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UNIVERSITY OF SOUTHAMPTON

Faculty of Arts and Humanities

Archaeology

**A new assessment of ceramics from the site of Al-Ukhdud in Najran, and its
implications for the economy of South Arabia (500 B.C. – A.D. 600)**

Volume 1 of 1

by

Abdullah S. Basonbol

Thesis for the degree of Doctor of Philosophy

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Abstract

Faculty of Arts and Humanities

Archaeology

Thesis for the degree of Doctor of Philosophy

A new assessment of ceramics from the site of Al-Ukhudud in Najran, and its implications
for the economy of South Arabia (500 B.C. – A.D. 600)

by

Abdullah S. Basonbol

Pottery is one of the most numerous and durable archaeological artefacts collected during surveys and excavations, and it can provide significant evidence about human activities. Pottery is likewise the most abundant archaeological materials at the site of Al-Ukhudud, which is located in the region of Najran, South of Saudi Arabia along the border with Yemen. However, no detailed modern study of material from this area currently exists to present new thoughts about the society and economy of South Arabia. With the absence of literary sources on the history of settlement and economy in this area, the aim of this study is to apply quantified pottery data and its implications to the economic question concerning the occupants of pre-Islamic Al-Ukhudud. My research is concentrated on the pottery from the pre-Islamic period, in particular materials discovered during the seasons of survey and excavation undertaken by the Saudi Commission for Tourism and National Heritage, Antiquities and Museums Sector in 1996 and 2000. Specifically, I have considered the impact of trade and exchange in Al-Ukhudud in order to understand the nature of economic exchange and communications between local society and surrounding area. How can we understand the implication of traded vs local pottery for the economic system of Al-Ukhudud, with regards to the movement of people, materials and goods between communities, and the influence of transportation on interaction and connection? This research also is a step to understand and compare the patterns of local and/or non-local trade vs consumptions of domestic pottery that emerged in Al-Ukhudud between 500 B.C. and 600 A.D. This research is an attempt to understand the economic system through pottery in the light of very little knowledge of both Al-Ukhudud's

pottery, and South Arabian pottery in general. However, it is hoped that the body of data and analysis within this thesis will represent a first step along the path to addressing these fundamental concerns.

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Research Thesis: Declaration of Authorship

Abdullah S. Basonbol

A new assessment of ceramics from the site of Al-Ukhdud in Najran, and its implications for the economy of South Arabia (500 B.C. – A.D. 600).

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission.

Signature: **Abdullah Basonbol**

Date: **March 10, 2021**

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Chapter 1 Introduction to the Project

1.1 Introduction

The Arabian Peninsula has provided the setting for a series of ancient, complex and interconnecting societies, during both prehistoric and, historic eras. These powerful polities originated especially in the southern regions of the Arabian Peninsula, and developed close inter-relations and inter-connections at all cultural, political, economic, religious, and social levels (Al-Ansary and Al-Mareeh 2007; Ba-faqih, 1985). These outward-looking polities also formed a link between the societies of the southern Arabian Peninsula and those in the middle, to the north and the east of it on the one hand, and the civilizations of the Levant, Mesopotamia, Egypt, Persia, and India on the other, in the first millennium B.C. (Artzy, 1994).

Over the past three decades, archaeological investigations in the Arabian Peninsula, specifically excavations at settlement sites including, Hureidha (Ḥaḍramawt) (Thompson, 1944), Hajar Bin Ḥumeid (Van Beek, 1969), Beihân and Mârib (Bowen and Albright, 1958) in Yemen, and Jurash (Al-Ghamedi, 1996), Qaryat Al-Fâw (Al-Ansary, 1982), Al-Kharj (Al-Ghazzi, 1990), Zubaidah (Gazdar, 1982), Al-Deffi (Al-Amer, 1996), Dadan, Al-'Ula (Al-Shehry, 2014) and Tayma (Al-Onazi, 2006) in Saudi Arabia, and Ras al-Khaimah in United Arab Emirates (Kennet, 2004) have revealed much information about the historical periods during which these sites were in use. In particular, material recovered from these excavations has provided data that has improved our understanding of the chronology of settlement in the Arabian Peninsula, with the establishment of a ceramic sequence and a attempts to relate it to political chronologies rooting in epigraphic evidence (Thompson, 1944; Van Beek, 1969; Bowen and Albright, 1958; Jamme, 1962 and 1966; Philby and Tritton, 1944; Beeston, 1987-1988; Al-Otaibi, 2006). These excavations specifically in South Arabia have also provided bodies of evidence relating to aspects of South Arabian society, especially urbanism, including domestic and massive architectural, which have allowed new insights into the social and political organization of South Arabian society (Thompson, 1944; Van beek, 1969; Bowen and Albright, 1958; Al- Ghamedi, 1996). Likewise, studies of material evidence have begun to inform us in a preliminary way about the activities and interactions of past populations across time (Thompson, 1944; Van Beek, 1969; Zarins et al, 1981 and 1983; Al-Zahrani et al, 2001, 2002, 2005, 2006 and 2012). The time is thus right for a more detailed analysis of South Arabian society of 500 B.C to 600 A.D., drawing on these new bodies of evidence in order to shed light on specific aspects of cultural, social and economic activity.

The essential role of trade and exchange in South Arabia has long been noted by scholars (Van Beek, 1960; Kennet, 2004; Magee, 2004; Demange, 2010; Fedele, 2014). The strategic location of South Arabia between the Indian Ocean sphere and that of the Middle East and Eastern Mediterranean made it a key corridor for the transport of various goods, most famously frankincense, over long distance (Doe, 1971; Groom, 1981; Al-Saud, 1997; Van Beek, 1960). However, the importance of trade at the local and/ or regional levels is much less well understood in terms of its contribution of the development and continued prosperity of South Arabian polities and society. The emergence of towns and villages in the region, and their recent archaeological investigation, provides an opportunity to investigate their association with trade, exchange and connectivity.

In the wider region, trade and exchange are known to have played a pivotal role in the formation of the first nucleus of several important settlements, now archaeological sites, especially those located on overland trade routes. Examples of this are located from as far north as Jordan (Petra) (Hogarth, 1904; Deblauwe, 1992; Singer, 2007), with many more in the northern and central areas of the Arabian Peninsula (Qurayyah, Al-Jawf, Tayma, Mada'in Saleh, Dadan (Al-'Ula), Madinah, Makkah, Thaj, Tarut, Layla and Qaryat Al-Fāw) (Al-Saud, 1997; Al-Zahrani, 2014). In South Arabia, such settlements include the important site of Al-Ukhdud, which will be the primary subject of this thesis, but also other sites located as far south as Marib, Aden, Qana, Taqah/ Samhar (Singer, 2007; Al-Saud, 1996; Philby and Tritton, 1944; Dayton and Dayton 1978/ 1979; Groom, 1981; O'Leary, 1927). The land trade routes from South to North Arabia run from Qanā, Shabwā, Timna', Ma'rb, Baraqish, Najran, from Najran, there are two branches of the route, one is went eastward through Qaryat Al-Fāw, and the second route continue northward to reach Tabalah, then Makkah, then Yathrib (al-Madinah), then Dadān (Al-'Ulā), Madā'in Sāleḥ and Taymā', al-Jawf and then the route heads towards to North of Arabia to Mesopotamia (Al-Saud, 1996, Groom, 1981, Philby and Tritton, 1944; Maraqtan, 1996) (Figure 1-1).

Some of these settlements, such as Qaryat Al-Fāw dated from around 3rd century B.C. to 3rd century A.D. (Al-Ansary, 1982; El-Hassan and Khabir (in press) and Al-Rabadhah dated as an Islamic settlement from early Islamic period to the middle of 'Abbasid period (Al-Rashid, 1986), today in Saudi Arabia, began as commercial stations and stopping places for convoys. At the site of Qaryat Al-Fāw, the commercial activities of exchange clearly imported the development of this settlement and its prosperity, and must thus, have played a role in the growth of the population, and changes in its social character as well.



Figure 1-1: Map of the trade routes in the Arabian Peninsula and the location of the settlements on the trade routes from South to North.

(Al-Zahrani, 2014, Figure 2).

In some ancient Arabian inscriptions, Qaryat Al-Fāw was mentioned as “Dhat Kahl”, which means the city of Dhat Kahl (Al-Ansary, 1982; Jamme, 1962), and the name of Kahal was found in many walls in the market area, in the houses area, and on incense burners. The location on the trade routes was reflected in the flourishing of Qaryat Al-Fāw through the architectural style of the houses, tombs and temples, and the decorations of their houses of various drawings, and the discovered materials, such as metal and marble statues. The significant trade impact on Qaryat Al-Fāw and its community was making their own coinage and inscribed the name of their “God Khal” on the coins (Al-Ansary, 1982).

The above archaeological sites and associated scholarship have thus demonstrated the important roles that trade, and exchange played during the period from 300 B.C. to middle Islamic period “Abbasid period” across the region, while the importance of trading connection for the development of complex polities in South Arabia has already been noted. However, at present no settlement-specific study of the impact of commercial activity on urban centre in South Arabia exists with a particular focus on the relationship between trade and connectivity, and urban settlement and communities. It is this absence that the current study attempts to address. Therefore, the important question that this study will address is the role that trade, exchange and connectivity played during 500 B.C. to 600 A.D. in the establishment of settlements (in particular Al-Ukhudud) and the impact of trade on the location, development and organisation of the settlement and its population.

1.2 Research Aims and Objectives

The aims and objectives of this study are thus as follow:

1. To investigate the impact and influence of trade in Al-Ukhudud by means of an analysis and characterisation of ceramic assemblages, in order to determine the nature and scale of economic exchange and communications among local populations and surrounding communities.
2. To consider the implication of traded vs local pottery for our understanding of the economic system of this ancient society, with reference of the movement of people, materials and goods between local and external communities, and the impact of transportation on interaction and connectivity.
3. Lastly, to understand and contrast the patterns of local and/ or long-distance (external/ or nonlocal) trade vs consumption of local goods that emerged in Al-Ukhudud between 500 B.C. and 600 A.D., specifically by means of an analysis of the distribution of archaeological materials in the site, which will allow comparison of the characteristics of different parts of the ancient town.

This study will examine archaeological material that has been revealed from the excavations at Al-Ukhudud in the region of Najran in the south of Saudi Arabia, with a particular focus on pottery. Pottery is closely related to economic activity and configuration through understanding the methods of its production, relocation and consumption, whether local or nonlocal (external). The recognition of patterns of pottery production and consumption at the site leads us to address one of the research objectives: defining the strength of commercial activity carried out at the site during the period under consideration through the identification of imported ceramic material. This study

will also reflect on the multiplicity of pottery production methods and the presence (or not) of local pottery production in the vicinity, and its nature and organisation. A focus on ceramic fabrics will provides important evidence for the main source of ceramic materials at the site, with implications for understanding local industries. The distribution of pottery wares and types across the excavated part of the site helps us to understand the nature of the local and distance/long-distance (nonlocal) production and exchange networks into which Al-Ukhduḍ was integrated. This research considers the extent to which trade and exchange to/from and within the site was active, and where possible, to what extent it influenced the construction of stratified social identities and the prosperity of the settlement.

As mentioned above, this study will be applied to archaeological materials that have been discovered from the site of Al-Ukhduḍ, located within the modern province of Najran, which occupies most of the southern part of the Kingdom of Saudi Arabia, along the border with Yemen (Figure 1-2).



Figure 1-2 Map of Saudi Arabia showing the location of Najran province.

https://www.google.com/url?sa=i&source=images&cd=&cad=rja&uact=8&ved=2ahUKEwiRsrzUjuTkAhUMhRoKHdd0BX4Qjhx6BAGBEAI&url=https%3A%2F%2Fes.m.wikipedia.org%2Fwiki%2FArchi vo%3ANajran_in_Saudi_Arabia.svg&psig=AOvVaw3Q_I15buTKkNc257wz1A5K&ust=1569230864292800

Najran province is home to a number of important modern and ancient towns, including Najran itself (the capital of the province and the modern descendant of the nearby site of Al-Ukhduḍ), Habuna, Kubash, Ḥimā and Yadama (Ministry of Education, 1999) (Figure 1-3). These are the largest the main towns in Najran, but indeed there are other small towns and villages. For example, Ḥimā or Bi'r Ḥimā, which refers to many ancient wells that found in Ḥimā, this town is located about 128

km north to Najran, and includes around 13 important locations of rock arts and ancient Arabian inscriptions, and some of rock arts presented drawings of herding animals, people hunting, drawing of human in large scales and other drawings presenting different types of weapons, such as spears, shields, bows and narrows, and in addition to some ancient Arabian inscriptions like the inscription of the Himyarite King Yūsuf 'As'ar and King Yūsuf 'As'ar Yath'ar and other Arabic inscriptions (Al-Ansary and Al-Mareeh, 2007; Ministry of Education, 1999). The spreading of ancient wells in Ḥimā can be indicated that this area was one of the main routes for conveys that departed from South to Central or North Arabia.

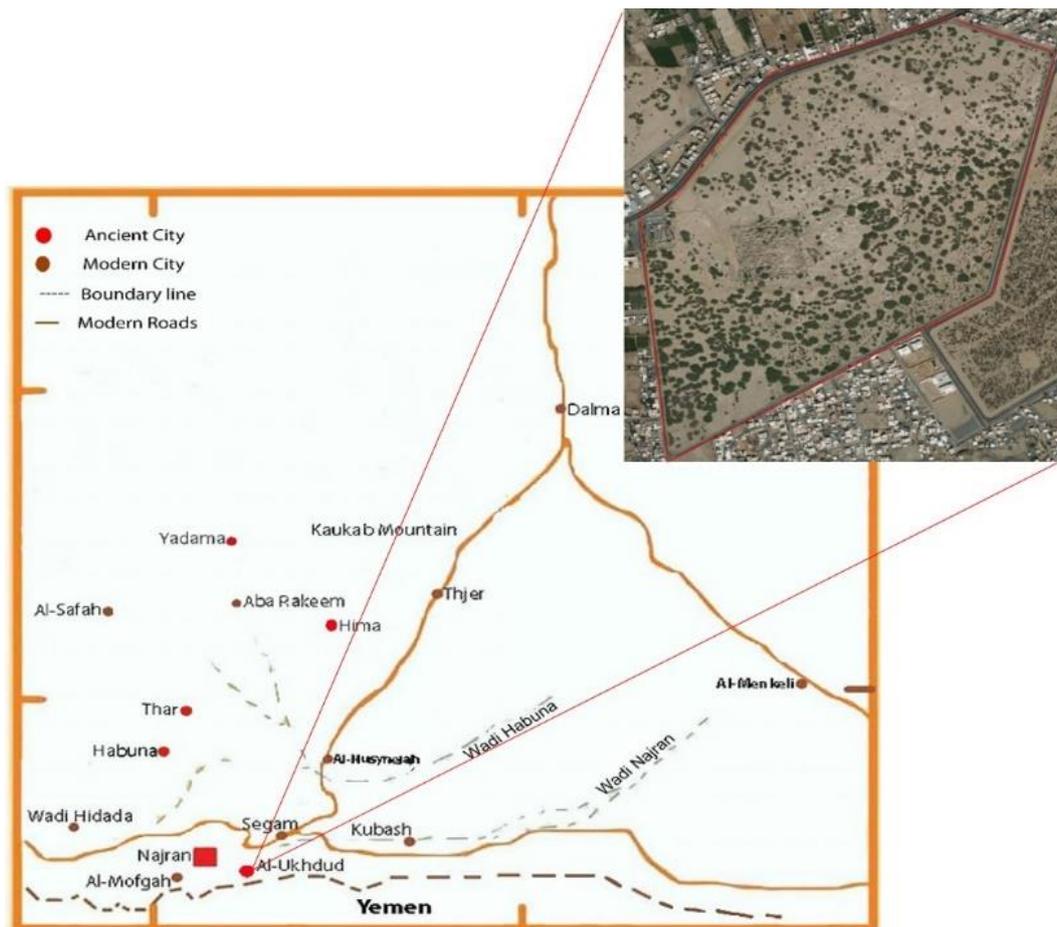


Figure 1-3 Map of Najran province showing Al-Ukhdud site.

Edited by A. Basonbol. (Al-Ansary and Al-Marreh, 2003, pp.9).

This study will cover the period from 500 B.C. to 600 A.D. In South Arabia, witnessed a commercial activity that started in the south of the Arabian Peninsula, and moved north that may have occurred during the 12th or 11th century B.C. (Demange, 2010). The commercial prosperity in south Arabia began to take shape around the 8th century B.C., a period that witnessed the rise of a number of complex polities often termed the 'southern Arabia Kingdoms' according to the discovery made by the Italian expedition to Yemen in 1988-1989 in Wādī Yalā site at Ḥawlān Aṭ-Ṭiyāl western of Marīb of some ancient inscriptions contained list of kings of Saba' "mukarribs" dated to 8th century B.C.,

another discovery was the construction inscription in Al-Suwda' Temple at Al-Jawf in Yemen support the idea of the prosperity of South Arabian Kingdoms by mentioning the "mukarribs" dated also to 8th century B.C. To this period 8th century B.C., some south Arabian inscriptions (Mūsnaḍ script) discovered in Palestine mentioned the frankincense in external sources; therefore, we can say that this is the signal of spreading the frankincense trade outside the region of South Arabia. These evidences can lead us to say that the trade was significant support for the prosperity of South Arabian complex polities (Arbach, 2009). Trading activity has been credited with the promotion and prosperity of most of the South Arabian Kingdoms and their archaeological territories (Van Beek, 1958; Groom, 1976). This trade was particularly associated with South Arabian incense production exporting to markets in eastern and northern Arabia. Over time, levels of trade increased and strengthened around the 5th/ 4th century B.C., an increase that has been to the domestication of camels in southern Arabia, which facilitated the transition of commodities and materials at large scales and in less time (Groom, 1981; Al-Saud, Van Beek, 1960; 1996; Fedele, 2014). The domestication of the camel assisted the establishment of strong and prosperous independent settlements, with considerable production and clear interaction with surrounding societies. The earliest evidences of using camel in Arabia were the historical reports that mentioned the attacks of Midianites from North Arabia into Palestine around 1100 B.C., and the cuneiform text that mentioned the Arabian camels dated to 9th century B.C. (Groom, 1981; Al-Saud, 1997). However, a few of South Arabian inscriptions referred the commercial trade from south to north particularly, the Minaean inscription was found on the wall of Baraqish city in Yemen mentioned the trade and the conveyes started from South Arabia to the North, and this inscription mentioned Najran as (Ragma), this inscription dated to around 4th/ 3rd century B.C., but without any reference to the types of goods (Al-Saud, 1996 and 1997; Doe, 1971). In that period 5th/ 4th century B.C., these settlements including Al-Ukhḍud played a major role in strengthening control of long-distance trade in South Arabia (Al-Ansary and Al-Mareeh, 2003; Al-Saud, 1996). Al-Ukhḍud has been interpreted as a focal point, lying on a significant land route connecting South and North Arabia (Dayton and Dayton, 1978/ 1979). This route divided into two branches: one ran parallel to the west coast of the Arabian Peninsula towards Gaza, Petra and the Mediterranean Sea, while the second started from Najran (Al-Ukhḍud) and ran north-east towards the centre of the Arabian Peninsula to serve the trade of Mesopotamia (Al-Saud, 1996; Dayton and Dayton 1978/ 1979; Al-Ansary, 1982). Al-Ukhḍud is thus well placed as a case study to investigate the influence of trade, both local/ regional and long-distance, on settlement development and distribution of particular categories of material, with the aspiration of better understanding the economic status and development of the town and its population.

1.3 Thesis Structure

The thesis will be divided into seven chapters as follows:

Chapter one has presented a brief introduction to the topic; and its main points of significance. It has stated the main aims and objectives of this study, and outlined the thesis structure.

In chapter two, I will consider previous archaeological approaches to understanding trade and exchange, drawing on examples of existing studies across a wide range of times and spaces. I will examine the strength and weaknesses of the particular approaches examined in terms of their potential applicability to the case study of Al-Ukhudud.

Chapter three will then present a geographical consideration of the region of Al-Ukhudud, and a discussion of the historical development of the site as it is understood on the basis of current evidence, set in the context of what is known of the history and social organisation of the South Arabian kingdoms, which dominated the area politically and economically during the first millennium B.C., and with an explicit focus on the evidence for local, regional and long-distance trade.

In chapter four, I present our current understanding of the archaeological site of Al-Ukhudud, including an analysis of past research and more recent fieldwork that started in the 1970s. This chapter will also provide an overview of previous studies of pottery in the area and the studies of 1990s pottery from Al-Ukhudud, noting their limitation in terms of modern scientific approaches to the material and the implications of these for addressing questions of trade vs local production. This chapter will furthermore present and refine the specific excavation sequence with which the ceramic assemblages analysed here are associated.

Chapter five will outline and justify the specific research methods to be used during the analysis of the ceramics, connecting them closely to the research question and aims, and aligning them with modern scientific best-practice standards and guidelines.

Chapter six provides a characterization of the ceramic assemblages under analysis. It includes detailed analysis of fabrics and forms, in addition to providing the first quantified ceramic dataset for the entire region/ period. Categorisation of the ceramic assemblage is based on fabric, manufacture technique, type and form. the resulting data is then analysed to identify patterns of spatial and, where possible, chronological variation of trade vs locally produced pottery.

The final chapter, chapter seven will discuss the implications of these data, and consider the relationship between pottery production, consumption and exchange at Al-Ukhudud. Final remarks

will be addressed to the characterisation of the economy of the region from the perspective of ceramics and the future work.

Chapter 2 Archaeological Approaches to Trade and Exchange

Investigation of trade and exchange in premodern periods can provide valuable data concerning previous communities, their activities, and their relationships with surrounding people; moreover, trade and exchange can offer meaningful information on the development of archaeological settlements in multiple ways, including political, economic, religious and social aspects. Over the last century, many archaeological studies of South Arabia have focused on archaeological sites from the perspective of understanding their chronology. However, there is at present no study of South Arabian archaeology that takes an approach explicitly focusing on the characterisation of trade and exchange, and their implications for society or economy, of the sort that this research is proposing to undertake through the medium of ceramics.

Key terms and concepts:

It is important in this chapter to clarify some key terms relating to the economy, trade, exchange and the market or market exchange before presenting the archaeological approaches to trade and exchange taken here. The definitions of these terms will underpin the framework adopted for the present study.

Economic anthropologists and historians have debated the structure of past economies for decades. Out of these debates have come a number of key definitions and models that have proved influential in different fields of study in various ways. One of the foremost of these scholars in the 20th century was Karl Polanyi, an Austro-Hungarian economic historian, anthropologist and theorist. In his paper entitled “The economy as instituted process”, Polanyi defined two economic models, “substantive” and “formal”. The substantive model “derives from men’s dependence for his living upon nature and his fellows” (Polanyi, 1957: 243), and thus emphasises the importance of interactions with local environment and society. The formal model “derives from the logical character of the means-ends relationship, as apparent in such words as “economical” or “economizing”” (Polanyi, 1957: 243), which requires that insufficient means to achieve ends leads to the use of other means to address needs. Karl Polanyi was the leading proponent of substantivism, based on his argument that the economy operates within distinct cultural contexts, rather than working separately from culture; in other words, this theory is based on the idea of the institutional integration of economic life (Polanyi, 1957; 1944). Polanyi further argued against anthropologists and sociologists who followed classical and neo-classical theory and its idea that exchange and competition in the market are an innate idea or tendency, which he opposed

(Garraty, 2010). Instead, he proposed that desire for economic gain is not linked with the natural behaviour of individuals, emphasizing “the pursuit of self-interested economic gain as an utterly unnatural human ambition” (Garraty, 2010, Feinman and Garraty, 2010: 11).

Three major characteristics of substantivism are reciprocity, redistribution, and exchange, representing the forms of institutional integration of economic life of most relevance to this theory (Polanyi, 1957; Kassner, 2017). Polanyi in his article “The Economy as Instituted Process”, described these three concepts as follows: reciprocity is “movements between correlative points of symmetrical groupings”; redistribution is “appropriational movements toward a center and out of it again”; and exchange is “vice-versa movements taking place as between “hands” under a market system” (Polanyi, 1957: 250). As Polanyi suggested, in order to establish instituted economic processes in any community, certain conditions should be available in the society. It should provide a collaboratively organised environment, establishing allocation centres and price competitiveness to create markets (Polanyi, 1957:251). Polanyi further noted “the absence of factor markets for land and labor, the social antagonisms inherent in market exchange and bargained pricing, and the technical inefficiency of primitive commutations” in the limited relevance of formalism to early economics (Garraty, 2010: 12; Polanyi, 1944: 30). Polanyi’s theory has some weaknesses, particularly regarding the absence of a clear understanding of the concept of exploitation; his analysis of economy was based on styles rather than production relations, downplayed economic conflict and competition, and emphasized integration into the economy without any pattern for the competition (Cartledge, 1983).

The application of these models within archaeological and anthropological scholarship has a long and complex history that has been usefully summarised by Smith (2004). Key to Smith’s discussion is consideration of the level of ‘commercialisation’ of pre-modern economies, with increasing levels of commercialisation dependent upon the increasing presence, development and strength of marketplace distribution, commodification of labour, presence of independent entrepreneurial merchants and central state control of economic institutions (Smith, 2004). As chapter three below will argue, we might best consider the South Arabian economy as tending towards Smith’s ‘full commercialisation’. The level of commercialisation is played a significance role in the diversity of ancient society economies. Smith defined commercialisation as “synthetic concept that includes several related aspects of economic process: the extent of which a price-making market allocates commodities and the factors of production; the prominence of entrepreneurial activity; and the pervasiveness of institutions such as money, marketplaces, credit, and banking” (Smith, 2004: 78-79). South Arabian economy is a long-distance transfers and exchanges, and the economic processes of the South ancient states are more likely to be managed by individual entrepreneurs or

commercial elites in tribes rather than state institutional economy. This type of economy in South Arabian states, although is a long-distance commercial exchange (international trade) from south to north, it somewhat remains under the control of individuals (the entrepreneurs of this commerce), and they often have a high status in the tribal hierarchy. These ancient economics have limited employees, but have an unlimited spatial scale as we described above 'long-distance transfers and exchanges' (Smith, 2004).

Since levels of economic commercialisation are defined by Smith according to the nature and development of specific economic aspects, we need to consider further what we understand by these. For instance, the relationship between 'trade' and 'market exchange' or 'exchange' is a complex one.

Scholars of archaeology, Smith argues, have been over-reliant on Polanyi's "simplistic triad of reciprocity, redistribution, and market exchange", which fails to distinguish between one- and two-way transfers, and conflates elements of reciprocity with exchange institutions such as redistribution (Smith, 2004: 84; Garraty, 2010). Smith proposes new categories of economic transfer:

"allocation within the unit of production (Sahlins's generalized reciprocity); gift, without expectation of return (from the family level to international diplomacy); taxes (obligatory transfers from individuals to the state); tribute (wealth transfers between state); and theft and plunder" (Smith, 2004: 84).

These categories can be applied between individuals or small groups, but are challenging to recognise in the archaeological evidence. Exchange between communities, whether within the same group or between different societies, can, Smith argues, take various forms based on institutional configuration:

"reciprocal trade institutions (trade partners, "down-the-line" trade); periodic marketing systems (solar, dendritic, and interlocking forms); redistribution (both voluntary and involuntary forms, including levelling institutions, rationing, and feasting); state finance [...]; internal commercial institution (merchants, money, credit, banking, accounting systems, etc.); and international exchange institution (e.g. long-distance merchants, administered trade, ports of trade)" (Smith, 2004: 84-85).

The terms trade and exchange can thus refer to the similar exchange activities, but taking place between people with different social and economic relationships. Bloch and Parry (1989), and Blench (1982), define trade itself as the material economic component of exchange, and a significant part of any social exchange, and since trade is part of exchange we can define exchange as a process of interaction between humans within biotic and abiotic systems (Befu, 1977; Webb 1974). Oka and Kusimba regard trade as a feature of exchange based on the analysis of commercial

behaviour associated with exchange infrastructures, materials exchanged and social relationships formed before, during and after exchange (Oka and Kusimba, 2008). Gift exchange has also been classified as an informal form of both trade and exchange, and can transfer objects between people and groups, including over long-distances outside formal networks (Dillian and White, 2010; Leacock, 1954). Gift-exchange between individuals and groups result in obligations to return reciprocal gifts, which may be sourced from the market (Mauss, 2002). Giving and receiving gifts seems to be voluntary behaviour, but in reality, it becomes necessary (Leacock, 1954), or as Mauss called it, “the obligation to give, the obligation to receive” (Mauss, 2002: 16). It can be seen, therefore, that distinct forms of economic action associated with trade and exchange are very closely intertwined.

The system of trade, exchange and market exchange in South Arabia, discussed in more detail in Chapter three, are still only vaguely understood, with evidence mainly through inscriptions, and there are at present no detailed studies investigating the nature of these systems and the fundamentals on which they were based. In ancient societies, limited commercial activities often began between members within the same community, and then developed and expanded to include neighbouring societies. These activities may have led to the establishment and gradual development of market exchange; we might see evidence of such an economic system in ancient settlements such as Qaryat Al-Fāw (see Chapter three below). The market or market exchange is “the hollow core at the heart of economics” (Lie, 1997: 342); moreover, the market can be defined as “a process in which individuals interact with one another in pursuit of their separate economic objectives” (Bitzenis and Marangos, 2007: 604). Gravelle and Rees (2004: 3) referred to the market as a process between individuals, and they argued that it exists “whenever two or more individuals are prepared to enter into an exchange transaction, regardless of time or place”. Garraty (2010: 6) considered markets somewhat vaguely as “an institution predicated on the principle of market exchange of alienable commodities”, while Polanyi identified the market as “an economic system controlled, regulated, and directed by markets alone” (Polanyi, 1944: 68). More specifically, Feinman and Garraty have utilised the term market exchange, describing it as “economic transactions where the forces of supply and demand are visible and where prices or exchange equivalencies exist” (Feinman and Garraty, 2010: 171). Pryor likewise defined market exchange as the process of transactions based on the visibility of supply and demand (Pryor, 1977).

There is thus a difference in the definitions of the market, some of which consider the market as an interactive process between individuals or groups within the same society or between societies to achieve economic objectives; we can see this in the definitions of Bitzenis and Marangos and Gravelle and Rees. The definitions provided by Feinman and Garraty and Pryor; however, connected

the market with economic transactions based on the principle of prices, supply and demand. However, these economic transactions do not accomplish their goals on their own; rather there are those who perform these transactions, individuals or groups that may sometimes belong to organised economic institutions. We find that the market, from the perspective of Lie and Polanyi is an existing economic system in itself, controlled and regulated by market forces with disregard for the role of societies as individuals or groups in their emergence and formation, with their economies and the evolution of their systems. The existence of a market (in the sense of the processes by which prices and quantities of different goods and services are determined and exchange is regulated) clearly links with Smith's levels of commercialisation, discussed above. In addition to the market as economic system, of course, the market may also exist as a specific place in which commercial exchange takes place, whether between individuals, groups or institutions. This form of the market is often more easily accessible to archaeologists.

A significant number of archaeological studies have concentrated on analysing trade and exchange from different angles in areas beyond South Arabia, and these provide insight of value to the present research. In this chapter, to clarify the relevance and thematic focus of archaeological studies relating to trade and exchange presented below, I have divided them into three categories: theoretical studies of trade and exchange, studies of trade and exchange based on archaeological evidence, and studies of trade and exchange relevant to pre-Islamic settlements in Arabian Peninsula.

Theoretical studies of trade and exchange

Of some theoretical studies of trade and exchange relevance to this project is a study of establishing new economic and social systems. In their 2008 study of the movement of people, and ideas, as well as artefacts, Rahul Oka and Chapurukha M. Kusimba argued that trade has a huge influence on people comparable to the impact of political, religious, and social processes (Oka and Kusimba, 2008). Their investigation examined data collected during the last three centuries on human interactions. This study is different from those presented above, in that it presents various theoretical patterns of trade, based on existing theories, in order to examine significant aspects of human interaction. This investigation concentrated particularly on the movement of people in terms of the transfer of ideas during the processes of trade and exchange of materials in ancient societies to understand how the process of interaction might have created various cultural mechanisms that shaped societies, and lead to social innovation.

Oka and Kusimba argued that trade played an important role in the formation of ancient communities in terms of their political, religious and social spheres, with associated influence on political and economic personal/ social structures. They highlighted the regulation of trade by

means of possible control mechanisms, as well as the changing roles of traders. Ultimately, they concluded that trade had positive impact on many aspects of premodern communities and individuals lives. Moreover, trade also had a positive impact in the flexibility of the movement of ideas and interactions between people, which facilitated the process of integrating knowledge and innovations by traders (Oka and Kusimba, 2008 and Kusimba and Oka, 2009). As they mentioned in this study, spread/ migration has played a significant role in the interaction between societies in terms of the transformation of similar archaeologically-evidenced, such as thoughts and materials from one community to another. For instance, traders have often held a significant role in spreading ideas alongside their transferring of commodities and materials from one place to another. They carry their local ideas and distribute them among different groups in which they travel, while at the same time they receive external ideas and spreading them in their communities. Therefore, spreading helped in building strong interactions between people in terms of ideas and traded materials, and cultural, religious, political and social aspects. These interactions provided opportunities to communities to change, making use of new ideas that helped the evolution of cities. Additionally, the combination of ideas because of trade increased the strength of urban sophistication through the domestication of animals and plants and technological transfers such as metallurgy. However, this study differs from the studies mentioned above, in that Oka and Kusimba do not extract their information from the results of analyses applied to specific archaeological settlements and the role of trade and its impact on the evolution of settlements and communities at particular times and places. The study of Oka and Kusimba, therefore, shows that we should consider the constructing of political entities and social identities for individuals and groups in specific settlements not only related to traded artefacts but also to the movement of people and ideas, which have strong impacts on settlements, communities and their inhabitants' innovation.

The above studies have identified trade as a key element in the development of the complexity of settlement and society, whether directly through the movement of goods and materials (Smith, 1999; Magee, 2004) mentioned below, or indirectly through the movement of individuals and groups associated with trade, the transfer of ideas among people as a result of trade and exchange, and the influence of those ideas on the development of settlements and communities (Oka and Kusimba, 2008 and Kusimba and Oka, 2009).

An additional strand of scholarship has been through the study of archaeological approaches to market exchange in ancient societies. In 2010, Christopher P. Garraty and Barbara L. Stark presented a series of studies in collaboration with archaeologists and other scholars focused on premodern market exchange and the influence of markets and market systems on the development of marketplaces in prehistoric periods, several of which are of relevance to the current research. In

his contribution to this work, Garraty examined different ways that can be utilised by archaeologists to explore market exchange, the development and decline of the market and market change in ancient societies. The investigation of market exchange in premodern markets can be stimulated by comparative studies to create new approaches in terms of major principles. Garraty focused on identifying markets and market systems associated with different sections of ancient economies, understanding market exchange in archaeological terms. He also considered the combination of premodern marketplaces with other institutions, for instance government, and the development of premodern markets over the long term. Garraty provided theoretical information on market exchange based on its definition by Fredric Pryor as “exchange transactions where the economic forces of supply and demand are highly visible” (Garraty, 2010: 5). However, Garraty defined markets as “institutions predicated on the principles of market exchange of alienable commodities” (Garraty, 2010: 6), or as central institutions similar to other human institutions, such as state forms of government (Feinman and Nicholas, 2010). In this way, we find that market exchange is not only linked to the system of economic exchange but also is a social and political institution. In terms of social context, the market is linked to networks of social relationships involved in the process of trade exchange and enterprise, whether for individuals or institutions, while in terms of political context, the market includes large institutions, such as governmental and religious organisations. This can help to create different relationships and communication networks between societies. Thus, marketplace exchange between different groups works on outgrowth of society as well as the growth of hierarchies and urbanisation in societies. This development is connected to people through sales and purchases, and is linked to large institutions by pushing markets towards development, opening them up to wider societies. The development of marketplace exchange leads to the creation of multiple markets and transfers them from local areas to regional marketplaces (Stark and Garraty, 2010).

In the same volume, Stark and Garraty reviewed a range of methodologies in the study of marketplace exchange among ancient communities based on reciprocity among relatives, household auto-production and collective participation, contrasting this with exchange by institutions and agencies as an example of large-scale economic integration. The previous studies (Garraty, 2010; Feinman and Nicholas, 2010; and Stark and Garraty, 2010) on marketplaces exchange were focused on particular places and times rather than focusing on the innovation of archaeological settlements in broader terms. Neither study mentioned above, therefore, presents marketplace exchange in terms of archaeological settlements, but instead engages with the topic by means of written sources and theoretical approaches; thus, these studies have not provided sufficient information concerning the impact of exchange on the evolution of archaeological settlements and the movement of people and their interactions with surrounding areas.

Studies of trade and exchange based on archaeological evidence

Of course, the relationship between archaeological settlements and communities is not only reliant upon the markets and marketplaces exchange to assist ancient settlements to flourish; archaeological evidences can provide sufficient data on new settlements. A study published in 1999 by Monica Smith, relating to the archaeological site of Kaundinyapura in Maharashtra in India. This study examined the significance of exchanged-goods and materials, and questioned why exchange is an essential social requirement for societies to achieve stability and sustainability. Smith used her examination of consumption patterns to illustrate the social role and utility of local goods in light of the emergence of complex societies, to understand the significance of exchange as a social activity, and how the distribution of diverse goods played a role in the construction and development of social hierarchies and individual and political identities within the settlement through time. The diffusion of nonlocal goods and materials, such as “micaceous pottery, and sandstone” (Smith, 1999: 126) that were not available in the vicinity of the site (based on the nature of local geology) provided evidence of extensive trade networks around the settlement that was aligned with the growth of political, social and religious entities around the Indian Ocean in the beginning of the 2nd century B.C. This development resulted from the connection between the Indian subcontinent and other communities in the Roman Mediterranean sphere, northeast Africa, Arabia and Southeast Asia. This study, therefore, demonstrates that we should understand traded artefacts as active agents in the construction of social and political identities within the settlements to which they were transported, and that their distribution within settlements is meaningful for our understanding of the nature of the societies occupying such settlements.

Abbott presented his thoughts about marketplace exchange by means of “barter” (Abbott, 2010: 61), a process that was widespread in the south-west of America during the prehistoric period. He noted that the distribution of clay containers from their centre of production at Salt River to the Palo Verde Ruin in Hohokam in Arizona supports the idea that marketplaces were associated with supply and demand transactions, emphasizing the independence of buyers and sellers of their social position and the absence of political control in the area of Hohokam. An important point here is that the process of marketplace exchange is not controlled by political entities, such as the government, or by commercial entities. Ceramic evidence in this area indicates that the distribution of pottery was widespread, based on the high percentage of imports from middle Gila river sources, such as a glittery rock and coarse-grained mica schist to Lower Salt river during the middle sedentary period (ca. AD 1000-1070) (Abbott, 2010). In addition to distribution, another aspect studied within this volume is technique of manufacture, as reflected in Feinman and Nicholas’s study of the active marketplace in the Valley of Oaxaca in Mexico by means of the identification of

the expansion of particular techniques by means of their adaptation in surrounding areas (Feinman and Nicholas, 2010). These two studies in combination, therefore, demonstrate that we should understand new ways of marketplace exchange, and the range of distribution within and between settlements is meaningful for our understanding of the nature of the societies occupying such settlements. In light of the above, we note that trade may sometimes not occur throughout archaeological settlements, but may be done through marketplace exchange such as in Oaxaca, which may create opportunities for social communication and new systems for trade and exchange of artefacts.

In their 2010 study of the mechanisms of prehistoric trade and exchange at the period from AD 1000 to 1500 at Spiro Mound site in Oklahoma, Dillian, Bello and Shackley argued that the trade of materials in prehistoric periods whether local, regional or continental, took the pattern of a combination of informal trade between individuals “person-to-person” (Dillian et al, 2010: 18) and formal trade via marketplaces. The impact of this new approach to trade on archaeological settlements and their development is perhaps less clear, but it surely assisted in the construction and strengthening of social networks among individuals within settlements and construction of wider relationships with other groups in neighbouring communities.

Understanding the patterns of trade and exchange in marketplaces is a significant point that may help scholars to recognise the benefits of marketplace exchange in building social connections and to understand innovation within settlements. Another way to understand trade and exchange from an archaeological perspective is to consider the value of products for their producers and users, and to analyse how the value of things varies when they move from their local place to different locations. In his 2010 study of the influence of objects on social networks, Christian Luke argued that the value of objects is different among producers and users, and the influence of cultural materials can be reflected in the integration of social networks between societies especially when exchanging materials and goods between different cultural regions (Luke, 2010). Often high value goods used by the upper classes played important roles in social network communication and building political entities and economic partners in society. Thus, strong economies and interrelated social networks promoted by trade and exchange assisted the development of ancient settlements and the outgrowth of population. A case study presented by Luke to illustrate this is concerned with the trade and exchange of marble vases between the Ulua Valley and lower Central America (600 – 800 A.D.). This study examined the production and utilisation of these artefacts, and their importance to individuals of different social status, presenting conclusions reflecting on their relationship to economic and social aspects of the site. Additionally, high value goods are not the only ones that have an impact on the evolution of ancient settlements; foreign and exotic objects

such as obsidian played significant roles in altering the social and political composition of prehistoric societies (Tripcevich, 2010). The effect of camels' domestication on the prosperity of ancient settlements in South Arabia was mentioned below (Magee, 2004). Likewise, the domestication of other animals, such as camelids, llamas and alpacas played significant roles in the transportation of goods elsewhere, which assisted the emergence of new strands of economical activity in ancient societies, specifically the pastoral economy (Tripcevich, 2010). Pastoral activity encouraged ancient settlements and communities to transform from simple settlements to strong societies with independent and organised economic, political and social systems that enabled them to establish integrated relationships with other communities (Ndiema et al, 2010). We may say that the transformation of eastern Lake Turkana communities to pastoral societies played a significant role in the development of populations, and it may have occurred in two ways, the fisher-gatherer communities adapted some pastoral strategies to gain domesticated food resources and integrated them into their traditional food systems, or perhaps by replacing gradually the populations of hunter-fisher-gatherer by pastoralists with their agricultural and cultural resources (Ndiema, et al, 2010).

Building on some of these ideas, a 2012 study of trade and society on the east coast of Africa by Paul Sinclair, Ehblom and Wood discussed the role of the settlement of Chibuene in, and its influence on, trade, specifically long-distance trade and in the formation of regional complex socio-political entities (Sinclair et al, 2012). Similar to Al-Ukhudud, Chibuene was a focal point for commercial conveyances and a key link connecting the African coast with surrounding interior areas. This link facilitated communication and trade of commodities, such as pottery, beads, glass and metals, with emerging farming and fishing communities; it is argued that associated influences assisted their development, and they became hierarchical societies and independent political and social entities. This settlement differs from Al-Ukhudud in that it is located on the African coast in connection with the Indian Ocean, but at the same time connected by land through interregional trade. The significance of interregional trade is that it simplified the movement of goods and the distribution of materials that contributed to social change among settlements and societies (Haour et al, 2016). This interregional trade was similarly examined with reference to the settlement of Birnin Lafiya, located near the Niger River, which likewise reflected the development of complex social organisation and trade networks (Haour et al, 2016). These studies of Chibuene and Birnin, therefore, presented single settlements placed on a coast or river and thus depending on its trade maritime trade, as opposite Al-Ukhudud located well inland. For an equivalent study of an inland site, Mattingly and Sterry (2013) presented an integrated and complex study of an archaeological region including ancient buildings, palaces, and agricultural and commercial systems, located in the Central Sahara during the late first millennium B.C. to the end of the first millennium A.D (Mattingly

and Sterry, 2013). The region in question was characterised by important agricultural areas that provided a good resource for the thriving of its settlements; as well as agriculture, trans-Saharan trade was a significant support for the existence of its communities. Thus, trade plays a significant role in the continuity of ancient societies by providing opportunities to communicate with other individuals or groups, which contributes to the construction of social and political identities whether for the exporting group or that to which goods were transported. As mentioned above, trade has played an important part in the formation of social, political and economic realities for most ancient societies. This study, therefore, demonstrates that we should understand trade activity as a major reason in the construction of communities, vital to our understanding of the nature of the communities occupying such settlements. The influence of land trade routes on those settlements located on them or nearby is evident, especially at times when these routes were most active, as is demonstrated by the diversity and distribution of artefacts. However, some land routes were reduced in importance due to the emergence of new maritime routes. For example, Castillo, Bellina and Fuller (2016) presented a new study of the early maritime Silk routes in Southern Asia during the late first millennium B.C. This study was different from those discussed above, in that its concentration was on maritime routes (Castillo et al, 2016). However, the point here is that both land and maritime routes had positive impacts on ancient people through cross-cultural interactions that assisted the evolution of communities and settlements (Castillo et al, 2016), whether through the transportation of goods and materials or the transportation of ideas. In light of the above, these studies, demonstrate that we should understand trade and exchange as active agents in the construction of the social, political, economic and even religious systems of ancient communities, and for the stability and development of most archaeological settlements through the transport of commodities or the distribution of materials. Trade is meaningful for our understanding of the nature of the societies occupying such settlements and the changes that occurred within and around those populations that had the ability to establish special systems that transformed them from simple entities to integrated complex communities.

In the light of the above studies, we understand that the value of objects differs from one place to another, as well as between people, and this differential influence is reflected within the development of social networks. This also helped ancient communities' development and helped the distribution of goods, from which appeared new shapes of economic activity.

Studies of trade and exchange relevant to pre-Islamic settlements in the Arabian Peninsula

There are few studies of ancient settlements in Arabia from the perspective of trade and exchange. The majority of studies in particular pottery studies are chronological and descriptive. In this

section, we will review the most relevant studies to pre-Islamic settlements in Arabia and the influence of trade and exchange on the development of these settlements and their communities. In his 2004 study of the influence of camel domestication, Peter Magee argued that the emergence of important new trade routes in itself contributed to the creation of a new form of political economy during the period between 1000 and 600 B.C. in the site of Muweilah (Magee, 1996a; 1996b) in south-eastern Arabia. Specifically, he proposed that the transportation of high-quality commodities, such as painted ceramics, iron and incense, played a positive role in the construction of a new settlement and resulted in the promotion of prosperity and organisation in areas that were unoccupied before. Moreover, Magee also emphasised that the irrigation system in the Iron Age settlement of Muweilah promoted the creation of many polities along the banks of wadis of the Al-Hajjar Mountain range, and that the trade in raw materials between places in the Arabian Peninsula and the Middle East increased the outgrowth of the Iron Age settlement and created a new living environment during that period. This study thus demonstrates that the development of settlements can be due to different factors, such as the use of particular animals, the availability of water and the sources of raw materials, which can assist societies to control the direction of convoys of commodities and increase the movement of local and nonlocal goods between areas, thereby promoting the growth of settlements in terms of political power, and creating social networks and integrated communication relationships.

The domestication of several types of animals is a new approach to the development of ancient societies and supported the distribution of goods, from which emerged new forms of economic activity. In their 2008 study of the connection between inland settlement and coastal areas, Mark Beech, Peter Hogarth and Carl Phillips argued that trade between ancient settlements and the coast delivered significant opportunities for communications between inland society and individuals within coastal communities. In the archaeological sites of Rafaq 2, located east of Huwaylat in the Wadi Al-Qawr, and Naslah, at the eastern end of the Wadi Al-Qawr at Ras Al-Khaimah in the United Arab Emirates, the transportation of some goods such as fish and crabs from marine resources provided clear evidences of traded/ exchange and communication between inland and coastal communities (Beech et al, 2008). These inland settlements are similar to Al-Ukhdud in terms of location, but no resources of clearly coastal origin have been identified at Al-Ukhdud. We can probably say that the processes of trade and exchange in both locations assisted the communication between people and affected positively economy, prosperity and development of these sites. The evidence is not limited to the remains of different types of fish and crabs, the excavations Rafaq 2 and Naslah revealed late Iron Age pottery, similar in date to pottery dated to Iron III period between 600 and 300 B.C. discovered at Muweilah (Magee, 1996b). The remains of marine resources in both inland sites in the Wadi Al-Qawr has comparable examples from another

inland site, Mleiha in Sharjah in the United Arab Emirates, and these examples are clear evidence that marine sources played a significant role in the flourishing of the inland economy, and impacted positively on the development of these inland settlements (Beech et al, 2008).

Some archaeological studies in the Arabian Peninsula deal closely with pottery recovered from settlements located on or close to overland trade routes in Arabia, such as Al-Kharj, Zubaidah, Dadan in Al-'Ula and Al-Deffi (Al-Ghazzi, 1990; Gazdar, 1982; Al-Shehry, 2014 and Al-Amer, 1996). Unfortunately, none of these studies explicitly considers land trade routes and their relationship to the settlements and communities, or their implications for the development of economic activities and prosperity, and relationships with communities in surrounding areas. There is no detailed information about the economy of these sites and societies even though these studies concentrate deeply on pottery discovered from these sites. Information provided by these studies is descriptive ceramic data and chronological information about the sites, and this is the gap in these previous works that this study aims to address.

Clearly, the literature reviewed above cannot hope to consider all existing archaeological studies of trade and exchange in premodern times that have connections with archaeological settlements and the development of these occupied areas; the development of individuals or complex communities; and/or the emergence of social, economic, political and religious entities through the influence of trade. However, we have tried to consider the most relevant and recent universal studies that intersect with the study of ancient archaeological settlement in terms of trade.

