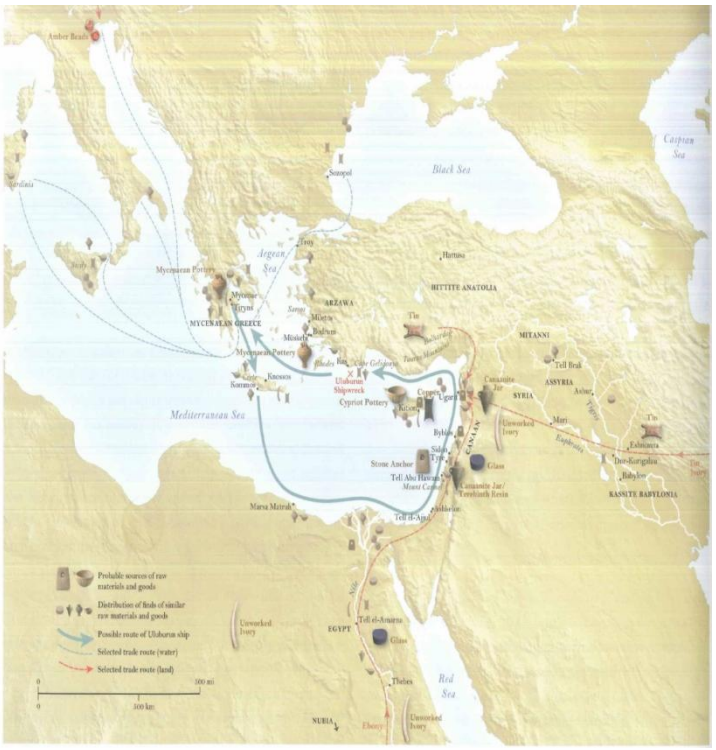


Figure. 2. Possible Route of the Uluburun Ship; Pulak 2008: 298.

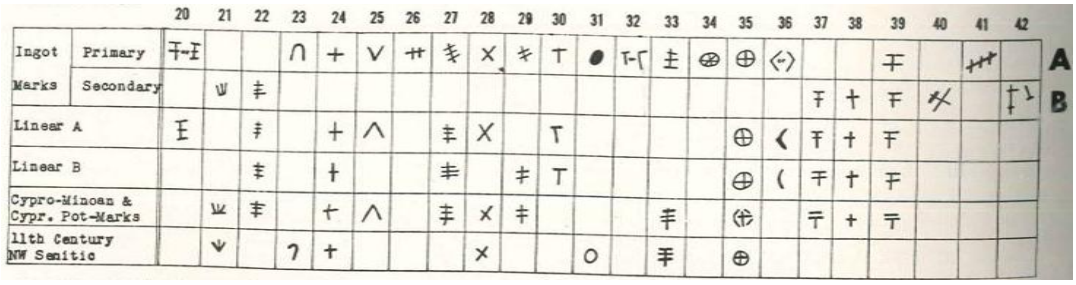


Figure 3. Comparison of Cape Gelidonya ingot marks with slightly later eastern Mediterranean scripts; Bass 1967: 72, Fig. 90.

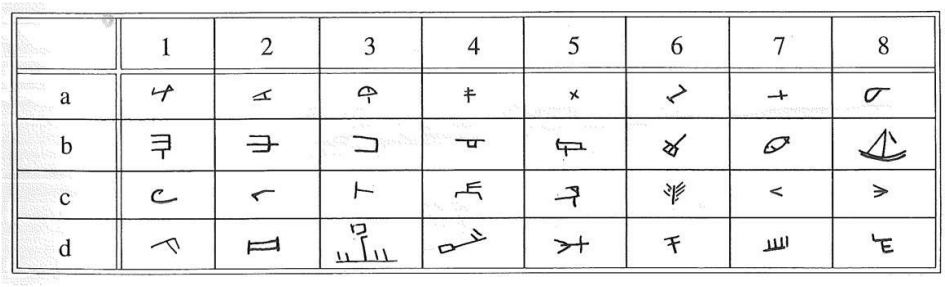


Figure 4. Chart of marks on Uluburun Ingots as of 1996; Sibella 1996: 9, Fig. 1.

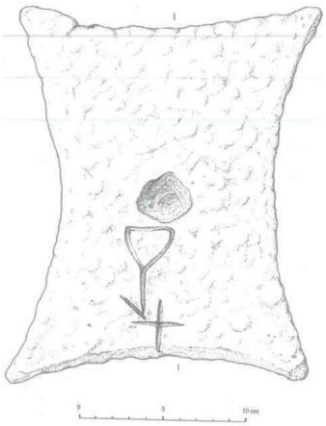


Figure 5. Type 1 Ingot from Sant' Anastasia, Corsia; Lo Schiavo 2009a: 416, Fig. 6.

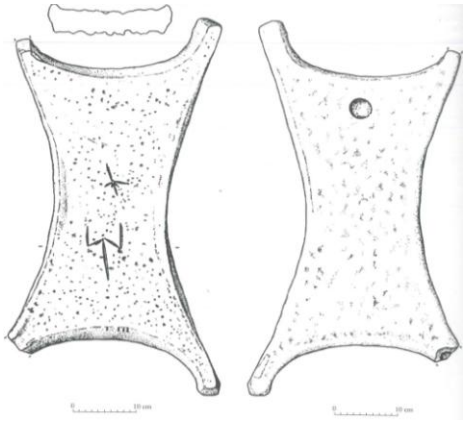


Figure 6. Ingot 2 from Nuragus, Sardinia; Lo Schiavo et al. 2009: 348, Fig. 2.

Figure 7. Marks on Type 1 ingot from Hagia Triadha; Wheeler, Maddin & Muhly 1975: 33, Fig.7.

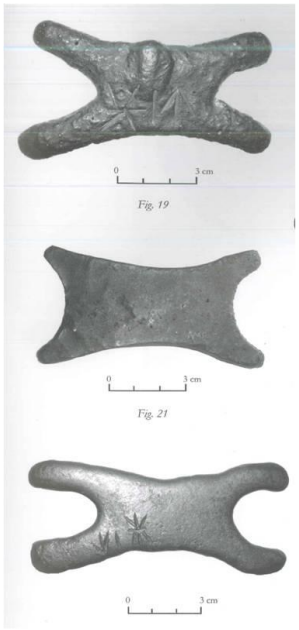


Figure 8. Three Miniature Copper Oxhide Ingots from Enkomi; Papasavvas 2009: 125, Figs. 19, 21, 23.

Figure. 9. Göksu Creek Ingots, Turkey; Belli 2004: 31, Res. 33.

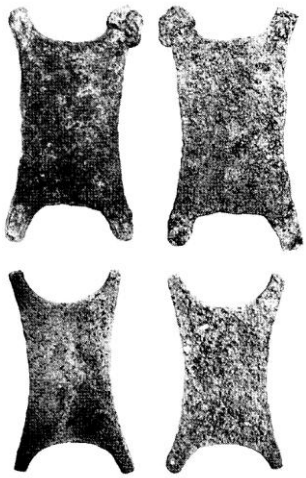


Figure 10. Kameno Pobit/Kamek Ingots, Bulgaria; Leschtakov 2005: Plate CIX,B.

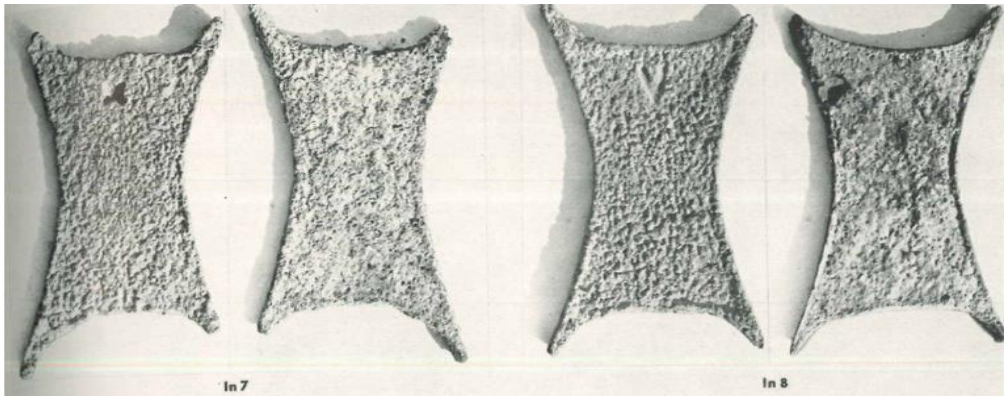


Figure 11. Examples of Cape Gelidonya Ingots (In. 7 and In. 8); Bass 1967: 55, Fig. 57.

APPENDIX IV

COPPER OXHIDE INGOT DATABASE

The following catalogue of copper oxhide ingot remains is composed of variables taken from my complete database. These variables are: geographic region, site, context, date, signifier (identification number), integrity of artifact, ingot type (Buchholz-Bass categorization), width, length, thickness, weight, provenance of copper,[72] marks, and references.[73] These variables were chosen for presentation in this abbreviated version because they are the most essential pieces of information regarding each artifact. The complete database is too large for a published paper document at this time, but is published online for the use of present andfuture scholars. The database can be found at: http://core.tdar.org/document/380819.[74] Members of the academic and archaeological community are encouraged to interact with this database, and are invited to submit additions and suggestions.

[72] All provenances are from scientific results that place the specimen within the filed of ores from certain areas. Detailed information regarding each entry can be found in the corresponding references.
[73] All dates are Before Current Era (B.C.E.).
[74] The Digital Archaeological Record (tDAR.org) is an innovative and international internet resource that enables archaeologists and associated professionals to store and share archaeological data and research.