In the light of the above, we can note some points that these studies may not have addressed at all, or in any detail. For instance, the concentration of these studies is on the trade and exchange of commodities and materials such as beads, metals and lithic materials, as well as foodstuffs such as rice and beans. As for the trade and exchange of pottery, there are few indications in these studies, perhaps because of the greater value and importance of those traded materials for those communities and individuals than other materials such as pottery. As mentioned above, most of the reports that have been published about the Al-Ukhudud excavations were preliminary nature, but nonetheless agree that most of the artefacts discovered from the site are pottery, with little or no reference to other categories of finds. This leads us to consider the existence of multiple distinct patterns/ types of pottery because of the influences within the site of Al-Ukhudud or from surrounding areas. In addition, the location of Al-Ukhudud on the land trade routes allowing movement from the south to the north Arabian Peninsula makes us consider the existence of diversity in the patterns of long-distance trade and its influence within the settlement. Our consideration should be focused on identifying different patterns, whether in terms of trade activities and their impacts on the development of the site and its society, or in terms of the various

types of pottery that may be considered in terms of production, distribution and consumption, given that we know that pottery is exchanged in at least two ways: as artefacts having their own inherent value or appeal, or as containers for other products.

Another point worth making is that most of the sites referred to in the studies mentioned above were not located on land trade routes, as is the archaeological site of Al-Ukhud. Therefore, we might ask whether location has an impact on ancient trade processes among different societies, as seems likely; whether these processes were active commercial actions connected with the main land routes; or whether trade was ordinarily serving the same community and those of its associated hinterland in the surrounding areas. Moreover, if land routes do exert influence on trade and exchange, how will this be seen in our research into the role of trade on the development of the settlement of Al-Ukhud and the growth of the community through studying its pottery?

A number of specific questions arise in the consideration of Al-Ukhud, in terms of the particularities of its social and economic situation. During the period of our study, South Arabia was the main source of incense for Egypt, Mesopotamia and the Mediterranean regions (Demange, 2010; Van Beek, 1958; Hepper and Wood, 1979), where the Arabian incense tree was distinctive species than African tree (Groom, 1977: 81; Hepper, 1969: 66-68), and thus, “the South Arabs developed a well-organised system of distribution” (Van Beek, 1960: 75). In addition, the importance of the incense trade was reflected in the site and its evolution and organisation as an archaeological settlement, having an impact on the quality and efficiency of trade, which started from the south of the Arabian Peninsula and served other important sites located in central and northern Arabia. In terms of individuals, the trade of incense was a significant source of wealth at that time. Thus, this trade may have created a new type of economy in the form of a taxation on conveyances passing through the territory of certain groups in exchange for protecting and facilitating their passage and creating a new distribution system as mentioned above. The trade of incense may have facilitated the exchanging of other kinds of commodities such as pottery; we may likewise find that there was an impact on non-pottery goods in terms of production quality and quantity.

Some of the studies discussed above focused on marketplace exchange and its influence on the development of ancient societies, and thus the development of archaeological settlements, through trade and exchange. Some archaeological sites apparently started as commercial stations for convoys before they developed into archaeological settlements: one such is Qaryat Al-Fāw in central Arabia, where some trade and exchange occurred before larger convoys launched their way towards the centre, east and north of the Arabian Peninsula with various goods and materials (Al-Ansary, 1982). Ultimately, a detailed ceramic-archaeological study of Al-Ukhud, one of the most significant sites in the southern Arabian Peninsula, might surely determine whether this site acted

as an assembly point for commercial conveyances travelling around the Arabian Peninsula as well as an archaeological settlement, or whether the site was a focus for marketplace exchange. The scope of the research presented here, in the light of the very imperfect current knowledge of both Al-Ukhduḍ's archaeological remains, and South Arabian pottery generally, is inevitably less ambitious in scope. To collate the data required for a detailed account of the question posed above would require more time and space than can be afforded to a work of this scale. However, it is hoped that the body of data analysis within this thesis will present at first step along the path to addressing these fundamental questions.

Chapter 3 Al-Ukhdud in Context

3.1 The Regional Setting of Al-Ukhdud

The archaeological site of Al-Ukhdud is located next to the modern town of Najran, within the province of same name, which occupies most of the southern part of the Kingdom of Saudi Arabia, along the border with Yemen between longitude E 44° 10' 45.54" and latitude N 17° 28' 37.37" (Figure 3-1). The name of the archaeological site, "Al-Ukhdud" (The long ditch in the ground) comes from the Quranic epithet, "the people of the ditch" (Al-buruj, 85, v: 4-8), which is connected with the Christian martyrdom suffered under Yemenite king Dhū Nwās in the year 523 A.D (Zarins et al, 1981; Al-Ansary and Al-Mareeh, 2003).



Figure 3-1 Map of Saudi Arabia showing the location of Najran province.

(Source: mentioned above in Figure 1-2).

Najran, clearly has a long history and so is both modern and ancient; it includes settlements such as Najran which is the capital of the province, Al-Kirkhir, Badr Al-Janub, Habuna, Kubash, Sharora, Thar, Ḥimā and Yadama (Ministry of Education, 1999) (Figure 3-2, Figure 3-3), which evidence the importance of the region over a long time span.

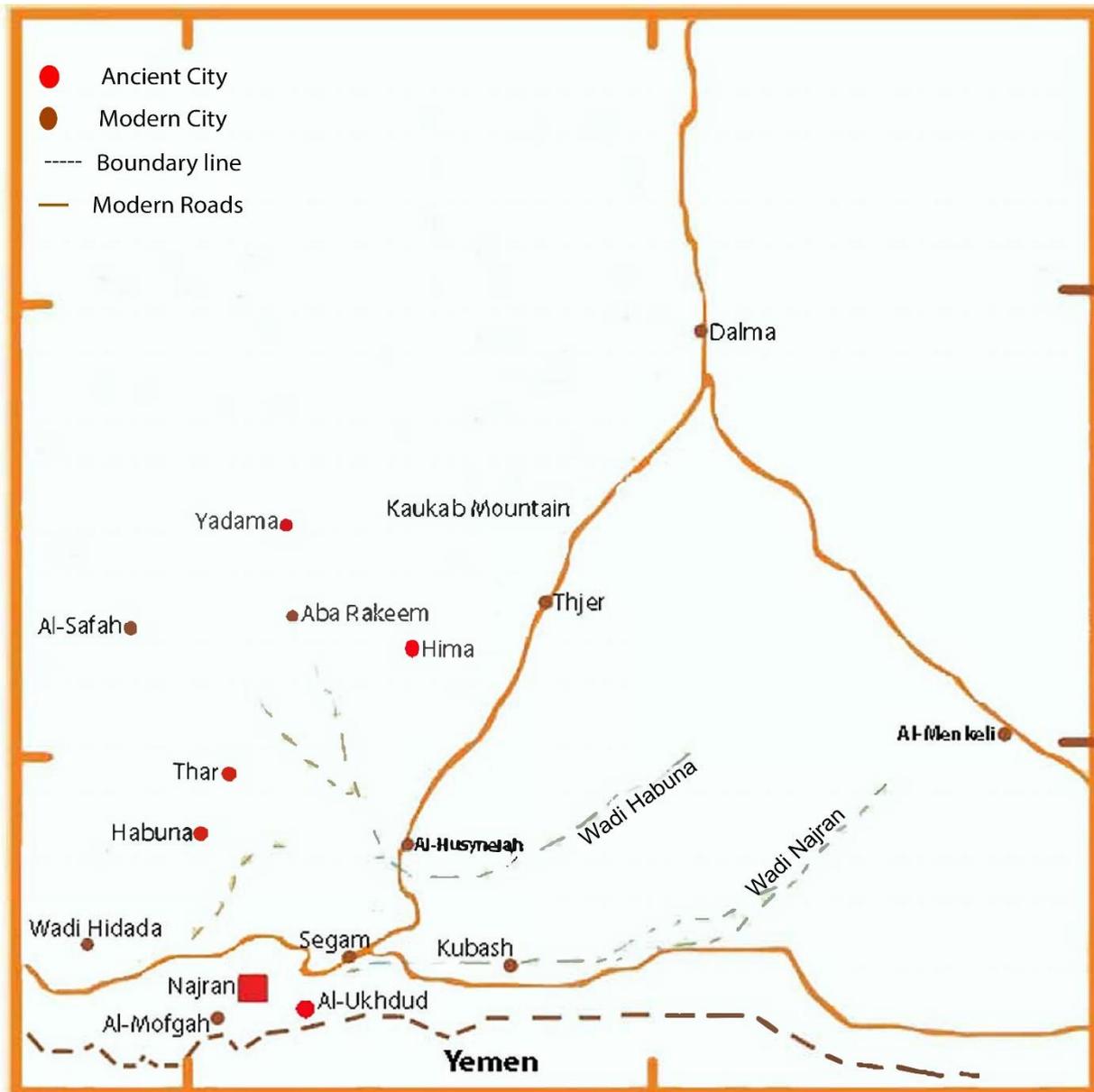


Figure 3-2 Map of Najran province and its towns.

Edited by A. Basonbol. (Al-Ansary and Al-Mareeh, 2003, pp.9).

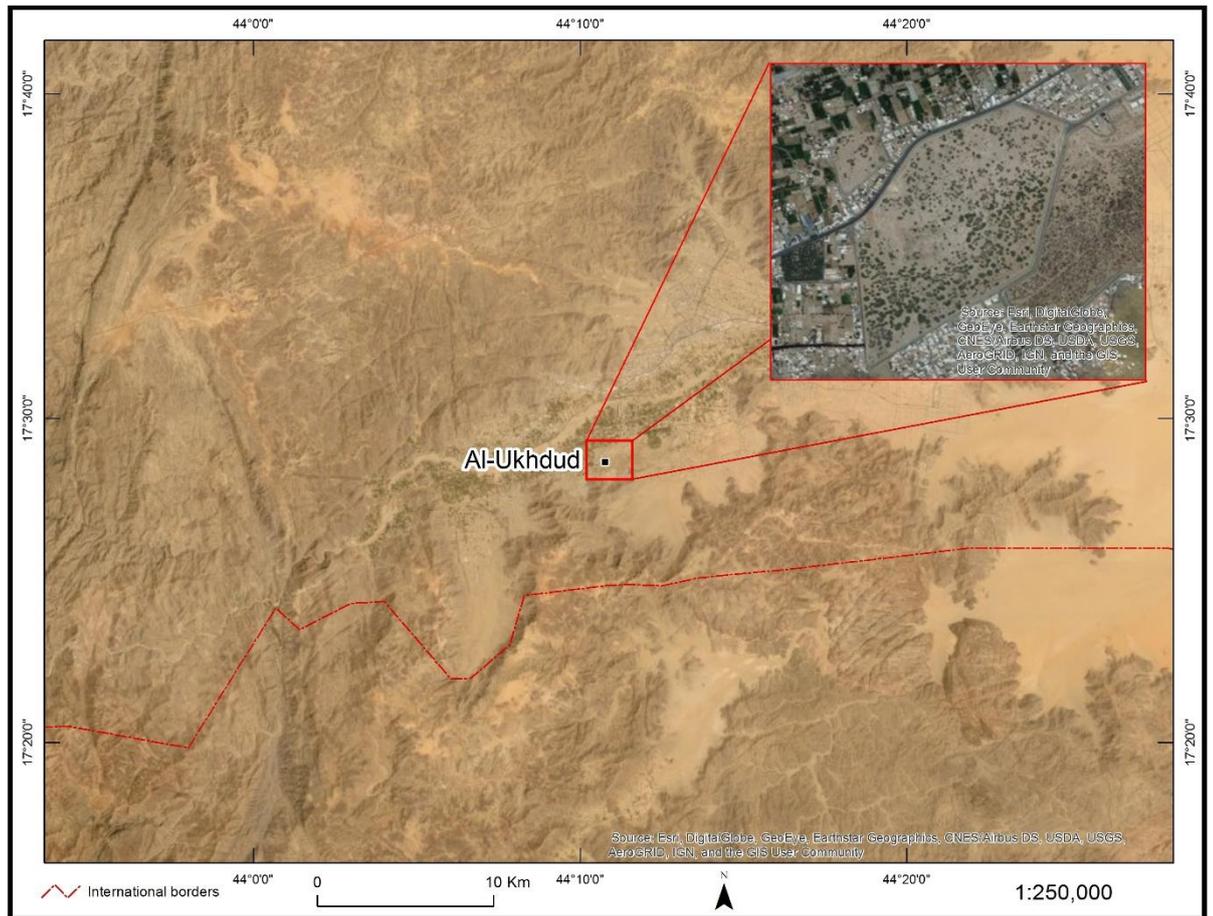


Figure 3-3 Map of Najran province showing the archaeological site of Al-Ukhdud.

Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, ING, and the GIS User Community.

In terms of its wider geographical and geological context, Najran lies on the eastern edge of the high mountain chains of Sarawat and Hijaz, with the great desert of Al-Rub' Al-khali to the east. The terrain here reaches elevations of 1700 meters above sea level, decreasing to 1100 – 1200 meters at the eastern fringes of Al-Rub' Al-khali desert (Saudi Geology Survey.org.sa, 2016; Al-Welea'y, 1997).

Ancient Al-Ukhdud is thus located at a point of geological transition, and this setting is likely to be connected with its importance. Around 1100 B.C. it became a focal point of the prosperous incense trade routes within the South Arabian Peninsula, being a key node on the main trade route from South to North Arabia (Dayton and Dayton, 1978/ 1979; Al-Ansary and Al-Mareeh, 2003; Al-Saud, 1996; Philby and Tritton, 1944; Pigulevskaja, 1960; Van Beek, 1958; Ryckmans, 1982; Philby, 1943).

All major land routes connecting Yemen to the north Arabian Peninsula passed between the difficult mountainous terrain of the Arabian Shield and the arid landscape of Al-Rub' Al-khali; they thus met at the 'pinch point' in the Najran area, where they branched into two directions (Al-Saud, 1996; Al-Ansary and Al-Mareeh, 2003). The first route ran from Marib via the Najran region onwards towards

Gaza, Petra and the Mediterranean, while the second route ran from Ḥaḍramawt, again via Najran and Gerrha, toward Al-Hufuf in the east of Saudi Arabia near the Arabian Gulf, and on into the Mesopotamian region (Potts, 2010; Al-Saud, 1996; Philby and Tritton, 1944; Dayton and Dayton 1878/ 1979). In this sense, we can say that Najran was a springboard for caravans and a crossroad of Arabian societies (Figure 3-4).



Figure 3-4 Map of the trade routes in the Arabian Peninsula and the location of the settlements on the trade routes from South to North.

(Al-Zahrani, 2014, Figure 2).

An additional benefit of the Najran area to traders and residents alike was its natural resources, in particular water. Wadi Najran expands over a wide area from the border of Saudi Arabia with Yemen and extends to the south into Yemeni territories. It forms a major east-flowing river in the Najran region, which seasonally distributes its water to Al-Rub' Al-khali desert (Al-Welea'y, 1997; Zarins et al, 1983).

It is a watercourse that flows only in the mountains' rainy season, in the summer. Because Najran is located on the Wadi Najran drainage network, some writers refer to it as the Oasis of Najran or Najran Oasis (Zarins et al, 1983; Philby and Tritton, 1944). Najran's 'oasis' is about eighteen kilometres long and three and half kilometers in width; it is located at latitude N. 17° 30' and longitude between E. 44° 05' and 44° 20' (Philby and Tritton, 1944: 121). It was clearly a very fertile region, as evidenced by the presence of many archaeological sites containing flint tools dating back to the Neolithic period (Zarins et al, 1983; Lippens, 1956 [1999]; Al-Istakhri, 2004; Al-Hamdani, 1990).

A good description of Wadi Najran was published in 1877, when Halevy described it in his account of a journey to Najran:

“Dans cet espace, les rives du wadi sont assez boisées, les roseaux et les plantes rampantes y abondent et réjouissent par leur fraîcheur la vue fatiguée du voyageur venant du désert. Au sud du wadi se trouve un grand puits donnant d'excellente eau; nous y voyons d'innombrables troupeaux de toutes les espèces attendant chacun son tour pour se désaltérer aux abreuvoirs.

Après avoir étanché notre soif, nous nous remettons en route. Le soleil baissait déjà et nous devons hâter nos pas pour ne pas coucher à la belle étoile. Bientôt nous traversons la seconde entrée étroite formée par les montagnes et nous entrons tout d'abord dans l'oasis de Nedjran, à la vue de laquelle je n'ai pas pu m'empêcher de pousser un cri d'admiration. Aussi loin que l'oeil pouvait embrasser, on n'apercevait qu'arbres et verdure. Les villages sont cachés dans des forêts épaisses de palmiers d'une prodigieuse hauteur; aux abords du wadi on ne voyait que des champs cultivés et verdoyants, partout le bien-être et l'abondance se faisaient remarquer à chaque pas” (Halevy, 1877: 478 - 479).

[In this space, the banks of the wadi are fairly wooded, reeds, and creeping plants abound there and delight with their freshness the tired sight of the traveller coming from the desert. To the south of the wadi is a large well giving excellent water; we see there countless herds of all species, each waiting its turn to quench their thirst at the drinkers.

After quenching our thirst, we set off again. The sun was already falling, and we had to hurry our steps so as not to sleep under the stars. Soon we cross the second narrow entrance formed by the

mountains and we first enter the oasis of Najran, at the sight of which I could not help but utter a cry of admiration. As far as the eye could see, you could only see trees and greenery. The villages are hidden in thick forests of palms of prodigious height; on the edge of the wadi we only saw cultivated and green fields, everywhere the well-being and abundance stood out with each step] (Halevy, 1877).

Wadi Najran thus had an extensive human settlement in the past, as it does now, on both banks of the Wadi, banks comprising old villages, farms and orchards, due to the availability of underground water. It continues to be a productive agricultural region, specialising in dates, grain and citrus fruits (Halevy, 1973; Al-Ansary and Al-Mareeh, 2003).

In addition to Wadi Najran, Wadi Habuna (see above Figure 3-2) is located to the north-west; both of these start from the Sarawat Mountains. Likewise, Wadi Hidadh lies to the west of Wadi Najran, while Wadi Yadama is north-west of Wadi Habuna (Al-Ansary and Al-Mareeh, 2007). All these valley systems offer resources to sustain present and past populations. Surrounding the core wadi system of Najran province is the highland area: chains of mountains located to the north, west and south, interspersed with narrow gorges that drain rainwater into Wadi Najran. The highland area is characterised by a mild, temperate climate, especially in the summer, with temperatures varying between 14 - 37°C, depending on altitude; however, in the winter, it can be very cold. Important historic settlements in the uplands, probably active during prehistoric (8th/ or 7th B.C.), historic and Islamic periods include Badr Al-Janub, Yadama, and Thar (Al-Shareef, 1984; Zarins et al, 1981). The mountains are a source for important resources including water that feeds wadis and some rocks including diorite, granite, marble, feldspar and nepheline syenite and gabbro (Al-Shareef, 1984; Hains et al, 2016). As noted above, the highlands disappear east of Najran towards Al-Rub' Al-khali.

This desert area occupies a large proportion of the eastern modern province, downstream of Wadi Najran towards Oman, and is the largest stretch of sand in the world. Locally, the area is known as the "sands of Yam", Yam being the name of one of the large and important tribes in the Najran region. Many of the tribes who currently occupy the desert edge are of Yemeni origin, and the territories with which they are traditionally associated are today called Yam, Wadi Yam or Yam Mountain. The main modern settlement in this region is the town of Sharora (Al-Ansary and Al-Mareeh, 2007).

In the light of the above, we can see the significance of Al-Ukhudud/ Najran over the long period of probably two millennia or more is connected with its geographical situation, with particular reference to:

- trade route pinch points that provided wealth and must have stimulated regulatory importance;

- agricultural prosperity facilitated by the abundance of water from Wadi Najran and other valleys;
- mountains providing access to mineral and other resources.

In the next section, we will provide a historical overview of the development of Al-Ukhdud and the Najran region since the Paleolithic or pre-Acheulean period, but with particular focus on the period of main importance for this research, the 500 B.C. – 600 A.D.

3.2 Al-Ukhdud in Historical Context

3.2.1 Prehistoric Archaeology of the Najran Region

Early archaeological surveys and excavations in the Arabian Peninsula provide evidence of Paleolithic settlement in Al-Nafūd desert in the north and in Al-Rub' Al-khali desert in the south, including stone tools dated to 1,000,000, 750,000 and 200,000 years ago (Masry, 1977; Ministry of Education, 1999). Human occupation and activity in the Peninsula thus have deep chronological roots represented by many sites (Zarins et al, 1981 and 1983).

By the 6th millennium B.C, large numbers of people occupied the coasts, deserts and inland of Arabia, (Magee, 2014). The evidence from south-western Arabia, specifically from Al-Hawa in the lowland desert of Ramalt as-Sabatyn in Yemen and at Manyzah in the Wadi Ḥaḍramawt, dated the occupation of the highland areas of Yemen from the 8th to the 7th millennium B.C. (Magee, 2014)

The Najran region likewise has been a site of human activity for millennia; it includes well known and large archaeological sites that date back to prehistoric times, as well as more recent evidence from the time of the Arabian Kingdoms and into the Islamic period. The prehistoric site of Sh'aib Dahda, located in a small sub-Wadi of Wadi Najran, dates to the pre-Acheulean period (Zarins et al, 1981), while in Bi'r Ḥimā, several sites were found dated to the middle/upper Paleolithic (Acheulean) covering periods from 100,000 or 75,000 B.C to 30,000 B.C., or to the upper Paleolithic period, from 35,000 B.C. to 10,000 B.C. (Zarins et al, 1980; Zarins et al, 1981; Al-Ansary and Al-Mareeh, 2003). The region was impacted by the drying of the climate at the end of the last Ice Age, which caused a reduction in water resources and must have had a considerable impact on people's lives. Drought affected large areas and forced late Paleolithic communities to assemble in areas that retained abundant water and vegetation (El-Amin, 2003).

These settlement sites have distinctive characteristics. They are rich in archaeological evidences due to their locations near or around water sources, such as Sh'aib Dahda, sited in a small sub-wadi of Wadi Najran. Likewise, Bi'r Ḥimā has particular artefacts, indicating the development of stability;

artefacts such as stone tools, cairns, inscriptions and rock art have provided important information on the early development of societies and their adaptation to the local environment. Some rock art references the early domestication of animals and hunting, new forms of behaviour that emerged during the Neolithic period (Zarins et al, 1981; Ministry of Education, 1999; Al-Ansary and Al-Mareeh, 2003).

The features of these cultures were hunting, agriculture and animal herding; the main characteristics of the Neolithic period in the Arabian Peninsula were the production of pottery and the domestication of animals and plants (Al-Ma'mary, 2000, 2005; Zarins et al, 1980). This period likewise saw a development in economic patterns and the style of social, ideological and, cultural life (El-Amin, 2003; Al-Ansary and Al-Mareeh, 2007).

The Neolithic era is represented by many sites in Arabia. In the east, for example, the site of Al-Dossariya, 'Ain Qannas, and Abo Khamees, dated between the 6th and the 4th millennium, yielded evidence, such as arrowheads, lances, and local and imported (Al-Ubaid) pottery (El-Amin, 2003).

In the South of Saudi Arabia, the major Neolithic sites that have been identified are within Al-Rub' Al-khali, Wadi Tathlith north of Najran, and the highland region of 'Asir (Al-Ansary and Al-Mareeh, 2007). Diversity of tools have been discovered in different locations in the Najran area, at sites such as Al-Mundafan, Khatmah and Al-Jeldah near Al-Rub' Al-khali and can be dated between 5,000 B.C. and 2,500 B.C. (Zarins et al, 1981; El-Amin, 2003). During this period, humans underwent many transitions in lifestyle, patterns of residence, clothing and food; people moved from hunting-gathering to stability with the onset of animal herding and agriculture. This in turn led to an era of production and creativity and the production of pottery, and again, art appeared on some massive rock panels in sites such as Bi'r Himā and Al-Ukhdud (Zarins et al, 1981; El-Amin, 2003; Al-Ansary and Al-Mareeh, 2003; Arbach et al, 2015).

3.2.2 The South Arabian Kingdoms

From the early first millennium B.C., a number of powerful kingdoms emerged in the Arabian Peninsula and continued to flourish until around the early 6th century A.D. Of most relevance to this study are those of the Southern Arabian Peninsula, including the Kingdoms of Saba' (Sheba), Ḥaḍramawt, Kinda and Ma'in, which arose in parallel with other kingdoms in North Arabia, such as those of the Nabataeans and the Ghassanids' (Zarins et al, 1981).

The kingdoms originated at different times; they were often overlapping and successive, simultaneously collaborating or competing with rival states, sometimes independent or at other times controlled by their neighbours (Ba-faqih, 1985).

Narratives relating to the history of southern Arabia are found both in the Old Testament (1 Kings 1:1-2:18) and in the Qur'ān (An-Naml, 27: verses 22-44), in particular the story of King Solomon and the Queen of Saba' (Sheba). Further details came from the early travellers and historians who visited South Arabia, discussed further below (Doe, 1971). In terms of archaeological evidence, a fundamental problem for South Arabian chronology is that at present, few excavations have been undertaken using detailed stratigraphic approaches, and little of the evidence yielded by archaeological projects can be directly connected with epigraphic data, which forms another key evidentiary strand for our understanding of the Arabian Kingdoms. The only finds that have so far been presented from stratigraphically controlled excavations belong to the sites of Hureidha in Wadi Ḥaḍramawt, Timna and Hajar Bin Ḥumeid in Wadi Bayhān in Yemen (Beeston, 1979; Albright, 1950), and these finds, although important, cannot by themselves be secure results for an accurate dating of the South Arabian kingdoms' chronology. It is thus challenging to produce a detailed analysis of the kingdom on the basis of current evidence.

Existing scholarship has tended to focus on establishing and obtaining chronologies, with an additional focus on rulership; little attention has so far been paid to social studies. The importance of the South Arabian kingdoms has been interpreted differently by scholars depending on their date of appearance. For instance, Doe (1971), presented a history of the South Arabian kingdoms in which they came to prominence in the following order: the Minaeans, the Qatabānians, 'Awsān, the Saba'eans and Himyar and the Ḥaḍramawt. In terms of rulership, the kingdoms have been categorised based on the title of their "sovereigns" (De Maigret, 2009: 198), such as the mukarrib, king or malik of Saba', the kings of Saba' and Dhū-Raydān, and the king of Saba' and Dhū-Raydān, Ḥaḍramawt and Yamnat. Even though the title of mukarrib is mentioned in several inscriptions, its meaning is still unknown; a religious meaning has been suggested but without supporting evidence (De Maigret, 2009).

In terms of the kingdoms' historical development, Pirenne (1987/1988), has argued for the separation of the chronology of the kingdoms into three groups: Long, Short and Intermediate chronology (Al-Saud, 1997), the main points of which will now be outlined.

1- The Long Chronology

Edward Glaser and Fritz Hommel were the first scholars to attempt the reconstruction of the history of South Arabia, based on connections between the Kingdom of Saba' and the Assyrian kings; they equated the former with the mukarribs outlined in the inscriptions (Al-Saud, 1997; Pirenne, 1987/1988). Assyrian inscriptions recorded that the Saba'eans sent a tribute of gold, camels and spices to the Assyrian king Tiglath Pliaser III (745 – 727 B.C.), while in 751 B.C. Sargon II (722 – 705

B.C.) received from Yatha' 'Amr, the Saba'ean ruler, gold, incense, horses and camels (O'Leary, 1927; Doe, 1971; Müller, 1987/1988). On this basis, Glaser and Hommel dated the Saba'ean rulers, and Saba's associated archaeological material and inscriptions, to the 8th century B.C. (Pirenne, 1987/1988).

At the same time; however, Glaser and Hommel dated other kingdoms to an earlier period, due to mukarribs recorded in number of Qatabānian inscriptions, and argued that the Kingdoms of Qatabān and Ma'īn emerged in the 13th century B.C.

According to their theory, the Kingdom of Ma'īn disappeared in the 7th century B.C.; however, the Kingdom of Qatabān existed until the end of the 2nd century B.C. side by side with the Kingdom of Saba'. Around 115 B.C., the Kingdom of Himyar was established, and the Himyarites extended their power over Ḥaḍramawt and added "Kings of Saba' and Dhū-Raydān and Ḥaḍramawt and Yamnat" to their titles (Al-Saud, 1997; Pirenne, 1987/ 1988; Beeston, 1984).

2 The Short Chronology

Pirenne noted that Hommel's studies of South Arabian chronology were based only on copies of inscriptions collected by Halevy during his journey to Arabia, rather than photographs. Subsequently, she collected photographs of inscriptions from museum collections, and realised that Mi'naean and Saba'ean inscriptions presented geometrically ordered letters, written from left to right and from right to left alternately (Pirenne, 1987/1988; Al-Saud, 1997). Pirenne suggested that, "this was crucial evidence against the long chronology for the South Arabic script, which is alphabetical" (Pirenne, 1987/1988: 117).

Specifically, Pirenne argued that the letters of the ancient Arabic alphabet were used in Dedan in north-west Arabia during the 6th century B.C., and these characters offered significant comparison with the Greek alphabet, which developed between the 7th and 5th century B.C. The ancient Arabic alphabet and the Greek alphabet, she argued, are clearly similar in style and thus dated to the same century. Thus, the mukarrib inscriptions that Hommel marked as the oldest inscriptions cannot be dated before the 5th century B.C.

Pirenne further argued that information presented in Greek and Latin sources referring to the Southern Arabian kingdoms comes only from the 4th century B.C., and mention these kingdoms as integrated with each other. Accordingly, the significant archaeological remains of Saba', Ma'īn and Qatabān cannot have existed before the 5th century B.C. An additionally argument of Pirenne's was based on the oldest Saba'ean coins which contain an illustration of an owl in simulation of the Athenian drachma. In the middle of the 4th century B.C., Athenian coins were copied in the east as

far as India, probably because of the domination of the Athenians ending around 412 B.C. As a result, the Greek economy decreased in the mid-4th century B.C., and Athenian coins became uncommon. Pirenne proposed that, if the archaeological remains associated with the Saba'eans dated to the 4th century B.C., this would connect well with the economic history of the wide Near East, and that it is very unlikely that the mukarribs created Athenian form coins three centuries before they generated their coins.

Pirenne's final argument related to the architectural monuments at Ma'rib in Yemen. She compared these with remains elsewhere dated between the 8th and the 5th century B.C. She concluded that Saba'ean architecture does not conform to the styles of the 8th or 6th century B.C. However, the Saba'ean mukarribs' architecture can be parallel with other constructions in Persian and Phoenician contexts dated to the 5th century B.C. Pirenne thus concluded that the archaeological remains of Saba' and Ma'in should be dated no earlier than the 5th century B.C. (Pirenne, 1987-88; Beeston, 1984; Al-Saud, 1997).

3 The intermediate Chronology

Further revisions to the established chronologies resulted from excavations at Timna', the capital of Qataban, and in Hayd bin 'Aqil, the cemetery of Timna', and Hajar bin Humeid in Yemen by the American Foundation for the study of Man (Van Beek, 1969; Bowen and Albright 1958). Artefacts revealed from these sites indicated that the material culture of Qataban and Ma'in could not be dated before the Kingdom of Saba', which held great power in the middle of the Hellenic period.

Ba-faqih (1985), considered the earliest of the kingdoms to be 'Ausan, followed by Ma'in, Qataban, Hadramawt and Saba'. The same author also divided the kingdom of Saba' into two eras based on the titles of kings found in some inscriptions: first, the Kings of Saba' and Dhū-Raydān between the 2nd and 3rd century B.C., or even earlier, and second, the Kings of Saba' and Dhū-Raydān and Hadramawt and Yamnat around the beginning of the first century B.C., which refers to the kingdom of Himyar.

De Maigret proposed a chronological framework for the history of ancient South Arabia "covers nearly 16th century", from the time of the Queen of Saba's journey to Palestine, visiting King Solomon to the Sasanian's conquest of South Arabia around 570 A.D. (2009: 195-196). In his book, De Maigret proposed a division into two eras. The first covers the whole of the first millennium B.C and includes the history of Saba', 'Awsan, Hadramawt, Ma'in and Qataban or what he called "the history of the kingdoms established in the interior of Yemen" (2009: 196). The political activity of these kingdoms took place around the desert; thus, he named this the period of caravan kingdoms,

which merged two types of rulers: the period of Saba'ean Mukarribs and the period of the Saba'eans Kings.

De Maigret's second era extended from the first century B.C. to the sixth century A.D. This era saw a movement of political and economic power into the highland areas and towards the sea, meaning that the old caravan routes were replaced by new maritime trade. The people of Himyar became independent from the kingdom of Qatabān, uniting with other tribes to set up a new kingdom. This era has been called the period of commercial maritime kingdoms or the period of the mountain kingdoms (De Maigret, 2009).

The most important South Arabian kingdoms are those of Saba', Qatabān, Ma'in, Ḥaḍramawt, 'Awsān and kingdom of Himyar. In the following section, I will provide brief details concerning the development of these polities, with reference to their connections with surrounding communities.

3.2.2.1 The Kingdom of Saba'

The Kingdom of Saba' is one of the oldest and the most powerful of the ancient South Arabian kingdoms and it was one of the wealthiest states in South Arabia. This group settled the region of Ma'rib in the first millennium B.C. (Doe, 1971; De Maigret, 2009). Ma'rib itself, an important archaeological site, was the capital of the kingdom (Al-Saud, 1997; Ba-faqih, 1985); it is located in northern Yemen on the edge of the desert in the dry delta of Wadi Adan, about 120 km east of San'a, the capital city of modern Yemen (Philby, 1939). The history of the kingdom of Saba' is poorly understood, in line with the wider problem of the chronology of ancient south Arabia discussed above.

We know a little more about the economic foundations of Saba' than we do about its historical developments. Pliny the Elder 1847/1948, and in his book *Natural History* stated that "The Sabaei are Richest in Fertility of their Woods, that bring forth Aromatic Gums: also, in Mines of gold; having Water to refresh their Lands, and plenty of Honey and Wax." (Pliny, 1847/1848, 152). Pliny's description reflects the fact that Saba' (and neighbouring kingdoms) were famous for their production and export of frankincense. Saba's territory extended from shore to shore, having part of the coasts of both the Red Sea and Arabian Sea (Pliny, 1847/1848, 150; O'Leary, 1927).

Saba' was thus significant regarding the economic control of overland trade in frankincense and myrrh. In terms of agricultural infrastructure, the great dam of Ma'rib (Sadd Ma'rib) was a large and significant construction of the period between the 8th and 7th century B.C., being around 550 m long and 915 m wide (Doe, 1971; Ba-faqih, 1985). The remains of this dam still exist a few miles south of Ma'rib, and water was distributed by controlling the flood via huge channels into two main harvest areas (Al-Saud, 1997; Doe, 1971). This extensive irrigation system was a considerable indication of

the strength and power of the kingdom of Saba', and the ability of its rulers and administrators to organise resources of wealth and people for large-scale construction projects.

Probably around 600 A.D. the dam of Ma'rib collapsed due to a great flood; the occurrence was cataclysmic enough to be described in the Qur'an (Al-Burûj, 85, v: 4-8). The consequences of this incident may have led to a reduction in the carrying capacity of the land in terms of agricultural production, with potentially an associated reduction of population (Al-Saud, 1997).

Another important construction in Ma'rib was the temple of Awwām dedicated to 'Ilumaquh, the Moon God, a building that is also known as Mahram Bilqis (the temple of the Queen of Saba'), built around the 8th century B.C. or before that date (Jamme, 1962). This temple consisted of a large wall of stone debris faced with ashlar blocks, the whole being approximately 4 m thick, enclosing an oval area approximately 115 m long and 77 m wide (Doe, 1971).

Regarding the Saba'ean dynasts, as mentioned above, two titles were used in inscriptions at particular times to refer to Saba's rulers; these were, mukarrib (mkrb) and malik (mlk) (king) (Al-Saud, 1997; Doe, 1971; Jamme 1962; Hoyland, 2001). The latter is relatively clear in meaning; but the linguistic root behind mukarrib (mkrb) is ambiguous in meaning.

Many scholars have tried to relate it to a proposed religious position for the mukarrib (Jamme, 1962; Al-Otaibi, 2006; De Maigret, 2009; Bin Tiran, 1992; Beeston, 1984; Hoyland, 2001; Pirenne, 1987/1988); however, in reality, there is no evidence to support this interpretation. Although abundant Saba'ean inscriptions include this title, there is as yet no explanation of what mukarrib actually means (De Maigret, 2009). We can say only that the kingdom of Saba' began in the first millennium B.C. (Doe, 1971; De Maigret, 2009), and reached its peak of power and stabilisation in the 6th or 7th century B.C., with the majority of Saba'ean inscriptions dated to the same period (Beeston, 1954; De Maigret, 2009; Doe, 1971).

3.2.2.2 The Kingdom of Qatabān

The kingdom of Qatabān was for a long time close to the south-west of the territories of its neighbour, the kingdom of Saba' (Al-Saud, 1997). Qatabān controlled many towns, such as Nagia (Hajar Najā) and Tamna (Timna'), which were its largest settlements (Doe, 1971; Beeston, 1972 and 1976). Pliny the Elder suggested that Qatabān had many towns and included as many as 65 temples (Pliny, 1847/ 1848, 150). However, no specific evidence supports his statement, and this number is not mentioned in any recent studies of Qatabān. Qatabān was mentioned for the first time in the inscription of Krib il Wtr (RES 3945) in his battle against 'Awsān, and Qatabān appeared in the inscription as an ally of the Kingdom of Saba', but in later times a few inscriptions described the battle of the kings of Saba' against Qatabān (Al-Otaibi, 2006; Hoyland, 2001).

Timna', which is now known as Hajar Quḥlan (Kulan) in Wadi Baihan, was Qatabān's capital city (Al-Saud, 1997; Doe, 1971). According to Wendell Phillips, president of the American Foundation for the Study of Man, who led the Arabian expedition to Yemen in the autumn of 1949 and excavated in Wadi Baihan, this kingdom flourished between the 7th and 1st centuries B.C. (Albright, 1950; Ba-faqih, 1985; De Maigret, 2009). However, we may extend this period to the 1st or 2nd centuries A.D. on the basis of various south Arabian inscriptions discovered from the same area (De Maigret, 2009; Albright, 1950). In terms of territory, the Qatabān kingdom occupied land from Wadi Baihan west to Wadi Harib and to the far south-west corner of Arabia, which is the main entrance to the Arabian Sea, known today as Bab Al-Mandab (Strabo, 1932; Al-Saud, 1997; De Maigret, 2009). The importance of Timna' is that it was a large market of Myrrh just as same as Shabwa was an important market of frankincense, and thus, Timna' was the natural and secure route for incense caravans that left Timna and heading west towards Ma'rib (Groom, 1976: 72-73).

Some scholars including Doe (1971), Beeston (1976), Müller (1987/ 1988), Al-Saud (1997) and De Maigret (2009) indicate that between 400 B.C. and 350 B.C. Qatabān reached heights of power and expanded from the Red Sea to the south-west and as far as the Indian Ocean to the south. Unfortunately, there are no known inscriptions from the area under the control of Qatabān that can support the theory that this kingdom-occupied land stretching as far as the western and eastern coasts of southern Arabia (De Maigret, 2009). The Qatabānians also created irrigation systems in the Wadi Baihan, and American archaeologists revealed that the main canal in the Wadi was equipped with a complex system comprising many passages and gates to control the distribution of floodwater into sub-channels (Ba-faqih, 1985; Groom, 1976). As with Saba', then, the kingdom of Qatabān was clearly able to mobilise resources for major infrastructure projects to maximise agricultural productivity in core areas of its territory.

3.2.2.3 The Kingdom of Ma'īn

The Minaeans built their kingdom in the north of Yemen along a strip of Al-Rub' Al-khali desert; its location is known today as Al-Jawf, in the north-east part of the province of San'a. The territories of Ma'īn extended to the Ḥaḍramawt (Doe, 1971), and the land of Ma'īn was a fertile and agricultural area (Bafaqih, 1985).

Pliny the Elder described "the Minaei, through whose territory the transit for the export of the frankincense is along one narrow track. It was these people who originated the trade and who chiefly practice it, and from them the perfume takes the name of 'Minaean'" (Pliny, 1960, 39). According to Strabo (1930, 311) the Minaeans were one of the largest tribes in South Arabia, occupying territory on the side towards the Red Sea and concurrent with the Saba'eans,

Qatabānians and Hadhramis. The capital of the kingdom was at Qarnawu (Karna) to the south of Al-Jawf; there were other famous cities in the kingdom, such as Yathil (Yṯl), known as Baraqish, and Nashan (Nashq), which is known today as Al-Sawdā (Doe, 1971; De Maigret, 2009).

There is no evidence that the Minaeans were ever ruled by a governor carrying the title of mukarrib; rather, they were ruled by a malik (king). This may reflect the possibility that they did not reach a level of political union comparable with that of Saba', Qatabān and Ḥaḍramawt; thus, this kingdom remained largely tribal in organisation (De Maigret, 2009). However, around 400 B.C. Ma'īn became an independent state, with the beginning of a royal Minaean dynasty (Albright, 1950; Doe, 1971; Al-Saud, 1997; Al-Otaibi, 2006), and an inscription found at Qarnawu indicates that a Minaean king ruled until about the third quarter of the 4th century B.C. (Doe, 1971). This increasing centralisation of rule facilitated the expansion of the Minaean kingdom, and supported their control of the incense trade routes from South Arabia to the Mediterranean (De Maigret, 2009; Doe, 1971).

In order to protect these trade routes and strengthen the economy of their empire, the Minaeans established market points under their control in the north-west of Arabia, called Dedan (Al-'Ula) and at Timna (Al-Saud; 1997; Doe, 1971; De Maigret, 2009); this is evidenced by a number of Minaean inscriptions found in Al-'Ula (Winnett, 1939). By the 3rd century B.C., the kingdom of Ma'īn had apparently achieved substantial growth in power and reach to the central of Arabia (Al-Otaibi, 2006; Hoyland, 2001), as reflected through their political dominance of lands on the trade routes, such as Qaryat Dhat Kahl (now Qaryat Al-Fāw) (Hoyland, 2001), and their commercial expansion, as evidenced through several inscriptions found as far afield as Egypt and the Mediterranean Levant, which illustrate the universal status of the Minaeans in that period (De Maigret, 2009; Hoyland, 2001).

As with other kingdoms, the kingdom of Ma'īn weakened and lost power around the second century B.C. (Ba-faqih, 1985; Al-Saud, 1997) due to the growth of the kingdom of Himyar (De Maigret, 2009). Doe (1971) argued that the end of the independence of Ma'īn might have been in 115 B.C. De Maigret (2009) remarked that the disappearance of the Minaeans as a great kingdom in the south Arabia took place around the beginning of the first century B.C., and the last inscription found in the area of Ma'īn was dated from around 100 B.C. On the other hand, the last indication of the kingdom of Ma'īn is found in Saba'ean inscription found in San'a and dating from around 5th century A.D., which mentions king Yatha' or "Yatha'il", the son of Yd'iL, king of Ḥaḍramawt, who also ruled Ma'īn (Doe, 1971; De Maigret, 2009).

3.2.2.4 The Kingdom of Ḥaḍramawt

Today, the region of Ḥaḍramawt is in the east of Yemen; it occupies 36% of the area of Yemen, and its capital is Al-Mukalla. Previously, though, the kingdom of Ḥaḍramawt was located to the east of Qatabān's territories, and its capital city was Shabwa (Al-Saud, 1997; De Maigret, 2009; Doe, 1971). Pliny (1847/ 1948, 150) described this kingdom as "the Atramitae, whose capital city, Sobotalè, had within its wall sixty temples." However, Breton (1987/1988, 111) mentioned Ḥaḍramawt and its capital Shabwa as being located on a hill and surrounded by a wall with an access gate, with around 60 buildings, among them the royal palace and a temple, inside the enclosure. The earliest evidence for the Kingdom of Ḥaḍramawt is found in certain South Arabian inscriptions, including Hadrami inscriptions discovered in the territories of Ḥaḍramawt and Qatabān, in addition to a number of Saba'ean and Minaeans inscription (Ba-faqih, 1985). It seems that the growth of the kingdom was again linked with the land trade routes for frankincense from the Dhufar (Zafar) area in Qamr Bay. Thus, it is highly likely that Ḥaḍramawt was an important location for the production of the significant supply of incense for trade caravans, which moved directly from Shabwa, then through Qarnawu (Karna, the capital of Ma'īn) in the land of Al-Jawf and finally through Marib, the capital of Saba' (Doe, 1971; Al-Saud, 1996; Serjeant, 1956, 1964). Beeston (2005) indicated that Ḥaḍramawt was the source of frankincense to the Mediterranean-Mesopotamia world. The supply of this material was through "an overland routes which started from the Hadramite capital Shabwah and ran westwards (the way northwards being barred by the sands of the great "Empty Quarter") the the Wādī Jawf (perhaps picking up myrrh en route), thence north via Nagrān and Dedān/al-'Ulā to Gaza; at Nagrān another route branched off north-eastward by Qaryat Al-Fāw and the oasis of Yabrīn to Gerrha/Thāj in north-east Arabia for the Mesopotamian market" (Beeston, 2005: 53).

Ḥaḍramawt rose to prominence around the 5th century B.C., during the same period as did other kingdoms in South Arabia. According to Saba'ean inscriptions, it was initially under the control of the Saba'eans, being described Ḥaḍramawt as a colony when the mukarrib Karib'il Watar, the son of Dhamar 'Aly, established it (Breton, 1987/ 1988). However, between the 5th century B.C. and the 4th century B.C., the kingdom of Ḥaḍramawt became an independent kingdom, according to several inscriptions mentioning the mukarribs and later the kings of Ḥaḍramawt, one of whom was Il Yafa' Dhubyān (Al-Saud, 1997; Breton, 1987/ 1988). The Kingdom of Ḥaḍramawt dominated the frankincense trade routes, and its territories extended to what it is known today as the Al-Mahrah region (Al-Ghaydah is its capital) and Dhufar (Zafar) in the east, to Wadi Mi'sal/ Al-Mi'sal South of Radaa' city in the west (Doe, 1971; Al-Saud, 1997; Philby, 1939; Albright, 1950; De Maigret, 2009).

Although some sites have been excavated in Ḥaḍramawt, including Al-Barirah and Al-Bina in Wadi Jirdan, and Naqib Al-Hajar in Wadi Mayfa'ah, the information gained has not as yet been sufficient to understand the society's activities, relations with other polities and the distribution of the ancient centres of the kingdom (De Maigret, 2009, Doe, 1983). The publication of the excavation of Hureidha (Ḥaḍramawt) by Thompson in 1944 has provided detailed information regarding the irrigation system in Hureidha, in addition to a description of the temples and an initial interpretation of the pottery (Thompson, 1944), but these data cannot lead us to understand the development of social activities and commercial exchange for South Arabia, due to the lack of archaeological work in the region. In addition, many ancient sites in the area of Hureidha are occupied by modern cities, such as Tarim and Shibam, presenting significant challenge to their archaeological investigation (De Maigret, 2009).

3.2.2.5 The Kingdom of 'Awsān

The kingdom of 'Awsān extended from the lands along the coast of 'Aden to Ahwar and inland as far as the borders of Qatabān south of Bihān. From the end of the 5th century B.C., 'Awsān was dependent on Qatabān (Al-Saud, 1997, Ba-faqih, 1985, Doe, 1971). The earliest indication of the kingdom of Ausān is an inscription describing the victory of Karib'il Watar, king of Saba', and dated to the 7th/ or 6th century B.C. This piece of epigraphy explains how the king of Saba' invaded and overran territories in the south-west part of Arabia, and destroyed 'Awsān in the South with help from his clients in Qatabān and Ḥaḍramawt by the end of 5th century B.C (Ba-faqih, 1985, Müller, 1987/ 1988; Al-Saud, 1997).

Several towns are referred to in this inscription, which notes the flourishing of the 'Awsān kingdom before the raid; the most significant of these was Mizwar, which was the capital of 'Awsān (Al-Otaibi, 2006; Doe, 1971). Furthermore, this inscription gives important data as to the extent of the strength of 'Awsān during the height of the power of the kingdom of Saba' and its subservient lands, including Qatabān and Ḥaḍramawt. It has been suggested that 'Awsān appeared as an autonomous kingdom around the 3rd century B.C. until the end of the 1st century B.C. (Philby, 1939); another suggestion is that the appearance of 'Awsān was around the 5th Century B.C. (Ba-faqih, 1985), but there is no specific evidence to support this theory.

The location of 'Awsān was key to its wealth and power. The commercial potential of 'Awsān was probably based on comprehensive maritime trade with the east coast of Africa to the south of Pemba and Zanzibar (Al-Saud, 1997; Doe, 1971). The domination of the coastal trade route by 'Awsān may reflect the power and wealth of the kingdom, and allowed it to compete with the kingdom of Saba' (Ba-faqih, 1985; Doe, 1971).

'Awsān was ruled by kings; however, the data that we are offered about them is restricted to the last king of independent 'Awsān (Ba-faqih, 1985). This king is in the above-mentioned inscription of king Karib'il Watar, "king of Saba'", which describes how the king attacked 'Awsān and burned its cities, killing its people, and subjected its king Martawa' to his share of violence, destroying his place in Miswara (the capital of 'Awsān) in addition to 'Awsān's temples (Al-Otaibi, 2006). The majority of inscriptions that have been found in the territory of 'Awsān do not allow us to infer detailed knowledge of this small kingdom, and many of them are short and of a religious nature, without information concerning the political or social situation of 'Awsān in this period (Ba-faqih, 1985; Doe, 1971).

3.2.2.6 The Kingdom of Himyar

The Kingdom of Himyar was a great and powerful kingdom; it spread widely in the south Arabian lands and ruled a large number of states and tribes. The rise of Himyar as a new kingdom has been linked with decline of the late Saba'ean kingdom from 110/ 115 B.C., when Saba' began to weaken and started to lose control over many of their territories (Doe, 1971; De Maigret, 2009; Yule, 2007; Beeston; 1984; Yule et al, 2010; Simon, 2002). The earliest reference to Himyar occurs in Strabo and Theodore Anagnostes: they mentioned Himyar as Immirenoi or Immeres (O'Leary, 1927). Pliny likewise names the Homeritae (Pliny, 1847/1848). A significant change during the period of Himyarite dominance is the extension of the king of Himyar's title to that of the king of Saba' and Dhū-Raydān and Ḥaḍramawt and Yamnat (Simon, 2002; Al-Otaibi, 2006; Potts, 2008).

Inscriptions found in 1982 by Christian Robin near the ancient city of Wa'lan (known today as Al-Mi'sal or Wadi Al-Mi'sal) provide useful information on the date of the emergence of Himyar. These inscriptions supplied a series of three Himyarite sovereigns, synchronous with kings of Ḥaḍramawt and kings of Saba'; these can be dated to a late period, the 3rd century A.D. (Robin, 1981, 2001; Al-Otaibi, 2006; De Maigret, 2009). The significance of these inscriptions is their provision of a series of fixed chronological points in the history of South Arabia (De Maigret, 2009). The inscriptions of Wadi Al-Mi'sal are very important for our knowledge of the kings of Himyar, but there is not enough information to understand its tribal configuration.

Himyar is described by Pliny (1847/ 1848, VI: 151) under the name of Homerites, and according to him included a large number of South Arabian tribes. As noted above, the emergence of Himyar was concurrent with that of Saba', and we can say that the tribes of Himyar were controlled by Qatabān: references to the "Children of 'Amm" appear in some Himyarite inscriptions, the name of 'Amm relating to the Moon God of the kingdom of Qatabān (Doe, 1971). When the rulers of Himyar began to assert control over the territory, they appear to have been based in Yafā', North of Abyan.

However, when the Himyarite kings became independent, they made Zafar their capital (Doe, 1971; De Maigret, 2009; Yule, 2007), or as marked in earliest sources, Saphar (Pliny, 1847/ 1848), or “near Homerita the Sappharitae” (Ptolemy, 2011 [1932]: 139).

A particular chronological problem regarding the kingdom of Himyar is that some scholars have dated the continuation of this kingdom to around 570/630 A.D, but there is no strong evidence to support these dates or to suggest that Himyar extended to that time (Yule, 2007). There are no texts dated to the 1st or 3rd century A.D., although inscriptions from the Radman area, dated to the 2nd century A.D., are close to Himyarite territory (Beeston, 1984).

In terms of its territories, after breaking from Qatabān, Himyar occupied the southeast highlands of Yemen (Müller, 1984; De Maigret, 2009). Around the first century A.D, Himyar extended and took ownership of part of Aden and part of the Red Sea coast, defining themselves as Himyarites or the kingdom of Himyar (Müller, 1984; Yule, 2007). This kingdom reached a high level of political complexity; aspects of their political system were already in existence before their emergence as an independent kingdom. The Himyarite core area centred in the highlands and the tribes integrated in mountainous rather than other areas. The Himyarites created their own calendar, which appears in some of the 43 Himyarite inscriptions dated from the 2nd to 6th century, which provide the most complete chronology we have for a South Arabian kingdom, naming Himyarite rulers, such as “Mabhad son of Abhad” (Yule, 2007: 43). In this calendar, the months were specified according to the movement of stars (Yule, 2007).

The subsequent use of the name of places within the titles of rulers, such as “king of Saba’ and Dhū-Raydān and Ḥaḍramawt and Yamnat” indicate the power and the span of territory the Himyarite rulers dominated (De Maigret, 2009; Potts, 2008). By means of wide territorial expansion to the south and south-west as far as the shores of the Red Sea and Indian Ocean, they eclipsed the old overland caravan trade routes (Doe, 1971, De Maigret, 2009). Himyar, as well, controlled other areas, such as Eudaemon Arabia (‘Aden), the province of Ma’afaritide (southern Tihāmah) and its port Mawza’ (De Maigret, 2009; Yule, 2016; Doe, 1971).

The core area of the archaeological site of the Himyarite capital of Zafar measures about 110 hectares, making it one of the largest archaeology sites in Arabia (Yule, 2007). Excavations of any archaeological site can provide reliable evidence of its population’s lifestyle, but in the case of Himyar, no completed and published excavations or finds exist that can give new data about the nature of this kingdom. Much, therefore, remains unknown about the nature of the population under the control of this powerful polity.

3.2.2.7 The Commercialisation of the South Arabian Kingdoms

From this account of the kingdoms, we can say that we have little clear idea of their political organisation, although the picture is slightly clearer for the kingdom of Himyar than for the others. The economic basis of these kingdoms was the trade routes, which they dominated at different times according to each kingdom's power, and the influence of which should not be underestimated. In the previous chapter, Smith's (2004) concept of 'commercialisation', was discussed, and it was argued that South Arabia tended towards 'full commercialisation', i.e. a society where control of economic systems was at least in part held by individuals as a form of private entrepreneurship rather than by the state or related institutions. Although we have seen that many of the kingdoms were centralised enough to facilitate major hydraulic infrastructure projects, the control of long-distance trade from South Arabia to North Arabia and into the Near East seems to have more informally organised. Peter Magee argues for a "furtive trade" from the ninth century B.C., avoiding control and taxation by neighbouring states, and sparked by access to domesticated dromedaries; these caravans, Magee argues, "kept their trading interaction brief and informal", operating under the control of tribal leaders with "entrepreneurial prestige", and governed by "tribal agreement and convention" (2014: 265-270; quotations on 265; 267; 269; 270). Although Magee's discussion focusses on Northern Arabia, he does not ascribe a greater degree of formal economic control of long-distance trade to South Arabia, which he proposes directly controlled neither the North Arabian tribes' trading activities, "nor did it necessarily control the movement of goods from south-western to north-western Arabia" (2014: 270). This is perhaps due to the fact that the political entities in North Arabia may have exercised more dominance over the overland trade routes, particularly in the north; however, this does not reduce the connection between South and North Arabia via these routes, as evidenced by the discovery of some north Arabian names in inscriptions at Najran, dated to 200 A.D. (Hoyland, 2001: 18; Potts, 1988: 128-133). It may not be coincidence that the Mineans played a key role in long-distance trade, since they appear to have been more tribally organised and less centralised than the other kingdoms, and located closer to desert-edge territories (Magee, 2014). The location of the Arabian Peninsula between the Mediterranean states, Mesopotamia, Africa, and India allowed a portion of international trade to pass through or near Arabia to and from these states. This advantage offered an opportunity to some individuals in Arabia, including tribal entrepreneurs among the Mineans, to exploit their position, to be intermediaries facilitating the crossing of caravans and protecting them, activities which provided the Mineans with wealth and prosperity (Hoyland, 2001: 107). Their inscriptions, unlike others', concern commerce over conflict, mentioning mercantile individuals, families and commercial expeditions to Egypt (Hoyland, 2001: 41). Overall, then, the admittedly

sparse evidence favours private, entrepreneurial organisation of trade at the tribal level over state enterprise; whether the situation was analogous for more localised or regional trade (e.g. in foodstuffs, pottery, etc) is unclear.

Despite the above, detailed information relating to social activities and relationships, economic situations, life styles and territorial development is still remarkable thin for the region. We thus do not have enough data to allow us to understand the South Arabian kingdoms entirely, and any new archaeological dataset relating to these kingdoms, such as study of pottery for economic purposes presented in this study, must add substantially to existing knowledge of South Arabian archaeology.

3.2.3 Najran in Context:

3.2.3.1 The Arabian Kingdoms and the Roman Conquest

The first mention of Najran appears in inscriptions on the great dam of Marib dating from the period of Saba'ean dominion over southern Arabia around 1100 B.C. (Philby, 1952). In 900 B.C. an important change took place in the southern Arabian political sphere when the province of Qatabān became an independent state from the Kingdom of Ma'īn, starting to refer to their rulers as mukarribs (Philby, 1952). Najran was conquered during this period, either by Saba'ean mukarrib Samah Ali Yanouf (Sumhu 'Alay Yanuf) in 660 B.C., or his son Yafa Amr Ben around 640 B.C. (Jamme, 1962; Al-Otaibi, 2006). Groom in his book *Frankincense and Myrrh* indicated that the earliest archaeological evidence of trade was mentioned by Herodotus, who was an ancient Greek historian, and the evidence was fragments of jars with some South Arabian letters on them found in North Arabia (1981). Najran is likewise mentioned in inscriptions relating to conquests (including of Najran and other cities) by the Saba'ean mukarrib during the reigns of Sha'rum 'Awtar, king of Saba' and Raydān, and his governor 'Abkarib 'Ahras Ben 'Ablum, dating approximately to the beginning of the 5th century B.C. (Jamme, 1962: 136 – 138; Al-Otaibi, 2006: 33), and a Minaean inscription found on the wall of Baraqish city in Ḥaḍramawt, Yemen mentioned Najran "Rajma" as a city located on the trade routes; this inscription dates to 4th/ 3rd century B.C. (Al-Saud, 1997: 47).

During the 1st century B.C., the Romans occupied Najran, but there are insufficient inscriptions to understand the sequence of battles that occurred in the South Arabian Peninsula at that time (Al-Otaibi, 2006). We know that Najran was the first southern Arabian city to fall to the Romans on their way to Ma'rib in Yemen (the Kingdom of Saba') (Al-Ansary and Al-Marreh, 2003). Greek geographer, philosopher and historian Strabo referred to Najran in his account of the expedition of Aelius Gallus in 24 B.C., reporting that in the face of the Roman force, "the king fled, and his town was captured at first assault" (Dayton and Dayton, 1978/ 1979: 31). The Roman military campaign

against Najran and Saba' did not continue for long as it had to withdraw from Marib after recall from Augustus (Robin, 2003); the reason may have been due to the long campaign and the disastrous news that was reaching Augustus, and probably due to the shortage of water and unknown and fearful diseases (Simon, 2002). In the 2nd Century A.D., Claudius Ptolemy, the Greco-Egyptian geographer, referred to Najran as "Nagra Metropolis", implying that it was the main area of a group settlements at this time (Dayton and Dayton, 1978/ 1979; Zarins et al, 1983; Halevy, 1872; Al-Ansary and Al-Mareeh, 2003). However, the Roman presence in Najran did not long endure, with control once again passing to Saba' at an unknown date. From the 3rd century A.D., a Saba'ean inscription from Mahram Bilqis in Ma'rib, Yemen, describes the revolution of the Najranites against the King of Saba' 'Ilsharh Yahdub and the admission of an Aksumite governor for Najran town. Furthermore, the inscription refers to the ruination that happened in Najran town and the towns near it: "... the king 'Ilsharh Yahdub and the troops and the two raid-corps he sent to fight against them, fought against them, and so they killed from the tribe Najran nine hundred and twenty-four soldiers and took away five hundred and sixty-two captives and they subjugated in the two wādî-side valleys of Najran, sixty-eight towns and plundered ..." (Jamme, 1962: 79; see also Zarins et al 1983; Dayton and Dayton, 1978/ 1979; Al-Otaibi, 2006; Al-Ansary and Al-Mareeh, 2003).

At the beginning of the 4th century A.D., Najran remained under Saba'ean control. The town appears in the Namāra inscription, a source of considerable importance regarding relations between Romans and Arab polities, from the eastern part of the Jabal Al-Druze in Syria. Namāra was the burial place of the Arab king Imru' Al-Qais; this inscription is on his tombstone, and is dated to the 7th of Kaslul of the year 223 of the Basra calendar, which is 7th December, 328 A.D. The inscription consists of five lines of Nabataean language (Zwettler, 1996; Dayton and Dayton, 1978/ 1979; Al-Ansary; and Al-Mareeh, 2003; Hoyland, 2001). Here, Najran is considered as part of the "realm (mdynt) of the Saba'ean king Shamr Yahra'ash king of Saba' and Raydān and Ḥaḍramawt and Yamnat" (Dayton and Dayton, 1978/ 1979: 31; Jamme, 1962: 163; Shahid, 2006: 31). However, in the early 6th century A.D., Najran became part of the territory of the Himyarite king Yūsuf 'As'ar Yath'ar (Dhū Nwās) (Dayton and Dayton, 1978/ 1979; Al-Ansary and Al-Mareeh, 2003; Ibn Al-'thīr, 1995). Many inscriptions found in the region of Najran from this period mention events that occurred in the town. In particular, an inscription naming king Dhū Nwās from in Bī'r Ḥimā near Najran was discovered by Philby 1936. This inscription was carved in South Arabian script (musnad) on sandstone; it is about twelve lines and up to six meters in length (Lippens, 1956 [1999]). The text explains Dhū Nwās's invasion of Najran and killing of the Habashites (Abyssinians), Christians and the military union of Najran (Jamme, 1966: 40-41; Al-Otaibi, 2006: 311-312).

To sum up, then, the majority of the information that we have about the rulership of the region of Najran at this time comes to us from inscriptions connected mostly with other Arabian kingdoms. Most of these describe the military campaigns directed against Najran, or other areas surrounding Najran in the South Arabian Peninsula. The Roman presence in Arabia resulted in an additional strand of evidence, specifically writings by the Graeco-Roman geographers and historians who visited the area or heard about it; their information may have come from the military campaign of Aellius Gallus in 24 B.C. Their works provide information relating to the natural history of Arabia, although they do describe a few particular monuments. It is clear, though, that the region remains in significant need of new strands of evidence to cast light on its economic and social situation, especially below elite level.

3.2.4 Early Islamic/ Medieval Najran

We have seen above that the ancient town of Najran was known to classical writers and mentioned in some South Arabian inscriptions. Najran was also known to medieval Arab historians, travellers and writers, who provide some information relevant to understanding economic practices and networks in the area. Additional sources of evidence for medieval Najran include Arabic inscriptions, gravestones, and architectural remains. This section will, first, provide a general overview of the importance of Najran in the Islamic era: although these sources post-date the main focus of interest of the current study, the information they provide is nonetheless useful in understanding the level of economic development that was in place at the end of our period of interest. It will then consider the evidence from some of these sources in more detail, with particular reference to 1. Agricultural practices; 2. Natural resources; 3. Manufacturing and production; 4. The presence of markets; and 5. Routes and roads.

Various Islamic-era inscriptions have been recorded in the region of Najran. These inscriptions are found in various locations, including Bi'r Ḥimā, Dhirwa' Mountain and the Al-Markib Mountains, and were written on rock faces in a simple Kufic script; probably they date to the first three centuries of Islam (Al-Ansary and Al-Mareeh, 2003: 58-59; Zarins et al, 1981: 32-33; 1983: 35). Other Islamic inscriptions found in the same areas were written on gravestones dated to 542 A.H./ 1184 A.D. and 592 A.H./ 1196 A.D. Gravestone inscriptions, currently in the Najran Museum, have likewise been found at the site of Al-Ukhdud dated to 190 A.H. / 806 A.D. and 516 A.H./ 1122 A.D. (Al-Ansary and Al-Mareeh, 2007: 70-71). The evidence of Islamic-era activity in the region does not only come from the inscriptions, but also from archaeological remains including glazed pottery found at Al-Ukhdud, with "blue glazes with moulded relief attributable to the 3rd century A.H."/ the

9th century A.D. (Zarins et al, 1981: 32), to be discussed further below, and from the works of medieval Arab historians and geographers.

Abī ‘ubayd ‘abdullah ibn ‘bdul‘zīz Al-Bakrī (404 – 486 A.H./ 1014 – 1094 A.D.) was the first Islamic geographer to mention Najran. In his book *Al-Mu‘jam* he mentioned the region and discussed the roots of its name, and described the archaeological site of Al-Ukhduḍ, which he wrote was in ruins with nothing left of it except the mosque built by Omar Bin Al-Khattab (Al-Bakrī, 1945: 121; 1949: 1298-1299 [1876-1877]). Yāqūt Al-Ḥamawī (574 – 626 A.H./ 1179 – 1229 A.D.) who wrote *Mu‘jam Al-buldān*, wrote the of name Najran came from the first person who settled in it, called Nagrn/ Nagrān bin Zaidān bin Saba’ bin Yashjub bin Ya‘rub bin Qaḥtān (Al-Ḥamawī, 1957: 266 [1865]). More generally, these authors principally consider the peak of settlement in Najran to be connected with the activity of Christian belief until around 780 A.D. Some Islamic writers, such as Al-Iṣṭakhrī and ibn Mujāwir, suggested that Najran was thriving even with reduced settlement during the early Islamic period until at least the 3rd century A.H./ the 9th century A.D. (Zarins et al, 1983: 32). Jamāl El-dīn Abū Al-faḥ Yūsif bin Ya‘qūb ibn Mujāwir (601 – 690 A.H./ 1205 – 1291 A.D.) in his book *Tarīkh Al-Mustabṣir* also gives account to both Najran and its inhabitants, and implies to Al-Ukhduḍ that was no longer inhabited (Ibn Mujāwir, 1996: 238 [1901, 1951-1954]). Specific aspects of these works relating to the topics listed above are discussed further below.

In terms of more recent remains, the area around Najran is famous for a number of castles and forts, which provide significant, unique and distinctive examples of the traditional mud architecture of the region. One such example is Qasr Al-Emara (today the office of the administrative governor) built in 1361/ 1942 (Ministry of Education, 1999; Al-Ansary and Al-Mareeh, 2003); another is the castle of Sheikh Yaḥya Bin Naseeb described by Philippe Lippens in his book *Expedition en Arabie Centrale 1956* (Lippens, 1956 [1999]). These complexes evidence the continued strategic importance of the area into the late medieval and modern periods.

1. Agricultural Practices

A number of medieval sources provide detailed information about the agricultural practices of the Arabian Peninsula in general and Najran in particular. One of these, Abū al-Qāsim ‘ubaidallah ibn ‘abdullah ibn Khurdādhbah (204 – 299 A.H./ 820 – 912 A.D.), was an Islamic historian and geographer. In his book *Kitāb Al-Masālik Wa al-Mamālik* he mentioned Arabia, including the region of Najran and surrounding areas. Ibn Khurdādhbah indicated some agricultural practices, comprising the farming of agricultural crops and some trees, including vineyards and palm trees (Ibn Khurdādhbah, 1889: 134). Despite the importance of their works, none of the accounts of Al-Mas‘ūdī (1988 [1861-1871]), Al-Daynūrī (1960 [1888]), Al-Ṭabarī (1979 [1879]) nor Al-Balādhurī (1957 [1863, 1866]) provide sufficient information about agricultural practices in the region of

Najran and Yemen or South Arabia. Najran is, however, mentioned by another Arab Muslim geographer, Abū Muḥammad Al-Ḥasan Al-Hamdānī (280 – 339 A.H./ 893 – 947 A.D.), in his book *Ṣifaa² Jazīraa² Al-‘arab*, which provides a detailed description of the history of Najran, and the measurement of the city; more relevant to our understanding of agriculture, though, is his description of the oasis of Najran and Wadi Najran, and the positive influence of Wadi Najran on agricultural practices (Al-Hamdānī, 1990: 64, 81-82 [1884]). Al-Hamdānī describes the production of different agricultural crops in Najran, caused by the availability of water and high soil fertility, including wheat, sesame, beans, pumpkins, watermelon and citrus. He described the wheat as being sometimes long and containing two or three or more wheat stalks (Al-Hamdānī, 1990: 318 [1884]). Abū Ishāq Ibrāhīm ibn Muḥammad Al-Iṣṭakhrī (235 - 346 A.H./ 850 - 957 A.D.), author of *Al-Masālik Wa al-Mamālik* (Al-Iṣṭakhrī, 1927), mentioned Najran as a large city with many palm trees (Al-Iṣṭakhrī, 1927: 16). The large number of palm trees in Najran reflects the agricultural activity of the residents, who were practicing date cultivation. In addition, Muḥammad Abū al-Qāsim ibn Ḥawqal (331 – 378 A.H./ 943 – 988 A.D.), who was a writer, geographer, historian and traveller, described Najran in his book of *Ṣūraa² Al-‘arḍ* as a city with many palm trees. He likewise indicated that some areas close to Najran, including Khawlān (Bilād Khawlān), “have villages and farms and water” (Ibn Ḥawqal, 1992: 43 [1919]). Another source, Shams El-Dīn Abū ‘abduallah Muḥammad ibn Aḥmad Al-Maqdisī (335 – 390 A.H./ 947 – 1000 A.D.), an Arab geographer and traveller, wrote *Aḥsan al-taqāsīm fī ma‘rifat al-aqālīm* (The Best Divisions in the Knowledge of the Regions). Al-Maqdisī mentioned some cities close to Najran and described their agricultural production: for example Taif, which “is a small city that has cold air and water, most of Makkah fruits from it; it is the place of much pomegranate, raisins, good grapes and delicious fruits” (Al-Maqdisī, 1877: 79); and “Bilād Raḥb close to Ṣan‘āa’ has many fruits and it has cheap prices” (Al-Maqdisī, 1877:86). In addition, he also mentioned the cities with the best soil, one of which was Najran (Al-Maqdisī, 1877:67). Al-Maqdisī again indicated Najran as a city with many palm trees similar to Jurash (1877:87).

These authors focused on Najran, Al-Ukhudud and South Arabia in general descriptive terms rather than with a view to providing detailed information about agricultural activities. Despite this, the sources do give an impression of the existing agricultural practices in early times in Najran, based around fairly intensive cultivation of diverse crops, with an emphasis on date palms, facilitated by the availability of fertile soils and relatively water resources, whether rain water, wadi runoff, or wells, which we will now consider.

2. Natural Resources

The topic of the natural resources in the Najran area has already been touched on in Chapter one above and section 3.1 from this chapter, so only a brief summary will be provided here. In considering the natural resources of the area, the focus of medieval writers was unsurprisingly on water. A number of sources provided information about Najran and South Arabia in these terms. One such was Ibn Khurdādhbah, who mentioned settlements in the region of Najran and the natural resources located in them, including Al-Mahjrah, “a great village with ‘uyūn” (Ibn Khurdādhbah, 1889: 134). “‘Uyūn are springs, or points at which water flows from an aquifer to the surface, indicating that this village had an abundance of water. Ibn Khurdādhbah also mentioned other cities, ‘irqah, which had a few water sources; Al-a‘mashiyah, which had only one small spring; Khaywān, which had two pools; and ‘athāfit, with many springs. Another source focused on the availability of waters is Al-Hamdānī, who provides a detailed description of the oasis of Najran, Wadi Najran, the large amount of water provided from it and the watercourse of the rainy season in the summer and its positive influence on agriculture (Al-Hamdānī, 1990: 64, 81-82 [1884]). Al-Hamdānī described “...the wadi Najran and its branches from three places, from bilād Banī Ḥayf from Wada'a, and from bilād Bani Jama'a from Khawlān, and from bilād Shākīr...” (Al-Hamdānī, 1990: 162 [1884]). Al-Hamdānī also mentioned several wadis (valleys) that brought water from different parts of Yemen and met in wadi Najran, and thus, his description is a clear indication that Najran had great abundance of water. The plentiful water provided by wadi Najran allowed the production of different agricultural crops as mentioned above. The information above provides a clear indication of the availability of water resources particularly in Najran. However, in contrast, the information presented by these authors on other types of natural resources – for example, the extraction of metals, clays, building stone, or similar geological resources from the mountainous regions of the Najran area is insufficient. Therefore, the scarce information about these types of natural resources may not provide enough knowledge about their availability in the region of Najran.

3. Manufacturing and Production

Like the evidence for natural resources, the medieval sources for manufacturing and production in Najran and South Arabia are very thin, and many do not note any type of manufacturing and production in this area. However, there is clear evidence for a focus on tanning and leatherworking in the wider region. For example, Ibn Khurdādhbah described the settlement of Sa'dah, around 85 km southwestern of Najran, as “a great city in which leather and shoes are tanned” (Ibn Khurdādhbah, 1889: 134); no equivalent information is given for Najran itself. Other sources indicating leather production in Najran were Al-Iṣṭakhrī (Al-Iṣṭakhrī, 1927) and Ibn Ḥawqal (Ibn Ḥawqal, 1992 [1919]). Both authors noted that “many abundant leathers are taken by Najran, and Jurash, and Taif, most of them are from Sa'dah” (Al-Iṣṭakhrī, 1927: 24; Ibn Ḥawqal, 1992: 43 [1919]).

Although the above information is rather thin, we can infer from these references' other aspects of relevance to our understanding of subsistence strategies in the region. The production of leather in any quantity requires access to animal hides, which in this area are most likely to have been sourced from goats; tanning also requires resources including water, salts and lime, which must thus have been locally available. Crone (2007) considered goats to be a source of hides for leather in North Arabia and the Roman Empire, but does not discuss whether goats were the source of leather in South Arabia (Crone, 2007). Clearly, other process of production, not least including ceramic manufacture, must have been taking place in the region, but the medieval sources provide no direct evidence for these; we encounter a similar problem with the presence of markets, as we shall now consider.

4. The Presence of Markets

The lack of information about the presence of markets parallels that on manufacturing and production, being very thin in terms of detailed description. Some references do, however, indicate the presence of markets in South Arabia. One of these is Al-Hamdānī who noted “the ancient Arab markets: ‘Aden, and Makkah, and Al-Jand, and Najran, and Dhū al-Mijāz, and ‘Okāz, and Badr, and Majnnah, and Hījaru Al-Yamāmah, and Hajr Al-Bahrain” (Al-Hamdānī, 1990: 296 [1884]), but no further details are provided about what type of market Najran was, or what varieties of goods were traded there. Another relevant source is Al-Iṣṭakhrī (Al-Iṣṭakhrī, 1927), whose description of some cities in the south and southwest of Saudi Arabia, including Najran itself, Jurash and Taif, focusses on the settlements as communities or centres of merchants and money (Al-Iṣṭakhrī, 1927: 24). In addition, Ibn Ḥawqal mentioned some markets in South Arabia during his description of particular routes; he wrote “Najran, Jurash and Taif contain a community or centre of merchants and money (Ibn Ḥawqal, 1992: 43 [1919]), which is similar to the indication of Al-Iṣṭakhrī mentioned above. Ibn Mujāwir also gives an account of Najran and its inhabitants, writing that, “Najran [...] depends on selling and buying” (Ibn Mujāwir, 1996: 238 [1901, 1951-1954]), which probably means that at this time, the areas close to Najran depended on it for sale and purchase, indicating its position, economic importance, the strength of its markets and the prosperity of its trade. Additionally, Andalusian religious scholar Abū J’far Muḥammad ibn Ḥabīb (died 245 A.H./ 860 A.D.), who wrote *Kitāb al-Muḥbbar* (1942) and *Kitāb al-Munmaq* (1964), and Islamic historian and geographer Abū al-‘abbās ‘aḥmad ibn Ishāq Al-y’qūbī (died 284 A.H./ 897 A.D.), who wrote *Al-Tārīkh*, mentioned the ancient markets and their locations from North to South Arabia; the authors note that the activity of these markets was based on the Islamic (Hijri) calendar. Unfortunately, these writers did not refer to Najran as the place of one of these markets, and they did not detail the type of trade activity or the types of commodities that were traded (Ibn Ḥabīb, 1942; Al-y’qūbī, 1883).

We can thus see from the information presented above that markets in Najran and South Arabia were present and active, but the little data that we have from these sources cannot offer a clear image of the physical form and nature of these markets and their activities or even the types of traded material.

5. Routes and Roads

Settlements with economic importance, including markets, often lay on the region's main routes. Most of the early Islamic sources described the routes from city to city or from one region to another, but none of them indicate the specific uses of these routes, as they relate to the organisation of trade or the transport of commercial caravans from South to North Arabia. Ibn Khurdādhbah described particular routes that linked together cities including Najran. One of these ran "from Al-Yamāmah to Al-Kharj, then to Naba'ah, then to Al-Majāzah, then to Al-Ma'din, then to Al-Shafaq, then to Al-Thawr, then to Falaj, then to Al-Safā, then to Bi'r Al-ābār, then to Najran, then to Al-Ḥimā, then to Barānis, then to Marya', then to Al-Mihjarah..." (Ibn Khurdādhbah, 1889: 152-153). He continued describing the route: "then to 'irqah and its waters are few and there are no people in it, then to Sa'dah, which is a great city, then to Al-a'mashiyah, where there are no people living, then to Khaywān, which is a great village, then to 'athāfat, then to Ṣan'āa', the city of Yemen..." (Ibn Khurdādhbah, 1889: 134). Al-Daynūrī indicated Najran in his description of the mission of Dhū Nwās to Yemen, but unfortunately, he did not refer to the direction travelled by Dhū Nwās's mission to the city of Najran (Al-Daynūrī, 1960: 14, 61 [1888]). In his book, Al-Iṣṭakhrī described the road from Yemen to Makkah as travelling "from Aden to Makkah for about a month, and it has two routes: one on the sea coast, which is further, and another route takes over Ṣan'āa', Sa'dah, Jurash, Najran and Taif until it end in Makkah..." (Al-Iṣṭakhrī, 1927: 15). Abū Al-faraj 'alī ibn Al-Ḥusayn Al-'aṣfahānī (284 – 356 A.H./ 897 – 967 A.D.) who wrote *Kitāb Al-'aghānī* and mentioned Najran on the way to Makkah "from Najran to Tabala and then to Makkah" (Al-'aṣfahānī, 2008: 199 [1868, 1888, 1905]). In addition, Ibn Ḥawqal described a route and some cities located on it, noting that a route from the coast at Aden ran through the mountains, passing through Ṣan'aā', Ṣa'dah, Najran, Bisha, Jurash and Tabalah (Ibn Ḥawqal, 1992: 30 [1919]). In addition, Al-Ḥamawī mentions Najran as a place (makhlaf) of Yaman, reached when travelling from Makkah (Al-Ḥamawī, 1957: 266 [1865]). Ibn Mujāwir provided a description of the way from Sa'dah to Najran (Ibn Mujāwir, 1996: 117 [1901, 1951-1954]). However, as mentioned above none of these accounts contains detailed descriptions of the nature of the routes or the organisation of the trade conveyed that crossed the Arabian Peninsula. The issue with the above references, then, is not the lack of sources, but their similarity and the scarcity of detailed information. This is the challenge that we face with most of the early South Arabian sources especially those related to the above topics. The above accounts

indicate to some details of interest, but they certainly do not provide us with detailed and sufficient knowledge on the nature of subsistence and commercial practices, nor on the types of goods that were traded by the merchants of southern Arabia.

In the light of the above, the site of Al-Ukhdud in Najran received its importance from its location on the land trade route running from South to North Arabia. This location provided the archaeological site of Al-Ukhdud in particular and Najran in general with the ability to communicate with surrounding areas; moreover, this location made Al-Ukhdud the meeting point of the trade conveyances that began from the South, and the key to the centre and North of Arabia.

Long-distance trade was without a doubt significant, especially since Najran is located as a starting point on the overland trade routes from the South to North Arabia. It seems likely that Najran was a key market in the region, and is located in an area that may have been able to produce an agricultural surplus during the period from 500 B.C. to 600 A.D., and perhaps leather production. It is likely that other activities occurred in the past for which we do not yet have direct evidence (e.g. mining of building stones), which may include pottery production and trade and exchange between individuals at Al-Ukhdud and surrounding communities.

In the last few decades, Najran has expanded both in terms of the area of the town, and its importance, becoming a modern provincial capital (Ministry of Education, 1999; Lippens, 1956 [1999]; Al-Ansary and Al-Mareeh, 2003; Zarins et al, 1983). Al-Ukhdud, the ancient city of Najran, is now preserved within the wider city as a protected area encompassing the core of its archaeological site, although archaeological remains outside the protected area have no doubt been obscured by modern construction. Al-Ukhdud became the focus of archaeological research to understand the nature of the site and its relationship to neighbouring settlements and the role that it played in terms of economic and the implications of that on the site and the surrounding communities, which we will clarify in detail in the chapters below by studying the archaeological material specifically pottery and its influence on trade and the relations between the site of Al-Ukhdud and surrounding areas. The following chapter will outline early descriptions of the archaeological remains, and discuss the main features of the site; it will also present and analyse excavations at the site, including those on which the ceramic study presented here are based.

Chapter 4 The Site of Al-Ukhdud: Current State and Previous Archaeological Work

In this chapter, we will review the archaeological work that has been done in Al-Ukhdud by travellers and archaeologists during the last decades. A number of explorers visited the site in their journeys to the Arabian Peninsula and provided some information about Najran and Al-Ukhdud. These accounts encouraged more detailed archaeological surveys in the region of Najran in 1979 and 1980, and the excavations of Al-Ukhdud started in 1982, with subsequent seasons between 1996 and 2014.

4.1 Explorations and Descriptions of the Site from the 18th to mid-20th Century

In 1763, Carsten Niebuhr (1733 – 1815), became the first western explorer to visit Najran. He reported that “Nedsjeran is situate [*sic*] in a pleasant and well-watered country, three days journey north-east from Saade. This narrow territory is fertile in corn and fruits, especially in dates”. His account gives much detail about the personality and practices of the ruling shaykh, but little specific description of the city, stating only that “[t]he capital of this small kingdom is Nedsjeran, an ancient city, famous in Arabian history. The other towns in it are places of little consequence” (Niebhur, 1792: 59, 61).

More than a century later, in 1870, Joseph Halevy (1827–1917), an orientalist and traveler from France, visited the site and described the oasis of Najran and the remains of Al-Ukhdud or as he called it, “Medinet El-Khoudoud or El-Oukhdoud” (Halevy, 1872: 39 – 40). His account of the site recounts the story of the burning of Christian people in Najran by the king Dhū Nwās. In addition to this, Halevy copied over one thousand South Arabian inscriptions during his journey to Yemen, including 13 inscriptions from Najran, 11 of which were from Al-Ukhdud (Halevy, 1872, 1873, 1877; Habshush, 1941). The inscriptions recorded by Halevy were fragments, and the majority were poorly written, and may have been the work of uneducated people. Most of the inscriptions seem to be names only (Philby and Tritton, 1944). In his description of the oasis of Najran, Halevy repeated 11th century geographer Al-Bakri’s announcement that only the mosque of Omar Bin Al-Khattab remained visible; Halevy suggested that this mosque was built on the base of Abd-Allah ibn Tamir’s tomb, who was regarded the first Christian to settle in Najran, around 356 A.D (Bin Jris, 2013; Shahid, 1971), but he did not provide any evidence to support this suggestion (Halevy, 1872).

The next formal investigation of Najran was by Harry St. John Bridger Philby, who visited the region in 1936 and described the oasis as a fertile area covered by a huge number of palms, the stands of which divided the area into settlements or villages such as Salwa and Al-Qabil. Philby's account describes his movements from place to place through the palm-belt of the Najran oasis toward the great Al-Rub' Al-khali desert (Philby, 1952). Philby drew detailed maps of Wadi Najran (Figure 4-1, Figure 4-2) and provide measurements of Najran oasis, giving a length and width of about 15 and 2 miles respectively. He also recorded around 474 south Arabian inscriptions, collected from the general region of Najran and Al-Ukhduh, some of which had previously been referred to by Halevy (Philby, 1952; Philby and Tritton, 1944). More important, though, in his description and survey of the site of Al-Ukhduh itself and its walled settlement; his plan predated much of the recent development of the area that has obscured and overbuilt the archaeological area (Figure 4-3, Figure 4-4).

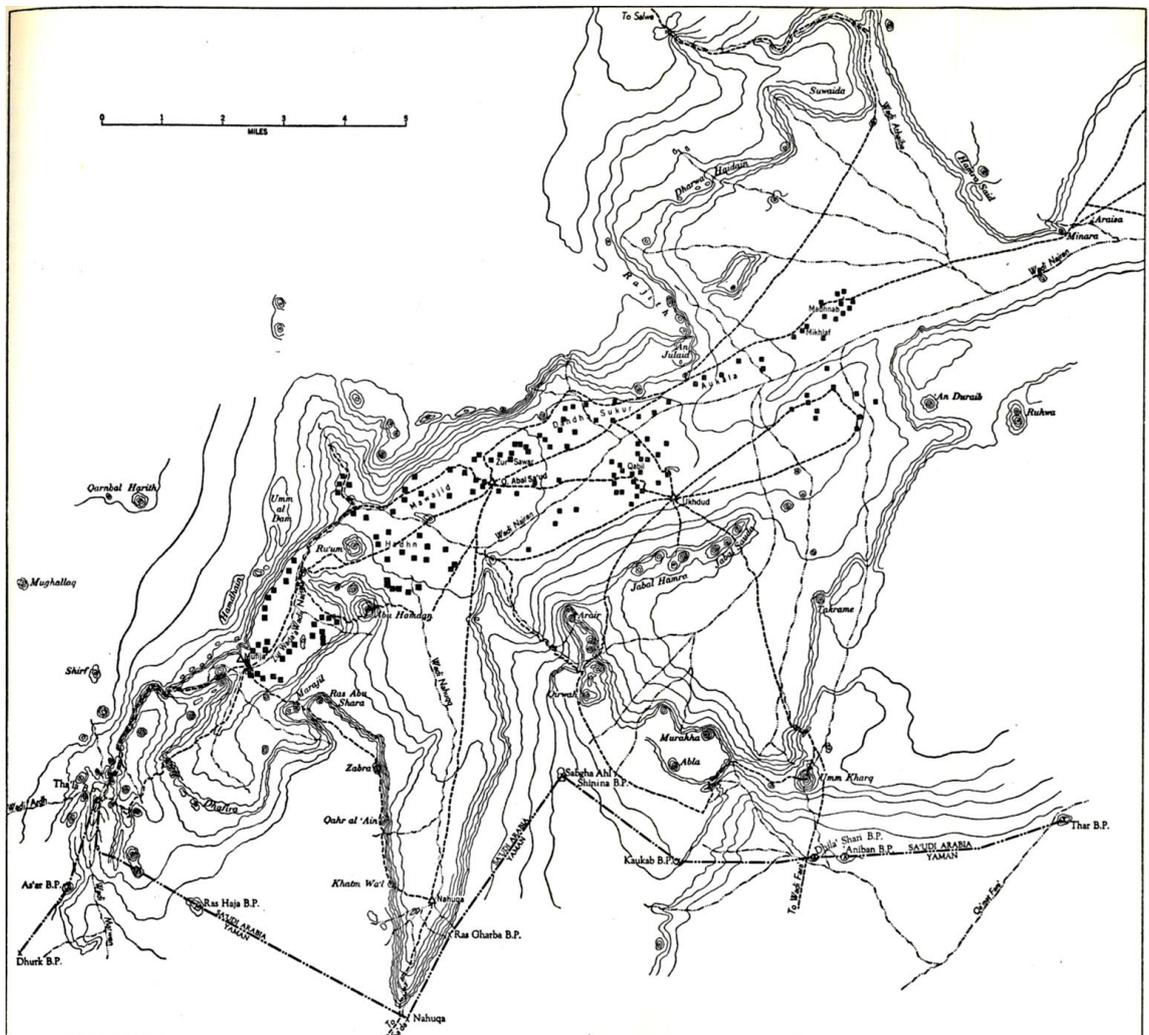


Figure 4-1 Map of Wadi Najran.

(Philby, 1952: 254).

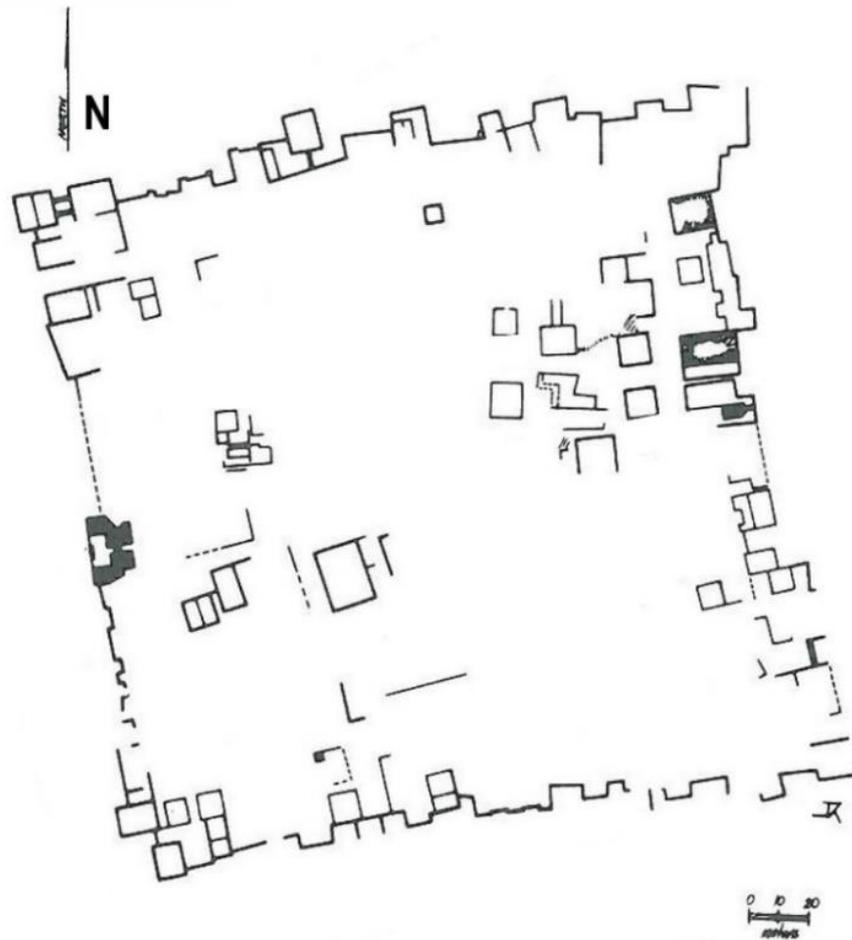


Figure 4-4 Map of the walled enclosure area from the Philby-Ryckmans-Lippens expedition of 1951.

(Ryckmans, 1981, 63).

Zarins et al (1983), consider Philby's description of Al-Ukhdud to be quite accurate and to offer an explanation of the site which is acceptable in terms of its detailed information; however, in fact, the measurements of the walled area in the archaeological site recorded by Philby were inaccurate. This is probably because Philby's survey of the eastern wall was undertaken separately from that of the northern wall, which was surveyed together with the north-eastern corner. So, when drawing his map of the walled area, Philby located part of the southern half of the eastern wall alongside the east of the northern half, instead of placing both halves end to end on the same line (Ryckmans, 1981). Philby describes the ancient city of Al-Ukhdud and its surrounding features as having an unstructured shape: "it sprawls rather untidily and without shape along the right bank of Wadi Najran at the edge of a scrub-covered plain, sloping gently up to the foot of the hills which line the valley on the south side. It is probable that this plain (about a mile wide and three or four miles long)"; Philby further notes, "in the immediate neighbourhood of the city there are plentiful evidences of canals and artificial lakes or reservoirs" (Philby, 1952: 265), and based on Philby-Ryckmans-Lippens expedition of 1951, Dayton and Dayton 1978/ 1979) sketched a map of Wadi

Najran and dam when they studied the pottery collection from the expedition (Figure 4-5). According to Philby's sketch map (see above Figure 4-3), "the whole city may have been enclosed on the land side by a ditch or moat emanating from the river upstream and draining back into it below the city. In any case the castle seems to have been completely surrounded by a moat, apparently separating it from the rest of the city" (Philby, 1952: 265). Philby also referred to a cemetery on the south side of the walled area (Philby, 1952).



Figure 4-5 Map of Wadi Najran showing Al-Ukhdud and the remains of a dam of the west. (Dayton and Dayton, 1978/ 1979).

The walled enclosure occupies the south-western part of Al-Ukhdud's ruins; even at the time of Philby's visit it had been partly destroyed by natural and human processes, but the outer wall could easily still be recognised, as well as interior buildings. The walled area as recorded by Philby is an irregular rectangle with prominences and entrances in the north wall and to a lesser extent on the south side, whereas the west and east walls are fairly straight. Philby noted the main entrance to the walled area in the north-east corner. He recorded the length of the west and north walls as 250 m, the south wall as 235 m, and the east as only 175 m. The diagonal length from north-west to south-east was recorded as 340 m, while the length from south-west to north-east was 300 m. The walled area as recorded by Philby covers an area of approximately 57,000 m² (12 acres) (Philby, 1952: 266). Philby's measurements were not accurate primarily because he mis-measured the eastern wall; for the other walls, his measurements are acceptable.

Philby provided some useful data Al-Ukhdud. All subsequent archaeological work there was based to some extent on his information. However, there were further errors in his information. Philby's description of the site as surrounded by a moat does not seem to have been accurate; no evidence derived from the later excavations has distinguished any type of moat or ditch around the site (Zarins et al, 1983).

Philby also recorded valuable observations regarding the interior of Al-Ukhdud's enclosure (see above Figure 4-3, Figure 4-4). No roofs or second storeys are preserved within the walled area of Al-Ukhdud, perhaps because they were built from wood; as Philby recounts, "many of them have been overlain by sand or silt and overgrown with desert vegetation - 'Arāk, 'Athl and so forth- but my general impression was that every roof had perished; and it is perhaps a reasonable inference from this fact the superstructure of all these buildings may have been of wood" (Philby, 1952: 266). Philby also mentioned other structures in the interior of the walled area, which he termed "palatial buildings" and suggested might be identified with the Christian cathedral or an earlier pagan temple (Philby, 1952: 266).

Philby returned to the Najran area in December 1951, guiding the Philby-Ryckmans-Lippens expedition, the information from which was published in 1956 (by Lippens) under the title *Expedition en Arabie Centrale* (Lippens 1956 [1999]). This expedition stayed in Najran for about four months and provided a more detailed about Al-Ukhdud site and the walled area (see above Figure 4-4) than Philby's previous map (see above Figure 4-3).

During this journey, Ryckmans described the walled area and the site's architectural style in detail, published in an article in 1981. The map of the walled area made at that time is quite detailed, but details of interior units are lacking (Zarins et al, 1983). The measurement of the walled enclosure made by the 1951 expedition is 235m² (Ryckmans, 1981), or 250 m² (Dayton and Dayton, 1978/ 1979). The whole area of archaeological remains at Al-Ukhdud was recorded as 1300 x 1100m, which is the area that was subsequently fenced.

The 1951 expedition resulted in the first collection of ceramic material from Al-Ukhdud, some of which was retained by Ryckmans. Nearly thirty years later, the pottery from this expedition was analysed by John and Ann Dayton (1978/ 1979). Dayton and Dayton divided the sherds into three distinct groups: delicate incised wares, heavy coarser ware, and glazed wares of various types. They concluded of that these sherds belonged to the late Byzantine/ early Umayyad period, and they also suggested that these groups could be dated between 525 A.D. and 660 A.D. or to the period of evacuation of Christians to Iraq by Omar Bin Al-Khattab (Dayton and Dayton, 1978/ 1979; Al-Ṭabarī, 1979 [1879]). The writers had no record of where the sherds had been collected or what they represented in terms of archaeological context (Zarins et al, 1983). In this study, Dayton and Dayton dated the sherds in term of historical events occurring in Al-Ukhdud in order to make the archaeology fit into the historical narrative. The detailed map below for the walled area is presented in *The Journal of Saudi Arabian Archaeology (ATLAL)* during the survey and excavation at Al-Ukhdud in 1982 by Juris Zarins (Figure 4-6).

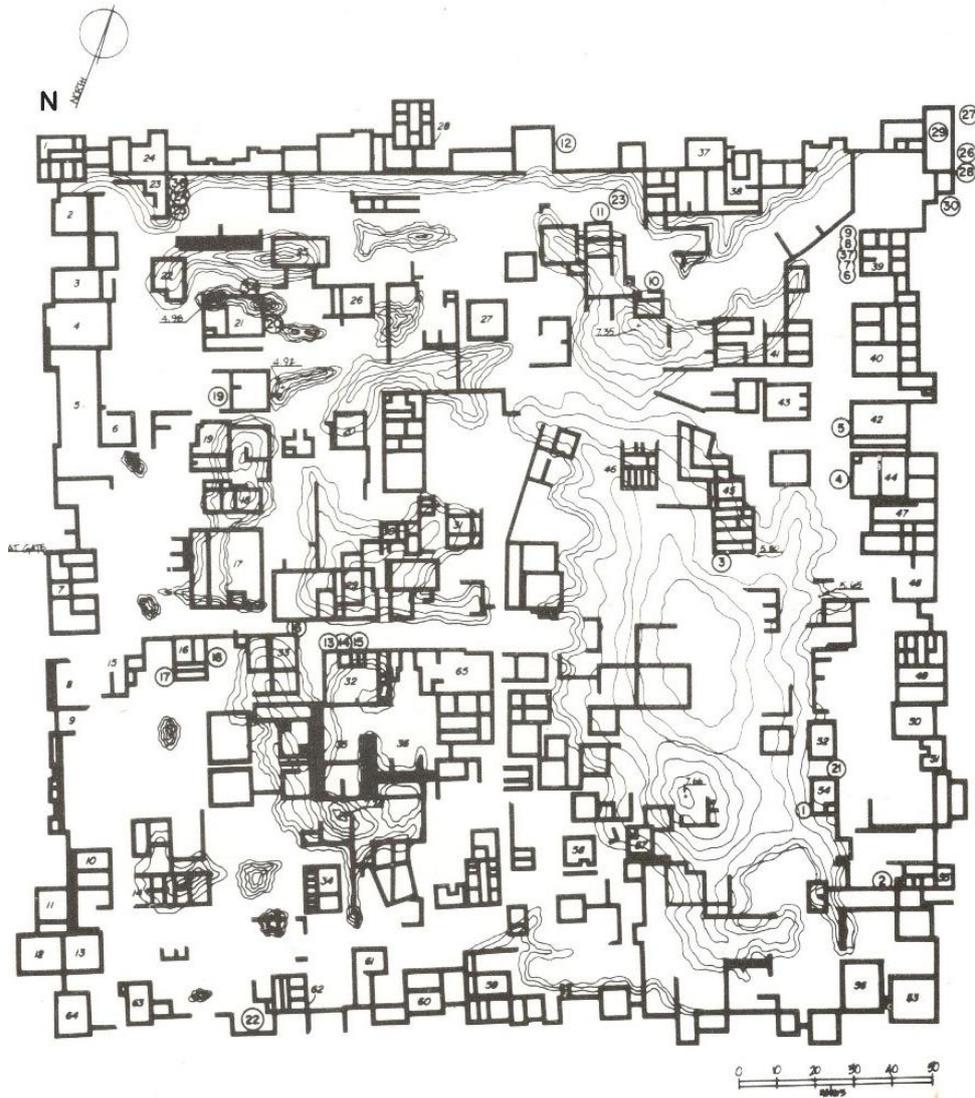


Figure 4-6 Map of Al-Ukhduḍ's walled area with details of the units.