Region	Site	Context	Date	Signifier	Integrity	Ty-pe	W (range; m)	L (range; m)	Th (range; m)	Wt (kg)	Provenance	Marks	References
France	Sete, Herault	n/a	LBA	n/a	Complete	2	.28, .27	.59, .60	0.1	26	n/a	0	Lo Schiavo 2009c:421-430
Corsica	Sant' Anastasia	n/a	LBA	n/a	Complete	1b	.355, .255	.40, .45	0.1	29	n/a	2 Impressed/incised marks, center, rough side (Table 11: A3, A5); Side mark (Table 13: L); concavity, center, mold side	Lo Schiavo 2009b:411-417
Sicily	Cannatello	Near square-planned hut.	13th c.	n/a	Fragment	n/a	.018 m^2		0.1	n/a	n/a	0	Lo Schiavo 2009 et al: 135-139
Sicily	Thapsos	Quadrant .XLV.21 of settlement	13th c.	n/a	Fragment	n/a	n/a	n/a	n/a	n/a	n/a	0	Lo Schiavo 2009 et al: 139-145
Sicily	Lipari	Below hut in alpha II area.	13th-12th c.	n/a	354 Bun / oxhide ingot fragments	n/a	n/a	n/a	n/a	n/a	n/a	0	Lo Schiavo et al 2009:147-215; Jones 2007: Appendix II
Sicily	Modi/ Leondari	n/a	LBA?	n/a	Fragment?	n/a	n/a	n/a	n/a	n/a	n/a	0	Jones 2007: Appendix II
Mesopo-tamia	Dur-Kurigalzu	Ramp chamber 76, Level 1	12th c.	DK4-124;IM51 170	Complete (missing)	2	.33, .32	.45,.56	n/a	n/a	n/a	0	Brinkman 1987
Israel	Ha Hotrim	Probable remains of shipwreck.	c. 1200	n/a	Fragments		n/a	n/a	n/a	n/a	n/a	0	Wachsmann & Raveh 1984:169-176; Gale 1999:111
Israel	Kefar Samir	n/a	14th-13th c.	n/a	Complete	2a	0	0.7	0	17	n/a	1 Impressed between handles, rough side (Table 11:B3)	Galili et al 1986:25-34; Kassianidou 2003: 109-20; Misch-Brandle et al. 1985:7-11
West Bank	Tell Beit Mirsim	SE 32 D-2	1600-1550	n/a	1/2 Mini oxhide ingot		n/a	n/a	n/a	n/a	n/a	0	Albright 1938:54, Pl. 42; Bass 1967: 57; Knapp 1986: 26
Egypt	Qantir	Level B/3	13th c.	n/a	fragment	n/a	n/a	n/a	n/a	n/a	Cyprus	0	Pusch 1995
Egypt	Thebes	Foundation deposit, Siptah	c.1200	n/a	2 mini ingots		n/a	n/a	n/a	n/a	n/a	Hieroglyphic dedication	O'Connor 1967:172-174
Egypt	Thebes	Foundation deposit, Twosre	c.1200	n/a	2 min ingots		n/a	n/a	n/a	n/a	n/a	Hieroglyphic dedication	O'Connor 1967:172-174
Turkey	Boğazköy	Quadrant 1/20	14^{th}-13^{th} c.	n/a	Small handle	n/a	n/a	n/a	n/a	n/a	n/a	0	Buchholz 1959:30; Buchholz 1988:194
Turkey	Göksu Creek	Discovered during dredging	LBA - 13th c.?	n/a	complete	2	n/a	n/a	n/a	n/a	Unknown	1 Impressed between handles, rough side (Table 11:B2)	Belli 2004:31-32; Jones 2007: Appendix II

		Discovered during dredging	LBA - 13th c?	n/a	Complete	2	n/a	n/a	n/a	n/a	Unknown	1 Impressed between handles, rough side (Table 11:B4)	Belli 2004:31-32; Jones 2007: Appendix II
		Discovered during dredging	LBA - 13th c.?	n/a	Half ingot	2	n/a	n/a	n/a	n/a	Unknown	0	Belli 2004:31-32; Jones 2007: Appendix II
Turkey	MET Museum (NYC)	Unknown-possibly from Side shipwreck	c.1450-1050	11.140.7	Complete	1	0	0.4	n/a	n/a	Cyprus	0	Buchholz 1959: 30; Karageorghis et al. 2000: 12, no. 13
Turkey	Şarköy	Hoard of Mycenean-style objects	Late 13th-11th c.	n/a	Ingot corner w/'handle'	2	n/a	n/a	n/a	n/a	Unknown	0	Jablonka & Rose 2004: 92;Gale & Stos-Gale 1999:272; Stos-Gale et al 1997:112
Turkish Coast	Side (Eski Adalia)	Shipwreck	15th c.	n/a	Complete	1a	n/a	n/a	n/a	26	Unknown	0	Pulak 1997:235; Buchholz 1959:30, n.6; Bass 1967:61, n. 18
	Side (Eski Adalia)	Shipwreck	15th c.	n/a	Complete	1b	n/a	n/a	n/a	19	Unknown	0	Pulak 1997:235; Buchholz 1959:30, n.7; Bass 1967:61, n.19
Turkey	Tarsus (?)	Unknown	n/a	n/a	Mini oxhide ingot		n/a	n/a	n/a	n/a	Unknown	0	Catling 1964:269, n.3; Knapp 1986:26
Turkish Coast	Uluburun	Shipwreck	Late 14th c.	Ingot specifics not published	354 Complete ingots, fragments	all	n/a	n/a	n/a	n/a	Cyprus	At least 160 ingots bear 1 to 3 incised marks on rough side.	Bass 1991:69-82; Sibella 1996:9-11; Pulak 2008:289-371
Turkish Coast	Cape Gelidonya	Shipwreck	c.1200	In 1.	Complete	2b	.35, .22	0.6	.045-.05	20	Cyprus	1 Impressed between handles, rough side; 2 inscribed, concavity, mold side; (Table 11:B4 or B5, Table 12:J1, similar to H4)	Bass 1967: 53, fig. 90 (21B/22B)
				In 2.	Broken, 2 joining halves	2b	.25, .35	0.7	n/a	21.75	Cyprus	1 Impressed between handles, rough side (Table 11:B3)	Bass 1967: 53,fig. 90 (23A)
				In 3.	Nearly complete	2c	.30, .45	0.6	.03-.04	20	Cyprus	1 Impressed between handles, rough side (Table 11:A3)	Bass 1967 :53, fig. 90 (24A)
				In 4.	Broken, 2 joining halves	2c	.28, .45	0.7	.02-.04	18.15	Cyprus	1 Impressed between handles, rough side (Table 11:B2)	Bass 1967: 53, fig. 90 (25A)
				In 5.	Broken, 2 joining halves	2c	.26, .44	0.6	0	22	Cyprus	1 Iimpressed, rough side (Table 11:B4)	Bass 1967: 53,fig. 90 (26A)
				In 6.	Nearly complete	2b	.22, .37	0.8	.025-.035	21	Cyprus	1 Impressed, rough side (Table 11:B5)	Bass 1967: 53, fig. 90 (27A)

				In 7.	Broken, 2 joining halves	2c	.26, .45	0.7	.03-.04	19	Cyprus	1 Impressed between handles, rough side (Table 11:A3)	Bass 1967: 53, fig. 90 (28A)
				In 8.	Complete	2c	.26, .44	0.7	.025-.042	21	Cyprus	1 Impressed between handles, rough side (Table 11:B2)	Bass 1967: 53, fig. 90 (25A)
				In 9.	Nearly complete	2c	.28, .44	0.7	.025-.03	20.75	Cyprus	1 Impressed between handles, rough side (Table 11:B2)	Bass 1967: 53, fig. 90 (25A)
				In 10.	3 Handles missing	2c	.26, .43	0.5	0	15.6	Cyprus	0	Bass 1967: 53
				In 11.	Incomplete	2b	.23, .33	0.8	0	16.85	Cyprus	1 Impressed, handle base, rough side (Table 11:B4)	Bass 1967: 53, fig. 90 (29A)
				In 12	Complete	2c	.27, .45	0.7	0	23.4	Cyprus	1 Impressed between handles, rough side (Table 11:A1)	Bass 1967: 53, fig. 90 (30A)
				In 13.	Complete	2a	.25, .38	0.7	.025-.04	26	Cyprus	Concavity, handle base, rough side	Bass 1967: 53
				In 14.	Complete	2a	.23, .36	0.7	.023-.04	20	Cyprus	1 Impressed between handles, rough side (Table 11:A1)	Bass 1967: 53, fig. 90 (30A)
				In 15.	Incomplete	2c	.26, .45	unknown	0	17.5.5	Cyprus	Concavity, handle base, rough side	Bass 1967: 53
				In 16.	Incomplete	2b	.19, .31	0.5	.04-.045	20.2	Cyprus	1 Possible mark, unintelligible	Bass 1967: 53
				In 17.	Incomplete	2b	.205, .32	0.6	0	23	Cyprus	1 Impressed between handles, rough side (Table 11:A3)	Bass 1967: 53, fig. 90 (24A)
				In 18	Incomplete	2a	.195	0.6	.032-.036	17	Cyprus	0	Bass 1967: 53
				In 19	Complete	2b	.195-.315	0.5	0	22	Cyprus	1 Impressed between handles, mold side (Table 11:A1)	Bass 1967: 53, fig. 90 (28A)
				In 20.	Complete	2b	.22, .365	0.6	.038-.048	22	Cyprus	1 Impressed between handles, rough side (Table 11:A1)	Bass 1967: 54, fig. 90 (30A)
				In 21	Complete	2c	.26, .44	0.6	.025-.04	20	Cyprus	0	Bass 1967: 57
				In 22.	Incomplete	2c	n/a	0.6	n/a	10.7	Cyprus	1 Impressed, rough side (Table 11:A3)	Bass 1967: 57, fig. 90 (28A)
				In 23.	Incomplete	2c	.25, .45	0.7	.025-.035	15.5	Cyprus	1 Impressed, rough side (Table 11: B4)	Bass 1967: 57, fig. 90 (27A)
				In 24	Complete	2c	.26, .45	0.6	.03-.04	17	Cyprus	1 Impressed; rough side (Table 11:B2); 1 impressed, center mold side (Table 11:C3)	Bass 1967: 57, fig. 90 (25A, 30A)

				In 25	Nearly complete	2c	.26,.40	0.6	.028-.04	21.3	Cyprus	1 Impressed, center of mold side, (Table 11:C2)	Bass 1967: 57, fig. 90 (27A, 35A)
				In 26	Incomplete	2c	.255, .43	0.6	.035-.053	16	Cyprus	1 Impressed, center of mold side, (Table 11:C2)	Bass 1967: 57, fig. 90 (35A)
				In 27	Incomplete	2b	.23, .37	0.6	.035-.05	23.8	Cyprus	1 Impressed between handles, rough side (Table 11:B2); 1 impressed, center mold side (Table 11:C2)	Bass 1967: 57, fig. 90 (25A, 35A)
				In 28	Incomplete	2a	.23, .39	0.6	.035-.045	18	Cyprus	1 Impressed, center of rough side (Table 11: B6)	Bass 1967: 57, fig. 90 (36A)
				In 29	Incomplete	2b	.22, .303	0.5	.035-.055	16.85	Cyprus	1 Impressed between handles, rough side (Table 11:A1)	Bass 1967: 57, fig. 90 (30A)
				In 30	Complete	2b	.235, .345	0.6	.025-.04	22	Cyprus	0	Bass 1967: 57
				In 31	Incomplete	2c	.265, .43	0.6	.025-.035	14.95	Cyprus	1 Impressed, 1 incised, mold side (Table 11:C1, Table 12:H2)	Bass 1967: 57, fig. 90 (39B)
				In 32	Incomplete	2c	.25, .43	0.5	.02-.03	12.85	Cyprus	1 Impressed, 1 incised, rough side (Table 11:A1, Table 12:D1)	Bass 1967: 57,fig. 90 (30A, 38B)
				In 33	Incomplete	2b	.235, .35	0.6	.04-.045	19.35	Cyprus	2 Impressed between handles, rough side (Table 11:A1, C5) (Possibly 1 mark)	Bass 1967: 57, fig. 90 (32A)
				In 34	Incomplete	2a or 2b	.345, max unknown	0.6	.04-.05	10.9	Cyprus	1 Impressed between handles, rough side (Table 11:C4)	Bass 1967: 57, fig. 90 (39A)
				In 35	Half	2c	0	0.3	.02-.04	9	Cyprus	1 Incised, handle base, mold side (Table 12:K6)	Bass 1967: 57, fig. 90 (40B)
				In 36	Half	2c	0	0.4	0	9	Cyprus	1 Incised, handle base, mold side (Table 12:K6)	Bass 1967: 57, fig. 90 (42B)
				In 37	Half	2c	0	0.3	.035-.045	9	Cyprus	1 Impressed, handle base, rough side (Table 11:B5)	Bass 1967: 57, fig. 90 (41A)
				In 38	Half	2c	0	0.3	0	10	Cyprus	0	Bass 1967: 57
				In 39	Half	2c	0	0.4	0	10	Cyprus	0	Bass 1967: 57
Crete	Gournia	Units Ea, Fh, & House Cg	1500-1450	32	Fragment	1?	n/a	n/a	n/a	n/a	Cyprus	0	Betancourt et al 1978, Gale & Stos-Gale 1999, Hakulin 2004, Evely 2000, Muhly 1979

		Units Ea, Fh, & House Cg	1500-1450	34	Fragment	1?	n/a	n/a	n/a	n/a	Cyprus	0	Betancourt et al 1978, Gale & Stos-Gale 1999, Hakulin 2004, Evely 2000, Muhly 1979
		Units Ea, Fh, & House Cg	1500-1450	35	Fragment	1?	n/a	n/a	n/a	n/a	Cyprus	0	Betancourt et al 1978, Gale & Stos-Gale 1999, Hakulin 2004, Evely 2000, Muhly 1979
		Units Ea, Fh, & House Cg	1500-1450	33	Fragment	1	n/a	n/a	n/a	n/a	Cyprus	0	Betancourt et al 1978, Gale & Stos-Gale 1999, Hakulin 2004, Evely 2000, Muhly 1979
Crete	Mochlos	House C	1500-1450	38	Fragment	n/a	n/a	n/a	n/a	n/a	Cyprus	0	Soles & Davaras1996
		House C	1500-1450	39	Fragment	n/a	n/a	n/a	n/a	n/a	Cyprus	0	Soles & Davaras1996
		Building A, room 2	1500-1450	IC.226 (CA20.1)	Fragment	1	0	0.1	0	.798	Cyprus	0	Soles & Davaras 1994
		Building A, room 2	1500-1450	IC.227 (CA20.2)	Fragment	n/a	0	0.1	0	.116	Cyprus	0	Soles & Davaras 1994
		Building A, room 2	1500-1450	IC.228 (CA20.3)	Fragment	n/a	0	0	0	.089	Cyprus	0	Soles & Davaras 1994
		Building A, room 2	1500-1450	IC.229 (CA20.4)	Fragment	n/a	0	0.1	0	.134	Cyprus	0	Soles & Davaras 1994
		Building A	1500-1450	IC.230 (CA20.5)	Fragment	n/a	0	0	0	.061	Cyprus	0	Soles & Davaras 1994
		Building A	1500-1450	IC.231 (CA20.6)	Fragment	n/a	0	0	0	.076	Cyprus	0	Soles & Davaras 1994
		Building A	1500-1450	IC.232 (CA20.7)	Fragment	n/a	0	0	0	.14	Cyprus	0	Soles & Davaras 1994
		Building A	1500-1450	IC.233 (CA20.8)	Fragment	n/a	0	0.1	0	.14	Cyprus	0	Soles & Davaras 1994
		Building A	1500-1450	IC.234 (CA20.9)	Fragment	n/a	0	0	0	.062	Cyprus	0	Soles & Davaras 1994
		Building A	1500-1450	IC.235 (CA 20.10)	Fragment	n/a	0	0	0	.174	Cyprus	0	Soles & Davaras 1994
		Building A	1500-1450	IC.236 (CA 20.11)	Fragment	n/a	0	0.1	0	.231	Cyprus	0	Soles & Davaras 1994
		Building A	1500-1450	IC.237 (CA 20.12)	Fragment, probably oxhide	n/a	0	0.1	0	.215	Cyprus	0	Soles & Davaras 1994
		Building A	1500-1450	IC.238 (CA 20.13)	Fragment	n/a	0	0	0	.035	Cyprus	0	Soles & Davaras 1994

		Building A	1500-1450	IC.239 (CA 20.14)	Fragment	n/a	0	0	0	.031	Cyprus	0	Soles & Davaras 1994
		Building A	1500-1450	IC.240 (CA 20.15)	Fragment	n/a	0	0	0	.029	Cyprus	0	Soles & Davaras 1994
		Building A, room 1	1500-1450	IC.241 (CA 82)	Fagment	n/a	0	0	0	.098	Cyprus	0	Soles & Davaras 1994
		Building A, room 4	1500-1450	IC.244 (CA 221)	Fragment	n/a	0	0	0	.30	Cyprus	0	Soles & Davaras 1994
		Building B, room 13E	1500-1450	IC.242 (CA 95)	Fragment	n/a	0	0.1	0	.539	Cyprus	0	Soles & Davaras 1994
		Building A, room 6	1500-1450	IC.243 (CA 123)	Fragment	n/a	0	0.1	0	.667	Cyprus	0	Soles & Davaras 1994
Crete	Chania	n/a	1500-1450	55	Fragment	n/a	n/a	n/a	n/a	n/a	Cyprus	0	Stos-Gale et. al 2000, 207, No. 4
		n/a	LM II	56	Fragment	n/a	n/a	n/a	n/a	n/a	Cyprus	0	Stos-Gale et. al 2000, 207, No. 5
		n/a	LM III AI	57	Fragment	n/a	n/a	n/a	n/a	n/a	Cyprus	0	Stos-Gale et. al 2000, 207, No. 8
Crete	Kommos	n/a	LM	59	Fragment	?	3	4	2	.05	n/a	0	Blitzer 1995, 501, no. M2
		n/a	LM	60 n	Fragment	?	3	4	2.5	.04	n/a	0	Blitzer 1995, 501, no. M3
		n/a	LM	62	Fragment	?	4	4.6	1.6	.08	n/a	0	Blitzer 1995, 501, no. M5
		n/a	LM	63	Fragment	?	4	0.5	2.3	.14	n/a	0	Blitzer 1995, 501, no. M6
		n/a	LM	58	Fragment	?	3	3	1.6	n/a	n/a	0	Blitzer 1995, 501, no. M1
		n/a	LM	61	Fragment	?	2	3	1.3	.02	n/a	0	Blitzer 1995, 501, no. M4
	Knossos	Long Corridor	LMI-II	1962	Fragment	?	n/a	n/a	n/a	n/a	n/a	0	Evely 2000 344 no.33
Crete	Tylissos	Unknown	1500-1450	1763b	Complete?	1	n/a	n/a	n/a	n/a	n/a	0	Mangou/Iannou 2000, 213; Hakulin 2004
		Unknown	1500-1450	1763a	Complete?	1	n/a	n/a	n/a	n/a	n/a	0	Mangou/Iannou 2000, 213; Hakulin 2004
		Unknown	1500-1450	1764	Complete?	1	0	0.4	0.1	27	n/a	0	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
Crete	Haghia Triadha	Vano 7 (palace storeroom)	1500-1450	6(HM 721)	Complete	1	0	0.5	0	27	Unknown	2 Incised marks (Table 12: F3, K3)	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
		Vano 7 (palace storeroom)	1500-1450	7 (HM722)	Complete	1	0	0.4	0.1	27	unknown	1 Incised (Table 12: F2)	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004

		Vano 7 (palace storeroom)	1500-1450	8 (HM723)	Complete	1	0	0.4	n/a	n/a	Unknown	1 Incised (Table 12: E1 or F2)	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
		Vano 7 (palace storeroom)	1500-1450	9 (HM724)	Complete	1	0	0.4	n/a	n/a	Unknown	1 Incised (Table 12: E4)	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
		Vano 7 (palace storeroom)	1500-1450	10(HM725)	Complete	1	0	0.4	0.1	30	Unknown	2 Incised marks (Table 12: D4, E3)	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
		Vano 7 (palace storeroom)	1500-1450	11(HM726α)	Complete	1	n/a	n/a	n/a	n/a	Unknown	1 Incised (Table 12: F1)	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
		Vano 7 (palace storeroom)	1500-1450	12(HM726β)	Complete	1	n/a	n/a	n/a	n/a	Unknown	1 Incised (Table 12: E5)	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
		Vano 7 (palace storeroom)	1500-1450	13(HM726γ)	Complete	1	n/a	n/a	n/a	n/a	Unknown	1 Incised (Table 12: F4)	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
		Vano 7 (palace storeroom)	1500-1450	14(HM726δ)	Complete	1	0	0.4	n/a	n/a	Unknown	0	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
		Vano 7 (palace storeroom)	1500-1450	15(HM726ε)	Complete	1	0	0.4	n/a	n/a	Unknown	0	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
		Vano 7 (palace storeroom)	1500-1450	16(HM726ζ)	Complete	1	0	0.5	n/a	n/a	Unknown	0	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
		Vano 7 (palace storeroom)	(1500-1450	17(HM726η)	Complete	1	0	0.5	n/a	n/a	Unknown	Ssmall hollow at centre" - possible concavity.	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
		Vano 7 (palace storeroom)	1500-1450	18(HM726Θ)	Complete	1	0	0.5	n/a	n/a	Unknown	"Hollow" - unverified concavity?	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
		Vano 7 (palace storeroom)	1500-1450	19(HM726t)	Complete	1	0	0.4	n/a	n/a	Unknown	0	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
		Vano 7 (palace storeroom)	1500-1450	20(HM726K)	Complete	1	0	0.4	n/a	n/a	Unknown	0	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
		Vano 7 (palace storeroom)	1500-1450	21(HM726λ)	Complete	1	0	0.4	n/a	n/a	Unknown	0	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
		Vano 7 (palace storeroom)	1500-1450	22(HM726μ)	Complete	1	0	0.3	n/a	n/a	Unknown	0	Mangou/Iannou 2000, 213; Evely 2000: Hakulin 2004
		Vano 7 (palace storeroom)	1500-1450	23	Fragment		n/a	n/a	n/a	n/a	Unknown	0	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004