(Zarins et al, 1983, figure 17).

In the summer of 1968, the American archaeologist Gus W. Van Beek (1922 – 2012) guided a short survey to the Najran region and mentioned the main archaeological site of Al-Ukhduḍ, presenting the parallels with South Arabian sites already observed and excavated in Wadi Beihan, such as Hajar Bin Ḥumeid. He located additional sites in the vicinity of Najran including Sha'ib Hahdah and Sadd Al-Qild, also known as Sadd Al-Jajad or Sadd Al-Mudhiq (Zarins et al, 1983). Van Beek's major contribution was to establish a working chronology for ceramics from the region, based on his excavation at Hajar Bin Ḥumeid (Van Beek, 1969).

Before presenting the results of the more recent archaeological surveys and excavations undertaken in Al-Ukhduḍ by local teams from Saudi Arabia, it is necessary to present more detailed information about the layout of the archaeological site of Al-Ukhduḍ. The Saudi project, from which the pottery studied below is derived, of course builds on the earlier work that was done by western travellers and archaeological experts, described above. An overview of the main features and

characteristics of the site as it is currently understood now follows, based on a combination of the evidence from past visits that presented above with more recent archaeological recording undertaken at Al-Ukhdud, described below.

4.2 The Layout and Characteristics of Al-Ukhdud

As noted above, the 1300 x 1100 m archaeological area of Al-Ukhdud is currently defined by a fence outlining the official limits of the site. It is located between longitude 44° 10' 45.54" and latitude 17° 28' 37.37", although clearly archaeological remains sprawl beyond this limit into and under the modern town (Zarins et al, 1983). Inside the fenced area, the quadrangular stone-walled enclosure (see above Figure 4-4, Figure 4-6) stands at an elevation of more than 3m above the surrounding area, being "erected on small hill of a sizeable height" (Ryckmans, 1981: 55). The impressive outer wall is built from ashlar masonry, with hammer-dressed outer surface and traced rubble core, the whole often preserved above ground to three meters in height or more (Zarins et al, 1981; Ryckmans, 1981). Inside the enclosure, there are several distinctive stone buildings of different sizes and shapes, built using stone blocks that are cut inward and toward their centre, with mud and stone used to fill the gaps between blocks. This style of building is comparable to the techniques used at many sites in Yemen, such as Hajar Bin Humeid, Timna, and other sites in Wadi Beihan (Zarins et al, 1981), as well as at ancient walled cities in Ma'rib and Al-Asahil in Wadi Raghwan and Al-Bayda in Wadi Al-Jawf in North Yemen (Ryckmans, 1981). Additionally, there are some buildings located to the east and north-east of the walled enclosure that apparently belong to the early medieval period of the city's occupation, and are built in a less accomplished style using rough stones and mud bricks (Ryckmans, 1981; Zarins et al, 1981 and 1983) (Figure 4-7, Figure 4-8).



Figure 4-7 Satellite image of the entire fenced area of Al-Ukhdud.

Google earth Pro, 2016, Al-Ukhdud fenced area 39.96°17'28"N, 48.27°44'10"W, DigitalGlobe. [online] Available through: <http://www.google.com/earth/index.html> [Accessed 24 May 2017].



Figure 4-8 Satellite image of the Al-Ukhdud walled enclosure area.

Google earth Pro, 2016, Al-Ukhdud walled enclosure area 38.30°17'28"N, 44.81°44'10"W, DigitalGlobe. [online] Available through: <http://www.google.com/earth/index.html> [Accessed 24 May 2017].

The archaeological remains have been damaged in the recent past. Without doubt, much of the destruction that has occurred at Al-Ukhudud is because of human behaviours. In the recent past, people in Najran removed clay from the mud walls in great quantities to build new houses in the modern city, or to enrich the fields for agricultural purposes. This is seen also at places in North Yemen; people use stone blocks to build traditional and modern houses, so that ancient stone buildings have disappeared or are disappearing at a fast rate (Ryckmans, 1981). However, despite the damage, many features of interest remain. The wall surfaces of some of Al-Ukhudud's buildings exhibit inscriptions, including engravings of ibex, camels, intertwined snakes, hands, crosses, feet, horses and checker boards (Zarins et al, 1981). To the South of the walled enclosure is a cemetery (noted by Philby and described by Van Beek in 1968, as mentioned above). According to archaeological survey work in 1983 (see below), "the cemetery area was divided into three large groupings covering an area of 350 x 250 m. These graves can be recognized by a distinctive outline of small stones forming a regular rectangle for each grave, approximately 3.50 x 2.5 m.in size" (Zarins et al, 1983: 24). These cemeteries may belong to the inhabitants of the ancient walled area of Al-Ukhudud. However, the individual cemeteries sit together as a group, organised in parallel rows; they are located outside the walled area and have been impacted by the modern road system (Zarins et al, 1983). Based on the assemblages that collected from the surface of the cemetery this area relates to the Byzantine period, and it may that this cemetery represents the interment of the deceased of Al-Ukhudud only for a relatively brief period of time (Zarins et al, 1983).

4.3 The Saudi Arabian Excavations

In 1979, a comprehensive archaeological survey programme started in the central and south-western areas of Saudi Arabia, supported by the Department of Archaeology, Ministry of Education. This was a collaborative endeavour between local and international archaeologists. This survey was divided into two stages, covering the central and part of the south-western area of Saudi Arabia respectively, which included four main zones: Durma' – Shagra zone, Dawadmi – Bijadiyya zone, Bisha – Ranya - Zulam zone and Turaba – 'Ashayra – Mahd Adh-Dhahab zone. Within these four zones, 267 sites were recorded, the earliest of which dated from the first Acheulean (around 200.000 years ago) and the latest of which included a number of Islamic forts from the 19th century (Zarins et al, 1980). The second phase of this survey took place in 1980 and included parts of south-western Saudi Arabia including the region of Najran; this phase identified many more archaeological sites including some in the Bi'r Himā area and in Al-Rub' Al-khali, Sh'aib Dahda (217-63: site number in Saudi Archaeological Archive), Al-Dreeb (217-65) Al-Qarya Al-Qadima ("The old village"), Al-Ukhudud (217-49), K'abat Najran (217-66) and Al-Mudhik Dam (217-64)/ Sadd Al-Jalad. As a result of

this large-scale programme of archaeological prospection, it was decided to target Al-Ukhudud for further investigation by means of excavation.

During the second phase of the survey of 1980, a small 2x2 m sounding was undertaken by Zarins et al (Zarins et al, 1981) and placed in the south-east corner of the main walled area of Al-Ukhudud (Figure 4-9). The sounding uncovered over three meters without reaching the natural soil, and exposed an abundance of bones from food refuse.

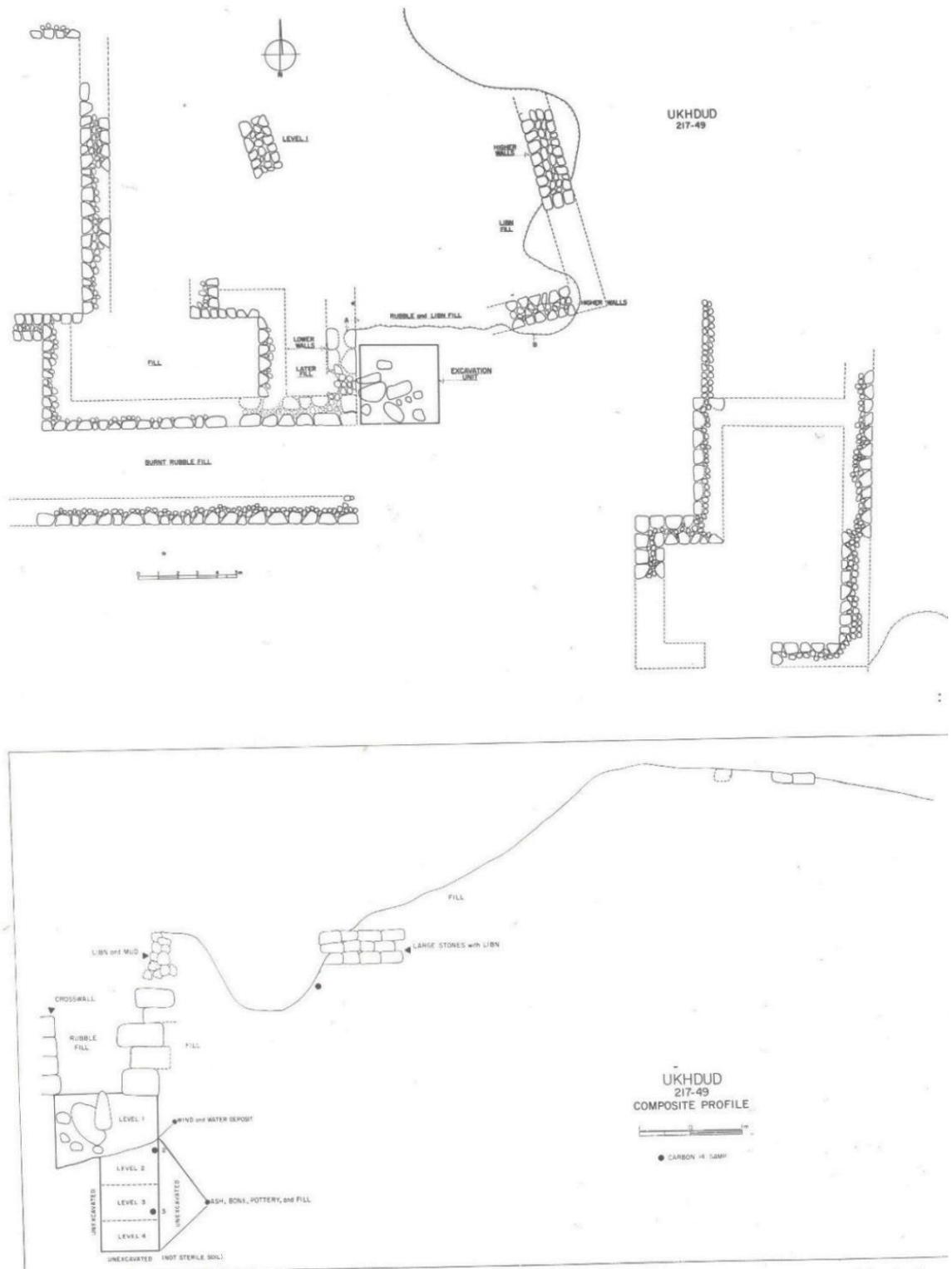


Figure 4-9 Al-Ukhudud 1980 excavation, plan and section of a small 2x2m sounding in the south-east corner of the walled enclosure area.

(Zarins et al, 1981, figure 7/ a and b).

The result of radiocarbon 14 (C14) dating of bone samples confirmed the chronological relationship of Al-Ukhudud with South Arabian cultures. Four samples were tested and gave calibrated date ranges. Sample 1 (GX - 7596), from the upper level of the sounding, was dated from 16 (95.4%) to

615 calAD with a probability of 95.4% (Figure 4-10). Sample 2 (GX - 7597) from the middle level of the sounding, gave the earliest date, which was 903 (94.2%) 357 calBC, 283 (0.9%) 256 calBC and 246 (0.3%) 236 calBC with a probability of 95.4 % (Figure 4-11). Sample 3, which was from the lowest level in the sounding, gave the same date as sample 1, which may indicate that it was intrusive. Moreover, sample 4 (GX 7599), collected from a burned layer, was dated between 76 (94.5%) 429 calAD, 495 (0.6%) 507 calAD and 521 (0.3%) 527 calAD with a probability of 95.4% (Figure 4-12) (Zarins et al, 1981: 23-24).

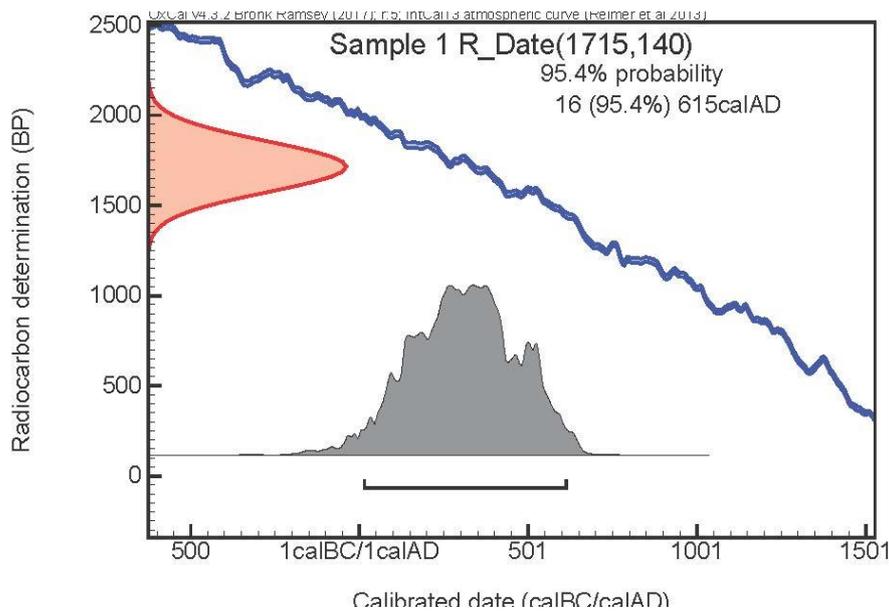


Figure 4-10 Radiocarbon determination for sample 1 from Al-Ukhudud's 1980 south-east corner sounding.

<https://c14.arch.ox.ac.uk/oxcal.html>

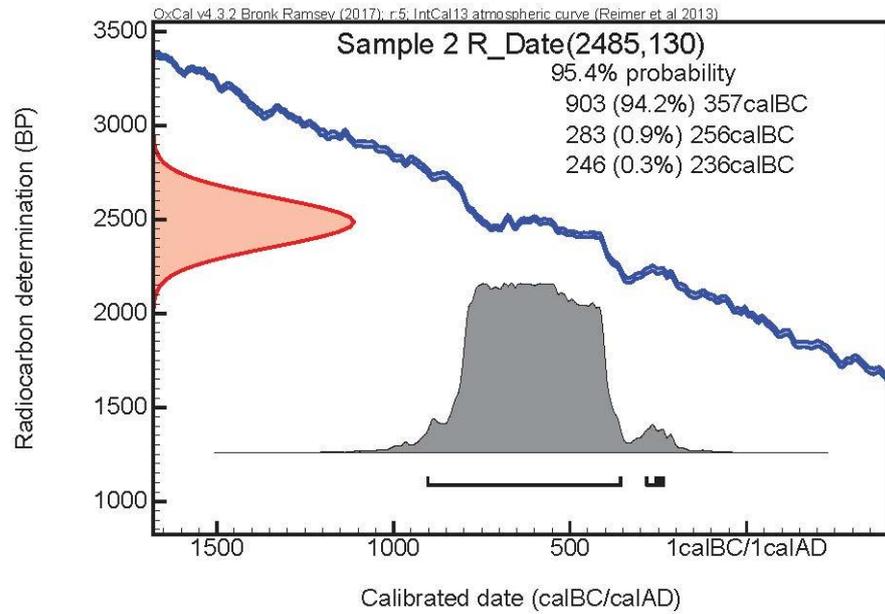


Figure 4-11 Radiocarbon determination for sample 2 from Al-Ukhudud's 1980 south-east corner sounding.

<https://c14.arch.ox.ac.uk/oxcal.html>

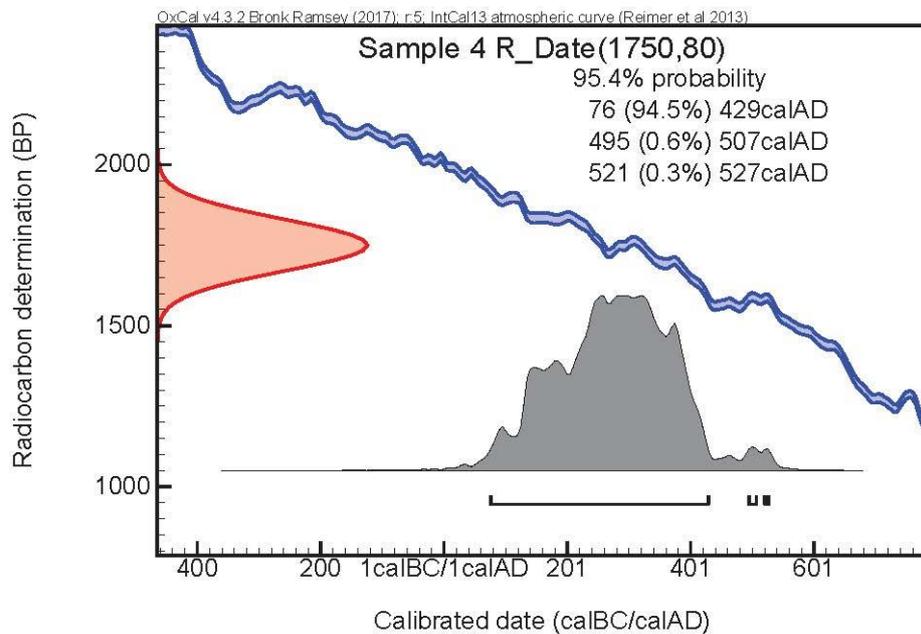


Figure 4-12 Radiocarbon determination for sample 4 from the burned layer at Al-Ukhudud's 1980 south-east corner sounding.

<https://c14.arch.ox.ac.uk/oxcal.html>

A primary study of pottery from the 1980 sounding contrasted the pottery types from the core of the walled enclosure area with those from north-west of (outside) the archaeological site. The core city group consisted of red wares with abundant chaff temper in the fabric, and formal features including ring bases and over-trimming rims, and various decorative elements including

“burnishing, incised dots, stamped decoration, and incised wavy single or multiple lines on ledge handles” (Zarins et al, 1981: 24). In addition, a group of lamps with toothed rims, with parallels to forms from Beihan and Hajar Bin Humeid that have been dated to the first and second centuries A.D., formed part of this assemblage.

The north-western pottery was different, in that many of these vessels were decorated with distinctive cut-out geometric designs, and included forms such as goblets (see below for discussion of forms) and flat-based vessels. In addition, this latter assemblage included unusual black ware with incised lozenge shapes and white-painted. Finally, Islamic glazed pottery was found outside the protected archaeological area, indicating that the site was occupied in later periods (Zarins et al, 1981: 24). From the above comparison, it may be suggested that the assemblage from the north-western town can be dated to a later time (late Byzantine/ early Umayyad period).

In 1982, the survey started in 1980 was continued, and the first expanded excavation at Al-Ukhudud itself took place. The fieldwork season ran from February 1, to March 10, and the protected area was mapped (Figure 4-13, Figure 4-14). The team was led by Juris Zarins, David Massey and Rexford from South-west Missouri State University and AbdulRahman Kabawi, AbdulJawad Murad, Lutfi Osman, Sayid Rashad and Rashdan Al-Otaibi from the Department of Antiquities and Museums (Zarins et al, 1983). The aims of this season were stated to be:

- “To restrict the modern town from the main ancient site;
- To prepare an adequate plan of the entire site;
- To recommend site boundaries and site stabilization plans;
- To investigate south Arabian architecture at the site in detail;
- To complete a sounding to reach natural soil;
- To make a detailed study of the occupational history of the entire site;
- To suggest adaptation of the site in association with the regional museum for visitation purpose;
- To submit recommendations for future detailed work” (Zarins et al 1983:23).

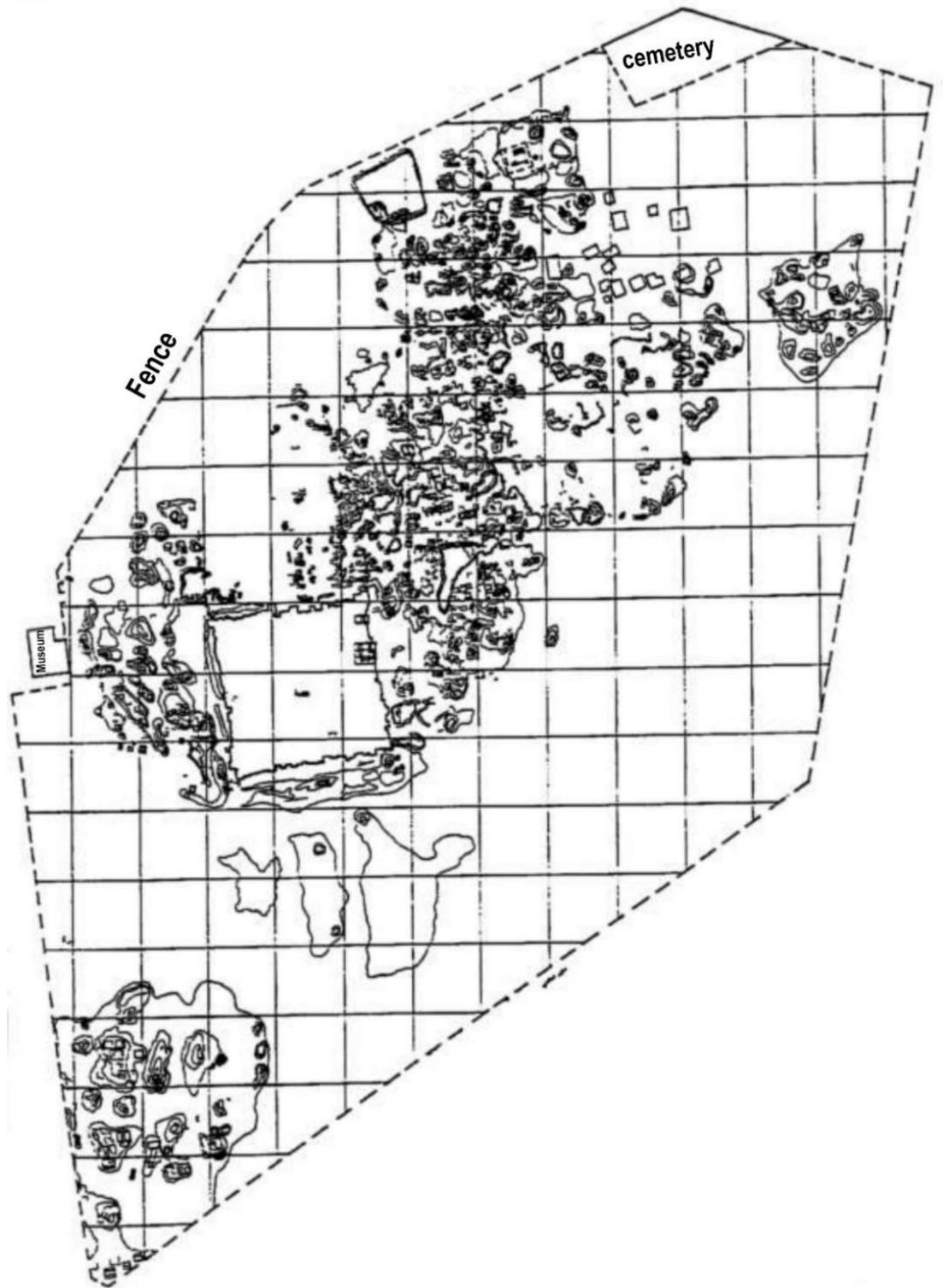


Figure 4-13 General survey map of Al-Ukhdu's archaeological site.

(Al-Zahrani et al, 2002, figure 1.1).

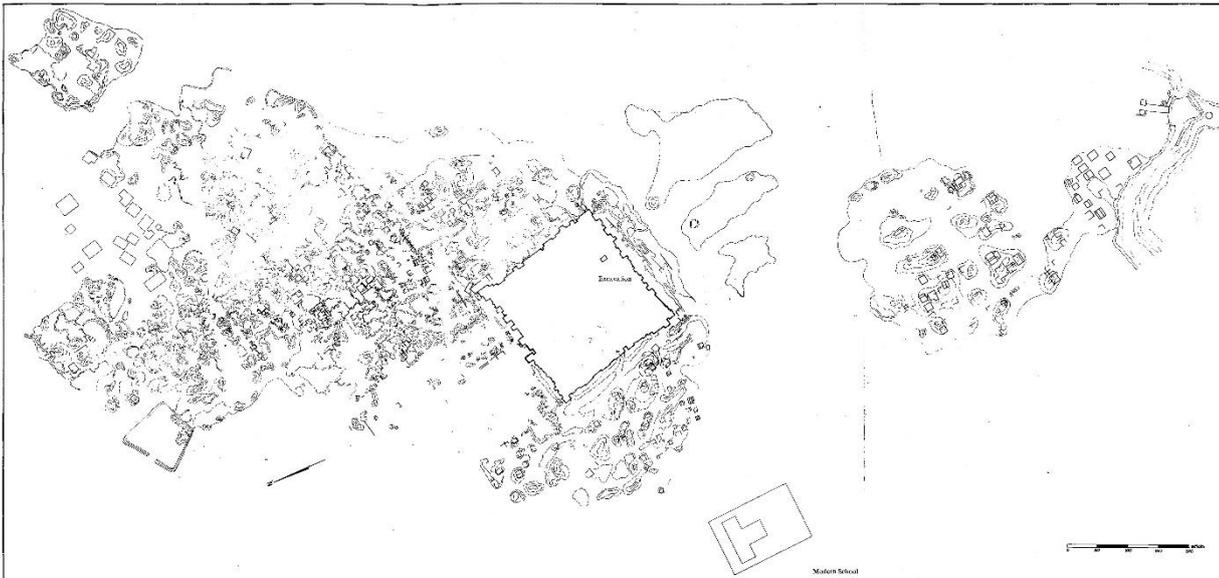


Figure 4-14 Detailed map of Al-Ukhudud.

(Zarins et al, 1983, figure 16).

This expedition recorded the site layout and architecture, the results of which are incorporated into the discussion above; the team likewise surveyed the irrigation system of Al-Ukhudud. As an important and multi-period settlement in the large Wadi Najran, remains were found over a large area of the site. Najran has a significant and extensive irrigation system to distribute water supplies from Wadi Najran (Zarins et al, 1983; Jamme, 1962; Al-Otaibi, 2006). This system is similar to other systems connected with South Arabian sites that depended on agriculture, such as Sadd Marib, Hureidha and Hajar Bin Humeid in Yemen (Zarins et al, 1983; Doe, 1971; Thompson, 1944; Van Beek, 1969; Bowen and Albright, 1958). A major feature of the irrigation system of Najran is Sadd Al-Jalad (Al-Jalad Dam) in Wadi Najran, also known as Sadd Al-Mudhik/ Al-Mudhik Dam (217-64) (Zarins et al, 1981: 24). The excavator noted that “while no remains of the dam itself have been located, extensive channels cut through granite and plaster-lined are present and may represent heavy rain water diverters to open fields lying to the east” (Zarins et al, 1983: 27-28; for more details see Ryckmans, 1982; Dayton and Dayton, 1978/ 1979).

Also in 1982, the sounding in the south-east corner of the walled enclosure was re-excavated to cover an area of 8x6 m. After removing the surface refuse, the excavation discovered parts of a flight of steps and stone walls, distinguishing one complete room and three sub-rooms that may form part of an integrated domestic structure (Zarins et al, 1983). Outside this structure, but still within the walled enclosure, the excavation continued to reach natural soil at a uniform depth of 3.45 m (Figure 4-15).

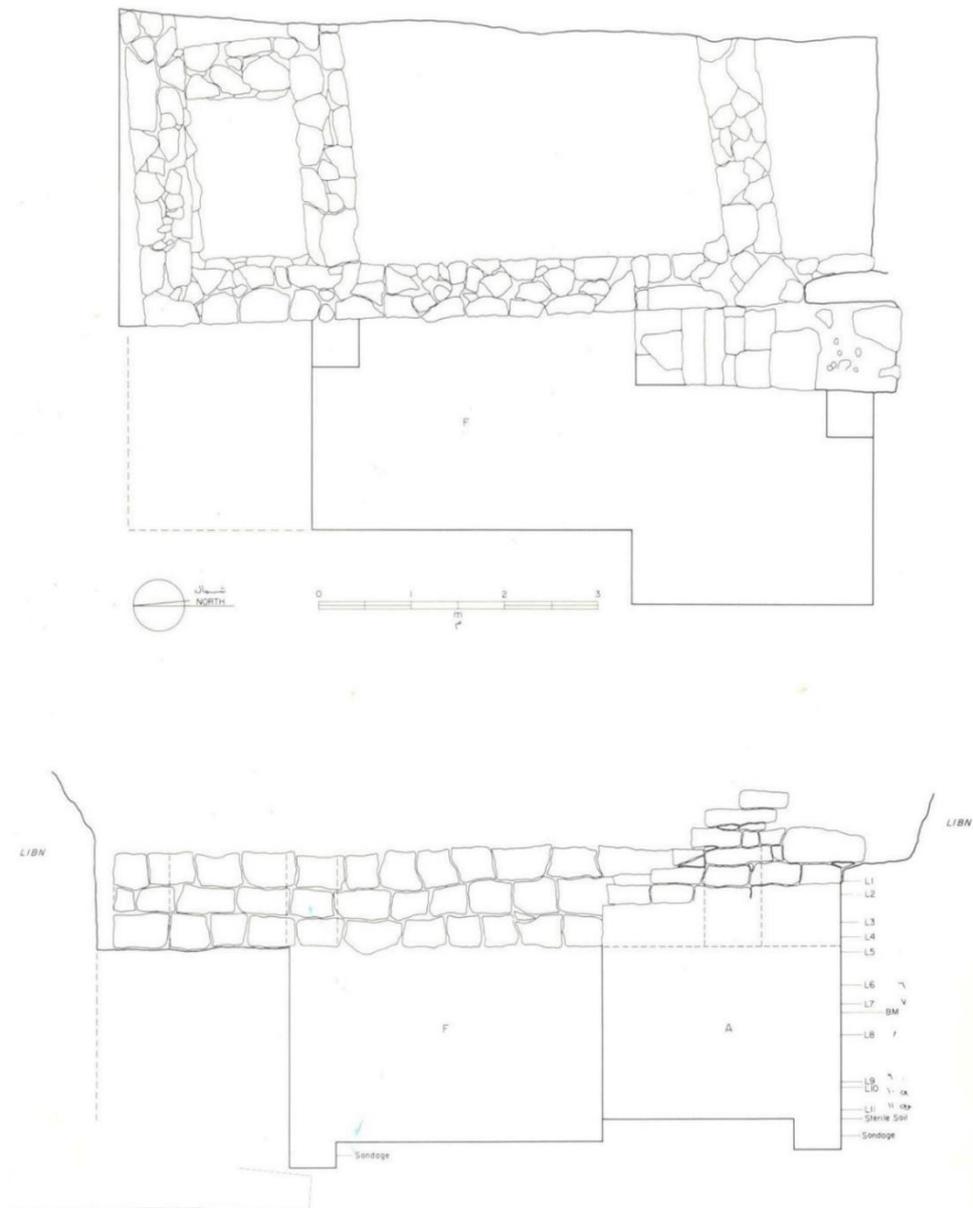


Figure 4-15 Map of the 1982 excavation.

(Zarins et al, 1983, figure 23).

The sounding extended the available assemblage of ceramics, allowing further characterisation of the nature and development of Al-Ukhudud's pottery: nine fundamental ceramic types were defined based on combinations of form, size, fabric composition and temper, decoration and glossiness (Zarins et al, 1983). Since this represents the most up-to-date presentation of ceramics from the site prior to this study, the details of this typology will be presented in this chapter below (section 4.6) (Table 4-1).

The next section will present the Saudi Arabian excavations at Al-Ukhudud that started in 1996, 2000, 2002, 2004, 2009, 2010 and 2013 in more detail, since these seasons have been published as preliminary reports. One further season took place in 2014, but unfortunately, this cannot be

discussed because it remains completely unpublished. With regard to the ceramics from all these excavations, and in the light of the large quantity of pottery that retrieved from all the excavations at the archaeological site of Al-Ukhudud, this research will focus only on the materials from season 2 (1996) and season 3 (2000) in detail. This decision was made following the categorisation of all Al-Ukhudud's pottery assemblages into three groups as follows:

Category A: material with the best quality contextual data, which can be assigned to a specific small square and/ or particular building and/ or trench.

Category B: material that can be designated to a particular square, but not any more closely than that in terms of association with a particular structure or depth.

Category C: material that we are not sure exactly to which square/s it came from.

Unlike other seasons, the excavations during season 2 (1996) and season 3 (2000) offered Category A with the best quality contextual data. Therefore, the rationale for the selection of the material presented below in chapter six is:

- 1- These materials have the best quality contextual data, and can be assigned to a specific small square and/ or particular building and/ or spit;
- 2- Some of these materials were discovered from completed and connected units within the walled enclosure area;
- 3- The excavations of seasons 2 and 3 covered different areas in the site of Al-Ukhudud, including units within the walled area and in other locations outside the walled area; this contrasts with other seasons that focused only inside the walled area and/ or in incomplete units, and allows cross-site comparison.

Therefore, the reasons for choosing these two excavations (seasons 2 and 3) were specifically because they have detailed information regarding the excavated trenches; they presented pottery materials with the best contextual data; and they allowed contrasting analysing from different locations within the walled area and from the South-west and North outside the walled enclosure area in the archaeological site of Al-Ukhudud.

4.4 1996 - 2010 Excavations

In 1996, excavations at Al-Ukhudud continued for a second season, undertaken by a team from the Antiquities and Museum Sector, Saudi Commission for Tourism and National Heritage, under the director of Dr Awad Al-Zahrani (Figure 4-16, Figure 4-17).

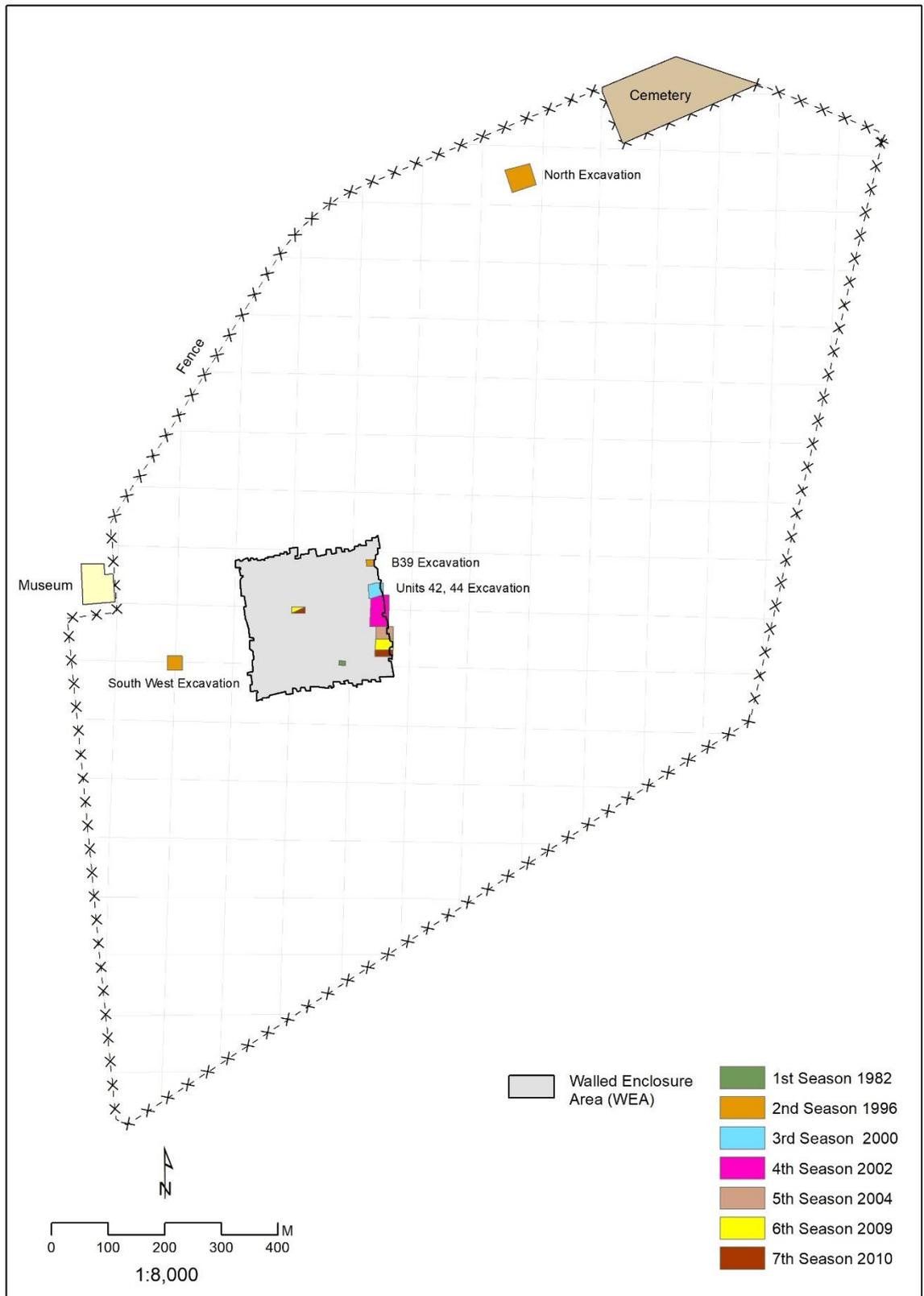


Figure 4-16 General map of Al-Ukhdu's archaeological site showing the walled enclosure area and the excavations from 1982 to 2010.

(Al-Zahrani et al, 2002, figure 1.2). Edited by Mr. Humud Al-Anazi.

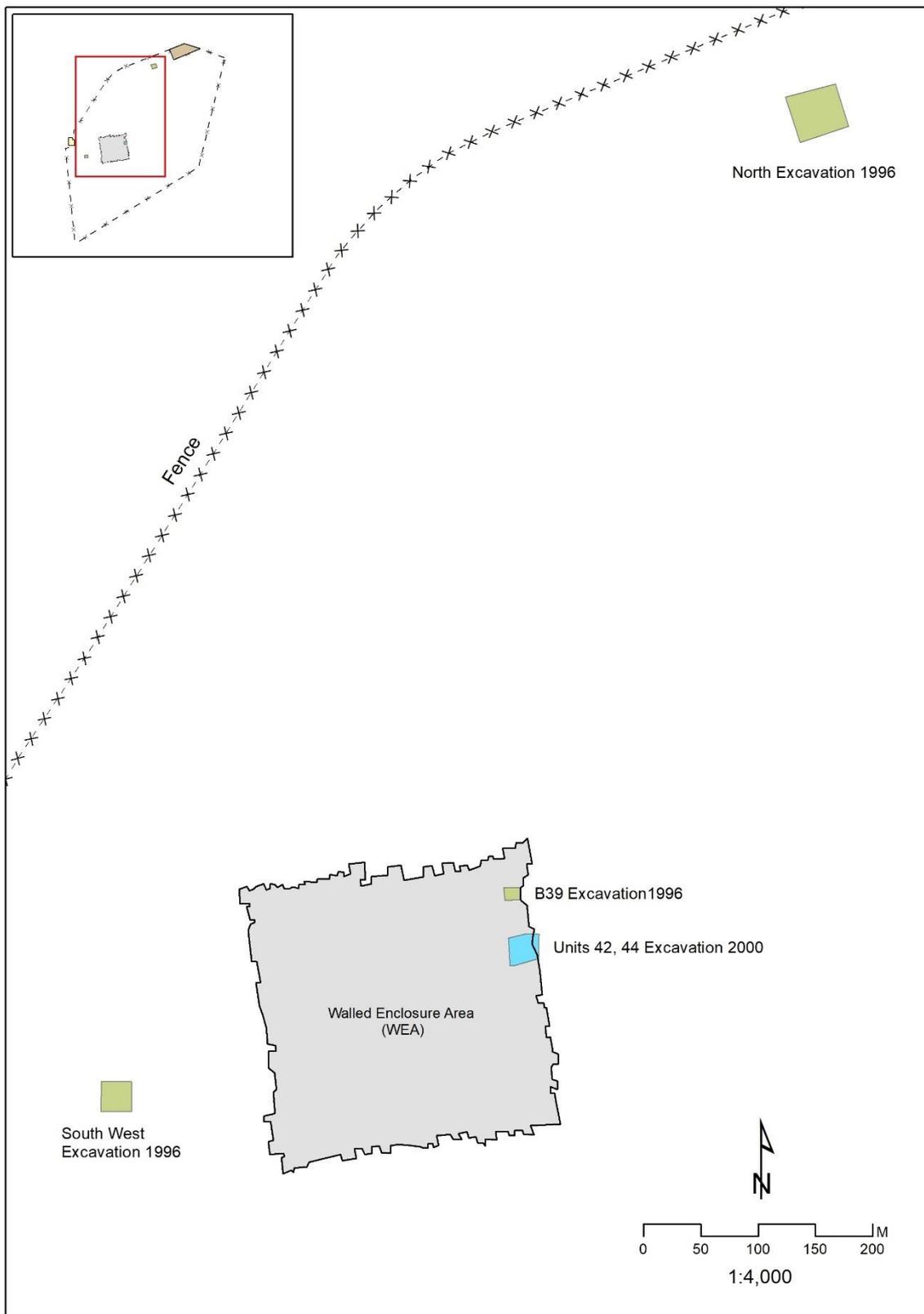


Figure 4-17 Locations of the excavations area within and outside the walled enclosure at Al-Ukhhdud for season 2 (1996) and season 3 (2000).

(Al-Zahrani et al, 2012, figure 1.1). Edited by Mr. Humud Al-Anazi.

The 1996 excavation focused on three areas of the site highlighted on the site plan (see above Figure 4-16, Figure 4-17). The three areas were the South-west excavation; building 39 within the walled area; and the North excavation; the South-west and North excavations are outside the walled enclosure area (Figure 4-16, Figure 4-17). In some parts of this thesis, I referred to the South-west excavation as (SWE), North excavation as (NE) and Building 39 as (B39). The decision to work in different areas of the site was made in order to understand potential architectural variety, and to clarify the chronological development of the site in order to link the results of the excavation with previous fieldwork (Figure 4-18).



Figure 4-18 Location of the second season's excavations at Al-Ukhduud.

(Al-Zahrani et al,2001, figure 1).

4.4.1 South-west Excavation (1996)

Excavations here, revealed a group of integrated units forming one building. These units spread over an estimated area of 500m long x 200m wide, and are clearly visible on the surface (Figure 4-18). The aim of the excavation was to identify the nature of these structures, and to understand its chronological sequence; it was thus decided to excavate in a complete unit. The area was divided

into numbered 5 x 5m squares (12H, 12W, 12Z, 13H, 13W, and 13Z). The fill of excavated rooms was of considerable consistency, with three distinct layers recorded across the complex. The uppermost layer consisted of surface debris, sand, solid mud and fallen rocks, with walls appearing clearly at a depth of 20cm from the surface, but the appearance of walls stopped after that. The second layer comprised sand mixed with animal bones, pottery sherds and small stones, and the depth of this layer was 55cm. The deepest layer comprised solid red mud and was devoid of any elements until a depth of 75 cm; here, the excavation hit the natural soil. The excavation continued to a depth of 150cm to confirm that there were no artefacts (Figure 4-19, Figure 4-20).

The stratigraphy here clearly demonstrates human activity in this unit, in particular the animal bones and pottery sherds are obvious in the first and second layers, which probably reflects the space as a living area, the site of social activities that resulted in the deposition of pottery sherds, ash and charcoal. The uppermost layers formed from collapsed wall stones, rocks and mud. Analysis of the pottery presented below indicates a date range of the pottery discovered from this excavation probably from the 1st millennium B.C. and half of 1st millennium B.C. to the Islamic period around 4th or 5th century A.D.

The excavations were undertaken according to standard practices in Saudi Arabian archaeology at that time, and the stratigraphic recording is thus not as detailed as might be desired, but the attribution of ceramic to specific layers does allow greater precision than is the case for many other sites and excavations in the region. It is important to indicate that the excavations were undertaken at the archaeological site of Al-Ukhdud according to the general network plan of the site (see above Figure 4-16) that covers the entire fenced area including the walled enclosure area. This network plan has divided the site into squares 10 x 10m, and these 10 x 10m squares sometimes divided by the archaeologists into 5 x 5 m to simplify the excavation work. The selection of excavated areas usually is based on the objectives of the excavation. In Al-Ukhdud, the aims of the excavations as mentioned above were to identify the nature of the walled enclosure area structure and to understand the chronological sequence of the site; therefore, the concentration of the works at Al-Ukhdud and the selection squares were in the eastern side of the walled area. The excavations in selected squares were undertaken with a methodology of stratigraphy if there are no clear visible architectural or archaeological remains, or by following the architectural or archaeological remains if they are clear and visible with recording all the stratigraphy in each square. During the excavation process, the archaeological stratigraphy is tracked and recorded, as well as all the archaeological artefacts associated with each level are recorded.

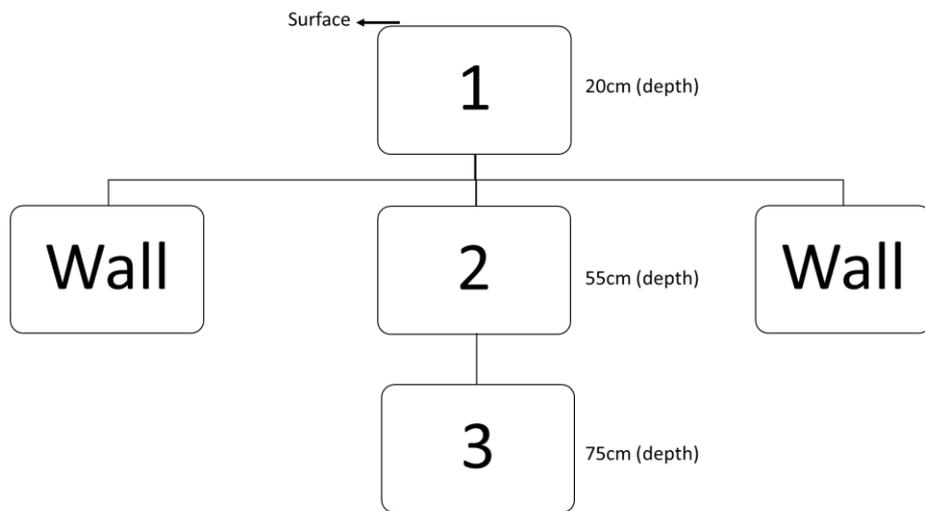


Figure 4-19 Summary matrix of the stratigraphy from the South-west excavation.

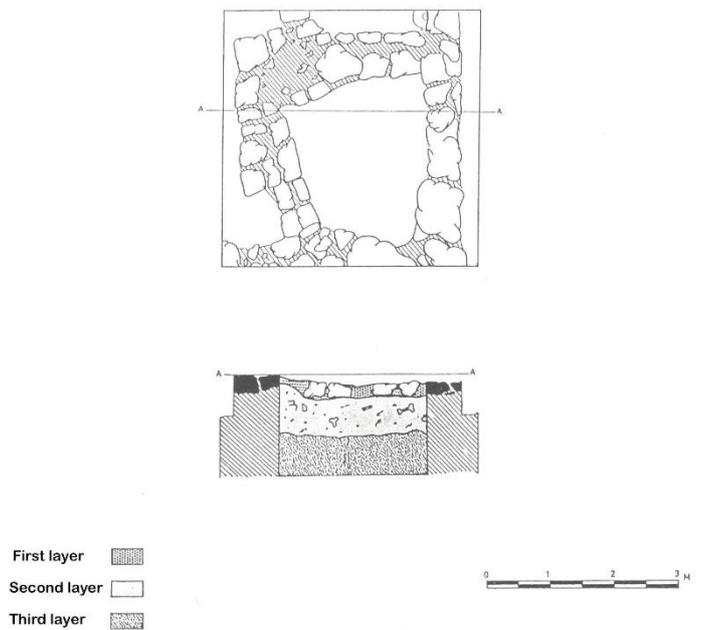


Figure 4-20 Section and plan of the South-west excavation.

(Al-Zahrani et al, 2001, figure 3).

In architectural terms, the unit consisted of seven rooms, four of which were small and located in the south. Opposite the four rooms were two large rooms, with a large hall-oriented north to south in between. The walls of the complex were built of irregular stone blocks, and the exterior walls were more irregular than the interior walls, and the rooms were not standardized in shape (Figure 4-21, Figure 4-22). The pottery analysed below was collected from all rooms in layers 1 and 2 only.