		Vano 7 (palace storeroom)	1500-1450	24	Fragment		n/a	n/a	n/a	n/a	Unknown	0	Mangou/Iannou 2000, 213; Evely 2000; Hakulin 2004
Syria	Tell Ras Shamra	Unknown, unpublished	LBA	n/a	2-3 Fragments		n/a	n/a	n/a	n/a	Unknown	n/a	Bass 1967: 57; Jones 2007: Appendix II
Ger-many	Oberwil-flingen	Hoard	14th - 13th c.	n/a	4 Fragments	n/a	n/a	n/a	n/a	n/an	n/a	0	Primas & Pernicka 1998:25-65; Primas 2005: 389
Sardinia	Alghero	Surface; near Nuraghe	FBA	n/a	Fragment	2	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 268-269; 1989:36; Lo Schiavo 1998:100
Sardinia	Arzachena	Hoard in covered bowl; under floor, base of room wall; top terrace.	Rba	20969	Edge fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 229-233; Lo Schiavo 1990: 19; Begemann et al 2001: 45-46
		Hoard in covered bowl; under floor, base of room wall; top terrace.	Rba	20967	Edge fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 229-233; Lo Schiavo 1990: 19; Begemann et al 2001: 45-46
		Hoard in covered bowl; under floor, base of room wall; top terrace.	Rba	20972	Edge fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 229-233; Lo Schiavo 1990: 19; Begemann et al 2001: 45-46
		Hoard in covered bowl; under floor, base of room wall; top terrace.	Rba	20968	Edge fragment	n/a	0	0	0	0	Unknown	0	Lo Schiavo 2009a: 229-233; Lo Schiavo 1990: 19; Begemann et al 2001: 45-46
		Hoard in covered bowl; under floor, base of room wall; top terrace.	Rba	20971	Fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 229-233; Lo Schiavo 1990: 19; Begemann et al 2001: 45-46
		Hoard in covered bowl; under floor, base of room wall; top terrace.	Rba	20970	Fragment	n/a	0	0	0	0	Unknown	0	Lo Schiavo 2009a: 229-233; Lo Schiavo 1990: 19; Begemann et al 2001: 45-46
Sardinia	Abini/Teti	unknown – near nuragic sanctuary	RBA-FBA	n/a	Fragment	n/a	0	0.1	.032,.038	1	Unknown	1 Impressed, rough side (Table 11: A2).	Lo Schiavo 2009a: 308-309; 1989: 34; Lo Schiavo 1982: 271

		Unknown – near nuragic sanctuary	RBA-FBA	A 1046	Edge fragment	n/a	0	0.1	.028, .038	2	Unknown	0	Lo Schiavo 2009a: 308-309; Lo Schiavo 1989: 34; Lo Schiavo 1982: 271
		Unknown - near nuragic sanctuary	RBA-FBA	A 1047	Edge fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 308-309; Lo Schiavo 1989: 34; Lo Schiavo 1982: 271
		Unknown – near nuragic sanctuary	RBA-FBA	A 1042	Edge fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 308-309; Lo Schiavo 1989: 34; Lo Schiavo 1982: 271
		Unknown – near nuragic sanctuary	RBA-FBA	A 1043	Edge fragment	n/a	0	0.1	.026, .038	1	Unknown	0	Lo Schiavo 2009a: 308-309; Lo Schiavo 1989: 34; Lo Schiavo 1982: 271
		Unknown - near nuragic sanctuary	RBA-FBA	A 1044	Edge fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 308-309; Lo Schiavo 1989: 34; Lo Schiavo 1982: 271
		Unknown – near nuragic sanctuary	RBA-FBA	A1041	Edge fragment	n/a	0	0.1	.03, .036	1	Unknown	0	Lo Schiavo 2009a: 308-309; Lo Schiavo 1989: 34; Lo Schiavo 1982: 271
		Unknown – near nuragic sanctuary	RBA-FBA	A1048	Edge fragment	n/a	0	0.1	.036, .04	1	Unknown	0	Lo Schiavo 2009a: 308-309; Lo Schiavo 1989: 34; Lo Schiavo 1982: 271
		Unknown – near nuragic sanctuary	RBA-FBA	A1021	Fragment	n/a	0	0.1	.03, .038	1	Unknown	0	Lo Schiavo 2009a: 308-309; Lo Schiavo 1989: 34; Lo Schiavo 1982: 271
		Unknown – near nuragic sanctuary	RBA-FBA	A1049	Edge fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 308-309; Lo Schiavo 1989: 34; Lo Schiavo 1982: 271
		Unknown - near nuragic sanctuary	RBA-FBA	A 1035q	Edge fragment	n/a	0	0.1	.03, .036	1	Unknown	0	Lo Schiavo 2009a: 308-309; Lo Schiavo 1989: 34; Lo Schiavo 1982: 271
		Unknown - near nuragic sanctuary	RBA-FBA	n/a	Fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 308-309; Lo Schiavo 1989: 34; Lo Schiavo 1982: 271
		Unknown - near nuragic sanctuary	RBA-FBA	n/a	Edge fragment	n/a	0	0.1	.028, .034	0	Unknown	0	Lo Schiavo 2009a: 308-309; 1989: 34; Lo Schiavo 1982: 271
		Unknown - near nuragic sanctuary	RBA-FBA	n/a	Fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 308-309;1989: 34; Lo Schiavo 1982: 271

		Unknown - near nuragic sanctuary	RBA-FBA	n/a	Edge fragment	n/a	0	0.1	.028, .034	0	Unknown	0	Lo Schiavo 2009a: 308-309; Lo Schiavo 1989: 34; Lo Schiavo 1982: 271
Sardinia	Assemini	Unknown (destroyed)	LBA?	n/a	Unknown # fragments	n/a	n/a	n/a	n/a	n/a	Unknown	0	Lo Schiavo 2009a: 381; Lo Schiavo 1989: 35
Sardinia	Belvi'	Unknown	LBA	60497	Fragment	n/a	0	0.1	.032, .038	2	Unknown	0	Lo Schiavo 2009a: 321; Lo Schiavo 1989: 35
Sardinia	Capoterra	Unknown	LBA?	n/a	Fragment	2?	0	0.2	.05, .07	5	Unknown	1 Impressed between handles, rough side (Table 11: A2)	Lo Schiavo 2009a: 382; Lo Schiavo 1989: 35
Sardinia	Fonni	Between megaron & "Round Temple;" nuragic sanctuary.	LBA?	n/a	Fragment	n/a	0	0	0	n/a	Unknown	0	Lo Schiavo 2009a: 313-315; Lo Schiavo 1998: 100
		Between megaron & "Round Temple;" nuragic sanctuary.	LBA?	n/a	Fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a: 313-315; Lo Schiavo 1998: 100
		Between megaron & "Round Temple;" nuragic sanctuary.	LBA?	n/a	Fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a: 313-315; Lo Schiavo 1998: 100
		Between megaron & "Round Temple;" nuragic sanctuary.	LBA?	n/a	Fragment	n/a	0	0	0	n/a	Unknown	0	Lo Schiavo 2009a: 313-315; Lo Schiavo 1998: 100
		Between megaron & “Round Temple;” nuragic sanctuary.	LBA?	n/a	Fragment	n/a	0	0	0	n/a	Unknown	0	Lo Schiavo 2009a: 313-315; Lo Schiavo 1998: 100
		Between megaron & "Round Temple;" nuragic sanctuary.	LBA?	n/a	Fragment	n/a	0	0	0	n/a	Unknown	0	Lo Schiavo 2009a: 313-315; Lo Schiavo 1998: 100

Sardinia	Dorgali	Unknown-near nuragic remains.	LBA?	n/a	Fragment	n/a	0	0.1	0	2	Unknown	0	Lo Schiavo 2009a: 306-307; Lo Schiavo 1989: 34
Sardinia	Ittereddu	Probable hoard; foot of nuraghe tower.	Rba	60495	Edge fragment	n/a	0	0.1	.024, .041	1	Unknown	0	Lo Schiavo 2009a: 287-9; Lo Schiavo 1989: 33-34; Begemann et al 2001: 47.
		Probable hoard; foot of nuraghe tower.	Rba	60491	Fragment	n/a	0	0.1	.013, .034	1	Unknown	0	Lo Schiavo 2009a: 287-289; Lo Schiavo 1989: 33-34; Begemann et al 2001: 47.
		Probable hoard; foot of nuraghe tower.	Rba	60492	Edge fragment	n/a	0	0.1	.019, .031	1	Unknown	0	Lo Schiavo 2009a: 287-289; Lo Schiavo 1989: 33-34; Begemann et al 2001: 47.
		Probable hoard; foot of nuraghe tower.	Rba	60496	Edge fragment	n/a	0	0.1	.018, .029	1	Unknown	0	Lo Schiavo 2009a: 287-289; Lo Schiavo 1989: 33-34; Begemann et al 2001: 47.
		Probable hoard; foot of nuraghe tower.	Rba	60493	Edge fragment	n/a	0	0.1	.033, .041	1	Unknown	0	Lo Schiavo 2009a: 287-289; Lo Schiavo 1989: 33-34; Begemann et al 2001: 47.
		Probable hoard; foot of nuraghe tower.	Rba	60494	Edge fragment	n/a	0	0.1	.013, .025	0	Unknown	0	Lo Schiavo 2009a: 287-289; Lo Schiavo 1989: 33-34; Begemann et al 2001: 47.
Sardinia	Ittereddu	Hoard; covered vase in passage to nuraghe tower.	Rba	n/a	At least 19 oxhide ingot fragments	n/a	n/a	n/a	n/a	n/a	n/a	0	Lo Schiavo 2009a: 290-292; Lo Schiavo 1989: 33-34; Begemann et al 2001: 47
Sardinia	Lanusei	Area of nuragic village now destroyed.	LBA?	38477	Fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 338-339; Lo Schiavo 1982: 272
Sardinia	Nuoro Province	Near Mt. Gruttas	LBA?	38479	Fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 304-305; Lo Schiavo 1989: 34
		Near Mt. Gruttas	LBA?	38480	Fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 304-305; Lo Schiavo 1989: 34
		Near Mt. Gruttas	LBA?	38481	Fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 304-305; 1989: 34

		Near Mt. Gruttas	LBA?	38551	Fragment	n/a	0	0	0	0	Unknown	0	Lo Schiavo 2009a: 304-305; Lo Schiavo 1989: 34
Sardinia	Olbia	In carinate cup next to nuragic wall.	LBA?	n/a	Handle fragment	n/a	0	0.2	0	1.386, 1.424	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Handle fragment	n/a	0	0.1	0	.9207, .948	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Edge fragment	n/a	0	0.1	0	.969, .992	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Edge fragment	n/a	0	0.1	0	.75722, .794	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Edge fragment	n/a	0	0.1	0	.8389, .852	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Handle fragment	n/a	0	0.1	0	.9308, .958	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Handle fragment	n/a	0	0.1	0	.47069, .498	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Edge fragment	n/a	0	0.1	0	.40272, .418	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Edge fragment	n/a	0	0.1	0	.53219, .554	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Handle fragment	n/a	0	0.1	0	.3181, .328	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Edge fragment	n/a	0	0	0	.16286, .168	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Edge fragment	n/a	0	0	0	.17183, .178	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Edge fragment	n/a	0	0.1	0	.23367, .246	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Edge fragment	n/a	0	0	0	.09741, .102	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Fragment	n/a	0	0	0	.07803, .082	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107