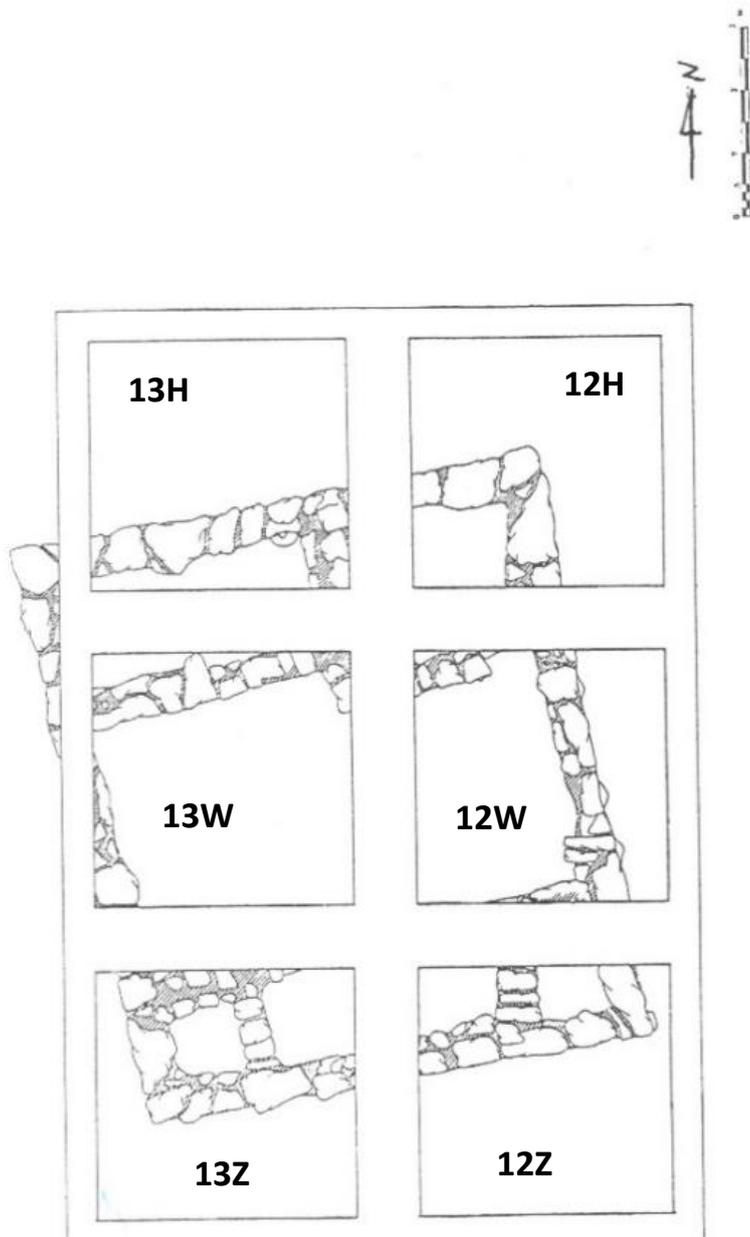


Figure 4-21 Plan of squares at the South-west excavation.
(Al-Zahrani et al, 2001, figure 4).

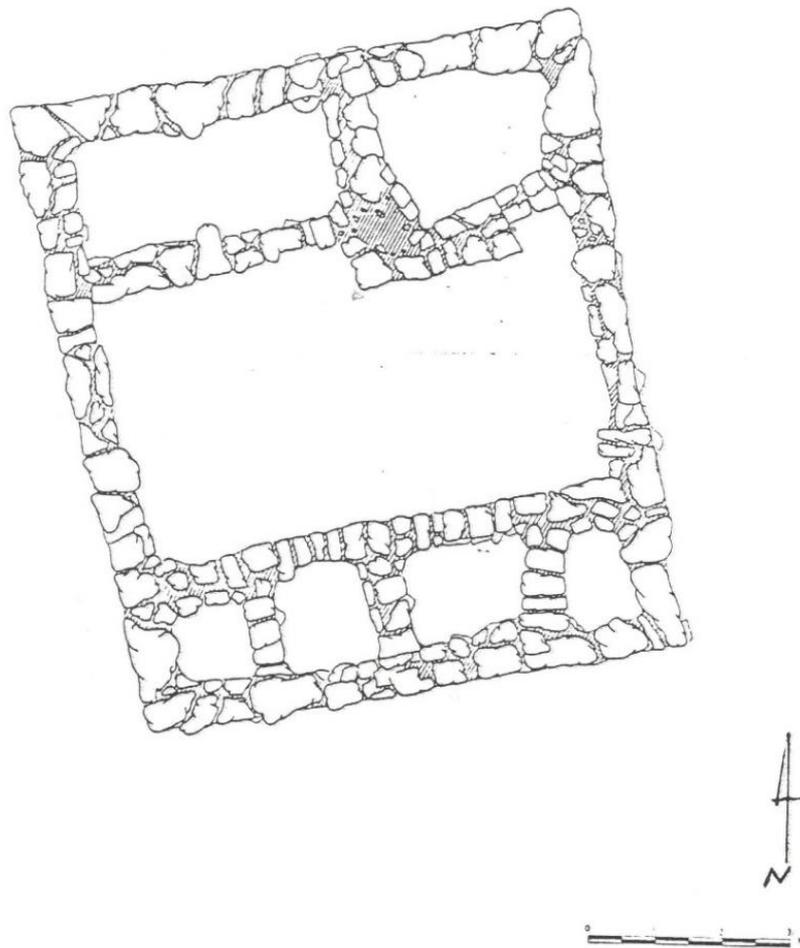


Figure 4-22 Plan of the whole excavated area at the South-west excavation.
(Al-Zahrani et al, 2001, figure 5).

4.4.2 Building 39 Excavation (1996)

This unit was investigated during the 1982 expedition to Al-Ukhdu, but it was re-examined in 1996 (see above Figure 4-16, Figure 4-17, Figure 4-18). The aim of its re-excavation was the same as for the South-west excavation outlined above: to clarify the settlement chronology, this time in the northern section of the walled area, and to illustrate architectural style. In this unit, the team was able to uncover a single rectangular-shaped residential unit. The dimensions of this unit are 13.40m (northern and southern walls); 11.70m (western wall); 11.5m (eastern wall). Excavation in this unit covered nine 5 x 5m squares (A, B, C, D, E, F, G, H and I) (Figure 4-23, Figure 4-24). The pottery analysed below was collected from squares A, B, C, D, E, F, G and H, in layers 1 and 2 only.

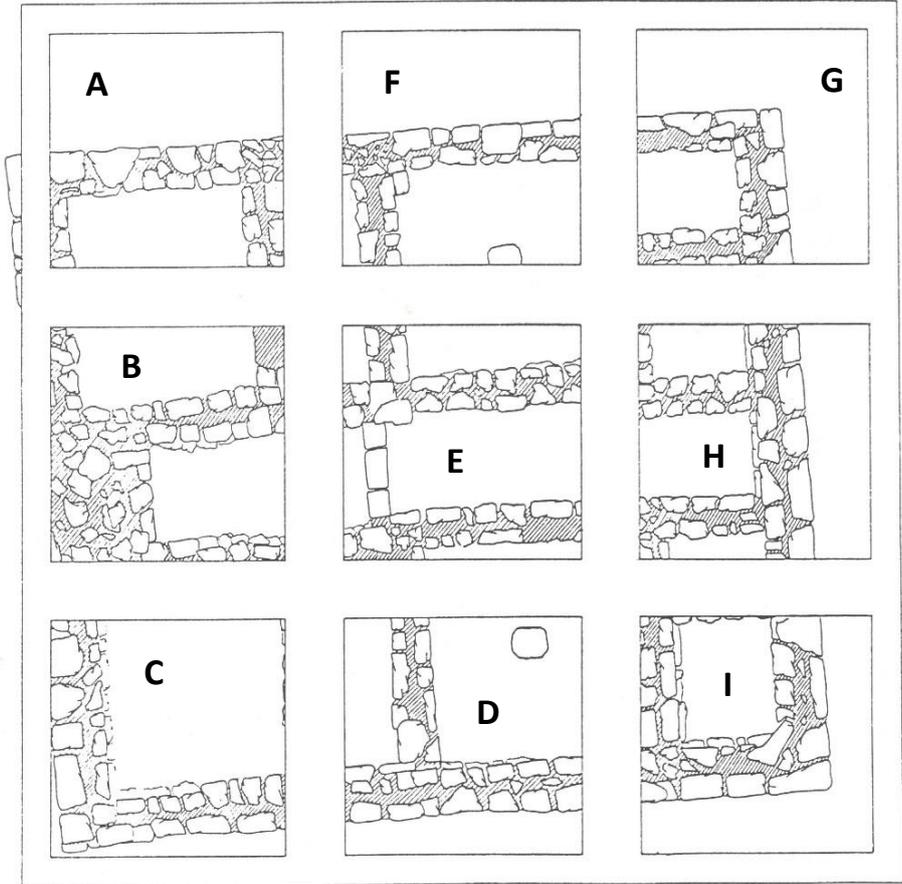


Figure 4-23 Plan of squares at building 39 (B39) excavation.
 (Al-Zahrani et al, 2001, figure 6).

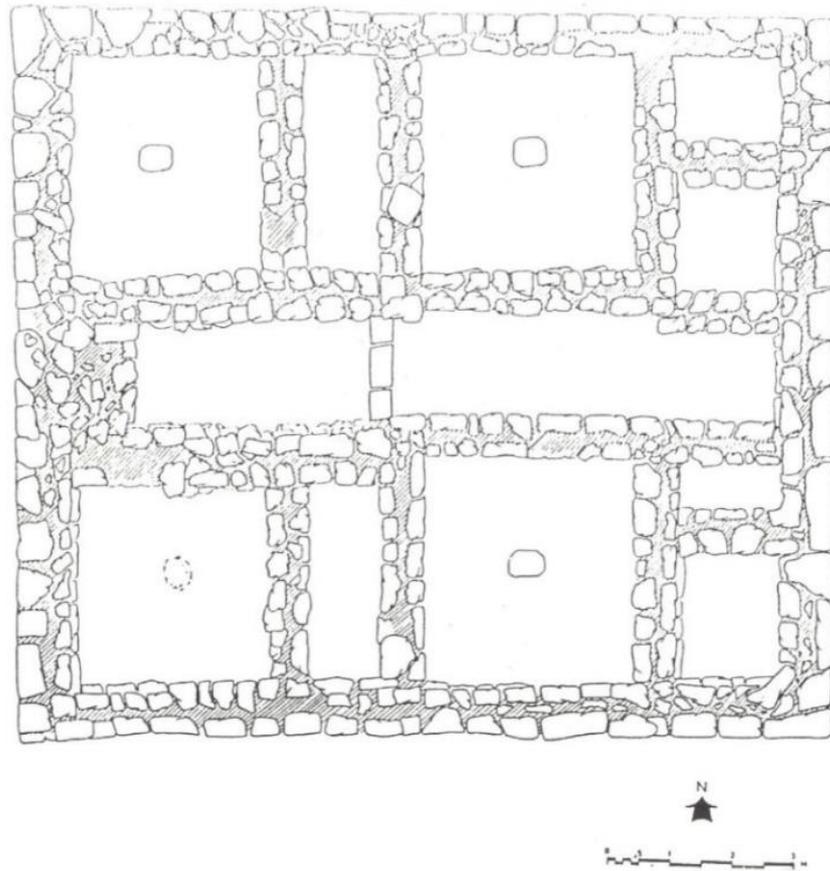


Figure 4-24 Plan of the whole excavated squares at building 39 (B39).

(Al-Zahrani et al, 2001, figure 7).

This stone-built unit consists of two subunits of similar plan and dimensions. The subunits are divided by a passage. The exterior wall was built using large stones, well-cut on the outside, but the inside surfaces were not trimmed. The rooms were built using smaller stones filled with a mortar of mud and small rocks, with gypsum floors. Some rooms had cylindrical stones in the middle rooms probably bases for columns. The difference in construction technique between the external and internal walls reflects the importance of the outside wall as the fundamental feature of this unit. This was confirmed by the small sounding excavated in square A., which showed that this unit was built on a small mound of pre-existing deposits; the lower levels of exterior walls built as a base of building 39. Moreover, under the gypsum floors appeared walls that may relate to an earlier occupation in this area. Analysis the pottery presented below indicates a range of 1st millennium B.C. to 6th or 7th century A.D form pottery discovered from layers 1 and 2 from building 39 excavation.

In terms of stratigraphy, the uppermost layer, which continued to a depth of 80cm, consisted of collapsed stones, probably from ceiling and walls, mud and pottery sherds. At a depth of 80cm, the main exterior walls and the walls of the rooms appeared. The second layer contained sand, mud,

charcoal, animal bones, small stones and pottery sherds, and its thickness was 25cm. This layer indicates that this room was probably used for preparing food or as living area. In squares A and F, a third, burned layer appeared, consisting of ash, charcoal and burned date pits. It is probable that these squares (A and F) were used as a cooking area. The burned layer was located on a 10cm-thick gypsum floor which appears in all rooms (Layer 4). Below the gypsum floor, as already noted, was evidence of an earlier phase of occupation. The excavation thus continued to a depth of 4.4m from the surface until it reached compacted red soil including small stones and remains of animal bones and plant material, without evidence of any artefacts or other signs of human activity (Figure 4-25, Figure 4-26).

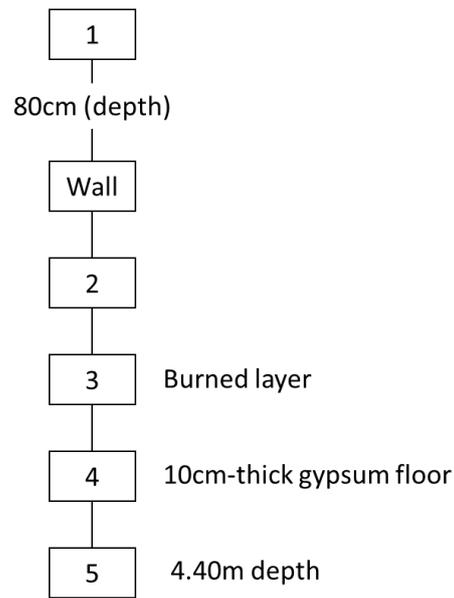


Figure 4-25 Summary matrix of stratigraphy from building 39 (B39).

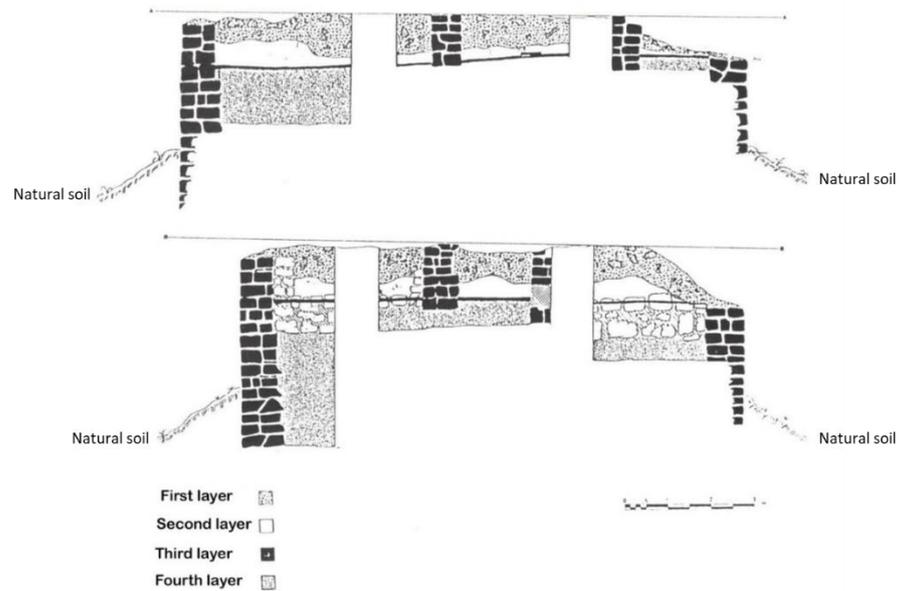


Figure 4-26 A stratigraphic sections for building 39 (B39).

(Al-Zahrani et al, 2001, figure 8).

4.4.3 North Excavation (1996)

This area is located on a small hill to the north of the walled area. It was selected to investigate how this mound might be connected with the chronology of Al-Ukhdu's walled area, as surface collection undertaken in 1982, described above, had indicated that this area might be dated to a later time than the walled area (see above Figure 4-16, Figure 4-17, Figure 4-18). A network was laid out in this area, consisting of 42 5 x 5 m squares; the excavation covered 24 squares with the remainder located outside the architectural area under investigation (Figure 4-27). The mound had been damaged by human activity especially at its edges. The complex revealed here was rectangular and built of well-laid heavy stone blocks. Its north-eastern wall was 20.50 m long; the north-western wall was 17.40 m long; the south-eastern wall was 20.60 m long; and the south-western wall was 17.10 m long. There was a stair in the south-eastern corner, 2.60 m in width, and behind it two small rooms attached to the south-eastern wall. In the south corner was another stair, 2.45 m in width, ending with a cut stone tile that included an inscription and animal figures. This complex was probably used for religious and/or social activities. In the early Islamic period, the north-western part of it was used as a mosque having a longitudinal orientation toward Makkah. The wall of this mosque was built near the earlier complex's exterior walls from irregular small stones with mud plaster (Figure 4-28); surface finds included a metal ring has an Arabic phrase "Allah suffices me" probably used as a stamp.



Figure 4-27 Plan of squares at the North excavation.
 (Al-Zahrani et al, 2001, figure 10).

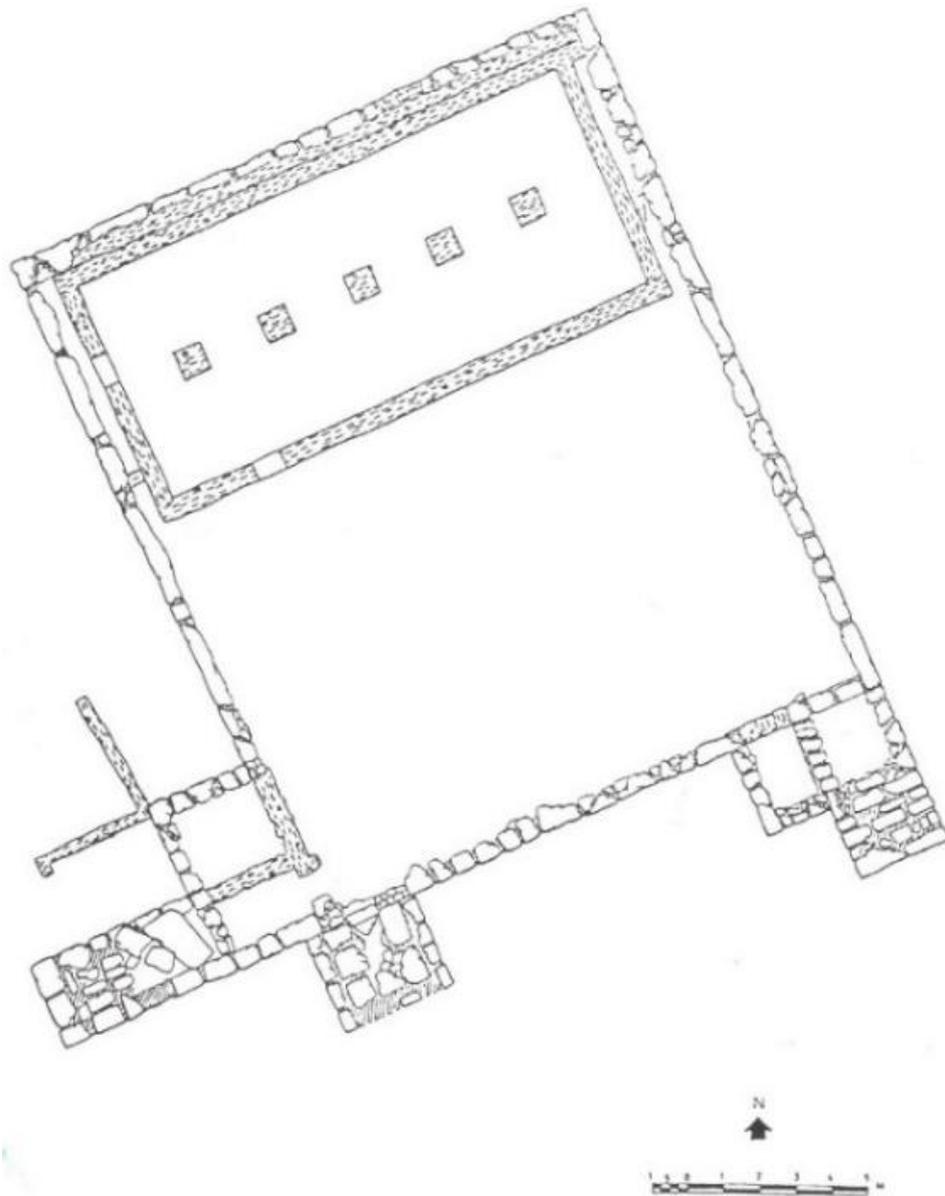


Figure 4-28 Plan of the whole excavated area at the North excavation.

(Al-Zahrani et al, 2001, figure 11).

This excavation was undertaken into two sections; section A covered squares 19, 20, 21, 22, 23 and 24 and section B covered squares 5, 8, 17, 20, 29, 32 and 41. The stratigraphy in this area was formed of natural erosion of soil and red sand, and human processes evidenced by pottery sherds, mud and small rocks used for construction, and organic materials such as bones, ash and charcoal. The uppermost, surface layer comprised mud, soil, pottery sherds and small rocks, and continued to a depth of 20 cm. The second layer consisted of red sand, pieces of mud, animal bones, small rocks and pottery sherds and continued to a depth of 195 cm from the surface. The third layer comprised ash and charcoal, and its thickness was between 5 and 15 cm, without any pottery. Excavation continued downward at a depth of 2.5 m, but without any further evidence of human activity until reaching the natural soil (Figure 4-29, Figure 4-30, Figure 4-31).

Section A: This matrix presents the section A in the North excavation, and it covers squares (19-24). As mentioned above, this section contains four layers (L1-L4), and the letters in front of each layer refer to the deposits found in the layers and the squares.

	S19	S20	S21	S22	S23	S24
L 1.	A ==	A				
L 2.	B ==	B				
L 3.		C				
L 4.	D ==	D				

Figure 4-29 Summary matrix of stratigraphy from the North excavation, section A.

Section B: This matrix presents the section B in the North excavation, and it covers squares (5, 8, 17, 20, 29, 32 and 41). As mentioned above, this section contains four layers (L1-L4), and the letters in front of each layer refer to deposits found in the layers and the squares.

	S5	S8	S17	S20	S29	S32	S41
L 1.	A ==	A					
L 2.	B ==	B					
L 3.			C ==	C ==	C ==	C ==	C
L 4.	D ==	D					

Figure 4-30 Summary matrix of the stratigraphy from the North excavation, section B.



Figure 4-31 Stratigraphic sections of the North excavation, sections A and B.

(Al-Zahrani et al, 2001, figure 12).

The pottery analysed below was collected from squares (1-2, 9-17, 19-21, 23, 27-29, 32-33 and 39). One point to note is the existence of differences between the ceramic corpus excavated here, when compared to that from the South-west and building 39 excavations in terms of surface treatments. Sherds from both South-west and building 39 were unglazed; these types are similar to those found in Thaj, Jubail and Qaryat Al-Fāw in Saudi Arabia, and can be dated around 300 B.C. to 200 A.D., similar to Type I of the surface collection from 1980 excavation at Al-Ukhdud (Zarins et al, 1983). The pottery from the North excavation, on the other hand, included glazed and unglazed sherds attributed to the early Islamic period. Glazed sherds decorated in green and white were similar to sherds found at 'Athar in Jazan and Al-Mabiyat in Al-Ula, dated to the 'Abbasid period (Al-Zahrani et al, 2001). Thus, the excavation showed the continued use of this area to a later date than the South-west excavation or even building 39.

4.4.4 Excavation of Units 42 and 44 (2000)

In 2000, excavations in Al-Ukhdud continued for a third season with work focusing on units 42 and 44 in the south-eastern part of the walled area (Figure 4-16, Figure 4-17). These units had a similar architectural system, because they share major parts of walls, in particular the outer eastern wall (Figure 4-32). During this excavation and based on the preliminary report, a variety of sherds were found in both units, representing forms such as jars, bowls, and cooking pots, some of them being decorated and glazed in green. Additionally, a number of kilns or ovens were discovered, located near the outer south-eastern wall of units 42 and 44. These structures were made of dark brown clay mixed with small to medium stones; they were open from both sides and gradually tapered toward the top; one was 50cm in diameter at the bottom, and 37cm at the top, and 72 cm in height. This measurement seems too small for pottery kilns; instead they are probably bread ovens, and the small amount of charcoal and ash found inside them probably reflects that domestic use. In these units, many artefacts were found, including metalwork, coins, wooden objects, incense burners, small stone basins, marble pots and inscriptions, reflecting high levels of human activity.

The structure consists of two units, with similar architecture and sharing major parts of walls, particularly the internal eastern wall. The construction is similar to that of building 39, excavated in 1996. Inside, the division of space indicates its nature as a living area. The variation in room size may indicate the utilisation of small rooms for storage or as places for preparing food; this may be supported by their abundance of organic materials and pottery sherds. Cylindrical stones in the middle of some rooms may again have carried the ceiling. This unit was damaged, particularly on its east and north-east sides due to the spreading roots of some huge trees, which affected the architecture. Additional destruction was caused by people taking stones for houses construction, and extracting soil for agriculture, which made it difficult to understand the stratigraphy.

During excavation, the unit was divided into nine 5x5m squares (87FB, 87QB, 87KB, 88FB, 88QB, 88KB, 89FB, 89QB, and 89KB) (Figure 4-32). These were further subdivided into 20 small squares to simplify the excavation. Squares 1, 2, 3 and 4 were located outside the complex; square 5 was partly located outside the complex and part within units 42 and 44. Squares 6 to 20 were located within the complex. So, we named squares (1, 2, 3, and 4) out of units 42 and 44, and squares (5- 20) units 42 and 44.

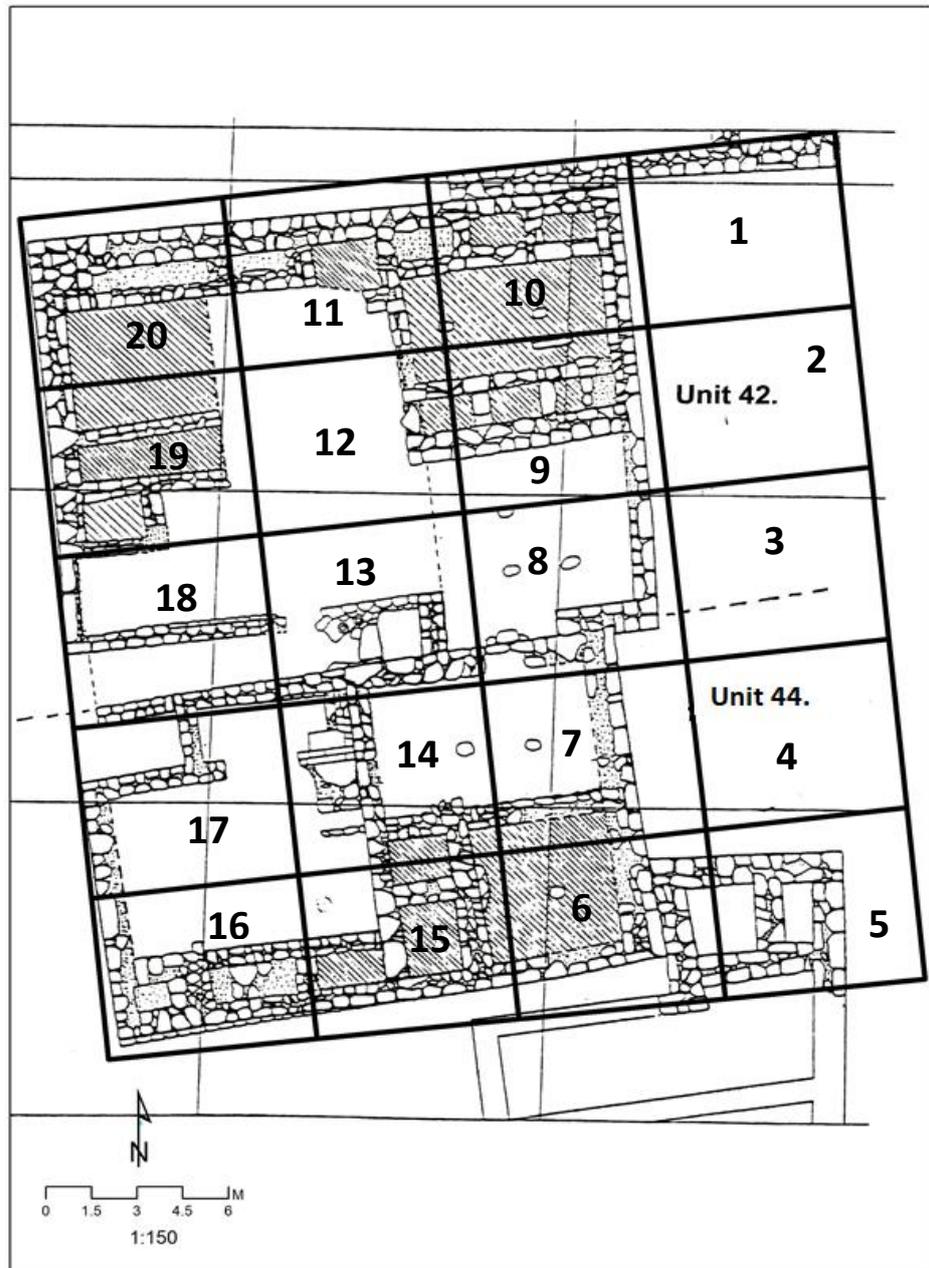


Figure 4-32 Plan of the whole excavated area at units 42 and 44.

(Al-Zahrani et al, 2002, figure 1.4).

Therefore, in this unit, we have two locations: outside units 42 and 44 includes squares 1, 2, 3, and 4, and units 42 and 44 includes squares 5 to 20. The stratigraphy of this unit is as follows:

- 1- The stratigraphy of the squares located outside units 42 and 44.
- 2- The stratigraphy based on three different sections, A, B and C, published by Deputy of Ministry of Antiquities and Museums in (2002), which summarise squares 5 to 20 located within units 42 and 44.

Section A: the stratigraphy of section A consisted of an uppermost debris layer mixed with medium to small rocks and soft soil with few pottery sherds. The second layer consisted of mud and sand mixed with a few animal bones, ash and pottery sherds. The third layer was a thin, burned layer of charcoal and ash, and the deepest layer comprised solid mud with some pottery sherds, and mixed with charcoal and ash until the appearance of the natural soil (Figure 4-33, Figure 4-34).

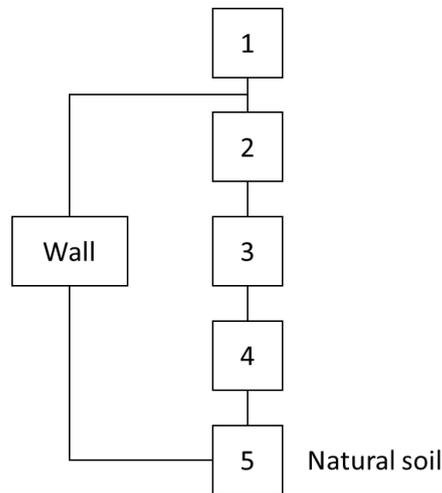


Figure 4-33 Summary matrix of stratigraphy for units 42 and 44 (Section A).

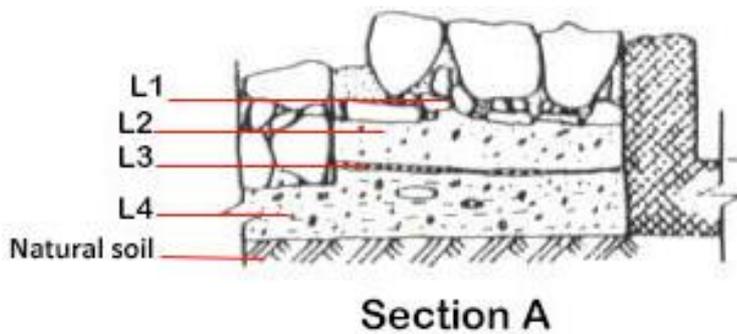


Figure 4-34 A stratigraphic section (Section A) for units 42 and 44.

(Al-Zahrani et al, 2002, figure 1.3 a).

Section B: The uppermost layer was a debris layer comprising medium to large rocks, pieces of mud and gypsum, sand, small plant remains and pottery sherds. The second layer consisted of a gypsum floor. The third layer contained mud, sand, rocks, ash, bones and large pottery sherds. The fourth layer consisted of mud mixed with small rocks and some pottery sherds; and the deepest layer was the natural soil (Figure 4-35, Figure 4-36).

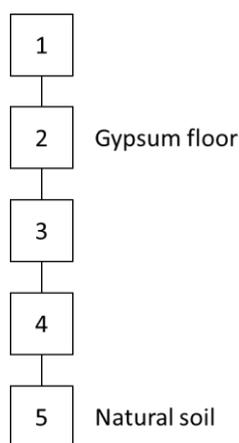


Figure 4-35 Summary matrix of stratigraphy for units 42 and 44 (Section B).

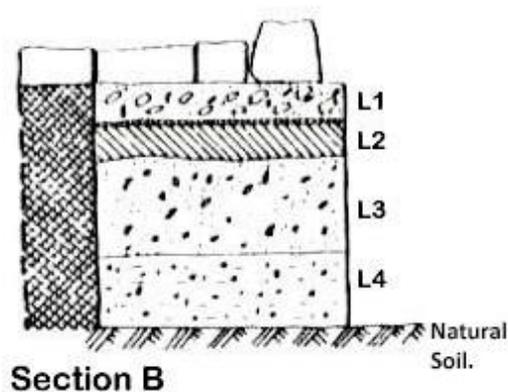


Figure 4-36 A stratigraphic section (Section B) for units 42 and 44.

(Al-Zahrani et al, 2002, figure 1.3 a).

Section C: the stratigraphy of section C is a bit different to that of sections A and B. After the surface layer, the gypsum floor layer appeared straight away. The third layer was a debris layer consisting of sand mixed with rocks, pottery sherds and organic materials. The fourth layer was mud, sand mixed with ash, charcoal and animal bones and a few pottery sherds. Below that, a thin burned layer contained loose mud mixed with some ash, charcoal, small rocks and pottery sherds. The deepest layer contained mixed solid and loose mud, and then reached the natural soil. In sections B and C, we see that the gypsum layer appeared early, unlike section A, where no gypsum layer was seen, although all three sections are from the same area inside the unit. It is probable that the gypsum layer in sections B and C is likely to be a separation layer between two occupation phases occurring in this unit. As the archaeologists mentioned in their report, in terms of stratigraphy, this was the most difficult part of the excavations because of the variation of layers, combined with the acts of vandalism. The stratigraphy shows that sections B and C have two phases before and after the gypsum layer. In section C, the wall continued down to the natural soil, in contrast to sections A and B. Moreover, human activities in this unit are quite clear and reflected the long occupation

in this area. The stratigraphy in this unit thus formed in a manner similar to the other stratigraphy recorded in the walled excavated (Figure 4-37, Figure 4-38, Figure 4-39). The pottery from this unit analysed below was collected from all the squares, and from all the layers except the gypsum and thin burned layers. The proportion of pottery revealed from the layers was high particularly in layers 1, 2 and 3.

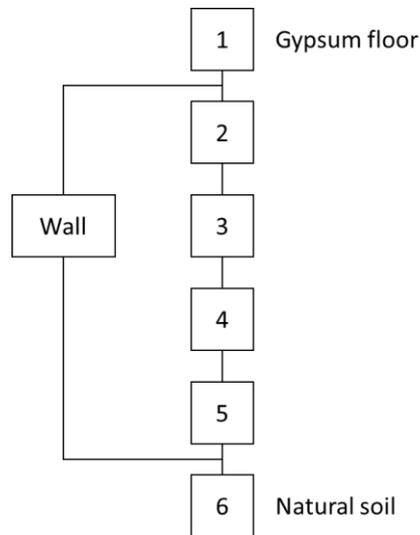


Figure 4-37 Summary matrix of stratigraphy for units 42 and 44/ Section C.

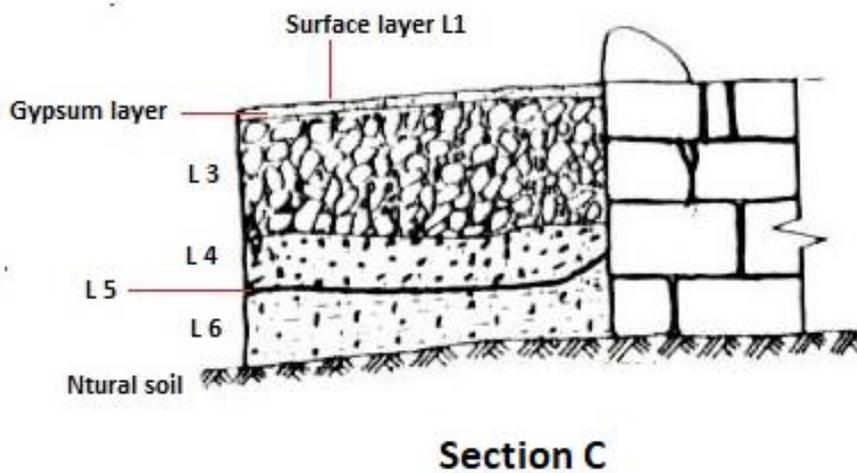


Figure 4-38 A stratigraphic section (Section C) for units 42 and 44.

(Al-Zahrani et al, 2002, figure 1.3 a).

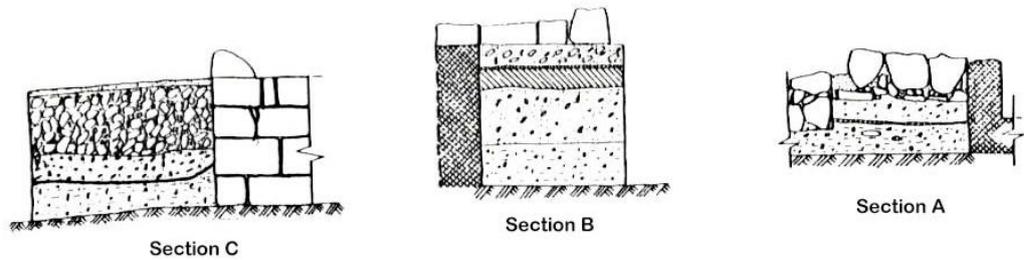


Figure 4-39 Stratigraphic sections for units 42 and 44 (Squares 6 to 20).

(Al-Zahrani et al, 2002, figure 1.3 a).

4.4.5 The Eastern Edge Excavation of the Walled Area (2002)

In 2002, archaeological work continued for the fourth season directed by Dr Awad Al-Zahrani (see above Figure 4-16). In this season, the excavation investigated new units in the east, close to units 42 and 44 excavated in 1996. Damage to the site has in many places resulted in collapse, creating difficulty recording the layers uncovered during this season. Four layers were recorded in this excavation: the uppermost consisted of mud mixed with sand and the remains of tiny plants materials; this was followed by a muddy layer, and then layers of debris containing dry mud, sand, large and middle-sized stones and pot sherds. The deepest layer comprised sterile soil overlain by the fallen walls. Unfortunately, the team did not record layer depths during this fieldwork. The ceramics from 2002 were classified by Al-Zahrani according to their manufacture technique, fabric, surface treatment, firing and decoration, the assemblage was diverse, including large and small jars, cups, bowls, water coolers, lids and filters. During this work, the team found a new “musnad” inscription (Sidqi, 1988), consisting of seven lines written on a rectangular bronze plate in a prominently sculpted style and dated between the 1st century B.C to 2nd century A.D (Bin Tiran, 2005). The translation of the inscription is:

- 1- “*SLMN/BN/... ZHRM/D'HL/MLKN*
- 2- *SL'/DSMWY/'DY/K'BTN/BHGRN/Z*
- 3- *RB/N... WTRD/SLMN/DSM*
- 4- *WY/... HGRN/'DN/DSM*
- 5- *WY/... SLMN/B'DN*
- 6- *DSMWY/... YTW/BNHW/WQNYHW*
- 7- *... TW/BN/TWB/YN'M* (Bin Tiran, 2005: 15).

The English reading of the above inscription is:

- 1- *Salman, bin (son of), Zhrm, from the tribe, Mlkn.*
- 2- *Offered, to Dw Smāwy, in his temple, K ʾ B T N, in the city.*
- 3- *Ṣrb (N ...) W T R D, Salman, Dw Smā.*
- 4- *(WY...) the city a power or authority of Dw Smā.*
- 5- *Wy, (...), by power or by authority.*
- 6- *Dw Smāwy, ... be blessed by (the deity), and his properties or his slaves.*
- 7- *(and his home) ... the reward, (the reward with which), he was benefited. (Bin Tiran, 2005: 15).*

Comparing the artefacts that appeared in this season with similar items from Qaryat Al-Fāw and Thaj, a chronology was suggested between the 3rd century B.C. to 3rd century A.D. (Al-Zahrani et al, 2005) (Figure 4-40).

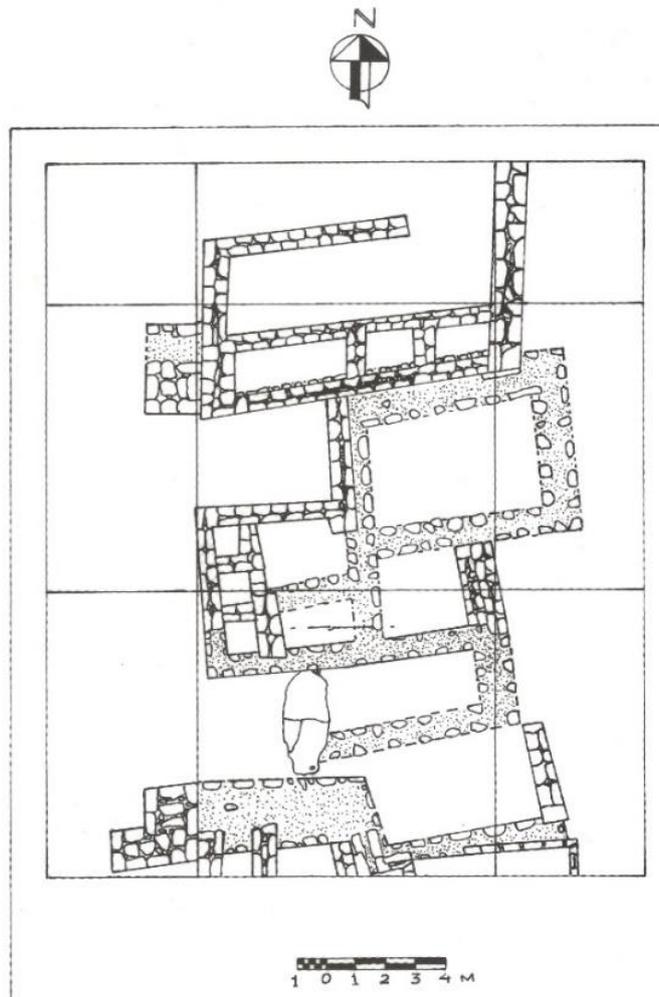


Figure 4-40 Plan of the whole excavated area at the eastern edge unit of the walled area.

(Al-Zahrani et al, 2005, figure 1.2).

4.4.6 Unit 49 Excavation (2004)

In 2004, archaeological excavations were continued by Al-Zahrani for the fifth season (see above Figure 4-16). The team excavated in three different locations in the eastern side of the walled enclosure area: unit 49, unit 45 and the northern trench excavation. Unit 49 consisted of four 10 x 10 m squares. The uppermost stratigraphic layers comprised sand mixed with small rocks and hard pieces of clay. The second layer had a mixture of sand, pieces of gypsum fallen from the walls, potsherds, mud, ash, charcoal and medium to large-sized stones. The deepest layer contained compact soil devoid of any artefacts; the walls did not continue below, this perhaps indicating that the natural soil had been reached. The architectural style of this unit was similar to other Al-Ukhdud buildings; it was built from well-shaped stone blocks, the gaps between them filled with small stones. The difference between interior and exterior walls is that the interior walls were built with middle-sized and less evenly shaped stones, whereas the exterior walls were built with long, thick and well-organized stones. This unit consisted of 18 stores measuring 1-1.5 m², and L-shaped. In some houses, names were written on one of the house wall stones, perhaps to record or identify the owner of the house, and this was found on some walls of unit 49, alongside drawings of animals such as snakes, interpreted as signs to protect the inhabitants (Figure 4-41).

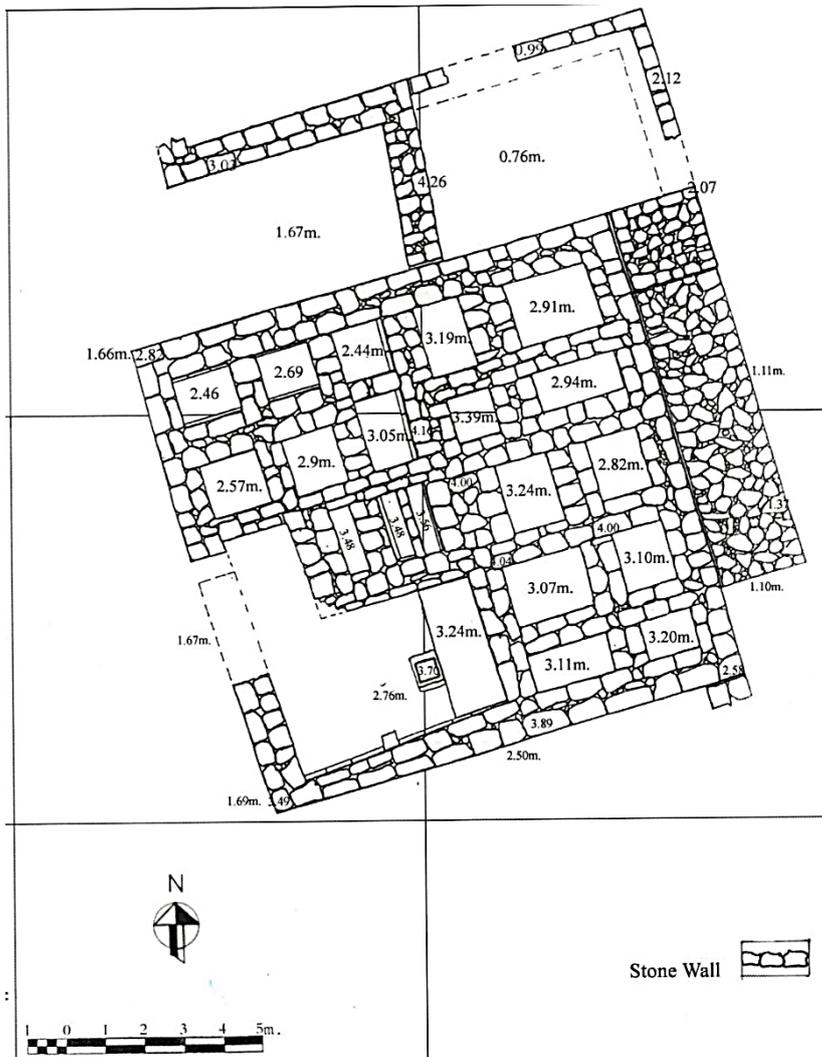


Figure 4-41 Plan of the whole excavated area at unit 49.

(Al-Zahrani et al, 2006, figure 1.2).

4.4.7 Unit 45 Excavation (2004)

Also excavated in 2004, this unit is located within the walled enclosure area to the south-west of unit 49 (see above Figure 4-17). The aim was to uncover its interior structures. The general condition of this unit was similar to the condition of unit 49: damage had occurred to the interior, while the exterior walls were better preserved. The uppermost stratigraphic layer in this unit comprised sand mixed with pieces of clay and rocks. The deepest layer contained ash, bones and clay. Due to the damage mentioned above, the stratigraphy of this unit was not clear enough to distinguish between layers.

The structure of this unit was comparable to that of unit 49. The style of construction was well-organised in term of the size and consistency of the stones used. A new feature in this complex was a cube-shaped stone found in its southern part. In the surface of this stone was a hole representing

4.4.8 Northern Trench Excavation (2004)

The third location in the 2004 season is the northern trench excavation. This trench was chosen for an additional small excavation, with the aim of clarifying the stratigraphy in the area between the walled area and the 1996 North excavation. The uppermost layer of this trench comprised small stones mixed with unbreakable soil of beige colour, and ash. The second layer was sandy soil, and its thickness was 30cm. The next layer contained ash, clay, bones, charcoal and some pottery. In this layer, four walls of a large room appeared built of medium stone blocks. The deepest layer was a sandy layer devoid of any artefacts except some pieces of gypsum that probably fell from the walls or belonged to the floor of this unit. Beneath that, a hard layer appeared without any evidence of human activity. This excavation revealed different sherds of storage jars made from a brown fabric mixed with sandstone and limestone with some decoration on the outer surface; sherds of cups, plates, lids, bowls, glazed pottery, pottery lamps and censers were also collected (Al-Zahrani et al, 2006). Unfortunately, the plan of this trench was not located on the site plan (see above Figure 4-17), and the absence of its plan is because there is not one published with the report published in 2006.

4.4.9 Unit 50 and 51 Excavations (2009-2010)

The most recent report from this project was published in 2012, and reported on the sixth season (2009) and seventh season (2010), both led by Al-Zahrani. The two seasons were combined in this report because of the proximity of the excavated area (see above Figure 4-16).

These units were located in the east of Al-Ukhudud's walled area, and were excavated in 2009. They consisted of three stratigraphic levels. The uppermost layer consisted of sand, and small to medium-sized stones. The second layer included plant material, mud and small stones; the third layer contained ash and mixed mud with different types of pottery. The deepest layer revealed medium-sized fallen stones, mud, gypsum and pot sherds. These units included five medium-sized rooms; a separate bigger room may have been used as a living room, and small store rooms related to the central area of the unit. In the stratigraphic records, no depths were recorded by the excavators. These rooms were built using medium-sized stones plastered with white gypsum (Figure 4-43).

In unit 50 and 51 few pottery sherds were found; these included vessels with flared prominent circular bases, open rims, and a cup with a wave-decorated rim made from a light brown fabric mixed with small stones and straw. Vessels were well-fired and wheel-made.

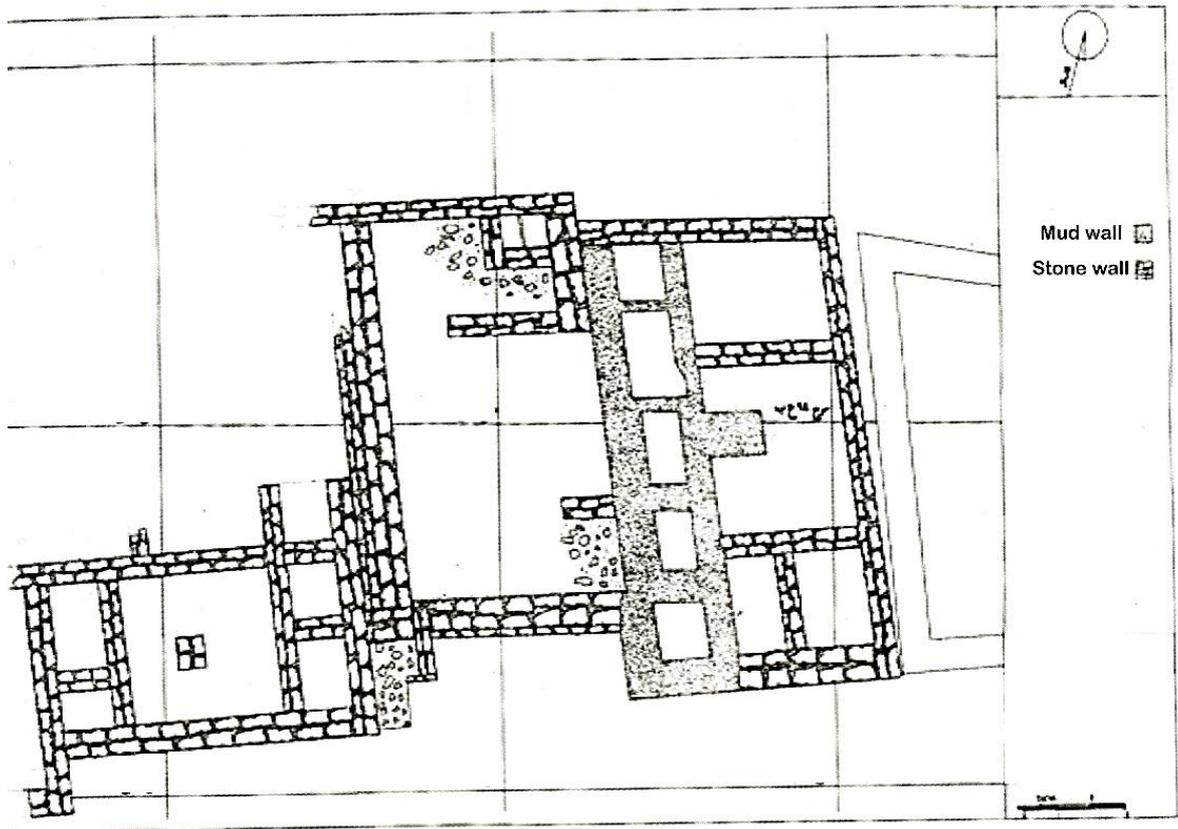


Figure 4-43 Plan of the whole excavated area in 2009 at units 50 and 51.

(Al-Zahrani et al, 2012, figure 1.3 a).

The other section of 2009-2010 excavation was inside the walled area, excavated in 2010. This excavation includes two squares (93TT and 93TH) (see above Figure 4-17), and consisted of four stratigraphic layers. The uppermost layer contained stones, pieces of gypsum and sand. The second layer contained mud, charcoal, ash and small fragments of bone, and the third layer consisted of soft sand. The deepest layer comprised ash, bones, charcoal and then soft clay. The artefacts discovered from this excavation were different from those of previous seasons. They consisted primarily of ceramics, circular open bases, open rims, dishes (plates) and refiners (filters), some decorated with incised decoration around the exterior body, well-fired and wheel-made (Al-Zahrani et al, 2012) (Figure 4-44).

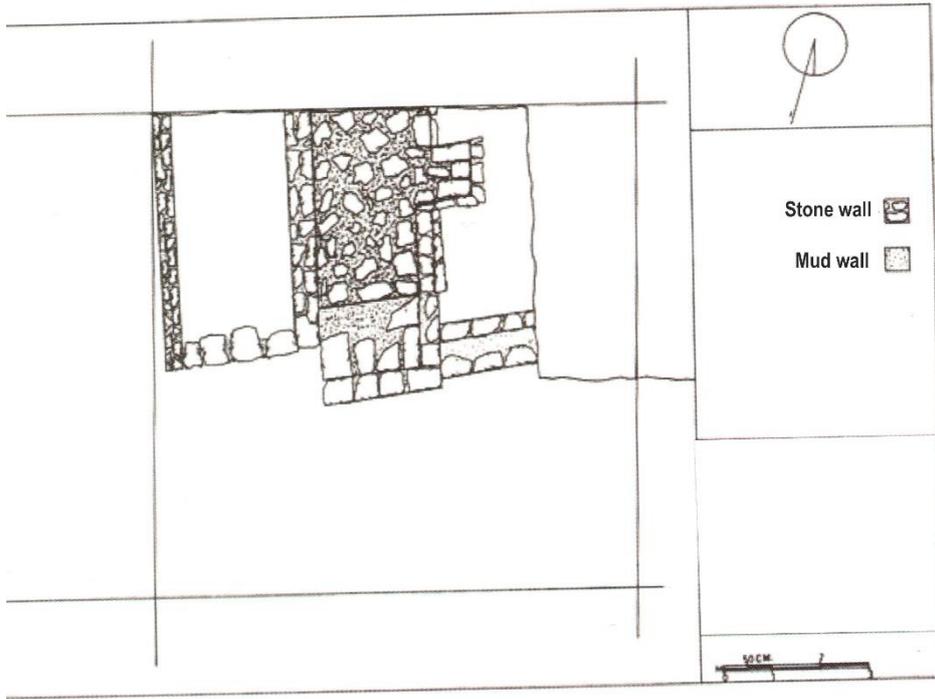


Figure 4-44 Plan of the whole excavated area in 2010 inside the walled enclosure area.

(Al-Zahrani et al, 2012, figure 1.9 a).

Thus, we can see that Al-Ukhdud has undergone excavations over ten years, and that these excavations have exposed large areas but at low stratigraphic resolution, and with poor levels of precision in the recording. This reflects the preoccupations and intellectual frameworks of local archaeological activity, and indicated a preference to concentrate on uncovering the nature of the site (structures, artefacts, inscriptions) without a parallel focus on the study of ancient society and relationships. The methods adopted during Al-Ukhdud's excavation thus presents the opportunity of a large quantity of materials from different areas across the site, but with some challenges in terms of the quality of contextual data. Likewise, previous studies of Al-Ukhdud's pottery have been limited in approach, being focused only on superficial features such as surface treatment and decoration, without providing deep analysis of fabrics or other features. A more systemic excavation at this important archaeological site would assist archaeologists to supplement archaeological and architectural data in order to clarify many aspects of past life at Al-Ukhdud, including its social, economic, religious and political activities.

4.5 Previous Pottery Analysis in the Area

As we have seen, the publication of the archaeology of the Arabian Peninsula is somewhat limited in quantity and resolution, despite its diversity and importance, especially as regards social

approaches to ancient societies. This might be due to the geographical and political nature of the Arabian Peninsula, or equally it might reflect the lack of qualified archaeologists to carry out such studies. The majority of published studies in this area have focused on explorations and/ or chronology without providing detailed information about other features of these sites and their communities.

In terms of pottery, its study can provide significant data about ancient citizens and their various activities. Most studies published to date on Arabian pottery are preliminary and descriptive works concerning the nature of the materials and the methods of its manufacture, with no information derived from pottery on local people's activities, such as trade and relationships and interactions with other societies.

This section will present previous archaeological studies of pottery from South Arabia and consider the advantages and disadvantages of these studies and the methodologies that were used to accomplish the research.

The South Arabian Peninsula is a rich territory of archaeological sites, each of which can offer abundant new data. The earliest studies of South Arabian pottery came from two sites, Hureidha and Hajar Bin Ḥumeid in Yemen. Hureidha is in Wadi 'Amed in the Ḥaḍramawt region, around 670km from Al-Ukhduḍ, and Hajar Bin Ḥumeid is located in Wadi Beihan in the Western Aden region, around 750km from Al-Ukhduḍ.

The study of Hureidha was undertaken by Gertrude Caton Thompson from December 1937 to March 1938, published in 1944, whereas the study of Hajar Bin Ḥumeid was done by Gus W. Van Beek in 1950 and 1951, published in 1969, as discussed below. These studies were the first systematic archaeological studies in the south of the Arabian Peninsula, and they created fundamental knowledge of ceramic studies. An almost complete absence of more recent work means that they are still relevant today.

4.5.1 The Excavation at Hureidha

Caton Thompson's excavation of Hureidha was the first archaeological excavation in Arabia to use the method of archaeological test trenches, and the excavation provided an early assemblage of South Arabian pottery. The analysis of this material identified the pottery based on fabric, offering descriptions of the fabric condition and colour that were detailed by the standards of the time. Caton Thompson categorised the Hureidha pottery into two groups: the complete vessels, which were discovered from the tombs, and the fragments, which were revealed from the Moon Temple (hereafter, the temple). Thus, she sought to simplify the typological process by using the complete

vessels as the basis of her classification, and then comparing and classifying the incomplete pieces on the basis of similarities of fabric. The pottery from the tombs was divided into fifteen types, each described according to form, ware, technique of manufacture and decoration.

Despite its pioneering nature, the study of Hureidha has significant weaknesses for the present purposes. Al-Ukhud, though still poorly understood, is primarily a settlement site, whereas the site of Hureidha, according to its publication, is a religious/ funerary site. Caton Thompson's account of Hureidha does not mention a settlement in the area, nor does she discuss the people who lived in proximity to and utilised these places, and deposited these artefacts. The extent to which the ceramics from Hureidha can be directly compared with those from the settlement at Al-Ukhud is therefore unclear. We do not yet clearly understand the relationship between temple/ tomb and settlement ceramics in this region, and whether we might expect the assemblages to be similar or different in terms of technique of manufacture, range of forms present, and evidence of use. The data presented in the present study will allow light to be shed on this area in the future.

Further limitations are evident in Caton Thompson's study of Hureidha's ceramics. Inevitably, it reflects a culture-historical style of archaeology, focused on typological definitions rather than the socially focused analysis to which modern archaeology aspires. Some aspects of the study reflect its semi-colonial origins (Thompson, 1944), including choice of vocabulary and interpretations indicative of implicit negative value judgements (e.g. 'barbarous' (p.24) and 'primitive' (p.58), both words no longer utilised in modern archaeology).

4.5.2 Cultural Connections at the Site of Hureidha

Caton Thompson believed that there were strong contacts and significant influence from Greek culture, and that this connection could be seen specifically in Hureidha and generally in Yemen through the presence of coins with Corinthian styles. She remarked that these coins date to "late Attic types from 393 to 322 B.C, but in South Arabia can be earlier than the third century B.C." (Thompson, 1944: 150). The Greek impact on Hureidha, Caton Thompson argued, can also be seen in the architectural style at the Moon Temple, and in other Persian and Sasanian influences on certain materials especially from tomb A6. The implicit implications of these observations are that Hureidha's society was culturally dependent on external communities, an impression reinforced by Caton Thompson's non-engagement with local people and their participation in their land. The question of local production vs external/ Greek influence is not, however, taken up by Caton Thompson in her presentation of the pottery, and her study pre-dates many of the standard approaches to establishing places of production and identifying local or imported manufacture.

4.5.3 Pottery of Hureidha

The Hureidha assemblage is very small, at 177 pieces, and thus, does not offer a full variety of pottery and will not provide a complete and clear picture of South Arabian pottery. This issue is exacerbated when the quantity of pottery is subdivided by phase. Caton Thompson defined three phases in her excavation of the temple, based on architectural stages of the building's walls: the early temple, phase A, which offered 13 pieces; the middle temple, phase B, which offered only 11 sherds; and the latest temple, phase C, which offered 60 pieces. Clearly, such small quantities will not provide enough information about the site or the assemblages, even in the case of phase C. Furthermore, Caton Thompson published the sherds from the temple in much less detail than the complete vessels from the tombs. Her publication does not provide detailed data about the stratigraphy of each excavated area, and there is no link between the ceramics and the excavated layers in the three buildings that can clarify the find-spot or specific context of the pottery. The complete vessels from the tombs are described and classified differently to the sherds from the temple. Ninety-three vessels were revealed from tombs A5 and A6, which Caton Thompson separated based on type. All types were given formal labels largely based around assumed use (Rice, 2015); some of these include archaic labels, such as 'goblet' and 'chalice', which today feel somewhat culturally inappropriate.

Although fifteen types were defined from the tomb assemblage, only three fabrics were described, comprising two ceramic fabrics and one curious fabric termed 'stone ware'. From the description and analyses presented in the publication, it remains unclear whether the stone ware is a pottery fabric or in fact a type of soft stone; Caton Thompson solicited inconclusive scientific studies, ultimately writing that "In the absence of agreed conclusion about the nature of this material I propose to call it 'stone ware'" (Thompson, 1944: 123). It is difficult to decide whether the description of the stone ware is accurate or not because there is no consensus as to the nature of this fabric, as noted above. The illustrations of the vessels from Hureidha, especially those of the stone ware, are not clear enough to distinguish the material from which these vessels were made.

4.5.4 Discussion

In light of the above, it is difficult to define accurately the fabric of intact vessels from Hureidha, not least because fabric can be best seen through a fresh fracture, which adds another element of inaccuracy to Caton Thompson's definition of pottery fabrics from the Hureidha tombs.

A further significant point relates to the wider site chronology; leaving aside the relative dating provided by Caton Thompson's phasing of the temple excavations, the date of the site as a whole

remains ambiguous. It is suggested to be 7th to 5th century B.C., based on comparing materials, (specifically beads and seals) found in tombs A5 and A6 with similar materials discovered in different areas of the Eastern Mediterranean region and beyond. This approximate date was suggested by Beck, who studied the beads from the site, not by Caton Thompson (Beck, 1928). Likewise, Frankfort argued that the seals from Hureidha were similar to agate seals produced outside Mesopotamia under the influence of the Achaemenids, so he dated these materials to the same period (Frankfort, 1939). Clearly, this remains open to some debate, and in light of the above, we must consider the dating of Hureidha as approximate, and relating only to one part of the excavated area of the site, specifically the tombs, from which the dated objects came.

The study of Hureidha's pottery is thus valuable in that it provides the fundamental typology of ceramic material on which subsequent scholarship has built; but it remains limited in a number of ways. Specifically, the material is not well dated in absolute terms, the fabric descriptions are somewhat schematic, and the assemblage is small and based largely around intact vessels. Moreover, some of the interpretations appear questionable in light of the inevitable theoretical repositioning of the field over the last 80 years.

Following Caton Thompson's pioneering work, two seasons of excavation were undertaken at the archaeological site of Hajar Bin Ḥumeid under the sponsorship of the American Foundation for the Study of Man in 1950 and 1951, directed by Wendell Phillips, W. F. Albright, Donald W. Dragoo, Gus W. Van Beek and John Simpson.

The significance of this site is that it is a pre-Islamic South Arabian settlement, which in contrast to Hureidha, appears similar to the settlement of Al-Ukhdu. The study of Hajar Bin Ḥumeid is more coherent in its presentation of information than is the earlier study of Hureidha (Van Beek, 1969). This publication provides detailed description and integrated information concerning the site; moreover, it also presents the history of and approaches to the excavations and details the methods of excavation and recording.

4.5.5 The Excavation at the Site of Hajar Bin Ḥumeid

One aim of the Hajar Bin Ḥumeid excavation was to create a chronological system for South Arabian pottery, and over two seasons a total of 2,751 sherds were recorded, making the assemblage significantly larger than that from Hureidha. Another key difference between the study of Hureidha and that of Hajar Bin Ḥumeid is that the latter offers an accurate and detailed explanation of the site stratigraphy, which comprised 21 levels, as well as site architecture. The excavation of Hajar Bin Ḥumeid followed a spit excavation style; this style was considered to be an appropriate method to accomplish the goal of collecting a large corpus of pottery. Furthermore, this style was applied

at Hajar Bin Ḥumeid due to the destruction of the west mound by natural and human factors, which denuded and obscured part of the site. Recorded features were linked with uncovered floor-levels, with the floor as the major stratigraphic sub-division; when a floor was reached all finds were recorded in relation to that. The publication provides detailed description of the site stratigraphy, supported by illustrations for each level and connecting the materials with their layers, information that was absent in the excavation of Hureidha. Although a spit excavation provides some challenges in the form of mixing of deposits of potentially different date and character, the detailed recording and publication of the excavations in this case provide a basis on which to assess the quality of each stratigraphic element.

4.5.6 Pottery of Hajar Bin Ḥumeid and its Classification

The basis of the classification of pottery at Hajar Bin Ḥumeid was clearer than for Hureidha, and the approach to classification can be drawn on for the study of Al-Ukhduḍ's pottery with some modification to match the specific nature of Al-Ukhduḍ's assemblage and the modern recording practices adopted within the present research. Classification was based on four categories: temper, surface coating, surface finishing and surface decoration, and each category was divided into sub-categories. The advantage of this approach is that it allows future study of related materials to extend these categories and add types or sub-types, but we do not yet know whether this methodological approach may be effective for pottery studies from different sites, due to the significant evolution that has occurred in recent archaeological studies and the modern methodologies used in analyses.

The primary basis of classification was temper, rather than fabric, because it was considered simpler to distinguish and define pottery based on that, due to the common use of temper in South Arabian pottery. In addition, few types of temper were identified in the Hajar Bin Ḥumeid pottery, making the process of classification and sub-division of the pottery relatively simple and clear. The study of Hajar Bin Ḥumeid pottery is thus methodologically helpful in support of the project of studying Al-Ukhduḍ's pottery.

Nonetheless, the study of Hajar Bin Ḥumeid is, like the study of Hureidha, rather dated, the work being done in 1950s and published after around two decades. Since then, archaeology has changed in terms of excavation methodologies, theoretical approaches and ways of interpreting archaeological data. In that period, the study of archaeology was mostly to identify and determine the history (chrono-typology) of archaeological sites. In the study of Hajar Bin Ḥumeid, the main concentration was thus to establish the ceramic chronology of the site itself and South Arabian pottery in general without any consideration of past communities' social, economic and political

activities. The Hajar Bin Ḥumeid methodology needs to be developed and modified to apply it to a current study of pottery, specifically in light of changes in the concepts of underlying modern archaeological studies, which perhaps help to provide detailed information based on the objectives of the study. For instance, in this study of Al-Ukhud pottery the classification of pottery will be based on fabric as a main element, especially when the majority of the material is incomplete, to facilitate the classification process in order to create sub-divisions for example based on form, vessel part and surface treatment.

The classification of Hajar Bin Ḥumeid ceramics was initially based on form, but as noted this approach subsequently altered to classifying pottery based on temper. At the start of his study, Van Beek utilised the methodological classification of Caton Thompson, based on form, but this proved inappropriate due to its exclusive focus on complete vessels. He pointed out that, "Of the 2,751 catalogued items of pottery, only 591 (21%) were whole or restorable pieces, or were sherds that could be definitely identified with one of the complete forms. The remaining 79% of the sherds could not be meaningfully classified by form because they were too fragmentary; an attempt to do so yielded just over 400 different forms in 2,160 sherds, which was obviously meaningless" (Van Beek, 1969: 82). His subsequent classification based on temper was chosen because it facilitated the rapid identification of sherds in the field and it reflected the creativity of manufacturing techniques. However, recently, fabric analysis represents a significant step towards modern archaeological approaches, which is forefront over form as a primary characteristic of ceramic material; thus, the classification based on fabric used here includes the type of clay with its inclusions, and their geological characteristics.

4.5.7 Discussion

The study of Hajar Bin Ḥumeid's pottery is valuable in that it provides a more relevant typology of ceramic material than does Caton Thompson's study of Hureidha's pottery, as well as more detailed stratigraphic descriptions and methodology; the study presents many illustrations which provide a fundamental source for subsequent studies to build on, especially in light of the absence of more recent work in the area. However, the study is essentially the presentation of a pottery typology, without the more interesting approaches that we undertake today.

The limitations of existing pottery studies in South Arabia, and the lack of new publications of pottery from the area require new archaeological methodologies in Arabian pottery studies. Recent published studies from beyond the immediate region may provide modern methodological approaches on which we can depend for some aspects of our study of Al-Ukhud's pottery. One

such study relates to Sasanian and Islamic pottery from the 4th/ 5th century A.D. to around the 18th century A.D. from Ras al-Khaimah, executed over the past ten years (Kennet, 2004).

The site of Ras al-Khaimah is located in the United Arab Emirates at the entrance of the Arabian Gulf in Eastern Arabia. This study concerns the classification, chronology and analysis of over 124,000 sherds of pottery revealed from excavations and surface collections from several sites.

4.5.8 The Excavation at the Site of Ras al-Khaimah

The first excavation was at al-Mataf (Julfar), and was undertaken by G.R.D King between 1989 and 1992. The second one was at the site of Kush, and was undertaken by Derek Kennet between 1994 and 2001. In addition, this study also included surface collections made during field survey by Kennet in early 1994 from Khatt, and Hulaylah, and from the mountain villages of Musandam, and lastly materials from different sites in Ras al-Khaimah.

4.5.9 Pottery of Ras al-Khaima and its Classification

Kennet's study followed a new methodology for classifying the abundant Ras al-Khaimah pottery, dividing the material into "classes". Class, as Kennet described it, related to a group of pottery that has harmonious similar features, with assemblages divided based on these features. This new method was utilised in Kennet's study due to the large quantities of sherds. The main features used to classify the pottery were: "fabric, decoration, technique of manufacture, type or form, and other variables recorded" (Kennet, 2004: 114). Thus, groups or classes were the major standard of classification in this research.

Each class/ group was defined by a specific name based on the unique characteristic in its description, and a code was given according to the class name. As Kennet mentioned, "Some of the classes, such as LQC (Longquan Celadon) and HGRAFF (Hatched Sgraffiato) are established classifications well known in literature" (Kennet, 2004: 33); however, other groups' names were new and appeared for the first time in Kennet's study. While classes were the fundamental method of classification for the Sasanian and Islamic pottery, a typology of the sherds in this study was also created for all rims, bases and handles.

4.5.10 Discussion

The illustrations were not provided for all relevant pieces, but those provided did give the impression of similarities between the pottery from Ras al-Khaimah and that from Al-Ukhudud. The methodology of this study clearly has much to offer our understanding of the pottery of Al-Ukhudud,

with some modifications and additions in light of its specific nature. Kennet's approach has been adopted by other scholars for sites across a wide area, for instance Priestman's study of ceramic exchange across maritime trade routes (Priestman, 2013).

4.6 Previous Studies of Pottery from Al-Ukhudud

Ceramic materials were collected both from the 2x2 m excavation undertaken in 1980 and the 8x6m excavation of 1982 in the south-east corner of the walled enclosure area. Their analysis allowed the excavators to define the period represented by these ceramics as approximately 600 B.C. to 250 A.D (Zarins et al, 1983).

Preliminary ceramics analyses were undertaken following the field season that took place between 1st February 1982 and 10th March 1982. This study increased our knowledge of South Arabian pottery, and also provided some basic principles characterising Al-Ukhudud's pottery, although it remained very schematic in approach. It was based on the interpretation of approximately 1000 ceramic pieces discovered from the south-east corner sounding excavated in 1980; the sherds came from the sounding that reached a depth of 3.45 m. The excavators identified nine main ceramic types based on "form, size, treatment and decoration" (see above Figure 4-15) (Zarins et al, 1983: 28-29). The types defined by Zarins et al are summarised in the (Table 4-1) below (Zarins et al, 1983: 28-29).

Also, in 1982, a surface survey was conducted at Al-Ukhudud by the same team. This survey covered the entire archaeological site within the walled enclosure and outside it. The objective was to identify further ceramic types, augmenting the pottery discovered from the excavations. To facilitate this, the entire archaeological site was divided into individual 10x10m squares, with collections undertaken in a randomised choice of squares clustered within five zones: the central walled enclosure (16 squares), and north (7 squares), south (8 squares), west (15 squares), and north-east (27 squares) (Zarins et al, 1983: 31). A total of 3772 sherds were collected from 73 squares.

The types defined by Zarins et al are summarised in the (Table 1) below, using their terminology (Zarins et al, 1983: 28-29).

Table 4-1 Identification of pottery types from the 1982 excavation (by Zarins et al, 1982).

Type no.	Surface collection type no.	Fabric	Forms	Bases	Rims	Wall thickness	Surface treatment
I	A	Chaff-tempered	Large jars and bowls	Full, slight and double ring	Straight, lipped, everted and inverted	1.5 cm	Less polished
II	A	As Type I	As Type I	As Type I	As Type I	As Type I	Polished
III	B	Chaff-tempered	Medium to small jars	Full and slight ring	Straight, lipped, everted and inverted	1-1.5 cm	Less polished
IV	B	As Type III	As Type III	As Type III	As Type III	As Type III	Polished
V	E	Chaff-tempered	Medium to small bowls	Full and slight ring	Straight, lipped, slightly everted and inverted	Less than 1 cm.	Less polished.
VI	E	As type V	As type V	As type V	As type V	As type V	Less polished
VII	E	Fine chaff-tempered	Medium to small vessels of uncertain	Flat-based	-	-	Polished
VIII	K	sand-tempered	Uncertain form	-	-	-	Coarse
IX	I	Chaff and grit tempered	-	-	-	-	-

They proposed the following phasing:

4.6.1 South Arabian Phase (First Millennium B.C.)

The surface materials collected during the survey were classified into seven types (A, B, E, G, K, L and I). The surface types A, B and E are comparable to the first seven types (I to VII) revealed from the sounding (see above Table 4-1). The similarities between the excavated pottery and the surface collection related, particularly to fabric, “chaff-tempered red wares with certain forms, decoration, slip and rim profile” (Zarins et al, 1983: 31). Zarins et al argued, based on Van Beek’s chronology at Hajar Bin Humeid and the results of C-14 from the sounding at Al-Ukhud, that the early settlement

of the central walled enclosure area should be dated from 500 B.C to around 300 A.D (Zarins et al, 1983). Types A, B and E (I - VII), have “chaff-tempered” fabrics comparable to some sherds excavated from Qaryat Al-Fāw, Wadi Al-Dawasir, designated by D. Potts as “Fāw ware” (Zarins et al, 1979: 31 and 1983: 31; Al-Ansary, 1982: 66-67).

Other surface types in this group match excavated types, specifically, surface Type K is similar to sounding Type VIII in fabric. Type K is “very distinctive tempered by sand with a unique rim and basic configurations” (Zarins et al, 1983: 31). This type dated to the 5th century B.C. based on comparative material found in Ḥadhramaut (Zarins et al, 1983). During the surface survey in the walled enclosure, Zarins et al noted one small piece probably of Nabatean pottery, similar to sherds found in Thaj and from Qaryat Al-Fāw in Saudi Arabia (Zarins et al, 1981; Al-Ansary, 1982).

4.6.2 Byzantine Phase (300 – 600 A.D.)

The ‘South Arabian’ ceramic phase probably ended around 300 A.D, and the excavators Zarins et al proposed that it might relate to the disappeared of many of the South Arabian polities (Zarins et al, 1983). Similar patterns have been recorded elsewhere: at Hajar Bin Ḥumeid, excavators found “15m of debris with 18 strata, the last (Level A) terminating in the fourth century A.D.” (Zarins et al, 1983:32). Caton Thompson (1944) suggested that Hureidha was abandoned during the same period. Weakness of the land trade route likewise occurred around 300 A.D. (Doe, 1971). However, Najran, may have flourished in connection with the rise of Christianity in Najran, Zafar and Qana (Bin Jrais, 2013, Zarins et al, 1983; Shahid, 1971) Thus, settlement continued in Al-Ukhudud between 300 and 700 A.D. as indicated by sherds from the walled enclosure and from the entire site (Zarins et al, 1983).

This Byzantine pottery has inverted some aspects of South Arabian pottery types (III, IV, V, VI and VII sounding types, and B and E surface collection) with some modifications in use of finer chaff for tempering fabric and providing new vessels in terms of rim and base forms and a new manufacture technique (Zarins et al, 1983: 32). One new Byzantine type (Type F), as mentioned above, has the same fabric as the South Arabian phase but with “new flat-based vessels with out-turned bodies, bases with four lugs for feet, notched rims, well-fired jars, cannisters which are wheel-made, a well-pronounced ledge rim, and decoration which tends to include multiple techniques such as combing, wavy and straight lines, vertical lines, punctate design and applique” (Zarins et al, 1983: 33).

A second new type (Type M) was “red to brown, chaff-tempered, and wheel-made” (Zarins et al, 1983: 33). The decoration of this ware was cut-out, incised technique, and the bases were small with attached legs. In Type M ware, no sherds were discovered from the sounding excavations or

surface collection from walled enclosure, implying that occupation had shifted elsewhere by this time. In particular, this type was found on the surface of the southeast part of the site (Zarins et al, 1983).

A third type (Type N) was close to type M in fabric, but with very simple surface treatment, with less incised decoration than type M, and common buff colour. Dayton and Dayton described the fabric of this type in their study of the pottery from the Philby-Ryckmans-Lippens expedition as “delicate incised wares of fine, well levigated clay” (Dayton and Dayton, 1978/ 1979: 32).

A final type belonging to the Byzantine phase was (Type P), represented by cups (“Goblets”: Zarins et al, 1983: 33). The technique of manufacture was wheel-made, similar to Type M. The necks and bases are diverse, “from being very high-footed to very low-footed” (Zarins et al, 1983: 33). An orange colour is very common in this type, especially for the slip; decorations are less common, and hand-made manufacture is occasional (Zarins et al, 1983). These types do indicate that the occupation of Al-Ukhud continued between 300 and 600 A.D., even if not across the entire settlement.

4.6.3 Umayyad Phase (630 – 750 A.D.)

Umayyad pottery in Al-Ukhud is characterised by vessels that are buff-slipped with red-painted designs or dark-slipped and white-painted (Sauer, 1973; Zarins et al, 1983). Umayyad pottery was identified at Al-Ukhud from the north-east area of the site. In particular, Type U comprised open and restricted bowls, decorated with incised wavy lines and combined, with white slip and red/ purple paint; it is similar in its chaff-tempered fabric to Byzantine Type F with elements of continuity to earlier fabrics (Zarins et al, 1983). Moreover, of Umayyad origin was Type V, having “a thick white painted interior slip on bowls (sometimes turning yellow) or a slip which has apparently been slightly glazed” (Zarins et al, 1983: 34).

4.6.4 ‘Abbasid Phase (750 – 1100 A.D.)

‘Abbasid period pottery was found in the north-west section of Al-Ukhud. It is recorded as commonly “monochrome blue/ green glaze” (Zarins et al, 1983: 34), which is a common feature of ‘Abbasid pottery (Whitcomb, 1978), and was designated Type J. Additionally, Type R is a well-known splash-ware utilising a tin glaze of yellow, green and brown. This type was very common in Al-Ukhud especially in the north-west sector. Another Abbasid-era type was Type Q, being well-known in Al-Ukhud, and exhibiting incised under-glaze decorated (Zarins et al, 1983). Lustre ware was present as a small portion of Al-Ukhud’s pottery, recorded as Type S; one small bowl had a

“fine white glaze and gold lettering or designs” (Zarins et al, 1983: 35). The last Abbasid-era type, Type T, was characterised by “crushed steatite temper” (Zarins et al, 1983: 35), and is similar to Type I from the sounding and Type A from the surface collections. The ‘Abbasid pottery revealed from the north-east area provided evidence of continuous settlement at Al-Ukhdud well into the first millennium A.D (Zarins et al, 1980; Zarins et al, 1983).

4.6.5 Post-‘Abbasid Phase (Medieval Islamic Period)

This period is confirmed at Al-Ukhdud by a number of distinct sherds found in the north-eastern area of the archaeological site specifically “green-glazed sherds with incised triangles and wavy lines” (Zarins et al, 1983: 35; Dayton and Dayton, 1978/ 1979). The Mamluk period was represented by three sherds identified by “a buff body with orange slip. Designs in purple paint are placed on the sides and neck” (Zarins et al, 1983: 35); there are similar to pieces found in Asir and Tihama in the south-west of Saudi Arabia during the 1980 comprehensive survey (Zarins et al, 1981). Medieval porcelain was also discovered at Al-Ukhdud, including non-decorated white and white-with-blue sherds similar to pieces found in Hureidha and Al-Hasa in the east of Saudi Arabia (Caton Thompson 1944; Whitcomb, 1978; Zarins et al, 1983).

From the above information, we can say that the focus of occupation at Al-Ukhdud shifted across different areas. The first settlement was within the walled enclosure, as indicated by ceramics analysis and the results of C-14 from the 1980 and 1982 soundings; these results provided a date c. 235 A.D for the upper levels to c. 535 B.C. for the lower levels (Zarins et al, 1981, 1983). During Byzantine, Umayyad, ‘Abbasid and Post-‘Abbasid times, settlement was concentrated outside the walled enclosure, especially in the north-eastern and north-western parts of the site, according to the large numbers of sherds found there that belong to those periods.

Chapter 5 Methodology

Chapter one introduced the topic, objectives, and structure of thesis, while chapter two presented an analysis of previous archaeological approaches to trade and exchange. In chapter three, we outlined the regional setting, historical context and significance of Al-Ukhudud and the region of Najran. In chapter four, we considered the current state of, and previous archaeological work at, Al-Ukhudud, including the exploration and description of the site, its layout, the Saudi Arabian excavations, and previous studies of pottery in the area and from Al-Ukhudud. In this chapter, we will present the methodology of our analysis of the pottery discovered during the 1996 and 2000 excavation seasons. Previous studies have been restricted to the production of basic chronotypologies, and have not placed the material into meaningful socio-economic context, failing to take advantage of a strength of ceramic studies, which is to generate data and approaches to reconstruct the day-to-day lives and activities of past people (Anderson, 1984).

5.1 Research Aims and Objectives

As outlined in chapter one and through studying Al-Ukhudud's pottery, this study aims to investigate the impact of trade in order to define the nature of economic exchange and the communications between societies, and to understand the economic system of ancient society in South Arabia and the impact of people, materials and goods movement on interaction and connectivity, and understanding the patterns of local/ nonlocal trade vs local goods consumption that appeared in Al-Ukhudud between 500 B.C. and 600 A.D.

An abundance of ceramic samples was uncovered from Al-Ukhudud during the survey season in 1979, and during the excavations in 1980, 1982, 1996, 2000, 2002, 2004, 2009 and 2010. Pottery is the most commonly retrieved artefact from the site, and its diversity raises important questions about Al-Ukhudud's society and economy. Given the absence of literary sources on the site's economic history, the study of Al-Ukhudud's pottery can provide significant evidence on the nature of the economy.

This research concentrates primarily on the pre-Islamic pottery from Al-Ukhudud, in order to apply an examination of these materials to the wider questions relating to trade and exchange situations outlined in Chapter one. Pottery is closely related to economic activity and situations through methods of production and consumption and ideas that have impacted on pottery manufacture, whether local or nonlocal. The recognition of patterns of pottery production and consumption at the site leads us to achieve one of the research objectives: defining the strength of commercial

movement at the site during that period and reflecting on the multiplicity of pottery production methods. A particular focus on fabric provides important evidence for the main source of ceramic materials at the site with implications for understanding local industries. The distribution of pottery on the site likewise helps us identify any patterns of variation in consumption and use of ceramic resources in the site in general. This thesis thus considers the extent to which trade within the site was active and influenced the prosperity of parts of the settlement.

5.2 Research Methods

This work focuses in detail on assemblages of pottery from Al-Ukhdud, undertaking analysis of materials collected by the Saudi Commission for Tourism and National Heritage (SCTNH), Antiquities and Museum section in Riyadh, Saudi Arabia during their excavations directed by Al-Zahrani et al in the years 1996 and 2000, as outlined above in Chapter four. The nature of these assemblages and the methodology employed in this study to better understand them, will now be presented.

5.2.1 Collection and Sampling Strategies

There are various methods in archaeology to acquire and identify materials for analysis, including surveys, excavations and studying existing museum assemblages (Sinopoli, 1991). A considerable variety of pottery was discovered from the excavation of different units within the eastern part of the walled area of the site of Al-Ukhdud, and forms an important and largely unanalysed corpus. However, certain characteristics of the excavation in general, and the assemblage in particular, need to be considered in order to understand the opportunities offered by these materials, as well as their limitations. In terms of the excavations, the excavated areas each of which measures 5x5 or 10x10 meters, represents only a fraction of the walled settlement area. Despite this, by modern standards these are large excavations, which were undertaken by means of clearance of deposits to arbitrary levels (spits), rather than following single-context recording strategies. A considerable amount of work thus needs to be done on the pottery and its contextual information in order to understand the nature of the groups that are available for comparative analysis. Consequently, the samples that were collected from Al-Ukhdud during all fieldwork seasons required preliminary sorting to identify groups of material that might be of high archaeological integrity.

A further complication is that, due to construction work in Najran Museum where the pottery from the excavations had been housed until 2014, all the materials from Al-Ukhdud were transferred to the National Museum in Riyadh in 2015, where they are now stored, randomly organised in large

boxes inside the main storage facility. Before identifying and analysing the samples for the present study, it was necessary to gather all the archaeological reports including unpublished reports that relate to the site in order to understand exactly how much detailed information we have about each excavated area. Focusing on seasons 1996 and 2000, information was sought on retained materials including pottery, such as find spots, associated stratigraphy and other relevant contextual information. Thus, the first step of the data collection process was sorting the poorly stored and mixed pottery based on its season of excavation, by means of the fundamental data written on each pottery bag. This was done to clarify how many seasons are represented in the collection, what quantity and type of pottery is there, and to understand pottery distribution and specific provenance to excavation area and square, in order to identify the materials with the best quality contextual data, i.e. connected to a single small square and/or specific building and/or spit.

Data collection focused on squares based on the site network (see above Figure 4-16, Figure 4-17), alongside the network of each individual excavated area especially for seasons 1996 and 2000, to simplify the exact locations discovered at Al-Ukhudud in order to understand pottery distribution locations whether from complete or incomplete architectural units. Moreover, we aim to consider what people used particular excavated architectural complexes for and to address the connection between the location and the nature of its ceramic assemblage. The stratigraphy for each excavation was derived from the primary reports (see above), to clarify the process of linking pottery with specific stratigraphic units and/or particular excavated structures (Zarins et al, 1981, 1983; Al-Zahrani et al, 2001, 2002, 2005, 2006, 2012). This association with architectural remains may assist our understanding of the utilisation of the identified pottery, whether from domestic contexts (in situ or disturbed), production areas or discarded deposits or middens.

Unfortunately, but not unexpectedly, the majority of Al-Ukhudud's pottery is fragmentary, and only a few pieces (usually bowls) are more complete and can be identified as complete forms. In terms of fabric identification, initially, we discriminated pottery fabrics visually, and then, I have applied a small hand lens (x10; 21mm magnification) to examine fresh fractures in most of sherds, to understand preliminarily the inclusions as much as possible and to group the sherds with similar inclusions together. Then some sherds were examined under the microscope (WF x10 magnification) in order to distinguish between fabrics in the selected sherds). The number of pottery pieces analysed was 3431 for the 2nd season and 4028 for the 3rd season, making a total assemblage of 7459 sherds.

5.2.2 Recording the Pottery

Recording pottery is a significant process that archaeologists should consider during and after excavation, to ensure an appropriate procedure for the analysis of these materials. At present, in Arabian archaeological study, there is no specific, uniform method for recording materials revealed from fieldwork (El-hassan and Ali, 2008). The process of recording pottery in the region is thus diverse from one study to another depending on the specific research aims and objectives. The main reason for a considered approach to ceramic sampling and recording during excavation is to link the sherds with contextual data such as find spot and stratigraphy, to facilitate the process of classification and study, and to prevent any vagueness relating to the materials. A challenge for the present study is the lack of detailed information that was provided from Al-Ukhudud's excavations and published in the preliminary reports.

The majority of this pottery was recorded in groups based on finding location. Only a small subset of excavated materials, such as pottery, coins, metals and inscriptions, was included as part of the preliminary reports. Although these objects were published in the *Saudi Arabian Archaeology Journal (ATLAL)*, they were still not recorded and studied in any great detail.

To improve this situation, the methodology adopted here will apply a systematic process following modern guidelines that any researcher can rely on, especially in order that the study of South Arabian pottery might develop a more modern vision of ceramics study. In particular, we will use the best-practice guidelines defined by the Prehistoric Ceramics Research Group (PCGR, 2010), with modifications suitable to the project, from which this study will adopt fabric classification procedures, formal approaches and quantification strategies. The study also draws on guidelines by the Study Group for Roman Pottery (SGRP) and Medieval Pottery Research Group (MPRG) (2016), from which we will derive analysis strategies that allow data to be collected from numerous sites following a consistent procedure to facilitate comparative study, in a way that is not possible if different strategies are followed for collecting and recording pottery site to site. These guidelines will be used in this research in the direction that is consistent with the nature of Al-Ukhudud's pottery; nonetheless, the characteristics of any assemblage might require some deviation from these practices at times, but where this happens it will be made explicit in this study. This approach will facilitate identification and classification, and design a completely new pottery fabric series and detailed formal catalogue for Al-Ukhudud in the absence of modern detailed pottery studies. It will also add much to current understanding of this important and little-known site, and by extension the societies and economies of pre-Islamic southern Arabia more widely.

Data for this study was recorded on paper, for pragmatic reasons, and subsequently entered into an Excel spreadsheet. A specific form was designed to record the pottery in order to allow a systematic approach: a pottery record form (Table 1 and 2, appendix 1). The pottery record form is based on one created by Elaine Morris, with some modifications to address the specific situation nature of Al-Ukhudud's corpus. In addition, it draws on the form used to record pottery from the Qaryat Al-Fāw project, undertaken by the Department of Archaeology, King Saud University. This form was used to record all diagnostic sherds.

The quantified approach adopted here will provide a total sherd count and weight for each group and sub-group. Quantified assemblages are not widely available in the region, with Kennet's (2004) publication of the Ras al-Khaima ceramics as something of an exception. Brief description of the key categories in the pottery record form is listed in (Table 3, appendix 1). Here is an explanation of the process of recording some categories in the pottery record form.

Measurements include the weight of each sherd. The body wall thickness varies from one sherd to another, so wall thickness codes were used from to represent the possible thickness of the body sherds in millimetres; these are listed in appendix 2. The measurements also include the rim and base diameter in centimetres and the percentage of preserved diameter.

Form type refers to the shape of vessels. Recording form creates two main issues. First, every sherd is individual in form, and these must be combined together to create meaningful classifications. Second is the issue of incomplete data. It may be possible to record pottery based for instance on the proportion of width to length, the base diameter, or the number of handles; however, with only fragments present, then the classification of form will allow various options (Orton and Hughes, 2013; Wheat, 1991). As noted above, the majority of Al-Ukhudud's pottery is fragmentary, and thus, all the sherds were categorised based on fabric, then by sherd type based on vessel part (i.e. body (B), rim (R), base (BA), handle (H), and body with handle (BH)). After drawing pottery sherds specifically rims and bases, we identified the sherds into major form type as follows: small bowl, medium bowl, large bowl, jar. This division specifically for bowls was based on the variation of diameter from 5 – 48 cm (Table 5-1) as follows:

Table 5-1 Bowls diameter scale

Rim diameter	Form type
5 – 16 cm	Small bowl
17 – 28 cm	Medium bowl
30 – 48 cm	Large bowl

In terms of jars, I identified rim sherds as jars based on rim shape after drawing them, based on a closed rim and opened thick body. In terms of rim types, I identified all rims based on similarities in shape to several types mentioned in chapter six and listed them in (Table 1, appendix 3) for hand-made rim forms, and in (Table 1, appendix 4) for wheel-made rim forms. The names of rim types in appendix 4 and 5 have been collected from different publications with some modification to comply with the actual rim types of Al-Ukhud pottery (Morris, 2004; Hally, 1983; Shopland, 2005; Hamburg, 1994). Classification based on diameter can be useful to distinguish between vessels. For instance, Rice (2015) mentioned that classification based on size and proportions simplifies the identification of flatware including plates and hollowware, in particular with restricted rims, in the classification process of colonial-period pottery in the United States; the difference between plates and dishes was based on diameter, less than 7 inches being a saucer, 7-10 inches a plate and above 10 inches is a dish. Another classification method was unrestricted rims of Maya pottery and included five forms (plate, dish, bowl, jar and vase). This method was based on the height of the vessel. The diameter of a plate was less than 1/5 mm, a dish was above 1/5 mm and deeper than the plate, a bowl can have a restricted or unrestricted rim with height between 1/3 to the maximum diameter, whereas a jar is classified as a restricted neck with highest maximum diameter. The difference in classifying jars can sometimes vary from one place to another; the jar vessel in the south-eastern United States was not classified as a jar in Maya pottery because there is no neck (Rice, 2015).

Surface treatment refers to the condition of the external and internal surface of pottery; whether it is coated, slipped, glazed, etc. This refers not only to the final treatment applied during manufacture, but also any indication of the manufacture technique. All surface treatment types and positions are indicated in appendix 5. In this research, I used codes for common surface treatments positions, which are indicated in appendix 5 as well.

Fabric type indicates the type of clay matrix plus inclusions and tempering used in Al-Ukhud's pottery. This study used the visual key identification of principal inclusions from the Prehistoric Ceramics Research Group Guidelines (PCRG, 2010: 46-47), with suitable modifications in the light

of exact nature of the materials. This study created a new fabric series for Al-Ukhudud's pottery presented in chapter six.

Through this study of fabric, I examined clay colour using the Munsell Colour Chart for colour codes and names; I also applied the core firing condition by using specific expressions listed in appendix 6 to indicate the circumstances of firing of the pottery (PCRG, 2010: 54; and I used a specific form: the fabric type recording form (Table 1, appendix 6) to include all the fabric data. In this research, I examined some sherds under the microscope in order to understand the fabric and its inclusions more deeply (Table 1, Table 2, Table 3, Table 4, Table 5, Table 6, appendix 7). This process assisted us to identify in-depth the inclusions depending on their visual features such as lithic/rock fragments, to understand which geological areas in south-west Arabia might be represented and how we can distinguish between one geological area of production and another in terms of local or nonlocal production, and/or to better understand economic practice in pottery production. It is necessary to point out that all the study of Al-Ukhudud's pottery to date has been descriptive rather than analytical, and this fabric series is the first of its kind for the site (Zarins et al, 1980, 1981; 1983; Al-Ghamedi, 1995; Al-Zahrani et al, 2001, 2002, 2005, 2006 and 2012) (Table 6-8, Table 6-9, Table 6-10, Table 6-11, Table 6-12, Table 6-13, Table 6-14).

Decoration is part of the surface treatment, and includes the type of primary and secondary decoration, technique, type of elements applied and its placement on the vessel. I mention decorative elements and techniques in chapter six, and for position, I utilised the same summary codes in the pottery record form and an Excel spreadsheet, listed in appendix 5.

Classification is the basic activity of putting similar pottery together as one group (Rice, 2015). There are many different ways of classifying pottery depending on the area of study, the aims of the research, the utilising of data from others and depending on the nature of the assemblage under study (Orton and Hughes, 2013). In this research, I classified pottery based primarily on fabric as indicated above, but also by characteristics such as manufacture techniques, vessel parts and rim forms, and recording the information from each excavation to be able to connect the sherds with their contexts as much as possible in order to classify and identify the assemblages and link them to economic questions.

5.2.3 Analysis and Comparison

Pottery plays important roles in the analysis of archaeological sites, especially when connected by context to wider assemblages and other materials (Anderson, 1984). Nonetheless, in this area of research at present, there is a lack of available information concerning the pottery of south Arabia generally; comparative sources are known only from Hajar Bin Humeid and from Hureidha, as noted above (Van Beek, 1969; Caton Thompson, 1944). Given their dates of publication, it is unsurprising that neither of these works uses a modern methodology, and their value, although considerable, is thus limited. Furthermore, as site reports these works treat the south-western region, leaving little coverage for much of the rest of Arabia, and little is known of the archaeological sites and ceramics of the wider Arabian Peninsula (Gazdar, 1982). This creates challenges around the identification of materials through use of parallels with other corpora, but equally, it adds value to the present study as the addition of an important new body of material, recorded using modern scientific methods, to a sparsely evidenced debate.

Comparative study relies on beneficial research within the same area in south Arabia, covering some sites in Yemen, which have similar aspects to Al-Ukhud, and similar specimens of pottery, such as Hajar Bin Humeid, Hureidha and Hawlan At-Tiyal and Al-Hada (De Maigret, 1988, 1990). In the light of the paucity of local parallels, though, the comparative aspects of the study necessarily extend further to the south-eastern part of the Arabian Peninsula, specifically into Oman and the United Arab Emirates, where there are archaeology sites comparable with Al-Ukhud especially in terms of artefacts and chronology. These studies of sites in Oman positively influenced the comparative aspects and supported the results the research (Whitcomb, 1975; Hastings et al, 1975; De Cardi et al, 1976, 1979; Frifelt, 1976; De Cardi 1977; Costa and Wilkinson, 1987). Material will also be considered from the site of Ras al-Khaima in the UAE (De Cardi, 1976 and Kennet, 1997, 2002, 2004) and other sites (Boucharlat et al, 1985, 1986, 1989, 1997; Boucharlat and Mouton, 1990; Mouton, 2001; Al-Tekretti, 1985). It must be emphasized though, that direct consideration will be given in the analysis to the specific circumstances, as well as the locations, of the sites to be examined for comparative purposes, in order to limit the dangers of over-generalising interpretations.