		In carinate cup next to nuragic wall.	LBA?	n/a	Fragment	n/a	0	0	0	.041 14, .042	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Fragment	n/a	0	0	0	.121 15, .126	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Edge fragment	n/a	0	0	0	.099 41, .104	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Fragment	n/a	0	0	0	.168 65, .176	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Edge fragment	n/a	0	0.1	0	0.26 453, .274	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Fragment	n/a	0	0	0	.522 88, .540	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Fragment	n/a	0	0	0	.295 22, .304	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Edge fragment	n/a	0	0.1	0	.355 8, .364	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Fragment	n/a	0	0	0	0.06 806, .074	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
		In carinate cup next to nuragic wall.	LBA?	n/a	Edge fragment	n/a	0	0.1	0	.031 17, .034	Unknown	0	Lo Schiavo 2009a: 235-239; Lo Schiavo 1998: 105-107
Sardinia	Olbia	Near nuragic temple.	LBA?	n/a	Fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 240-242;
Sardinia	Ortueri	Unknown	LBA	60498	Fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a:318-20; 1989:34; Stos-Gale & Gale 1992:333
		Unknown	LBA	60499	Fragment	n/a	0	0	0	0	Unknown	0	Lo Schiavo 2009a:318-20 1989:34; Stos-Gale & Gale 1992:333
Sardinia	Oschiri	Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Handle fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Edge fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36

		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Handle fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Edge fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Edge fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Handle fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Handle fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Handle fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Handle fragment	n/a	0	0	0	0	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Edge fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36

		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Fragment	n/a	0	0	0	0	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Fragment	n/a	0	0	0	0	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
		Probably hoard near nuraghe of S. Giorgio.	LBA	n/a	Fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a: 243-245; Tylecote 1984: 141; Lo Schiavo 1989: 35-36
Sardinia	Ozieri	Unknown	LBA?	n/a	Complete	2	0	0.4	0	23	Unknown	1 Impressed at handle base, rough side (Table 11: A1)	Lo Schiavo 2009a: 270-281; 1989:33; Bass 1967: 61
Sardinia	Ozieri	Hoard	LBA?	n/a	Fragment	n/a	n/a	n/a	n/a	n/a	Unknown	0	Jones 2007: Appendix II
Sardinia	Ossi	Unknown; near nuragic village.	FBA	Inv. 10622	Fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a: 246-248; 1989: 35-6; Tylecote 1984: 141
Sardinia	Pattada	Hoard within nuragic village, near to fountain and nuraghe.	11th c.	SAS 16A	Edge fragment	n/a	0	0.1	0	1.5885, 1.607	Unknown	0	Lo Schiavo 2009a: 296-303; Lo Schiavo 1998:100-104; Begemann et al 2001: 48.
		Hoard within nuragic village, near to fountain and nuraghe.	11th c.	SAS 16B	Edge fragment	n/a	0	0.1	0	1.507, 1.533	Unknown	0	Lo Schiavo 2009a: 296-303; Lo Schiavo 1998:100-104; Begemann et al 2001: 48.

		Hoard within nuragic village, near to fountain and nuraghe.	11th c.	SAS 16C	Edge fragment	n/a	0	0.1	0	.686, .708	Unknown	0	Lo Schiavo 2009a: 296-303; Lo Schiavo 1998:100-104; Begemann et al 2001: 48.
		Hoard within nuragic village, near to fountain and nuraghe.	11th c.	SAS 16D	Edge fragment	n/a	0	0.1	0	.879, .892	Unknown	0	Lo Schiavo 2009a: 296-303; Lo Schiavo 1998:100-104; Begemann et al 2001: 48.
		Hoard within nuragic village, near to fountain and nuraghe.	11th c.	SAS 16E	Edge fragment	n/a	0	0.1	0	.97, .997	Unknown	0	Lo Schiavo 2009a: 296-303; Lo Schiavo 1998:100-104; Begemann et al 2001: 48.
		Hoard within nuragic village, near to fountain and nuraghe.	11th c.	SAS 16F	Fragment	n/a	0	0.1	0	.553, .563	Unknown	0	Lo Schiavo 2009a: 296-303; Lo Schiavo 1998:100-104; Begemann et al 2001: 48.
		Near nuragic village, unpublished.	11th c.	n/a	Fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 296-303; 1998:100-044; Begemann et al 2001: 48.
Sardinia	Santoni	Surface find	LBA?	n/a	Fragments	n/a	n/a	n/a	n/a	n/a	Unknown	0	Jones 2007: Appendix II
Sardinia	Sàrdara	Hoard; ceramic bowl under floor of hut.	LBA? (Below 9th c. floor.)	n/a	Handle fragment	n/a	0	0.1	.04, .047	1	Unknown	0	Lo Schiavo 2009a:362-366; Vagnetti & Lo Schiavo 1989: 226
		Hoard; ceramic bowl under floor of hut.	LBA? (Below 9th c. floor.)	n/a	Handle fragment	n/a	0	0.1	0	1	Unknown	1Incised on rough side, unintelligible	Lo Schiavo 2009a:362-366; Vagnetti & Lo Schiavo 1989: 226
		Hoard; ceramic bowl under floor of hut.	LBA? (Below 9th c. floor.)	n/a	Edge fragment	n/a	0	0.1	.032, .037	1	Unknown	1Incised on rough side, unintelligible	Lo Schiavo 2009a:362-366; Vagnetti & Lo Schiavo 1989: 226
		Hoard; ceramic bowl under floor of hut.	LBA? (Below 9th c. floor.)	n/a	Edge fragment	n/a	0	0.1	.032, .04	1	Unknown	0	Lo Schiavo 2009a:362-366; Vagnetti & Lo Schiavo 1989: 226
		Hoard; ceramic bowl under floor of hut.	LBA? (Below 9th c. floor.)	n/a	Edge fragment	n/a	0	.07, .112	.02, .03	1	Unknown	0	Lo Schiavo 2009a:362-366; Vagnetti & Lo Schiavo 1989: 226
		Hoard; ceramic bowl under floor of hut.	LBA? (Below 9th c. floor.)	n/a	Edge fragment	n/a	0	0.1	.03, .042	1	Unknown	0	Lo Schiavo 2009a:362-366; Vagnetti & Lo Schiavo 1989: 226

		Hoard; ceramic bowl under floor of hut.	LBA? (Below 9th c. floor.)	n/a	Edge fragment	n/a	0	0.1	.032, .045	1	Unknown	0	Lo Schiavo 2009a:362-366; Vagnetti & Lo Schiavo 1989: 226
		Hoard; ceramic bowl under floor of hut.	LBA? (Below 9th c. floor.)	n/a	Edge fragment	n/a	0	0.1	.019, .03	n/a	Unknown	0	Lo Schiavo 2009a:362-366; Vagnetti & Lo Schiavo 1989: 226
		Hoard; ceramic bowl under floor of hut.	LBA? (Below 9th c. floor.)	n/a	Edge fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a:362-366; Vagnetti & Lo Schiavo 1989: 226
		Hoard; ceramic bowl under floor of hut.	LBA? (Below 9th c. floor.)	n/a	Fragment	n/a	0	0.1	.021, .036	n/a	Unknown	0	Lo Schiavo 2009a:362-366; Vagnetti & Lo Schiavo 1989: 226
		Hoard; ceramic bowl under floor of hut.	LBA? (Below 9th c. floor.)	n/a	Fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a:362-366; Vagnetti & Lo Schiavo 1989: 226
		Hoard; ceramic bowl under floor of hut.	LBA? (Below 9th c. floor.)	n/a	Fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a:362-366; Vagnetti & Lo Schiavo 1989: 226
		Hoard; ceramic bowl under floor of hut.	LBA? (Below 9th c. floor.)	n/a	Fragment	n/a	0	0.1	.031, .036	n/a	Unknown	0	Lo Schiavo 2009a:362-366; Vagnetti & Lo Schiavo 1989: 226
		Hoard; ceramic bowl under floor of hut.	LBA? (Below 9th c. floor.)	n/a	Fragment	n/a	0	0.1	.018, .026	n/a	Unknown	0	Lo Schiavo 2009a:362-366; Vagnetti & Lo Schiavo 1989: 226
		Hoard; ceramic bowl beneath floor of hut.	LBA? (Below 9th c. floor.)	n/a	Edge fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a:362-366; Vagnetti & Lo Schiavo 1989: 226
Sardinia	Nuragus	Surface, near nuraghe Serra Ilixi.	LBA (14th c.)	7880	Complete	2	.275, .33	.475, .525	.03, .035	27	Unknown	1 Impressed, center of rough side (Table 11: B1); side chisel marks (Table 13: M or C)	Lo Schiavo 2009a: 345-8; Bass 1967: 61; Lo Schiavo 1989: 35; Buchholz 1959: 38-9
		Surface, near nuraghe Serra Ilixi.		10882	Complete	2	.17, .35	.47, .72	0.1	33	Unknown	2, center of rough side (Table 12: D2, D1); concavity, mold side	Lo Schiavo 2009a: 345-8; Bass 1967: 61; Lo Schiavo 1989: 35; Buchholz 1959: 38-9
		Surface, near nuraghe Serra Ilixi.		10881	Complete	2	.18, .34	.45, .645	0	33	Unknown	1 impressed between handles, rough side (Table 11:A2); 1 incised, handle base, mold side (Table 12:D3)	Lo Schiavo 2009a: 345-8; Bass 1967: 61; Lo Schiavo 1989: 35; Buchholz 1959: 38-9

		Surface, near nuraghe Serra Ilixi.		n/a	2 Complete ingots (lost)	2	n/a	n/a	n/a	n/a	Unknown	n/a	Lo Schiavo 2009a: 345-8; 1989: 35; Bass 1967: 61; Buchholz 1959: 38-9
Sardinia	Soleminis	Surface find	LBA?	181945	Fragment	n/a	0	0	0	0	Unknown	0	Lo Schiavo 2009a: 379-380; Vagnetti & Lo Schiavo 1989: 226
		Surface find	LBA?	181944	Fragment	n/a	0	0	0	0	Unknown	0	Lo Schiavo 2009a: 379-380; Vagnetti & Lo Schiavo 1989: 226
		Surface find	LBA?	181946	Fragment	n/a	0	0	0	0	Unknown	0	Lo Schiavo 2009a: 379-380; Vagnetti & Lo Schiavo 1989: 226
		Surface find	LBA?	181943	Fragment	n/a	0	0	0	1	Unknown	0	Lo Schiavo 2009a: 379-380; Vagnetti & Lo Schiavo 1989: 226
Sardinia	Sorgano	Unknown	LBA	n/a	17 Fragments	n/a	n/a	n/a	n/a	n/a	n/a	0	Jones 2007: Appendix II; Buchholz 1959: 39
Sardinia	Tertenia	2nd Level of "east tower b" of nuragic complex.	LCIIC	10231	Fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 349; Lo Schiavo 1989: 34
		2nd Level of "east tower b" of nuragic complex.	LCIIC	10230	Fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a: 349; Lo Schiavo 1989: 34
Sardinia	Triei	Hoard; bowl below floor of hut.	LBA?	60497	Edge fragment	n/a	0	0.1	0	2	Unknown	0	Lo Schiavo 2009a: 325-327; Lo Schiavo 1989: 34
Sardinia	Villagrande Strisaili	Possibly near lintel of nuraghe.	LBA?	n/a	Handle fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a:329-331; Lo Schiavo 1989: 34
		Possibly near lintel of nuraghe.	LBA?	n/a	Handle fragment	n/a	0	0.1	0.1	n/a	Unknown	0	Lo Schiavo 2009a:329-331; Lo Schiavo 1989: 34
		Possibly near lintel of nuraghe.	LBA?	n/a	Handle fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a:329-331; Lo Schiavo 1989: 34
		Possibly near lintel of nuraghe.	LBA?	n/a	Handle fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a:329-331; Lo Schiavo 1989: 34
		Possibly near lintel of nuraghe.	LBA?	n/a	Handle fragment	n/a	0	0.1	n/a	n/a	Unknown	0	Lo Schiavo 2009a:329-331; Lo Schiavo 1989: 34
		Possibly near lintel of nuraghe.	LBA?	n/a	Handle fragment	n/a	0	0.1	n/a	n/a	Unknown	0	Lo Schiavo 2009a:329-331; Lo Schiavo 1989: 34

		Possibly near lintel of nuraghe.	LBA?	n/a	Edge fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a:329-331; Lo Schiavo 1989: 34
		Possibly near lintel of nuraghe.	LBA?	n/a	Edge fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a:329-331; Lo Schiavo 1989: 34
		Possibly near lintel of nuraghe.	LBA?	n/a	Edge fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a:329-331; Lo Schiavo 1989: 34
		Possibly near lintel of nuraghe.	LBA?	n/a	Fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a:329-331; Lo Schiavo 1989: 34
		Possibly near lintel of nuraghe.	LBA?	n/a	Fragment	n/a	0	0.1	.03, .035	n/a	Unknown	0	Lo Schiavo 2009a:329-331; Lo Schiavo 1989: 34
		Possibly near lintel of nuraghe.	LBA?	n/a	Fragment	n/a	0	0.1	.025, .03	n/a	Unknown	0	Lo Schiavo 2009a:329-331; Lo Schiavo 1989: 34
		Possibly near lintel of nuraghe.	LBA?	n/a	Fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a:329-331; Lo Schiavo 1989: 34
Sardinia	Villagrande Strisaili	2 hoards; room with "Temple Repository."	Lba	n/a	15 Fragments	n/a	n/a	n/a	n/a	n/a	n/a	0	Lo Schiavo 2009a: 336-337; Lo Schiavo 1989: 34
Sardinia	Villagrande Strisaili	Inside large nuragic complex.	LBA	n/a	Fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a: 332-333
		Inside large nuragic complex.	LBA	n/a	Fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a: 332-333
Sardinia	Villanova-forru	Clay pot, 30cm below surface.	rca-fba	BS1	Edge fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a: 378-360; Lo Schiavo 1989: 35; Stos-Gale & Gale 1992: 330-33
		Clay pot, 30cm below surface.	rca-fba	BS2	Edge fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a: 378-360; Lo Schiavo 1989: 35; Stos-Gale & Gale 1992: 330-33
		Clay pot, 30cm below surface.	rca-fba	BS3	Edge fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 1989:35; 2009a: 378-360; Stos-Gale & Gale 1992: 330-33
		Clay pot, 30cm below surface.	rca-fba	BS4	Handle fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 1989: 35; 2009a: 378-360; Stos-Gale & Gale 1992: 330-33

		Clay pot, 30cm below surface.	rca-fba	BS5	Edge fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a: 378-360; Lo Schiavo 1989: 35; Stos-Gale & Gale 1992: 330-33
		Clay pot, 30cm below surface.	rca-fba	BS7	Edge fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a: 378-360; Lo Schiavo 1989: 35; Stos-Gale & Gale 1992: 330-33
		Clay pot, 30cm below surface.	rca-fba	BS9	Edge fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a: 378-360; Lo Schiavo 1989: 35; Stos-Gale & Gale 1992: 330-33
		Clay pot, 30cm below surface.	rca-fba	BS10	Edge fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a: 378-360; Lo Schiavo 1989: 35; Stos-Gale & Gale 1992: 330-33
		Clay pot, 30cm below surface.	rca-fba	BS13	Edge fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a: 378-360; Lo Schiavo 1989: 35; Stos-Gale & Gale 1992: 330-33
		Clay pot, 30cm below surface.	rca-fba	BS45	Edge fragment	n/a	0	0.1	.034, .048	n/a	Unknown	0	Lo Schiavo 2009a: 378-360; Lo Schiavo 1989: 35; Stos-Gale & Gale 1992: 330-33
Sardinia	Baradili	Hoard in ceramic pot.	LBA	n/a	Handle fragment	n/a	0	0.1	.042, .048	2	Unknown	0	Lo Schiavo 2009a: 354-356
		Hoard in ceramic pot.	LBA	n/a	Handle fragment	n/a	0	0.1	0	2	Unknown	0	Lo Schiavo 2009a: 354-356
		Hoard in ceramic pot.	LBA	n/a	Edge fragment	n/a	0	0.1	.034, .038	1	Unknown	0	Lo Schiavo 2009a: 354-356
		Hoard in ceramic pot.	LBA	n/a	Edge fragment	n/a	0	0.1	.024, .027	0	Unknown	0	Lo Schiavo 2009a: 354-356
		Hoard in ceramic pot.	LBA	n/a	Edge fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 354-356
		Hoard in ceramic pot.	LBA	n/a	Edge fragment	n/a	0	0.1	.024, .028	0	Unknown	0	Lo Schiavo 2009a: 354-356
		Hoard in ceramic pot.	LBA	n/a	Edge fragment	n/a	0	0	0	0	Unknown	0	Lo Schiavo 2009a: 354-356
		Hoard in ceramic pot.	LBA	n/a	Fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 354-356
		Hoard in ceramic pot.	LBA	n/a	Edge fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 354-356
		Hoard in ceramic pot.	LBA	n/a	Edge fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 354-356
		Hoard in ceramic pot.	LBA	n/a	Edge fragment	n/a	0	0.1	0.1	1	Unknown	0	Lo Schiavo 2009a: 354-356
		Hoard in ceramic pot.	LBA	n/a	Edge fragment	n/a	0	0.1	.027, .03	0	Unknown	0	Lo Schiavo 2009a: 354-356

		Hoard in ceramic pot.	LBA	n/a	Edge fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 354-356
		Hoard in ceramic pot.	LBA	n/a	Edge fragment	n/a	0	0	0	0	Unknown	0	Lo Schiavo 2009a: 354-356
Sardinia	Ghiramonte (Siniscola)	Surface	LBA	n/a	Fragment	n/a	0	0	0	n/a	Unknown	0	Lo Schiavo 2009a: 302-303
		Surface	LBA	n/a	Fragment	n/a	0	0	0	n/a	Unknown	0	Lo Schiavo 2009a: 302-303
Sardinia	Giva 'e Molas (Villasor)	Surface	LBA	VI/RI 683	Handle fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 367-368
		Surface	LBA	VI/SI 675	Handle fragment	n/a	0	0.1	0	2	Unknown	0	Lo Schiavo 2009a: 367-368
		Surface	LBA	VI/SA 678	Edge fragment	n/a	0	0.1	0	1	Unknown	0	Lo Schiavo 2009a: 367-368
		Surface	LBA	VI/SA 677	Edge fragment	n/a	0	0.1	.028, .034	1	Unknown	0	Lo Schiavo 2009a: 367-368
		Surface	LBA	VI/SA 676	Edge fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 367-368
		Surface	LBA	VI/SA 679	Edge fragment	n/a	0	0	0	0	Unknown	0	Lo Schiavo 2009a: 367-368
		Surface	LBA	VI/RI 680	Fragment	n/a	0	0	0	0	Unknown	0	Lo Schiavo 2009a: 367-368
		Surface	LBA	VI/RI 681	Fragment	n/a	0	0	0	0	Unknown	0	Lo Schiavo 2009a: 367-368
		Surface	LBA	VI/RI 682	Fragment	n/a	0	0.1	0	0	Unknown	0	Lo Schiavo 2009a: 367-368
Sardinia	Nieddiu (Nurallao)	Unknown-Nuragic area	LBA	n/a	Fragment	n/a	0	0.1	.03, .036	0	Unknown	0	Lo Schiavo 2009a:342-344
Sardinia	Talana	Unknown – by nuraghe.	LBA	n/a	Fragment	n/a	0	0.1	0	n/a	Unknown	0	Lo Schiavo 2009a: 323-324
Sardinia	Seulo	Unknown	LBA	n/a	Fragment	n/a	0	0.1	0	0	nknown	0	Lo Schiavo 2009a: 340-341
Sardinia	Monastir	Surface of nuragic structures 34S, 25.	LBA	n/a	Fragments	n/a	n/a	n/a	n/a	n/a	Unknown	0	Lo Schiavo 2009a: 377-378
Bulgaria	Cernozem	Unknown	LBA	n/a	Complete	2a	0	0.7	.03, .052	26	Unknown	1 Incised between handles, rough side (Table 12:D6); concavity, center mold side	Buchholz 2005:152; Jones 2007: Appendix II; Leshtakov 2005: 449, PL. CIX
Bulgaira	Cape Kalliakra	Unknown; possibly from sea.	LBA?	n/a	Mini ingot	n/a	0	0.3	0	1	Unknown	0	Leshtakov 2005: 449, PL. CIX; Lichardus et al. 2002: 165; Hiller 1991:209-210