As stated above, the interpretative aspects of the present study aspire to apply the data to a wider consideration of social and economic situations connected with the past populations of Al-Ukhud. To achieve this, we draw on existing published studies from Al-Ukhud (Ryckmans, 1981; Zarins et al, 1980, 1981; Al-Zahrani et al, 2001, 2002, 2005, 2006, 2012), and from the site of Jurash which is located in the south-west of Saudi Arabia (Zarins et al, 1981; Al-Ghamedi, 1996; Graf et al, 2012; Al-

Zahrani et al, 2013, 2017). However, these papers have similar limitations to those already discussed, in that they are descriptive studies and preliminary reports containing only limited consideration of the inhabitants of the region, their behaviour and economic situations. Where necessary, we also support this study with research focusing on sites of similar chronology in more distant, central parts of Saudi Arabia, such as Qaryat Al-Fāw (Al-Ansary, 1982; El-Hassan and Khabir, in press), Al-Aflaj (Al-Saud, 1997), Al-Kharj valley (Al-Ghazzi, 1990; Schiettecatte et al, 2017) and Zubaidah (Gazdar, 1982). The comparative analysis of Al-Ukhudud's pottery also examines materials from several sites in the western region of the Kingdom, such as Mada'in Salih in Al-'Ula region (Al-Talhi et al, 2010; Nehme et al, 2006, 2010, 2014; Dentzer et al, 2002, 2005; Auge, 2010), Dedan in Al-'Ula region (Al-Saed et al, 2010, 2011; Al-Shehry, 2014), Al-Mabbiyat (Qurh) in Al-'Ula region (Al-Omeer et al, 2006; Al-Muaikel et al, 2011) and lately, the study of Tel Al-Katheeb in Al-'Ula region (Al-Zahrani, 2007).

In contrast, some detailed research focuses on pottery from various sites in the eastern part of Saudi Arabia, and we depend on these to discover the similarities and differences between the pottery from these sites and from Al-Ukhudud (Al-Amer, 1996; Al-Zahrani, 2014).

Comparative study is a principal method to investigate special aspects of the pottery from Al-Ukhudud and South Arabian more widely. It supports identification of the unique aspects of our pottery; moreover, comparative study may assist us to provide an accurate chronology for the site of Al-Ukhudud and its pottery. By these means, we hope that this research can present much substantial knowledge to current understanding of the site, and by extension the societies and economy of pre-Islamic Southern Arabia more entirely.

To that end, the following chapters present a categorisation of the ceramic assemblage, and its analysis in terms of chronological variation, and the patterns of local and nonlocal pottery production, and the interpretation of ceramic data in terms of the relationship between pottery consumption and trade and exchange at Al-Ukhudud in order to provide a preliminary understanding of the economic activity in the region in general.

Chapter 6 Presentation and Analysis of the Ceramic Evidence

6.1 Introduction

The goals of this chapter are to present the preliminary study of the pottery that was collected during two fieldwork seasons at Al-Ukhudud. We will identify the primary fabric types of the samples based on geological data for the region, and assess the extent to which we can distinguish between local and imported pottery.

The main question of this study examines ancient South Arabian trade, and its influence on the development of the settlement and its people. Therefore, we have concentrated on the sherds from Season 2 and 3 (Al-Zahrani et al, 2001, 2002). These assemblages yielded a variety of sherds that can provide sufficient information about the trade and exchange of South Arabian communities when analysed following the methodology outlined in the previous chapter. The pottery collected from seasons 2 and 3 at Al-Ukhudud is summarised in (Table 6-1 and Figure 6-1, Figure 6-2). The full fabric descriptions are discussed further below, and the microscope inclusion descriptions listed in appendix 7.

Table 6-1 Summary of the assemblages from seasons 2 and 3.

Vessel Part	Season 2	Season 3
BODY (B).	2777	3204
RIM (R).	396	568
BASE (BA).	223	252
BODY WITH HANDLE (BH).	5	-
HANDLE (H).	30	4
TOTAL PER SEASON	3431	4028
OVERALL	7459	

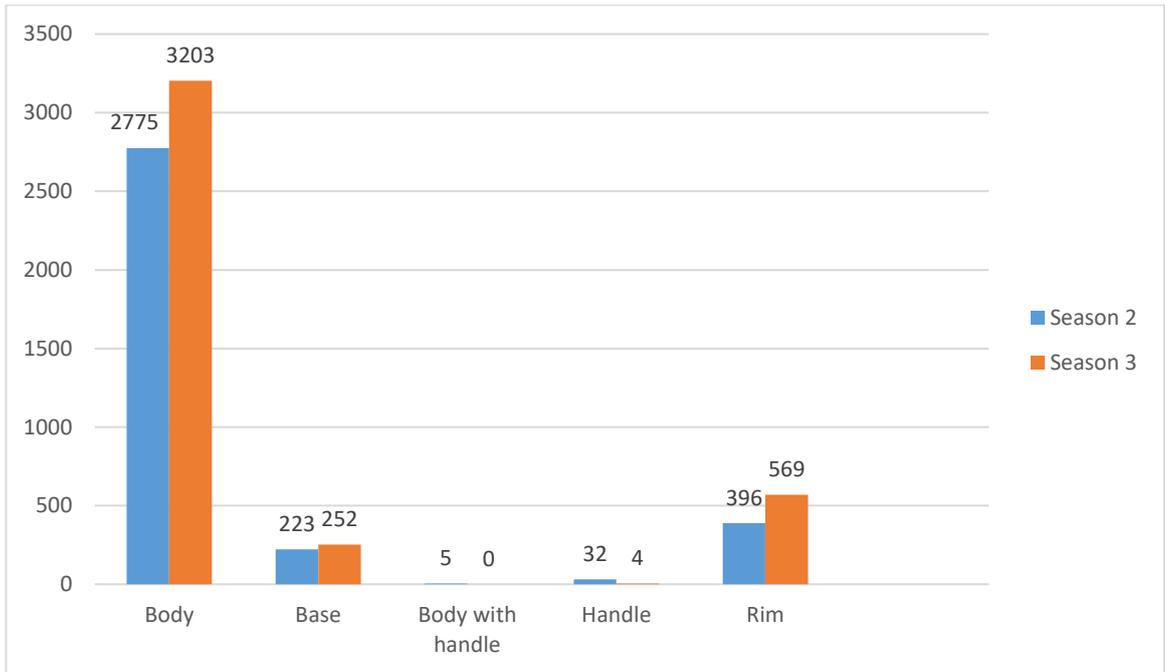


Figure 6-1 Chart providing a summary of the assemblages from seasons 2 and 3.

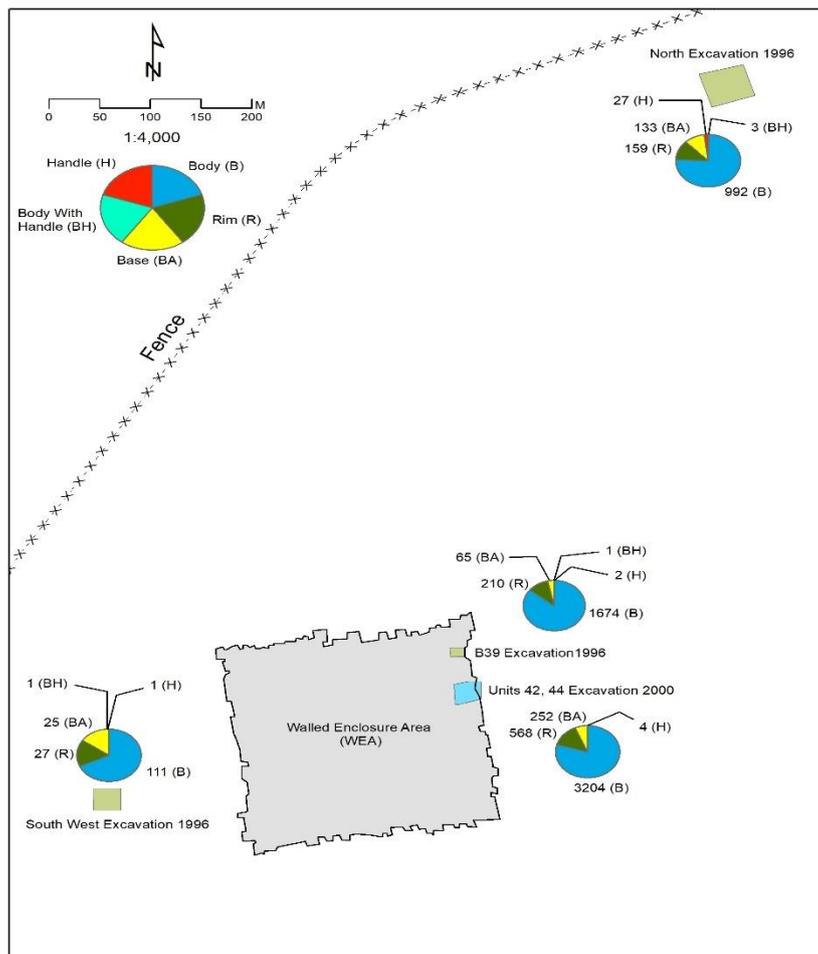


Figure 6-2 Map of the excavations at Al-Ukhduḍ's archaeological site showing the quantification of vessel parts from season 2 and 3.

The table and figures above summarise the samples from seasons 2 and 3, and we can see that – unsurprisingly the largest number of pieces from both seasons are body sherds, followed by rims. The assemblage quantities indicate a relatively high rate of ceramic production and consumption at the site.

The average sherd weight from both seasons is 86.8 g (Table 6-2); the average weight from season 2 is 95.2 g (Table 6-2, Table 6-3 and Figure 6-3); the average weight from season 3 is 79.6 g (Table 6-2, Table 6-4 and Figure 6-4), indicating that the assemblage is characterised by relatively large sherds perhaps representing dominance of vessels such as jars, large bowls or cooking pots; in addition, of course, a large mean sherd size indicates relatively low levels of breakage.

Table 6-2 Total of sherds, weight and average of weight from season 2 & 3.

Season	Total sherds.	Total Weight. (g.)	Average sherd weight. (g).
Season 2	3431	326694	95.2
Season 3	4028	320952	79.6
Total of assemblage.	7459	647646	86.8

Table 6-3 Quantified summary of the season 2 assemblage by sherd count and weight, with percentages, based on vessel parts.

Vessel Part	Season 2				
	No. of sherds.	% No. of sherds	Weight (g.)	% Weight	Average sherd weight (g).
BODY (B).	2777	80.9%	244120	74.7%	78.9
RIM (R).	396	11.5%	35892	10.7%	90.6
BASE (BA).	223	6.4%	44696	13.6%	200.4
BODY W/ HANDLE (BH).	5	0.4%	176	0.3%	35.2
HANDLE (H).	30	0.8%	1810	0.5%	60.3
TOTAL	3431	100%	326694	100%	95.2

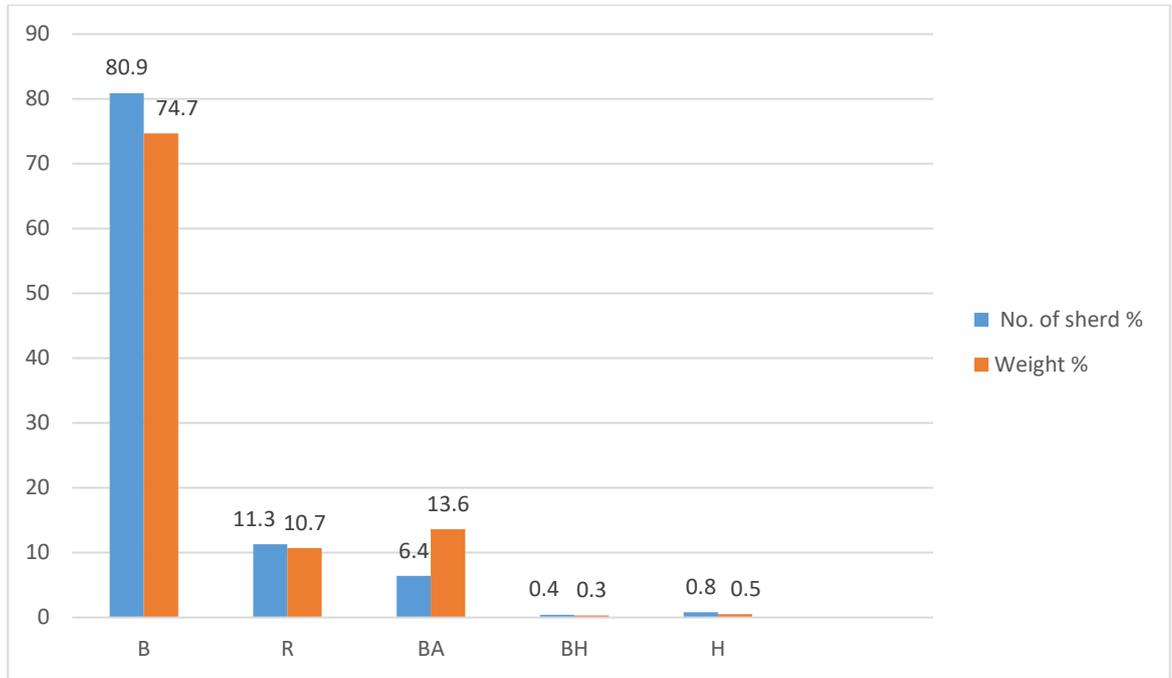


Figure 6-3 Chart providing quantified summary of the season 2 assemblage by sherd count and weight, with percentages, based on vessel parts.

Table 6-4 Quantified summary of the season 3 assemblage by sherd count and weight, with percentages, based on vessel parts.

Vessel Part	Season 3				
	No. of sherds.	% No. of sherds	Weight (g.)	% Weight	Average sherd weight (g).
BODY (B).	3204	79.5%	231078	71.9%	72.1
RIM (R).	568	14.1%	49020	15.2%	86.3
BASE (BA).	252	6.2%	40752	12.6%	161.7
HANDLE (H).	4	0.9%	102	0.3%	25.5
TOTAL	4028	100%	320952	100%	79.6

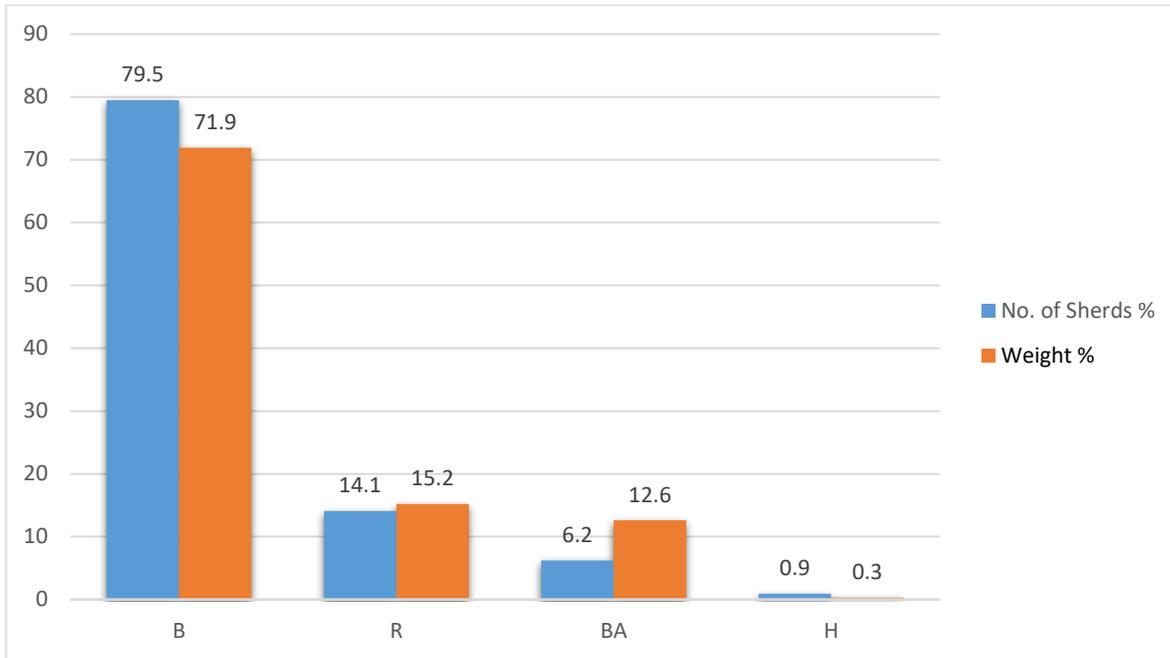


Figure 6-4 Chart providing quantified summary of the season 3 assemblage by sherd count and weight, percentages, based on vessel parts.

6.2 AI-Ukhudud Pottery Classification

The remainder of this chapter will analyse the assemblages, first from the perspective of fabric, and second by form. The ceramics from both seasons have been classified within a new, scientific fabric series, and subsequently grouped into formal types; the spatial and temporal distribution of fabrics and types within the archaeological site is then considered (Table 6-5). Formal types have been defined as we will now briefly outline (Table 6-6, Table 6-7), and as described in full below (section 6.5), they comprise, small bowls, medium bowls, large bowls, and jars. The majority of body sherds cannot be assigned to a formal type.

Table 6-5 Quantification of formal types - seasons 2 & 3.

Formal type	No. of Sherds	Weight (g.)	% No of Sherds	% Weight	Average sherd weight (g.)
Unidentified form	6020	477811	80.7%	73.8%	79.4
Jar	40	7007	0.5%	1.8%	175.2
S. bowl	612	53042	8.2%	8.2%	86.7
M. bowl	566	76240	7.5%	11.8%	134.7
L. bowl	221	33510	2.9%	5.2%	151.6
Total	7459	647610	100%	100%	627.6

Table 6-6 Quantification of formal types - season 2.

Formal type	No. of sherds	Weight (g.)	% No of Sherds	% Weight	Average sherd weight (g.)
Unidentified form	2812	246282	81.9%	75.3%	87.6
Jar	20	4127	0.5%	1.3%	206.3
S. bowl	242	21275	7.5%	6.6%	87.9
M. bowl	261	40570	7.6%	12.4%	155.4
L. bowl	96	14260	2.7%	4.4%	148.5
Total	3431	327234	100%	100%	685.7

Table 6-7 Quantification of formal types - season 3.

Formal type	No. of sherds	Weight (g.)	% No of Sherds	% Weight	Average sherd weight (g.)
Unidentified form	3208	231529	79.6%	72.1%	72.2
Jar	20	2880	0.5%	0.9%	144
S. bowl	370	31803	9.2%	9.9%	85.9
M. bowl	305	35490	7.6%	11.2%	117.8
L. bowl	125	19250	3.1%	5.9%	154
Total	4028	320952	100%	100%	573.9

In terms of archaeological area, the highest proportions of unidentified form sherds, which includes body, body with handle and handle were concentrated within the walled enclosure, particularly in B39 and units 42 and 44. The proportion is slightly reduced in the North excavation and significantly lower in the South-west excavation. A high proportion of unidentified form sherds might reflect assemblages with higher proportions of closed form, since those produce fewer diagnostic sherds on breakage; we should therefore bear in mind possible bias against closed forms in the quantification of form. Despite this, there are considerable differences in the proportions of types. Small bowls represent the most common type from both seasons, present in all excavated areas, with slightly more found in the North excavation and units 42 and 44. Medium bowls are less common than small bowls, with larger mean sherd size. This type is more concentrated in units 42 and 44, the North and building 39 excavations, with a few sherds from the South-west excavation. Interestingly, the highest densities of this type came from different locations in the archaeological site, within the walled area and North excavation, approximately 715 m apart. Large bowls are

represented as a low percentage from both excavations, in particular from units 42 and 44, B39 and the North excavations. Jars represent the lowest proportion of the types, but we have already noted their likely under-identification among the body sherds. Jar forms were present in units 42 and 44 (including a few sherds from outside the architectural unit), South-west, B39 and North excavations. Thus, the greatest formal diversity is revealed in the assemblage from B39 and units 42 and 44 within the walled enclosure area, and from the North excavation, reflecting the nature and concentration of human settlement in these areas, and the accompanying consumption of pottery, taking into account the division within the walled enclosure area of the architectural units. In contrast, no architectural features are visible on the surface of the North excavation, except small mounds and the remains of the foundations of the probable mosque. We might speculate that this was an open commercial area at a little distance from the walled enclosure area and away from any buildings. We will present the data broken down by excavated areas and its stratigraphy in further detail below.

6.3 Classification of Fabrics

A major aim of this project is the creation of a new, scientific fabric series for the assemblage, to allow question of provenance and trade to be addressed; no such study exists at present for the whole South Arabian region. We recorded six fabric types, summarised below in (Table 6-8):

Table 6-8 List of fabric types.

Fabric Number	Fabric summary
FT 1	Limestone, voids and rare to sparse mica.
FT 2	Limestone, voids and grog.
FT 3	Limestone, voids and black grains.
FT 4	Limestone, voids and quartz.
FT 5	Limestone, voids and decomposed calcareous particles.
FT 6	Mica, limestone and voids.

The following tables provide detailed descriptions of each fabric and its inclusions, based on microscopic analysis of samples:

Table 6-9 Description of Fabric 1.

Fabric type	Fabric name	Description
<p>FT 1</p>	<p>Limestone, voids and rare to sparse mica.</p>	<p>Hard-fired, oxidised reddish brown and red orange in colour, (Munsell 2.5YR 6/8 “light red” - 10R 4/8 “red” and 2.5YR 4/8 “red” – 2.5YR 5/8 “red” – 2.5YR 5/4 “reddish brown”), containing: moderate to sparse (15 % _ 7 %), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), subrounded to rounded, moderately-sorted to poorly-sorted limestone; moderate to sparse (15 % _ 7 %), medium to very coarse (0.25 mm – 0.5 mm to larger than 1.0 mm), angular to subangular, moderately-sorted to poorly-sorted voids which are oval, spherical or irregular in shape, which could have contained limestone; moderate (10 %), medium (0.25 mm - 0.5 mm), angular in shape, poorly-sorted voids plate-like sometimes showing striations, which could have been shell; moderate (10 % _ 3 %), medium (0.25 mm - 0.5 mm), angular to subangular, moderately-sorted to poorly-sorted voids elongated in shape with striations, which very likely contained straw or grass; moderate (10 %), fine to medium (0.1 mm – 0.25 mm to 0.25 mm – 0.5 mm), subrounded to rounded, moderately-sorted to poorly-sorted small grains, “dull”, sometimes yellowish, blackish or brownish in colour, rounded to oval in shape, which could be black iron ore fragments or could be shale; sparse (7 % _ 5 %), fine to medium (0.1 mm – 0.25 mm to 0.25 mm – 0.5 mm), angular to subangular, moderately-sorted to poorly-sorted mica, white and dark in colour; sparse (5 %), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), subrounded to rounded, poorly-sorted quartz.</p>

Table 6-10 Description of Fabric 2.

Fabric type	Fabric name	Description
FT 2	Limestone, voids and grog.	<p>Very hard to hard-fired, oxidised reddish brown, red orange, pale orange, pale yellow and off-white in colour; or unoxidised fired to a dark and pale grey colour, (Munsell 2.5YR 6/4 “light reddish brown” – 10YR 5/8 “red” – 10R 4/4 “weak red” – 5Y 4/5 “olive” – 5Y 7/3 “pale yellow” – 2.5YR 5/8 “red” – 5YR 4/3 “reddish brown” – 10R 2/2 “very dark brown” – 5YR 5/6 “yellowish red”), containing: very common to sparse (30 % _ 5 %), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), subangular to rounded, well-sorted to poorly-sorted limestone; moderate to sparse (15 % _ 5 %), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), angular to subangular, moderately-sorted to poorly-sorted voids elongated in shape with striations, which could have contained straw or grass; moderate to sparse (15 % _ 3 %), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), subrounded to rounded, moderately-sorted to poorly-sorted quartz; moderate (10 %), fine to medium (0.1 mm – 0.25 mm to 0.25 mm – 0.5 mm), angular to subangular, moderately-sorted to poorly-sorted white and dark mica; moderate to sparse (10 % _ 5 %), medium to very coarse (0.25 mm – 0.5 mm to larger than 1.0 mm), angular to rounded, moderately-sorted to poorly-sorted voids which can be irregular oval, spherical and rhomboidal in shape and which could have contained limestone or calcite; moderate to sparse (10 % _ 5 %), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), angular to subangular, poorly-sorted voids plate-like, sometimes with striations which could have been shell; moderate to sparse (10 % _ 7 %), medium (0.25 mm – 0.5 mm), subangular to rounded, moderately-sorted to poorly-sorted fine grains, some of which can be shiny, and sometimes laminated which could be volcanic rock probably black iron ore or carbonised matter; moderate to rare (10 % _ 2 %), medium (0.25 mm – 0.5 mm), subangular to rounded, moderately-sorted to poorly-sorted dull red-brown, clay-like or reddish-brown and soft, which could be grog, or clay pellets or mudstone.</p>

Table 6-11 Description of Fabric 3.

Fabric type	Fabric name	Description
FT 3	Limestone, voids and black grains.	<p>Very hard to hard-fired, oxidised red orange, reddish brown and brown in colour; and unoxidised black, grey and pale grey colour, (Munsell 2.5YR 5/8 “red” – 10R 5/8 “red” – 5YR 5/8 “yellowish red” – 7.5YR 6/6 “light red” – 5YR 4/3 “reddish brown” – 10R 2/1 “black” – 2.5YR 5/6 “red” – 5YR 5/6 “yellowish red” – 7.5YR 6/3 “light brown” – 2.5YR 4/3 “dark reddish brown”), containing: common to rare (20% _ 1%), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), subrounded to rounded, well-sorted to poorly-sorted quartz; common to sparse (25% _ 3%), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), subrounded to rounded, well-sorted to poorly-sorted limestone; moderate to sparse (10% _ 5%), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), angular to rounded, moderately-sorted to poorly-sorted voids which can be irregular, oval or spherical in shape, and which could have contained limestone; moderate to rare (10% _ 2%), fine to medium (0.1 mm – 0.25 mm to 0.25 mm – 0.5 mm), angular to rounded, moderately-sorted to poorly-sorted black grains, rectangular or rounded to subangular in shape, hard, bright, which could be volcanic rock; moderate to rare (10% _ 2%), fine to medium (0.1 mm – 0.25 mm to 0.25 mm – 0.5 mm), angular to subangular, moderately-sorted to poorly-sorted white and dark mica; moderate to sparse (10% _ 3%), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), angular to subangular, poorly-sorted voids elongated in shape with striations, which could have been straw or grass; moderate to rare (10% _ 2%), fine to medium (0.1 mm – 0.25 mm to 0.25 mm – 0.5 mm), rounded, moderately-sorted to poorly-sorted reddish-orange and dull red-brown, soft clay-like, which could be clay pellets; moderate to rare (10% _ 2%), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), very angular to angular, poorly-sorted voids plate-like with striations, which could have been shell; sparse to rare (7% _ 1%), medium (0.25 mm – 0.5 mm), subangular to rounded, moderately-sorted to poorly-sorted black grains with a laminated structure, not hard, which could be organic or carbonaceous matter.</p>

Table 6-12 Description of Fabric 4.

Fabric type	Fabric name	Description
<p>FT 4</p>	<p>Limestone, voids and quartz.</p>	<p>Hard-fired, oxidised reddish brown in colour, (Munsell 7.5RY 5/6 “strong brown” – 5YR 5/6 “yellowish red”), containing: very common to common (30 % _ 20 %), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), angular to subrounded, moderately-sorted limestone; common to sparse (20%_ 7%), medium to coarse (0.25 mm – 0.5 mm to larger than 1.0 mm), subrounded to rounded, moderately-sorted quartz; moderate (10 %), coarse (0.5 mm – 1.0 mm), angular to subangular, poorly-sorted voids or decomposed calcareous particles (depending on firing temperature); moderate to sparse (10%_ 7%), coarse to very coarse (0.5 mm – 1.0 mm to larger than 1.0 mm), angular, poorly-sorted voids elongated in shape with striations, which could have contained straw or grass; moderate (10 %) medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), angular to subangular, poorly-sorted voids plate-like, sometimes with striations, which could have been shell; sparse (5 %), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), angular to subangular, poorly-sorted voids irregular in shape, which could have contained limestone.</p>

Table 6-13 Description of Fabric 5.

Fabric type	Fabric name	Description
<p>FT 5</p>	<p>Limestone, voids and decomposed calcareous particles.</p>	<p>Hard-fired, oxidised red orange, reddish brown and red in colour; and unoxidised fabric core, grey in colour, (Munsell 10R 5/8 “red” - 10R 5/6 “red” – 2.5YR 5/6 “red” – 2.5YR 5/8 “red” – 5YR 4/4 “reddish brown”), containing: very common to sparse (30% _ 5%), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), subrounded to rounded, moderately-sorted to poorly-sorted limestone; common to sparse (20% _ 7%), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), subrounded to rounded, moderately-sorted to poorly-sorted quartz; moderate to rare (15% _ 2%), coarse to very coarse (0.5 mm – 1.0 mm to larger than 1.0 mm), angular to subrounded, poorly-sorted voids plate-like with striations, which could have been shell; moderate to sparse (10% _ 5%), fine to medium (0.1 mm – 0.25 mm to 0.25 mm – 0.5 mm), angular to subangular, moderately-sorted to poorly-sorted white or dark mica; moderate to sparse (10% _ 5%), medium (0.25 mm – 0.5 mm), subangular to subrounded, moderately-sorted to poorly-sorted voids or decomposed calcareous particles (depending on firing temperature); moderate to sparse (10% - 7%), medium to very coarse (0.25 mm – 0.5 mm to larger than 1.0 mm), angular to rounded, moderately-sorted to poorly-sorted voids irregular, oval or spherical in shape, which could have contained limestone; sparse (7%), medium to very coarse (0.25 mm – 0.5 mm to larger than 1.0 mm), angular to subangular voids elongated with striations, which could have contained straw or grass; rare (2%), medium (0.25 mm – 0.5 mm), subrounded, poorly-sorted dull red-brown, clay-like, which could be grog.</p>

Table 6-14 Description of Fabric 6.

Fabric type	Fabric name	Description
FT 6	Mica, limestone, and voids.	<p>Hard-fired, oxidised red orange, pale brown, reddish brown, tan-buff and orange in colour, (Munsell 2.5YR 5/8 “red” – 2.5YR 6/8 “light red” – 10R 5/8 “red” – 5YR 5/4 “reddish brown” – 7.5YR 6/6 “light red” – 5YR 5/8 “yellowish red” – 10R 7/8 “light red”), containing: very common to sparse (30% _ 5%), medium to very coarse (0.25mm – 0.5mm to larger than 1.0mm), subangular to rounded, well-sorted to poorly-sorted limestone; moderate to sparse (15% _ 3%), fine to medium (0.1 mm – 0.25 mm to 0.25 mm – 0.5 mm), angular to subangular, moderately-sorted to poorly-sorted white and dark mica; moderate to sparse (15% _ 5%), medium to coarse (0.25 mm - 0.5 mm to 0.5 mm – 1.0 mm), subrounded to rounded, moderately-sorted to poorly-sorted quartz; moderate to rare (15% - 2%), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), angular to subangular, moderately-sorted to poorly-sorted voids elongated in shape with striations, which could have contained straw or grass; moderate to sparse (15% _ 5%), medium to coarse (0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm), angular to subangular, moderately-sorted to poorly-sorted voids plate-like, sometimes with striations, which could have been shell; moderate to sparse (10% _ 3%), medium to very coarse (0.25 mm – 0.5 mm to larger than 1.0 mm), angular to rounded, moderately-sorted to poorly-sorted voids irregular, oval, or spherical in shape which, could have been limestone; sparse (5%), medium (0.25 mm – 0.5 mm), subrounded, poorly-sorted red-dark to dark colour grains, harder glistening or shiny, which may be ferro-magnesian minerals or could be volcanic rock; sparse (3%), medium (0.25 mm – 0.5 mm), subrounded, poorly-sorted reddish-orange, clay-like, which could be clay pellets; rare (2%), medium (0.25 mm – 0.5 mm), angular, poorly-sorted black grains, rectangular, with a laminated structure, not hard which could be organic or carbonaceous matter; rare (1%), very coarse (larger than 1.0 mm), angular, poorly-sorted, voids, rhomboidal in shape, which could be calcite.</p>

Analysis of ceramic inclusions shows that a high percentage of pottery includes sedimentary rocks fragments, such as limestone and mudstone, alongside other types of small grains and inclusions. In particular, limestone, a sediment that erodes due to wind and water, is one of the most common geological features in the southern Arabia, alongside sandstone (Zarins et al, 1981); limestone is found in all fabrics.

In (Table 6-15) below shows the distribution of pottery by fabric from seasons 2 and 3. The highest proportion of sherds in both seasons belong to fabrics 4 and 5 (Figure 6-5, Figure 6-6). It is thus reasonable to assume that fabrics 4 and 5, and perhaps fabric 2, may be local to the site or region, especially in light of their compatibility with local geology (Al-Zahrani et al, 2001; 2002).

Table 6-15 Quantification of fabric types for seasons 2 and 3.

Fabric Number	Season 2					Season 3					Total count of sherds for seasons 2 and 3
	Count	% count	Weight (g)	% weight	Average sherd weight (g)	Count	% count	Weight (g)	% weight	Average sherd weight (g)	
FT 1	167	4.8%	13538	6%	81.6	38	0.9%	2152	0.6%	56.6	205
FT 2	370	10.7%	20160	8.9%	54.4	931	23.1%	76426	23.8%	82.9	1301
FT 3	183	5.3%	12085	5.3%	66.3	29	0.7%	2271	0.7%	78.3	212
FT 4	1044	30.4%	95611	42.3%	91.5	1188	29.4%	78512	24.4%	66.8	2232
FT 5	1263	36.8%	38410	17%	30.4	1696	42.1%	145195	45.2%	85.6	2959
FT 6	404	11.7%	45814	20.3%	113.4	146	3.6%	16396	5.1%	112.3	550
Total	3431	99.7%	225618	99.8%	437.6	4028	99.8%	320952	99.8%	482.5	7459

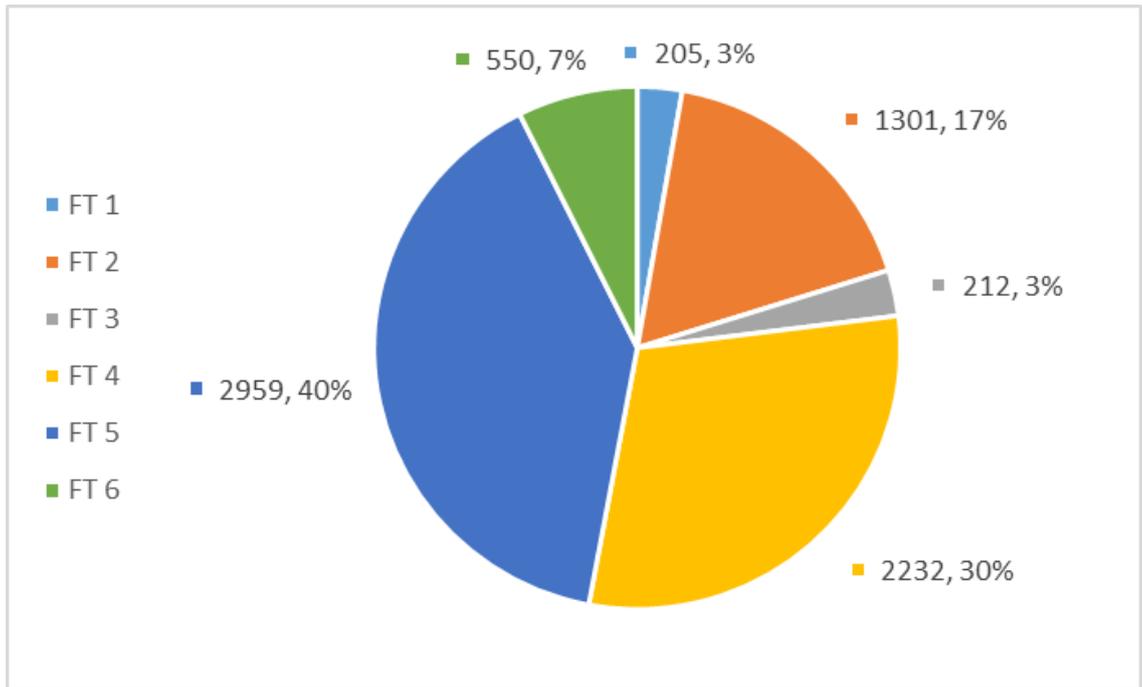


Figure 6-5 Fabric types percentage of Al-Ukhudud's pottery from season 2 and 3.

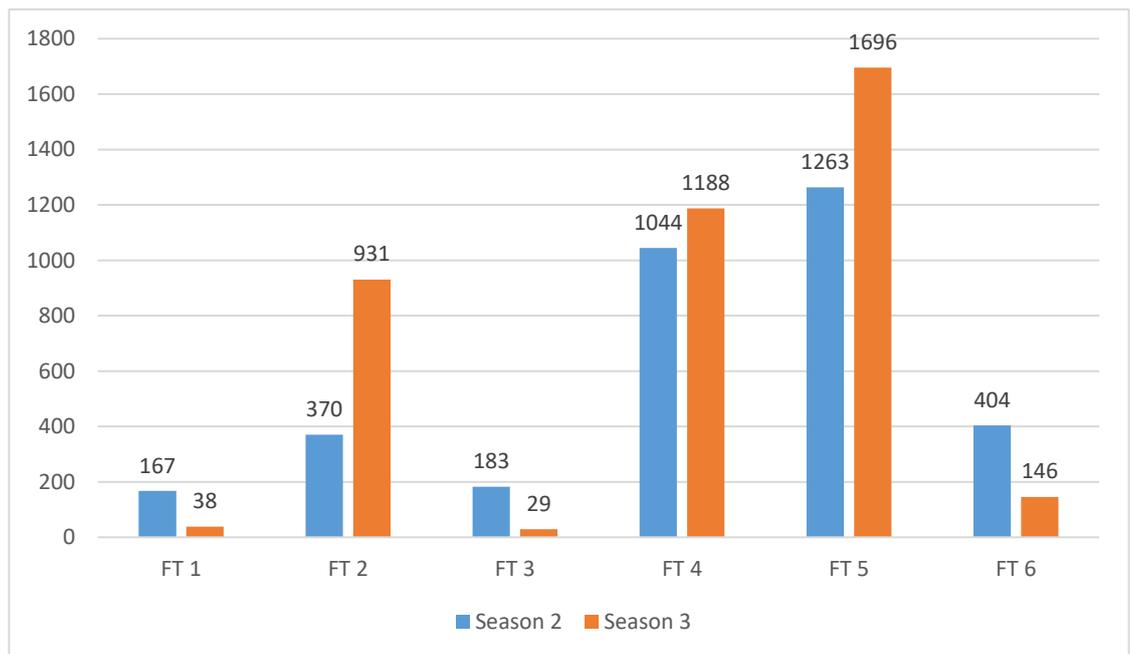


Figure 6-6 Fabric distribution of Al-Ukhudud's pottery from season 2 and 3.

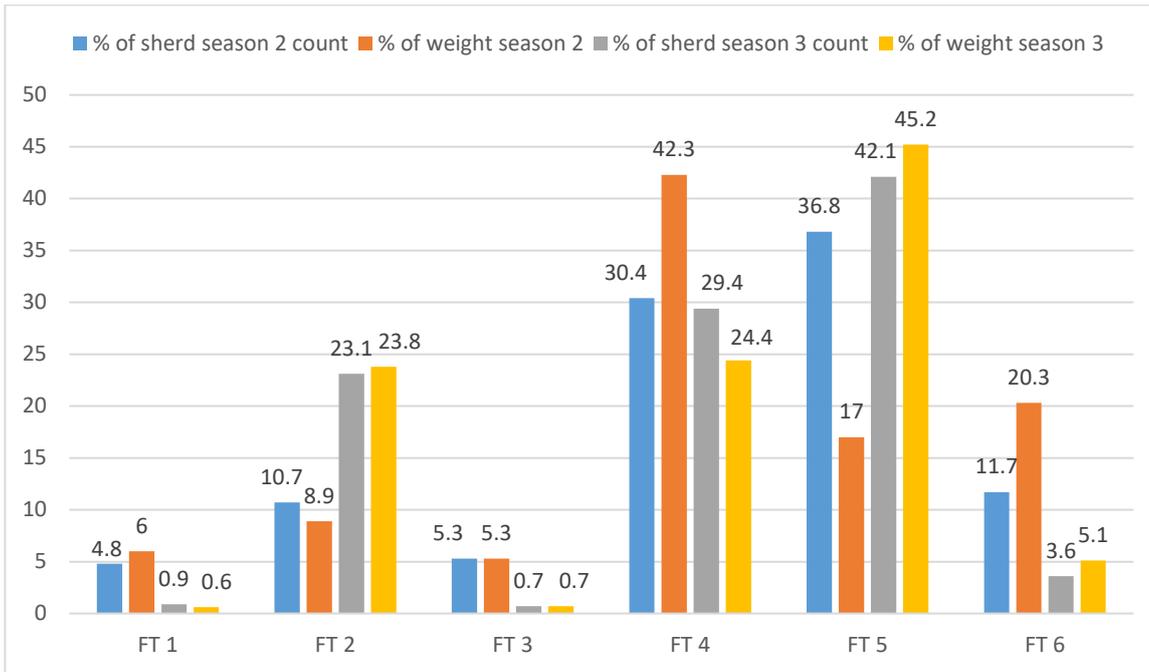


Figure 6-7 Fabric distribution according to percentage by sherds count and weight from seasons 2 and 3.

The chart above (Figure 6-7) shows that fabric 4 was used for more larger, thicker-walled vessels that break into bigger pieces with average weight of 79.15 g. Fabric 5 was used for less thicker wares that break into smaller sherds. The process of fabric classification adopted here has a great deal of flexibility, allowing for the addition of new fabrics in the future as new data may appear. We will now present details of the relationships between fabric categories, technology and form, as well as finding location, in order to better understand the assemblage and the nature of the site. We will assess the extent to which it is possible to distinguish between local and imported pottery, with implications for understanding trade and its impact on the development of the archaeological site and its local community, and neighbouring societies.

6.3.1 Fabric Distribution by Formal Types

As noted above, fabrics 4 and 5 are most common in both seasons. We found that in all fabric types, after unidentified body sherds, bowl forms are most common. A comparison of all fabrics is presented below in (Table 6-16), while summarising all fabric types from seasons 2 and 3 in (Table 6-17 to Table 6-28 and Figure 6-8 to Figure 6-19) below, which present individual fabrics by season based on manufacture technique (HM: hand-made and WM: wheel-made) and form.

Table 6-16 Summarising all fabrics type from seasons 2 and 3.

Fabric	Total sherd count	Total sherd weight (g)	No. of HMs	Weight HMs (g)	No. of WMs	Weight WMs (g)	Formal Types									
							Unidentified form		S. bowl		M. bowl		L. bowl		Jar	
							HM	WM	HM	WM	HM	WM	HM	WM	HM	WM
FT 1	205	15690	121	11725	84	3965	90	50	8	17	11	10	7	5	6	1
FT 2	1301	96586	1171	105489	130	8199	1072	73	32	30	47	21	9	5	10	1
FT 3	212	14356	98	8514	114	5842	79	81	6	13	8	17	4	3	1	-
FT 4	2232	174123	1334	124021	901	50102	1149	560	71	172	64	122	44	41	6	3
FT 5	2959	183605	1946	200469	1014	67110	1729	714	82	141	94	116	38	40	3	2
FT 6	550	62210	409	52859	141	9351	343	79	15	25	31	27	20	6	2	2
Total	7459	546570	5079	503077	2382	144569	4462	1557	214	398	255	313	122	100	28	7

Table 6-17 Fabric 1 distribution according to form types in season 2.

Season 2		FT 1: Limestone, voids and rare to sparse mica.													
Vessel part	Total Count	Technique		Thickness average (cm.)		Formal types									
		HM	WM	HM	WM	Unidentified form		Jar		S. bowl		M. bowl		L. bowl	
						HM	WM	HM	WM	HM	WM	HM	WM	HM	WM
Body (B)	109	68	41	6.7	4.3	68	41	-	-	-	-	-	-	-	-
Rim (R)	44	23	21	6.6	3.3	-	-	4	1	5	7	8	8	6	5
Base (BA)	11	4	7	6	6	-	-	1	-	-	6	3	-	1	-
Body with handle (BH)	2	-	2	-	3	-	2	-	-	-	-	-	-	-	-
Handle (H)	1	1	-	9	-	1	-	-	-	-	-	-	-	-	-
Total	167	96	71	22.3	16.6	69	43	5	1	5	13	11	8	7	5

Table 6-18 Fabric 1 distribution according to form types in season 3.

Season 3 FT 1: Limestone, voids and rare to sparse mica.															
Vessel part	Total Count	Technique		Thickness average (cm.)		Formal types									
		HM	WM	HM	WM	Unidentified form		Jar		S. bowl		M. bowl		L. bowl	
						HM	WM	HM	WM	HM	WM	HM	WM	HM	WM
Body (B)	28	21	7	5.2	3	21	7	-	-	-	-	-	-	-	-
Rim (R)	7	4	3	5.6	2.7	-	-	1	-	3	1	-	2	-	-
Base (BA)	3	-	3	-	3.6	-	-	-	-	-	3	-	-	-	-
Body with handle (BH)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Handle (H)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	38	25	13	10.8	9.3	21	7	1	-	3	4	-	2	-	-

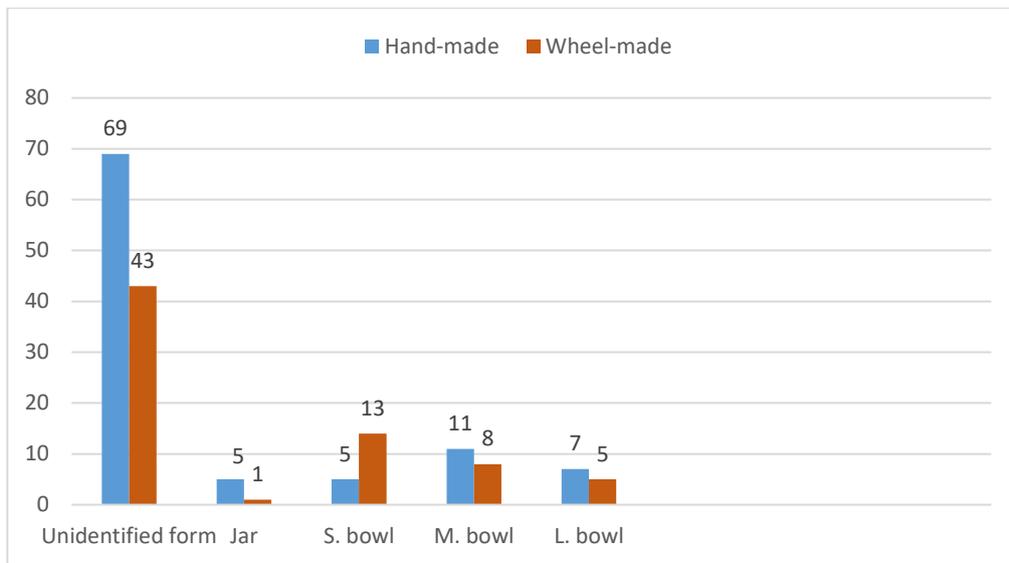


Figure 6-8 Number of form types based on manufacture technique from season 2, fabric 1.

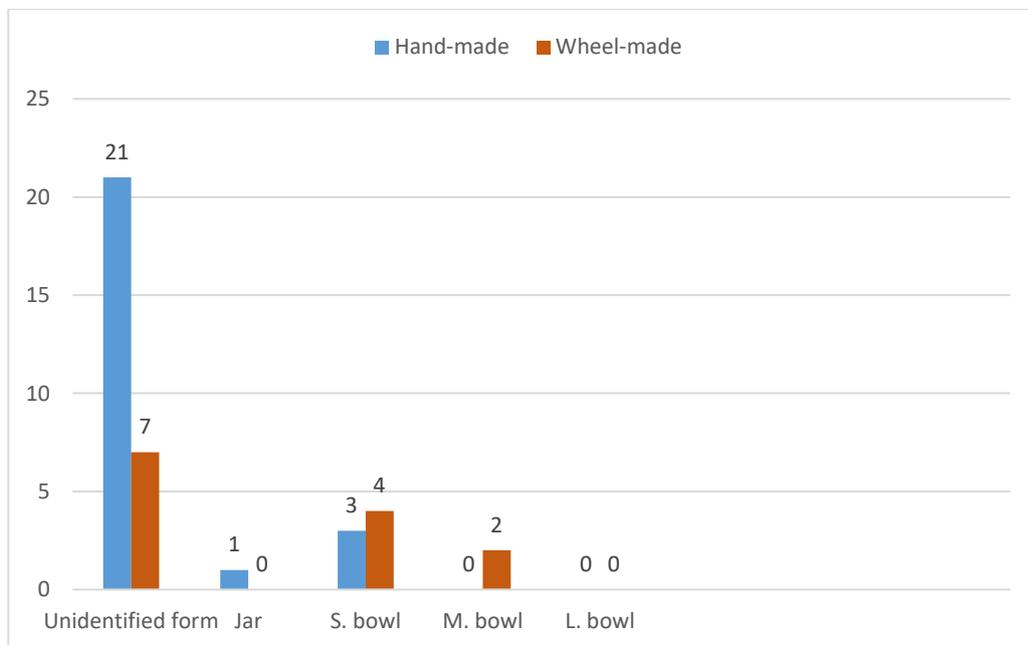


Figure 6-9 Number of form types based on manufacture technique from season 3, fabric 1.