Bulgaria	Tcherkovo (Cerkovo)	Unknown	LBA	n/a	Complete	2	0	0.6	0	26	Unknown	1 Incised between handles, rough side (Table 12:G1)	Leshtakov 2005: 449, PL. CIX; Kolb 2004; Dimitrov 1979:70-79; Stos-Gale et al. 1997:112
Bulgaria	Yabalkovo	Unknown	LBA	n/a	Miniature ingot	n/a	n/a	n/a	n/a	n/a	Unknown	4 Incised marks, all handles, rough side (Table 12:G6); chisel marks on sides	Leshtakov 2005: 450, PL. CIX
Bulgaria	Kameno/Pobit-kamak	Unknown	LBA	I 3772	Complete	2	0	0.7	0	23	Unknown	1Iincised, center, rough side (Table 12:G5)	Leshtakov 2005: 449, PL. CIX
		Unknown	LBA	I 3773	Complete	2	0	0.7	0	27	Unknown	0	Leshtakov 2005: 449, PL. CIX
Croatia	Makarska (?)	Unknown	LBA?	n/a	Mini ingot	3	0	0.1	n/a	0	Unknown	0	Buchholz 1959: 37; Catling 1964: 269, n.3; Bass 1967:61; Forenbaher 1995: 272
Keos	Ayia Irini	Unknown	LHII	n/a	Fragment		n/a	n/a	n/a	n/a	Cypriot	0	Mangou & Ioannou 2000: 208, 213; Weiner 1990: 146; Gale 1991:226
			LHII	n/a	Fragment	n/a	n/a	n/a	n/a	n/a	Cyprio	0	Mangou & Ioannou 2000: 208, 213; Weiner 1990: 146; Gale 1991:226
		Unknown	LHII	n/a	1/2 Ingot	n/a	n/a	n/a	n/a	n/a	Cypriot	0	Mangou & Ioannou 2000:208, 213; Weiner 1990: 146; Gale 1991:226
Chios	Emporio	Unknown	LH III C	n/a	Fragment	n/a	n/a	n/a	n/a	n/a	Cypriot	0	Gale 1991:226; Jones 2007: Appendix II
Greece	Tiryns	Unknown	LBA	n/a	Fragment	n/a	n/a	n/a	n/a	n/a	Unknown	0	Mangou & Ioannou 2000: 207, 215; Jones 2007:Appendix II
Greece	Aegina	Unknown	LBA?	n/a	Fragment	n/a	n/a	n/a	n/a	n/a	Unknown	0	Buchholz 1959: 36; Jones 2007: Appendix II
Greece	Athens	Existence questionable according to Buchholz.	LBA?	n/a	Possible ingot	n/a	n/a	n/a	n/a	n/a	Unknown	0	Buchholz 1959: 36; Jones 2007: Appendix II
Greece	Kyme	Found in sea.	16th-15th C.	n/a	Complete	1	0	0.4	0	18	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
		Found in sea.	16th-15th C.	n/a	Complete	1	0	0.4	0	17	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61

		Found in sea.	16th-15th C.	n/a	Complete	1	0	0.4	0	17	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
		Found in sea.	16th-15th C.	n/a	Complete	1	0	0.4	0	14	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
		Found in sea.	16th-15th C.	n/a	Complete	1	0	0.4	0	14	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
		Found in sea.	16th-15th C.	n/a	Complete	1	0	0.4	0	13	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
		Found in sea.	16th-15th C.	n/a	Complete	1	0	0.4	0.1	13	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
		Found in sea.	16th-15th C.	n/a	Complete	1	0	0.4	0	13	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
		Found in sea.	16th-15th C.	n/a	Complete	1	0	0.4	0.1	13	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
		Found in sea.	16th-15th C.	n/a	Complete	1	0	0.4	0	13	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
		Found in sea.	16th-15th C.	n/a	Complete	1	0	0.4	0	12	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
		Found in sea.	16th-15th C.	n/a	Complete	1	0	0.4	0	12	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
		Found in sea.	16th-15th C.	n/a	Complete	1	0	0.4	0	11	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
		Found in sea.	16th-15th C.	n/a	Complete	1	0	0.4	0	10	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61

		Found in sea.	16th-15th C.	n/a	Complete	1	0	0.4	0	9	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
		Found in sea.	16th-15th C.	n/a	Complete	1	0	0.3	0	7	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
		Found in sea.	16th-15th C.	n/a	Complete	1	0	0.4	0	5	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
		Found in sea.	16th-15th C.	n/a	Fragment	1	n/a	n/a	0	9	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
		Found in sea.	16th-15th C.	n/a	Fragment	1	n/a	n/a	0	8	Unknown	0	Demakopoulou 1998:37; Buchholz 1959:36-37; Bass 1967:61
Greece	Mycenae	Outside palace	14th c.	n/a	Complete	2b	0	0.6	0.1	n/a	Unknown	1 Impressed between handles, rough side (Table 11:A2)	Buchholz 1959: 36; Iakovides 1974: 297;;Mangou & Ioannou 2000: 210-211, 215; Stubbings 1979: 296; Wace 1953: 6-7, Pl. 2a
		Poros Wall Hoard	c. 1340-1200	n/a	Fragment	n/a	n/a	n/a	n/a	n/a	n/a	1 Impressed, rough side (Table 11:B2)	Wace 1953:6-7, Pl. 2a; Stubbings 1979:296; Mangou and Ioannou 2000: 210-211, 215
		Poros Wall Hoard	c. 1340-1200	n/a	11 Fragments (no individual specifics)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Wace 1953:6-7, Pl. 2a; Stubbings 1979:296; Mangou and Ioannou 2000: 210-211, 215
		Small bronze hoard	LH IIB-C	n/a	Fragment	2	n/a	n/a	n/a	n/a	Unknown	n/a	Bass 1967: 61; Mylonas 1962: 406-408, Pl. 121
Greece	Nauplion Museum	Unknown	LBA?	n/a	Handle fragment	n/a	n/a	n/a	n/a	n/a	n/a	0	Gale 1991: 226; Jones 2007: Appendix II; Catling 1964:269
Greece	Salamis	n/a	c.1200	n/a	Fragments	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Jones 2007: Appendix II
Greece	Thebes	Unknown	LBA	n/a	Fragment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Mangou & Ioannou 2000: 208; Jones 2007: Appendix II

		Unknown	LBA	n/a	Fragment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Mangou & Ioannou 2000: 208; Jones 2007: Appendix II
		Unknown	LBA	n/a	Fragment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Mangou & Ioannou 2000: 208
Cyprus	Alassa-Pano Mandilaris	Room Π, cultic	c. 1275-1200	n/a	1/2 Miniature ingot	n/a	n/a	n/a	n/a	n/a	n/a	0	Hadjisavvas 1986: 62-67; Hadjisavvas 1989: 38-39
Cyprus	Bay of Soli	Recovered. from sea.	LBA	n/a	Ingot (lost)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Bass 1967: 61; Jones 2007: Appendix II
Cyprus	Unknown	Unknown	LBA	1936/VI-19/1	Miniature ingot	n/a	n/a	n/a	n/a	n/a	n/a	Incised inscription	Jones 2007: Appendix II; Catling 1964: 269; Knapp 1986: 26
Cyprus	Maroni-Vournes	Beneath/ around large Ashlar Building	c.1300	MV/M18 1	Fragment	n/a	0	0	0	n/a	Cypriot	0	Kassianidou: 2009:46-47; Cadogan 1987:83
		Beneath/ around large Ashlar Building	c.1300	MV/M20 1	Fragment	n/a	0	0.1	n/a	n/a	Cypriot	0	Kassianidou: 2009:46-47; Cadogan et al 2001: 77-78; Cadogan 1984:1-10
		Beneath/ around large Ashlar Building	c.1300	MV/M21 0	Fragment	n/a	0	0	n/a	n/a	Cypriot	0	Kassianidou: 2009:46-47; Cadogan et al 2001: 77-78; Cadogan 1984:1-10
		Beneath/ around large Ashlar Building	c.1300	MV/M21 6a	Fragment	n/a	0	0	n/a	n/a	Cypriot	0	Kassianidou: 2009:46-47; Cadogan et al 2001: 77-78; Cadogan 1984:1-10
		Beneath/ around large Ashlar Building	c.1300	MV/M21 6b	Fragment	n/a	0	0	n/a	n/a	Cypriot	0	Kassianidou: 2009:46-47; Cadogan et al 2001: 77-78; Cadogan 1984:1-10
		Beneath/ around large Ashlar Building	c.1300	MV/M26 0	Fragment	n/a	n/a	n/a	n/a	n/a	Cypriot	0	Kassianidou: 2009:46-47; Cadogan et al 2001: 77-78; Cadogan 1984:1-10
		Beneath/ around large Ashlar Building	c.1300	MV/M18 1	Fragment	n/a	0	0.1	0	n/a	Cypriot	0	Kassianidou: 2009:46-47; Cadogan et al 2001: 77-78; Cadogan 1984:1-10
Cyprus	Maroni-Tsaroukkas	Building 1 - ZW/15, 2.3	LCIIC	MT449	Fragment	n/a	0	0	0	n/a	Cypriot	0	Manning 1998: 42, 45; Manning & De Mita 1997: 126-128; Kassianidou 2009:47
Cyprus	Kalavasos-Ayias Dhimitrios	Room A50; large ashlar masonry building.	c.1300-1200	K-AD468	Fragment	n/a	0	0	0	1	Cypriot	0	South et al. 1989:123; South 1983:104, fig. 11

		Room A50; large ashlar masonry building.	c.1300-1200	K-AD471	Fragment	n/a	0	0.1	.027, .042	0	Cypriot	0	South et al. 1989:123; South 1983:104, fig. 11
		Room A50; large ashlar masonry building.	c.1300-1200	K-Ad588	Fragment	n/a	0	0.1	0	0	Cypriot	0	South et al. 1989:123; South 1983:104, fig. 11
Cyprus	Pyla Kokkino-kremos	Bronze hoard; pit in external courtyard; Complex B.	LCIIC	Inv. No. 65a	Handle fragment	n/a	.036, .078	0.1	.041, .059	2	Cypriot	0	Muhly & Maddin 1989: 472; Karageorghis & Demas 1984: 12, 55-57, 63
		Bronze hoard; pit in external courtyard; Complex B.	LCIIC	Inv. No. 65b	Handle fragment	n/a	.032, .036	0.1	0	0	Cypriot	0	Muhly & Maddin 1989: 472; Karageorghis & Demas 1984: 12, 55-57, 63
		Bronze hoard; pit in external courtyard; Complex B.	LCIIC	Inv. No. 65a	Fragment	n/a	n/a	n/a	n/a	n/a	Cypriot	0	Muhly & Maddin 1989: 472; Karageorghis & Demas 1984: 12, 55-57, 63
		Bronze hoard; pit in external courtyard; Complex B.	LCIIC	Inv. No. 65b	Fragment	n/a	n/a	n/a	n/a	n/a	Cypriot	0	Muhly & Maddin 1989: 472; Karageorghis & Demas 1984: 12, 55-57, 63
		Bronze hoard; pit in external courtyard; Complex B.	LCIIC	Inv. No. 65c	Fragment	n/a	n/a	n/a	n/a	n/a	Cypriot	0	Muhly & Maddin 1989: 472; Karageorghis & Demas 1984: 12, 55-57, 63
Cyprus	Maa-Palaeo-kastro	Unknown	c.1250-1200	n/a	Fragment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Muhly & Maddin 1988: 471-472, Pl. A; Zwicker 1988: 429
		Area 1, Rooms 1 and 2.	c.1250-1200	n/a	Corner fragment	n/a	n/a	n/a	n/a	28	Cypriot	0	Muhly & Maddin 1988: 471-472, Pl. A; Zwicker 1988: 429
Cyprus	Mathiatis	Bronze hoard in circular depression.	LBA	1936/VII-17/9a	Quarter ingot with handle	n/a	0	0.2	.047, .052	5	Cypriot	0	Kassianidou 2009:52-54, 68-69; Bruce 1937: 639-671, Fig. 14; Catling 1964:283; Muhly et al. 1980: 84-95;Knapp 1986:26
		Bronze hoard in circular depression.	LBA	1936/VII-17/9b	Corner fragment	n/a	0	0.2	.045, .05	4	Cypriot	0	Kassianidou 2009:52-54, 68-69; Bruce 1937: 639-671, Fig. 14; Muhly et al. 1980: 84-95

		Bronze hoard in circular depression.	LBA	1936/VII-17/9d	Corner fragment	n/a	0	0.1	0	2	Cypriot	0	Kassianidou 2009:52-54, 68-69; Bruce 1937: 639-671, Fig. 14; Catling 1964:283; Muhly et al. 1980: 84-95;Knapp 1986:26
		Bronze hoard in circular depression.	LBA	1936/VII-17/9e	Handle fragment	n/a	0	0.1	0	1	Cypriot	0	Kassianidou 2009:52-54, 68-69; Bruce 1937: 639-671, Fig. 14; Catling 1964:283; Muhly et al. 1980: 84-95;Knapp 1986:26
		Bronze hoard in circular depression.	LBA	1936/VII-17/9f	Edge fragment	n/a	0	0.1	0	2	Cypriot	0	Kassianidou 2009:52-54, 68-69; Bruce 1937: 639-671, Fig. 14; Catling 1964:283; Muhly et al. 1980: 84-95;Knapp 1986:26
		Bronze hoard in circular depression.	LBA	1936/VII-17/9g	Fragment	n/a	0	0.1	0	1	Cypriot	0	Kassianidou 2009:52-54, 68-69; Bruce 1937: 639-671, Fig. 14; Catling 1964:283; Muhly et al. 1980: 84-95;Knapp 1986:26
		Bronze hoard in circular depression.	LBA	1936/VII-17/9h	Edge fragment	n/a	0	0.1	0	1	Cypriot	0	Kassianidou 2009:52-54, 68-69; Bruce 1937: 639-671, Fig. 14; Catling 1964:283; Muhly et al. 1980: 84-95;Knapp 1986:26
		Bronze hoard in circular depression.	LBA	1936/VII-17/9i	Edge fragment	n/a	0	0.1	0	1	Cypriot	0	Kassianidou 2009:52-54, 68-69; Bruce 1937: 639-671, Fig. 14; Catling 1964:283; Muhly et al. 1980: 84-95;Knapp 1986:26
		Bronze hoard in circular depression.	LBA	1936/VII-17/9j	Fragment	n/a	0	0	0	0	Cypriot	0	Kassianidou 2009:52-54, 68-69; Bruce 1937: 639-671, Fig. 14; Catling 1964:283; Muhly et al. 1980: 84-95; Knapp 1986:26
		Bronze hoard in circular depression.	LBA	1936/VII-17/9k	Fragment	n/a	0	0	0	0	Cypriot	0	Kassianidou 2009:52-54, 68-69; Bruce 1937: 639-671, Fig. 14; Catling 1964:283; Muhly et al. 1980: 84-95;Knapp 1986:26

		Bronze hoard in circular depression.	LBA	Inv. No. 1936/VII-17/9l	Mini ingot fragment	n/a	0	0.1	0	0	Cypriot	0	Kassianidou 2009:52-54, 68-69; Bruce 1937: 639-671, Fig. 14; Catling 1964:283; Muhly et al. 1980: 84-95; Kassianidou 2009:52-54, 68-69
		Bronze hoard in circular depression.	LBA	n/a	16 Fragments	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Bruce 1937: 639-71, Fig.14;Kassianidou 2009:52-4, 68-9; Catling 1964:283; Muhly et al. 1980: 84-95;Knapp 1986:26
Cyprus	Skourio-tissa	Unknown	LBA	1976-I-20/6	Corner fragment	n/a	0	0.1	0	3	Cypriot	0	Gale 1991:201; Stos-Gale et al. 1997:107; Jones 2007: Appendix II
		Unknown	LBA	1976-I-20/7a	Fragment	n/a	0	0.2	0	2	Cypriot	0	Gale 1991:201; Stos-Gale et al. 1997:107; Jones 2007: Appendix II
		Unknown	LBA	1976-I-20/7b	Fragment	n/a	0	0.2	0	1	Cypriot	0	Gale 1991:201; Stos-Gale et al. 1997:107; Jones 2007: Appendix II
		Unknown	LBA	1976-I-20/7c	Fragment	n/a	0	0.1	0	1	Cypriot	0	Gale 1991:201; Stos-Gale et al. 1997:107; Jones 2007: Appendix II
		Unknown	LBA	1976-I-20/7d	Fragment	n/a	0	0.1	n/a	0	Cypriot	0	Gale 1991:201; Stos-Gale et al. 1997:107; Jones 2007: Appendix II
		Unknown	LBA	1976-I-20/7e	Edge fragment	n/a	0	0.1	0	n/a	Cypriot	0	Gale 1991:201; Stos-Gale et al. 1997:107; Jones 2007: Appendix II
		Unknown	LBA	1976-I-20/7f	Handle fragment	n/a	0	0.1	0	0	Cypriot	0	Gale 1991:201; Stos-Gale et al. 1997:107; Jones 2007: Appendix II
Cyprus	Enkomi	"Foundry Hoard"	12th c.	18,970,40 1.15	Complete	3	0	0.7	0.1	37	Cypriot	1 Impressed between handles, rough side (Table 11:B5)	Murray et al. 1900:16-17; Catling 1964:278, 286
		"Foundry Hoard"	12th c.	1897,0401 .1520.12	Fragment	n/a	0	0.1	0	n/a	Cypriot	0	Murray et al. 1900:16-17; Catling 1964:278, 286

		"Foundry Hoard"	12th c.	1897,0401 .1520.13	Fragment	n/a	0	0.1	0	n/a	Cypriot	0	Murray et al. 1900:16-17; Catling 1964:278, 286
		"Foundry Hoard"	12th c.	1897,0401 .1520.14	Fragment	n/a	0	0.1	0	n/a	Cypriot	0	Murray et al. 1900:16-17; Catling 1964:278, 286
		"Foundry Hoard"	12th c.	1897,0401 .1520.15	Fragment	n/a	0	0.1	0	n/a	Cypriot	0	Murray et al. 1900:16-17; Catling 1964:278, 286
		"Foundry Hoard"	12th c.	1897,0401 .1520.33	Fragment	n/a	0	0.1	0	n/a	Cypriot	0	Murray et al. 1900:16-17; Catling 1964:278, 286
		"Foundry Hoard"	12th c.	1897,0401 .1520.36	Fragment	n/a	0	0.1	0	n/a	Cypriot	0	Murray et al. 1900:16-17; Catling 1964:278, 286
		Ingot Hoard, Quartier 6W	c. 1200	1939/VI-20/4	Complete	2	0	0.7	.039, .055	39	Cypriot	0	Kassianidou: 2009:45
		Ingot Hoard, Quartier 6W	c. 1200	n/a	Complete	2	0	0.7	.0375, .056	32	Cypriot	1 Impressed between handles, rough side (Table 11:A1)	Kassianidou: 2009:45
		Ingot Hoard, Quartier 6W	c. 1200	n/a	5 Mini ingots	2	n/a	n/a	n/a	n/a	Cypriot	n/a	Schaeffer 1952: 28; Kassianidou 2009:45
		Ingot Hoard, Quartier 6W	c. 1200	n/a	Half ingot	n/a	n/a	n/a	n/a	n/a	n/a	1 Impressed, rough side (Table 11:C1, C2, or C3)	Lagarce 1971:297
		Quartier 5W	c. 1400	n/a	Corner fragment	n/a	n/a	n/a	n/a	n/a	n/a	0	Catling 1964:268; Lagarce & Lagarce 1986:66
		Bronze Hoard, Well 212, Quartier 5E	c.1200	19	Edge fragment	n/a	0	0.1	.0345, .042	n/a	Cypriot	0	Lagarce 1971:405, 415-417
		P.T. 352, Quartier 5E	c.1300	99a	Fragment	n/a	0	0.2	0	2	Cypriot	0	Courtois 1984; Kassianidou 2009: 46; Jones 2007: Appendix
		P.T. 352, Quartier 5E	c.1300	99b	Fragment	n/a	0	0.1	0	1	Cypriot	0	Courtois 1984; Kassianidou 2009: 46; Jones 2007: Appendix
		P.T. 343, Quartier 3W	c. 1300-1200	80a	Edge fragment	n/a	0	0.1	.025, .037	0	Cypriot	0	Courtois 1984:22; Kassianidou 2009: 46; Jones 2007: Appendix II
		P.T. 343, Quartier 3W	c. 1300-1200	80c	Edge fragment	n/a	0	0.1	.037, .046	0	Cypriot	0	Courtois 1984:22; Kassianidou 2009: 46
		P.T. 783, Quartier 3W	c. 1300-1200	121B	Fragment	n/a	0	0.1	0	2	Cypriot	0	Courtois 1982:166-7; Courtois 1984:37; Kassianidou 2009:46

		P.T. 783, Quartier 3W	c. 1300-1200	121G	Handle fragment	n/a	0	0.1	0.1	1	Cypriot	0	Courtois 1982:166-7; Courtois 1984:37; Kassianidou 2009:46
		P.T. 708, Quartier 5E	c. 1300-1200	82a	Possible fragment	n/a	0	0	0	0	Cypriot	0	Courtois 1982:166-7; Courtois 1984:37; Kassianidou 2009:46
		P.T. 708, Quartier 5E	c. 1300-1200	82b	Possible fragment	n/a	0	0	0	0	Cypriot	0	Courtois 1982:166-7; Courtois 1984:37; Kassianidou 2009:46
		P.T. 708, Quartier 5E	c. 1300-1200	82c	Possible fragment	n/a	0	0.1	0	0	Cypriot	0	Courtois 1982:166-7; Courtois 1984:37; Kassianidou 2009:46
		P.T. 1458, Quartier 3W	c. 1300-1200	Fragment J	Fragment	n/a	0	0.1	0	0	Cypriot	0	Courtois 1984:40; Kassianidou 2009:46; Jones 2007: Appendix II

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