Table 6-19 Fabric 2 distribution according to form types in season 2.

Season 2		FT 2: Limestone, voids and grog.													
Vessel part	Total Count	Technique		Thickness average (cm.)		Formal types									
		HM	WM	HM	WM	Unidentified form		Jar		S. bowl		M. bowl		L. bowl	
						HM	WM	HM	WM	HM	WM	HM	WM	HM	WM
Body (B)	303	264	39	6.8	4.9	264	39	-	-	-	-	-	-	-	-
Rim (R)	44	22	22	7	5.3	-	-	2	-	5	5	11	12	4	5
Base (BA)	21	9	12	7.9	6.7	-	-	2	-	2	10	4	2	1	-
Body with handle (BH)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Handle (H)	2	2	-	8.5	-	2	-	-	-	-	-	-	-	-	-
Total	370	297	73	30.2	16.9	266	39	4	-	7	15	15	14	5	5

Table 6-20 Fabric 2 distribution according to form types in season 3.

Season 3 FT 2: Limestone, voids and grog.															
Vessel part	Total Count	Technique		Thickness average (cm.)		Formal types									
		HM	WM	HM	WM	Unidentified form		Jar		S. bowl		M. bowl		L. bowl	
						HM	WM	HM	WM	HM	WM	HM	WM	HM	WM
Body (B)	841	807	34	5.7	3.9	806	34	-	-	-	-	-	-	-	-
Rim (R)	58	44	14	7.2	4.2	-	-	6	-	13	8	21	6	4	-
Base (BA)	32	23	9	7.6	5.4	-	-	-	1	12	7	11	1	-	-
Body with handle (BH)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Handle (H)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	931	874	57	20.5	13.5	806	34	6	1	25	15	32	7	4	-

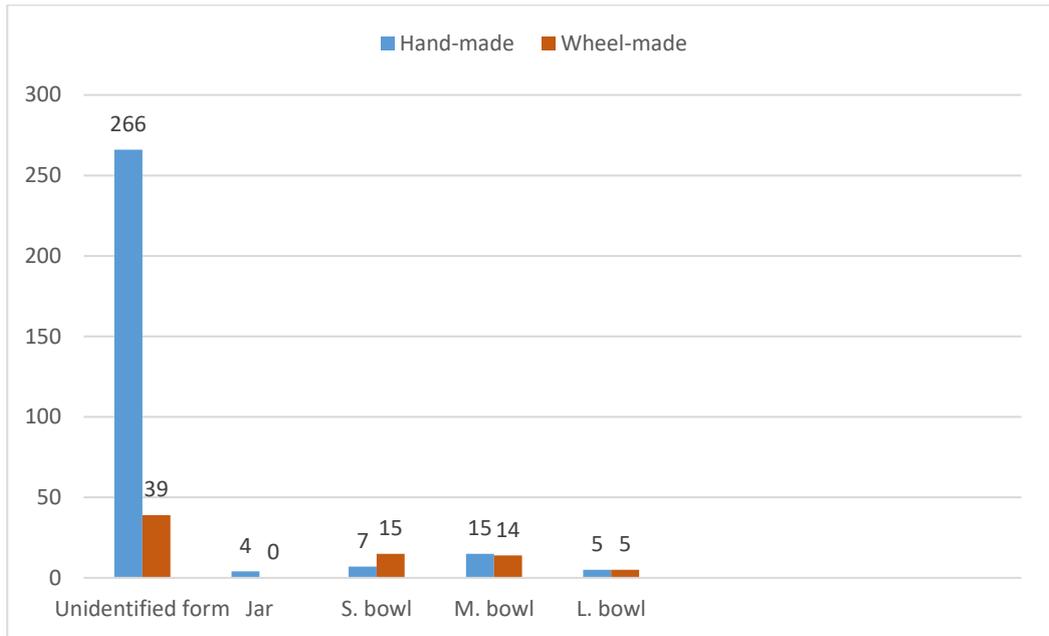


Figure 6-10 Number of form types based on manufacture technique from season 2, fabric 2.

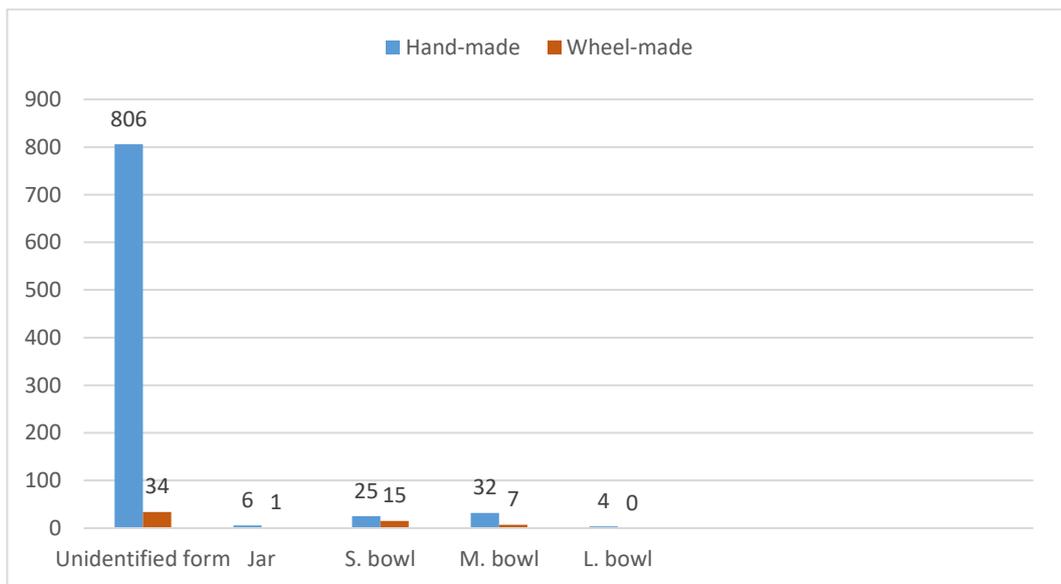


Figure 6-11 Number of form types based on manufacture technique from season 3, fabric 2.

Table 6-21 Fabric 3 distribution according to form types in season 2.

Season 2		FT 3: Limestone, voids and black grains.													
Vessel part	Total Count	Technique		Thickness average (cm.)		Formal types									
		HM	WM	HM	WM	Unidentified form		Jar		S. bowl		M. bowl		L. bowl	
						HM	WM	HM	WM	HM	WM	HM	WM	HM	WM
Body (B)	140	64	76	5.8	4.6	64	76	-	-	-	-	-	-	-	-
Rim (R)	24	8	16	5.1	4.8	-	-	-	-	2	3	4	11	2	2
Base (BA)	13	5	8	7.1	6.1	-	-	-	-	3	7	2	1	-	-
Body with handle (BH)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Handle (H)	6	6	-	8.9	-	6	-	-	-	-	-	-	-	-	-
Total	183	83	100	26.9	15.5	70	76	-	-	5	10	6	12	2	2

Table 6-22 Fabric 3 distribution according to form types in season 3.

Season 3 FT 3: Limestone, voids and black grains.															
Vessel part	Total Count	Technique		Thickness average (cm.)		Formal types									
		HM	WM	HM	WM	Unidentified form		Jar		S. bowl		M. bowl		L. bowl	
						HM	WM	HM	WM	HM	WM	HM	WM	HM	WM
Body (B)	14	9	5	5.7	4.2	9	5	-	-	-	-	-	-	-	-
Rim (R)	10	3	7	5.7	3.6	-	-	-	-	1	1	-	5	2	1
Base (BA)	5	3	2	8.5	2	-	-	1	-	-	2	2	-	-	-
Body with handle (BH)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Handle (H)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	29	15	14	19.9	9.8	9	5	1	-	1	3	2	5	2	1

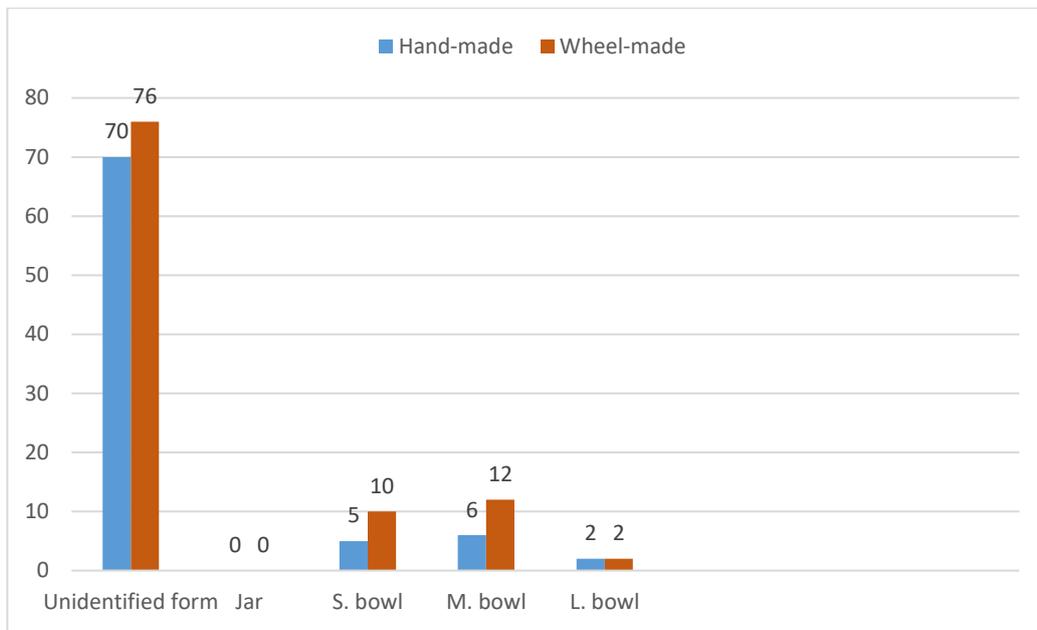


Figure 6-12 Number of form types based on manufacture technique from season 2, fabric 3.

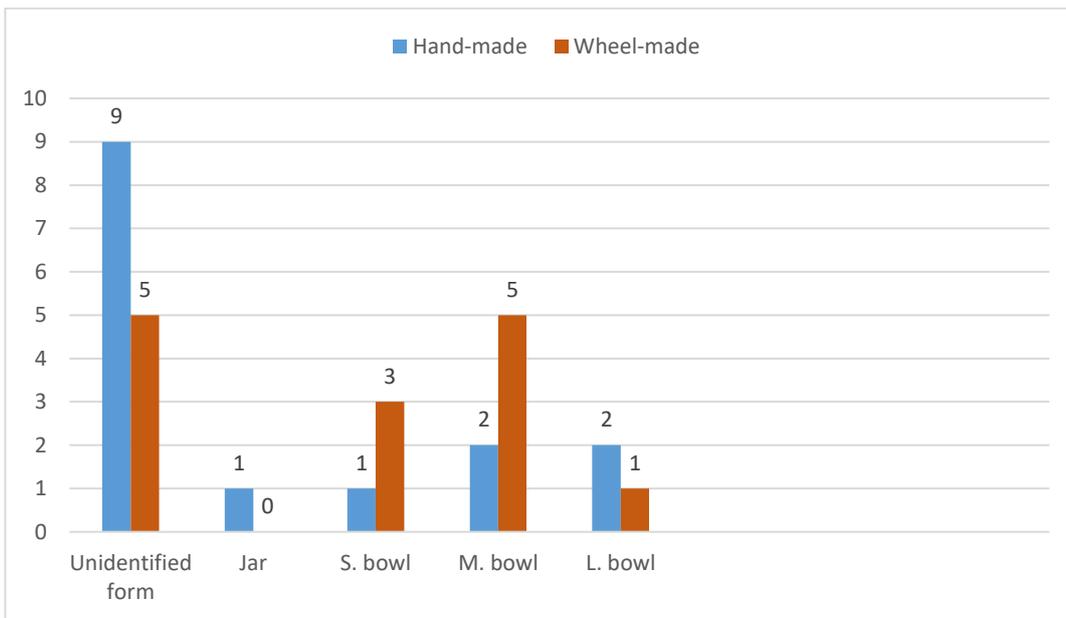


Figure 6-13 Number of form types based on manufacture technique from season 3, fabric 3.

Table 6-23 Fabric 4 distribution according to form types in season 2.

Season 2		FT 4: Limestone, voids and quartz.													
Vessel part	Total Count	Technique		Thickness average (cm.)		Formal types									
		HM	WM	HM	WM	Unidentified form		Jar		S. bowl		M. bowl		L. bowl	
						HM	WM	HM	WM	HM	WM	HM	WM	HM	WM
Body (B)	861	589	272	6.6	5.75	589	271	-	-	-	-	-	-	-	-
Rim (R)	110	34	77	6.9	5.5	-	-	3	2	6	22	9	39	16	14
Base (BA)	63	20	43	7.3	7.2	-	-	1	-	10	37	8	6	1	-
Body with handle (BH)	1	-	1	-	7	-	1	-	-	-	-	-	-	-	-
Handle (H)	9	9	-	6.1	5.6	9	-	-	-	-	-	-	-	-	-
Total	1044	652	393	26.9	36.8	598	272	4	2	16	59	17	45	17	14

Table 6-24 Fabric 4 distribution according to form types in season 3.

Season 3 FT 4: Limestone, voids and quartz.															
Vessel part	Total Count	Technique		Thickness average (cm.)		Formal types									
		HM	WM	HM	WM	Unidentified form		Jar		S. bowl		M. bowl		L. bowl	
						HM	WM	HM	WM	HM	WM	HM	WM	HM	WM
Body (B)	837	553	284	5.3	4	553	284	-	-	-	-	-	-	-	-
Rim (R)	247	86	161	5.6	3.2	-	-	1	1	16	58	42	75	27	27
Base (BA)	102	45	57	6.5	5.1	-	-	1	-	39	55	5	2	-	-
Body with handle (BH)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Handle (H)	2	2	-	3	5	2	-	-	-	-	-	-	-	-	-
Total	1188	686	504	20.4	17.3	555	284	2	1	55	113	47	77	27	27

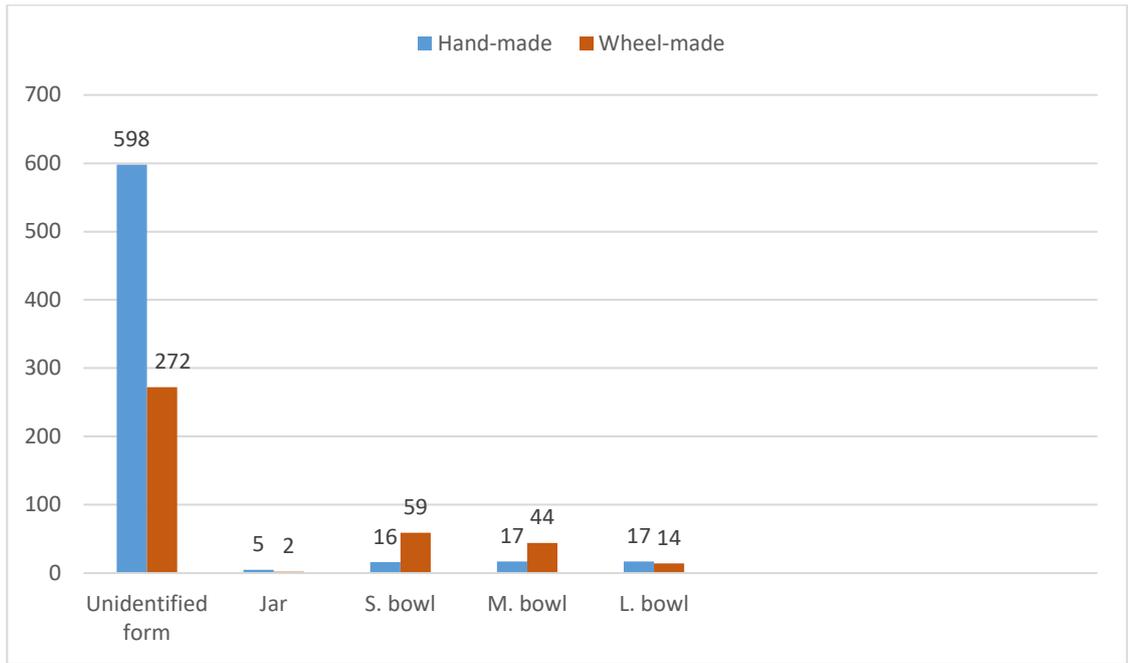


Figure 6-14 Number of form types based on manufacture technique from season 2, fabric 4.

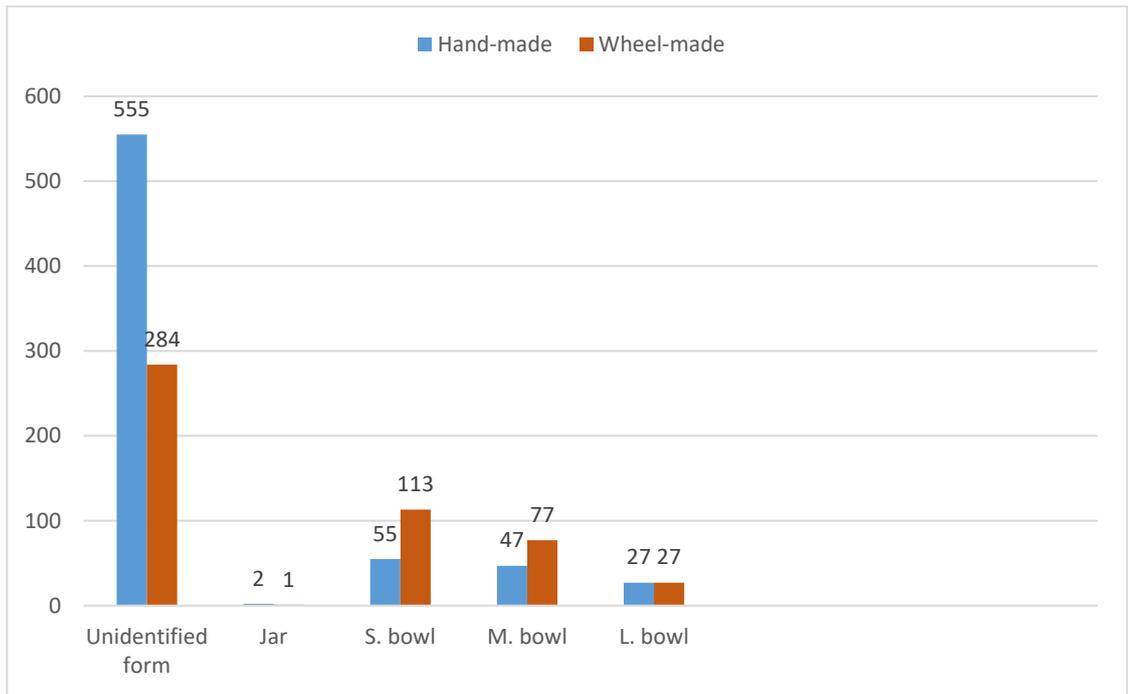


Figure 6-15 Number of form types based on manufacture technique from season 3, fabric 4.

Table 6-25 Fabric 5 distribution according to form types in season 2.

Season 2 FT 5: Limestone, voids and decomposed calcareous particles.															
Vessel part	Total Count	Technique		Thickness average (cm.)		Formal types									
		HM	WM	HM	WM	Unidentified form		Jar		S. bowl		M. bowl		L. bowl	
						HM	WM	HM	WM	HM	WM	HM	WM	HM	WM
Body (B)	1052	730	322	6.8	5.3	730	322	-	-	-	-	-	-	-	-
Rim (R)	110	46	65	6.8	7.1	-	-	1	1	13	13	21	40	11	11
Base (BA)	87	42	45	6.6	7.2	-	-	1	-	21	36	20	9	-	-
Body with handle (BH)	1	-	1	-	3	-	1	-	-	-	-	-	-	-	-
Handle (H)	12	12	-	6.2	-	12	-	-	-	-	-	-	-	-	-
Total	1263	830	433	26.4	22.6	742	323	2	1	34	49	41	49	11	11

Table 6-26 Fabric 5 distribution according to form types in season 3.

Season 3 FT 5: Limestone, voids and decomposed calcareous particles.															
Vessel part	Total Count	Technique		Thickness average (cm.)		Formal types									
		HM	WM	HM	WM	Unidentified form		Jar		S. bowl		M. bowl		L. bowl	
						HM	WM	HM	WM	HM	WM	HM	WM	HM	WM
Body (B)	1377	987	390	6.1	4.5	987	390	-	-	-	-	-	-	-	-
Rim (R)	213	83	130	6.7	4.4	-	-	-	-	20	43	36	58	27	29
Base (BA)	105	46	59	5.6	5.6	-	-	1	1	28	49	17	8	-	1
Body with handle (BH)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Handle (H)	1	1	-	-	5	1	-	-	-	-	-	-	-	-	-
Total	1696	1117	579	19.4	19.5	988	390	1	1	48	92	53	66	27	30

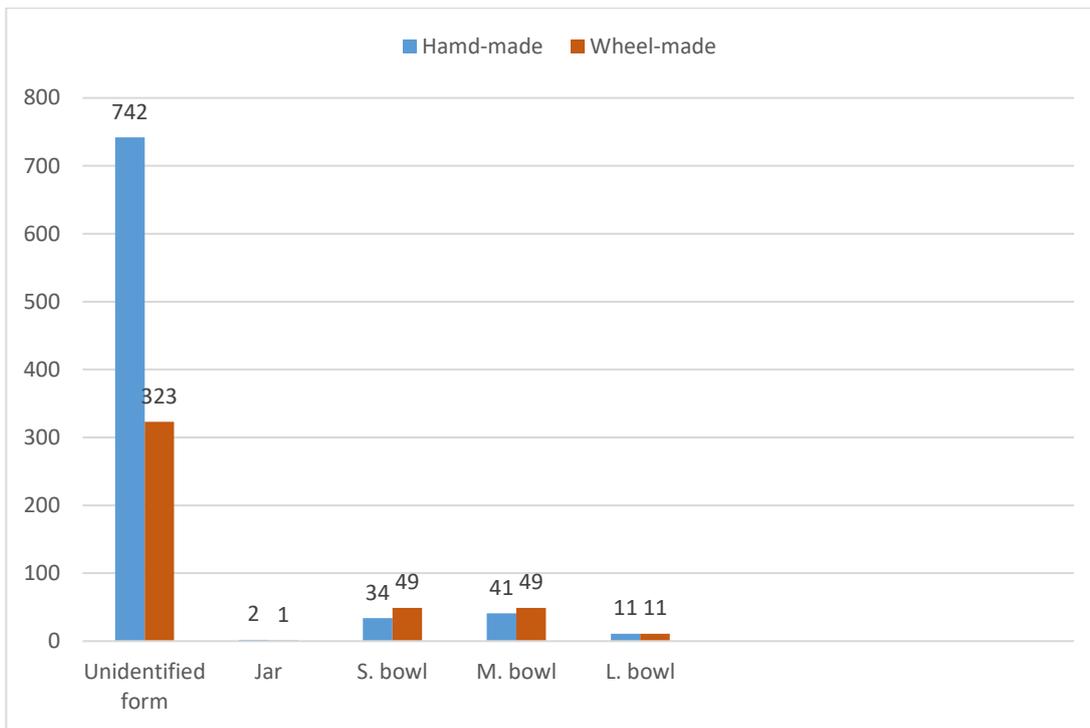


Figure 6-16 Number of form types based on manufacture technique from season 2, fabric 5.

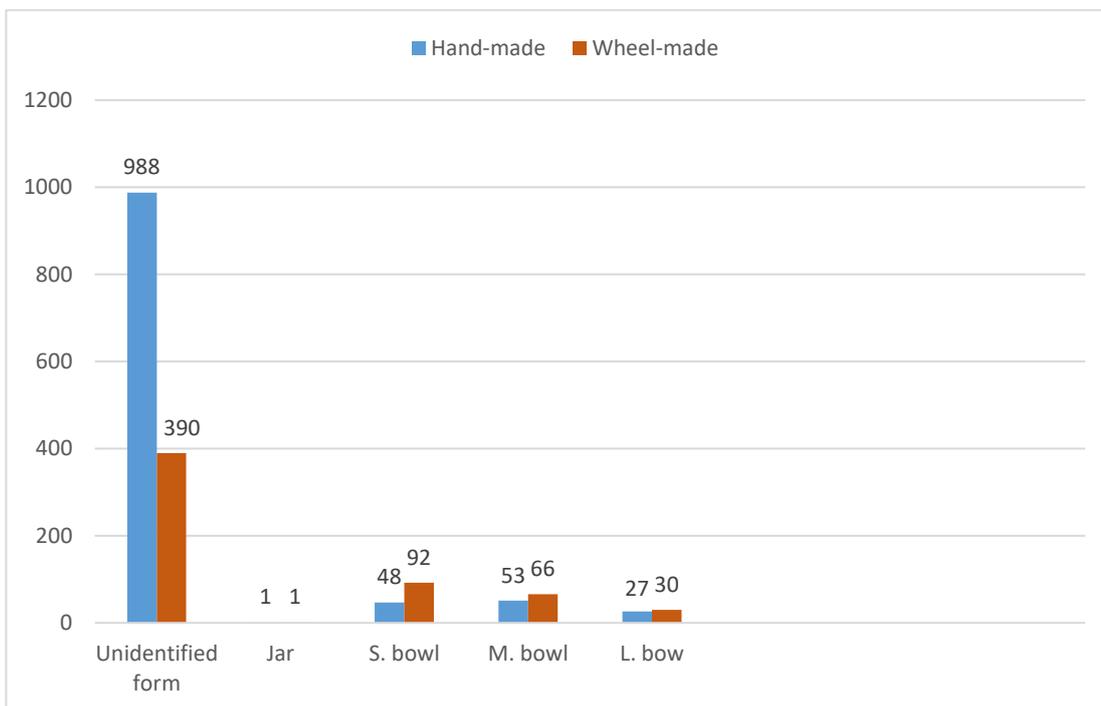


Figure 6-17 Number of form types based on manufacture technique from season 3, fabric 5.

Table 6-27 Fabric 6 distribution according to form types in season 2.

Season 2		FT 6: Mica, limestone and voids.													
Vessel part	Total Count	Technique		Thickness average (cm.)		Formal types									
		HM	WM	HM	WM	Unidentified form		Jar		S. bowl		M. bowl		L. bowl	
						HM	WM	HM	WM	HM	WM	HM	WM	HM	WM
Body (B)	311	255	56	6.9	5.7	255	56	-	-	-	-	-	-	-	-
Rim (R)	63	33	30	6.9	4.7	-	-	1	-	5	8	15	18	12	4
Base (BA)	27	17	10	7.8	6.1	-	-	1	-	7	8	8	2	1	-
Body with handle (BH)	1	1	-	9	-	1	-	-	-	-	-	-	-	-	-
Handle (H)	2	-	2	-	5.5	2	-	-	-	-	-	-	-	-	-
Total	404	306	98	30.6	22	258	56	2	-	12	16	23	20	13	4

Table 6-28 Fabric 6 distribution according to form types in season 3.

Season 3		FT 6: Mica, limestone and voids.													
Vessel part	Total Count	Technique		Thickness average (cm.)		Formal types									
		HM	WM	HM	WM	Unidentified form		Jar		S. bowl		M. bowl		L. bowl	
						HM	WM	HM	WM	HM	WM	HM	WM	HM	WM
Body (B)	107	84	23	7.3	4.6	84	23	-	-	-	-	-	-	-	-
Rim (R)	32	17	15	7.1	4.1	-	-	-	1	3	5	7	7	7	2
Base (BA)	6	1	5	9	4.1	-	-	-	1	-	4	1	-	-	-
Body with handle (BH)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Handle (H)	1	1	-	1	-	1	-	-	-	-	-	-	-	-	-
Total	146	103	43	24.4	12.8	85	23	-	2	3	9	8	7	7	2

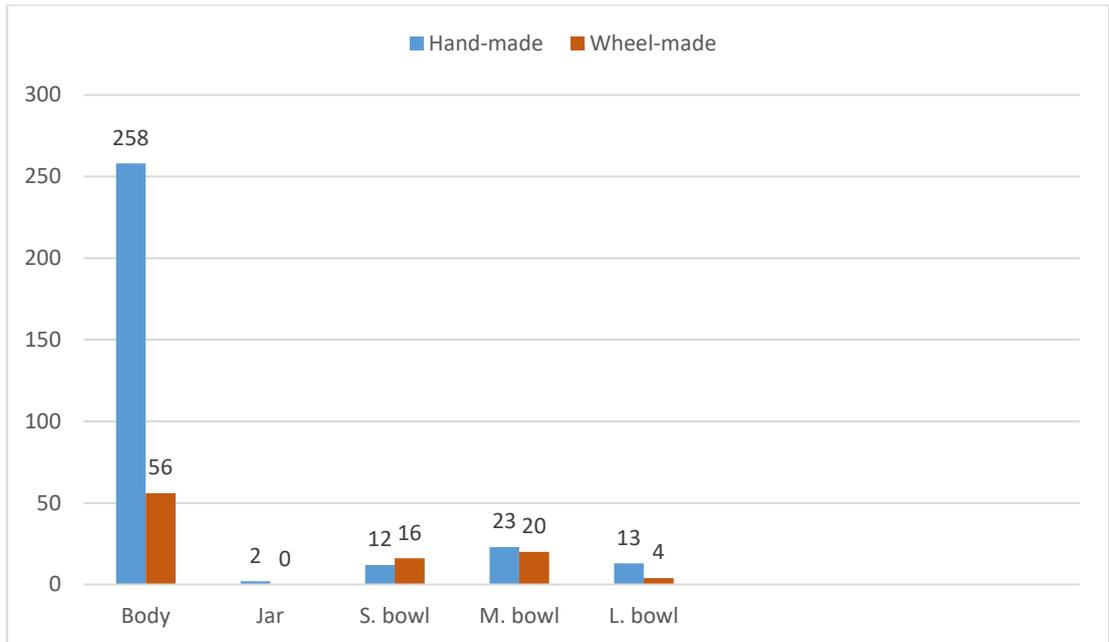


Figure 6-18 Number of form types based on manufacture technique from season 2, fabric 6.

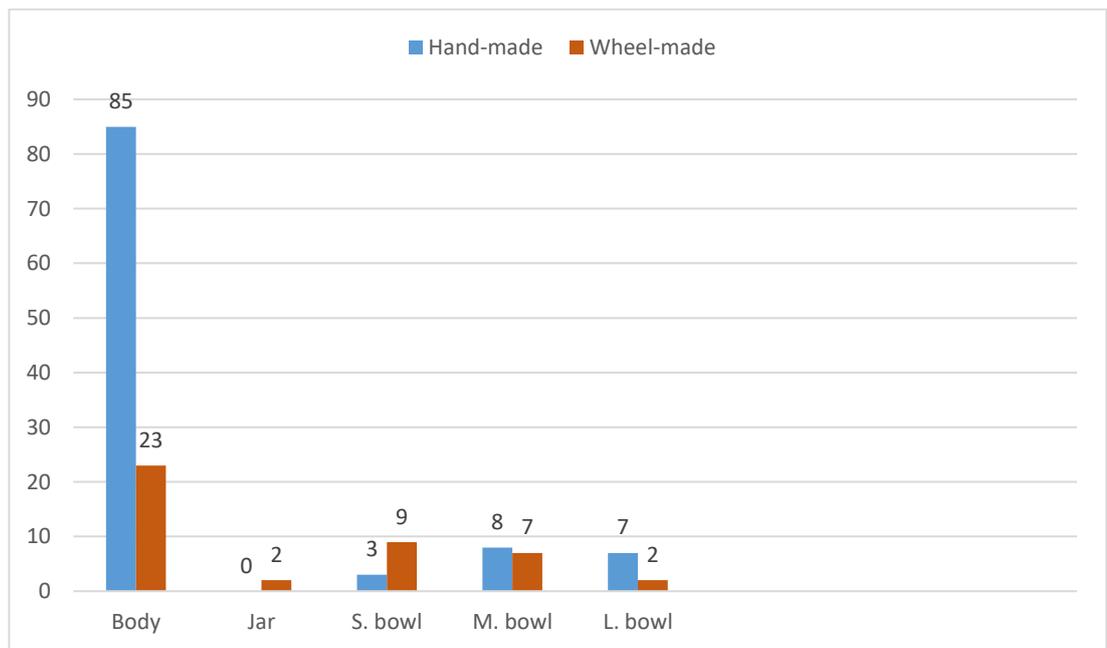


Figure 6-19 Number of form types based on manufacture technique from season 3, fabric 6.

In the light of above, all fabrics showed diversity of form types. Regarding an average wall thickness in all fabrics, we found that the largest quantity of sherds can probably be formed of small, medium and large bowls, with fewer jars based in all fabrics and techniques in both seasons. The charts below (Figure 6-20, Figure 6-21, Figure 6-22, Figure 6-23) present the whole assemblage in all fabrics and both seasons, which clearly show that hand-made techniques were the most common way of method of production at Al-Ukhudud, in particular for fabric 2, 4 and 5, which have already

been identified as probably local to the site or region (see above). Additionally, fabric 3 was used more in wheel-made vessels, in particular for small and medium bowls in season 3.

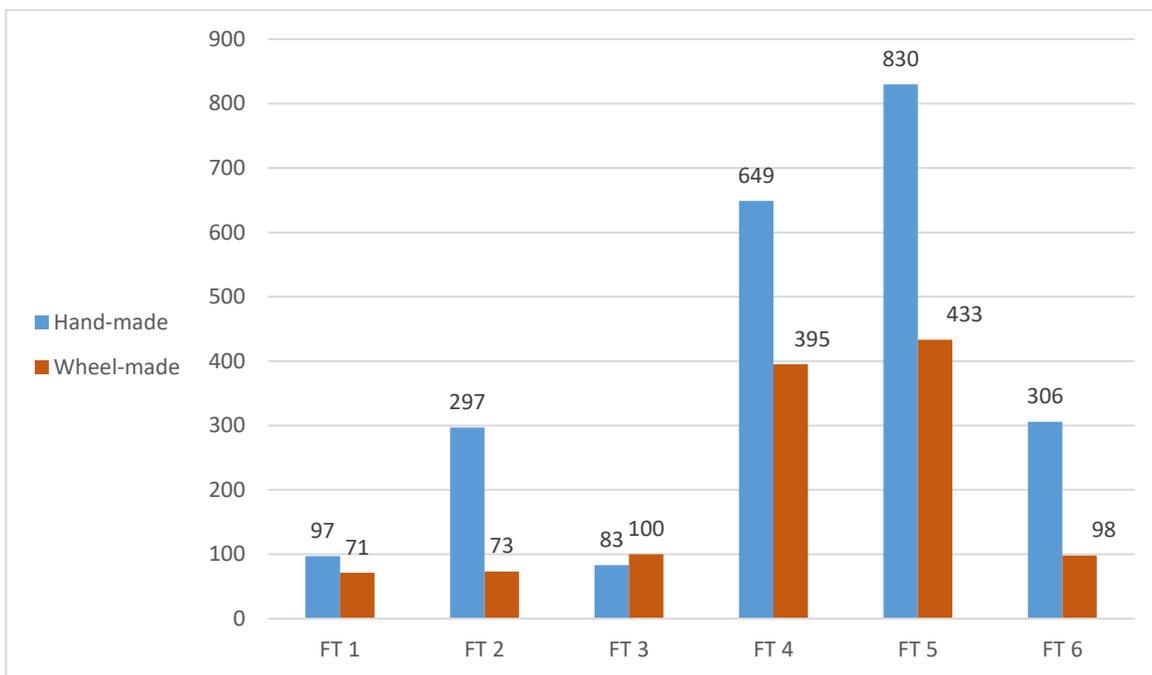


Figure 6-20 Number of sherds based on manufacture technique for each fabric from season 2.

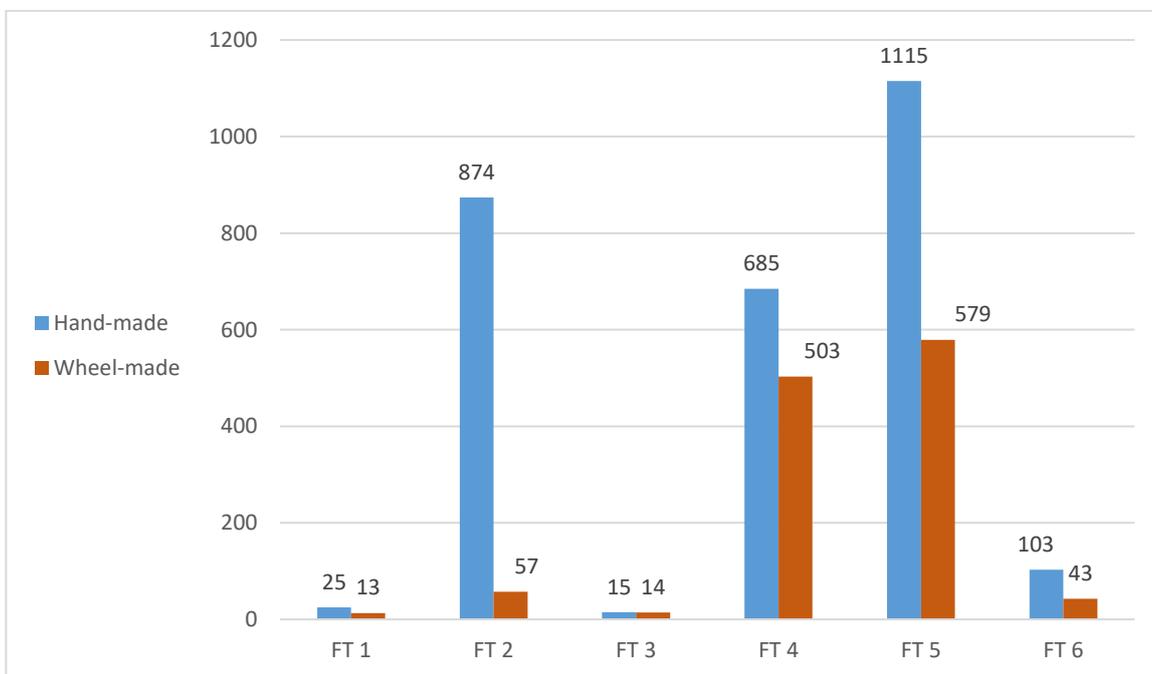


Figure 6-21 Number of sherds based on manufacture technique for each fabric from season 3.

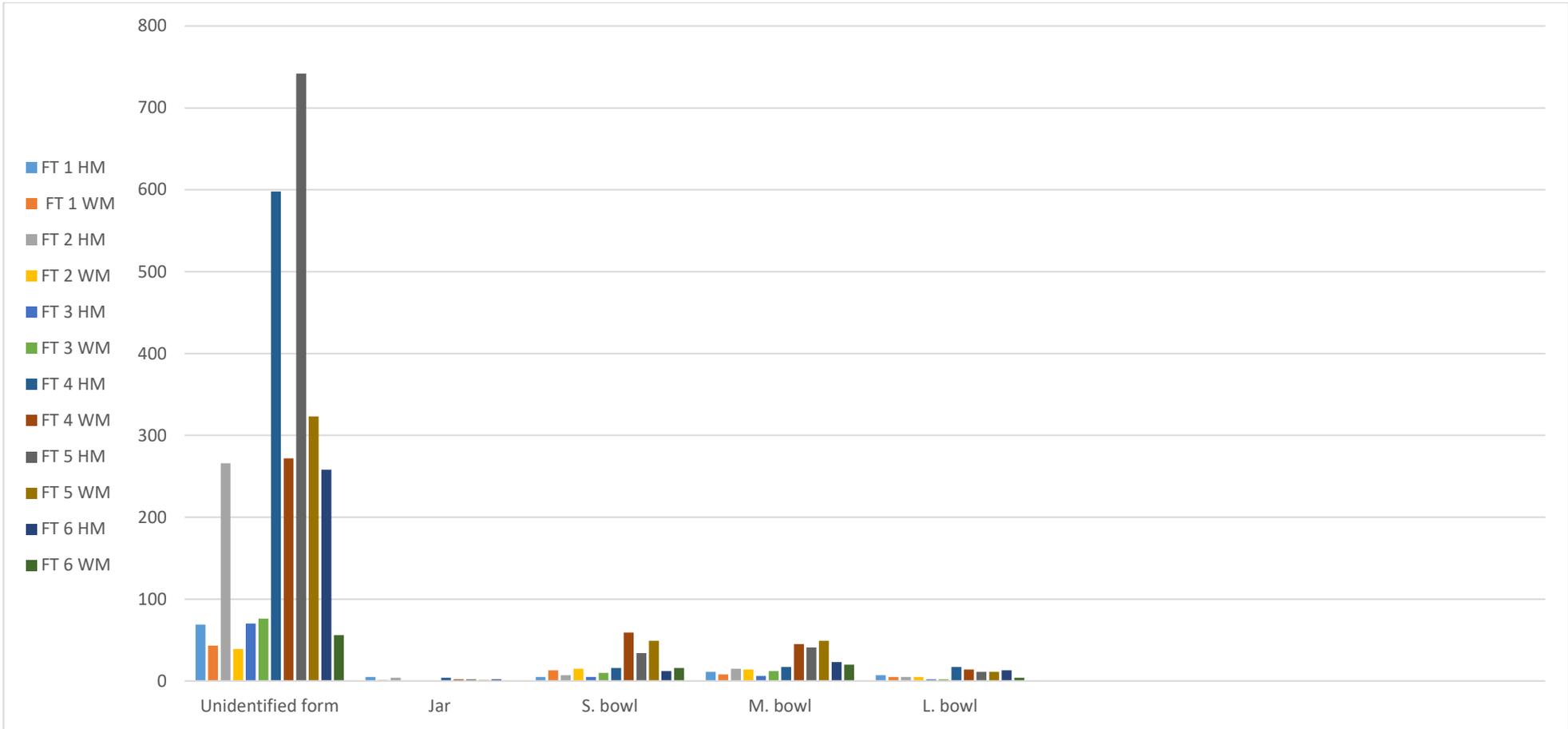


Figure 6-22: The quantity of pottery for each form type in each fabric according to manufacture technique from season 2.

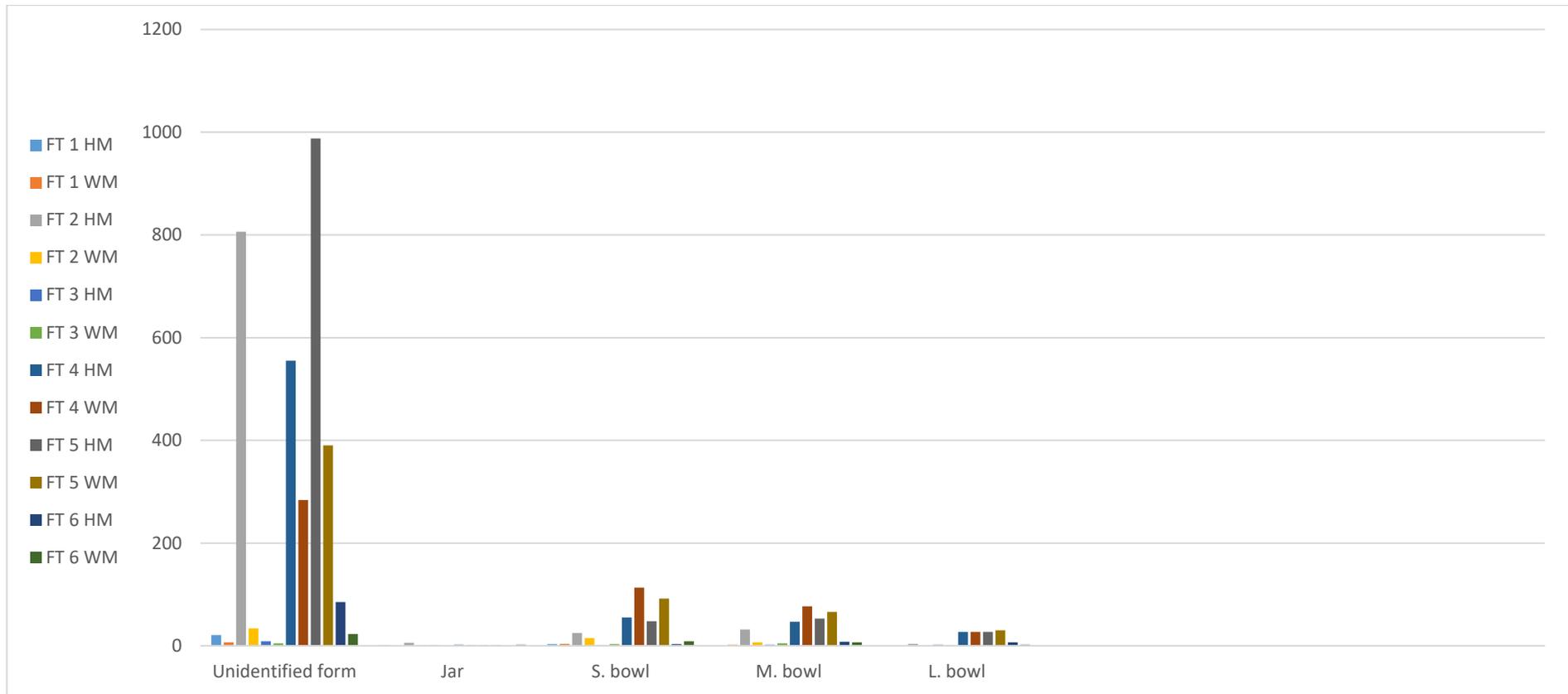


Figure 6-23: The quantity of pottery for each form type in each fabric according to manufacture technique from season 3.

In the next section, we will present each excavated area individually examining the stratigraphic distribution of pottery, in particular fabrics, forms and techniques of manufacture, in order to understand the variation between each excavation and the nature of these excavated areas. Subsequently, we will present a chronological comparative study of Al-Ukhdud's pottery.

6.4 Al-Ukhdud's Pottery and the Archaeological Stratigraphy

In this section, we will develop the study of pottery samples discovered from Al-Ukhdud's excavations during two seasons, the 2nd season in 1996, and the 3rd season in 2000. In the second season, as mentioned above, the excavation covered three different areas in the site, the South-west excavation (SWE); building 39 (B39) within the walled enclosure area; and the North excavation (NE). This season was chosen as it presents an integrated excavation, including three locations, to allow greater understanding of the architectural systems, and to clarify the chronological and spatial distribution of the site and its ceramics. Moreover, this fieldwork revealed a complete architecture unit within the walled area, B39, as well as investigating partial features in the South-west and North excavations that can be contrasted. Thus, our focus in this section will be on the three different locations, and we will analyse and compare their pottery assemblages, and the distribution of fabrics, technologies and formal types in light of the recorded stratigraphy. The ultimate aim is to understand the nature of these locations based on stratigraphy, pottery characteristics and utilisation, in order to clarify both ceramic consumption patterns and any identifiable connection with trade and exchange.

6.4.1 South-west Excavation

As presented in detail above in chapter four, in the South-west excavation, the uppermost layer comprised surface debris, sand, solid mud and collapsed rocks, and the walls appeared 20cm below the surface (Al-Zahrani et al, 2001). No further wall appeared below that level. The second layer comprised sand mixed with animal bones, pottery sherds and small stones, and continued for 55cm. The deepest layer comprised solid red mud and was devoid of any elements until a depth of 75cm; the excavation continued to a depth of 150cm to confirm that no artefacts were present.

The figures presented for weight and thickness in (Table 6-29) probably indicate that many of these sherds belonged to medium and large-sized vessels. We can see that the distribution of pottery in the South-west excavation is concentrated in stratum 2, and this may be because more fill was excavated from this layer, which was 55cm deep. It is notable that the South-west excavation is located close to the walled enclosure area; however, it is notable that less pottery was discovered

in the South-west than was in B39 within the walled area. The reason for this may be due to the relatively small area that was revealed in the South-west excavation.

Table 6-29 Pottery distribution based on stratigraphy, weight and thickness from the South-west excavation in season 2.

Vessel part	Stratum 1. Sherd count	Average sherd weight (g.)	Average wall thickness (mm.)	Stratum 2. Sherd count	Average sherd weight (g.)	Average wall thickness (mm.)
Body (B)	31	99.6	7.6	80	63.1	6.3
Rim (R)	1	141	5	26	201.3	12.2
Base (BA)	-	-	-	25	219.2	6.8
Body with handle (BH)	1	60	9	-	-	-
Handle (H)	-	-	-	1	44	6
Total	33	-	-	132	-	-
The average weight for all sherds (g)						118.3
The average wall thickness for all sherds (mm)						7.5

Fabric distribution in the South-west excavation is different to that in building 39 and the North excavation (presented below) in terms of the quantity of sherds based on stratigraphy and manufacture techniques.

Table 6-30 The distribution of fabric according to manufacture technique from the South-west excavation, season 2.

Fabric	Stratum 1		Total sherds	Stratum 2		Total sherds
	Hand-made	Wheel-made		Hand-made	Wheel-made	
FT 1	1	1	2	18	6	24
FT 2	1	-	1	16	3	19
FT 3	1	-	1	5	6	11
FT 4	4	1	5	9	7	16
FT 5	11	1	12	13	19	32
FT 6	10	5	12	21	9	30
Total	28	5	33	82	50	132

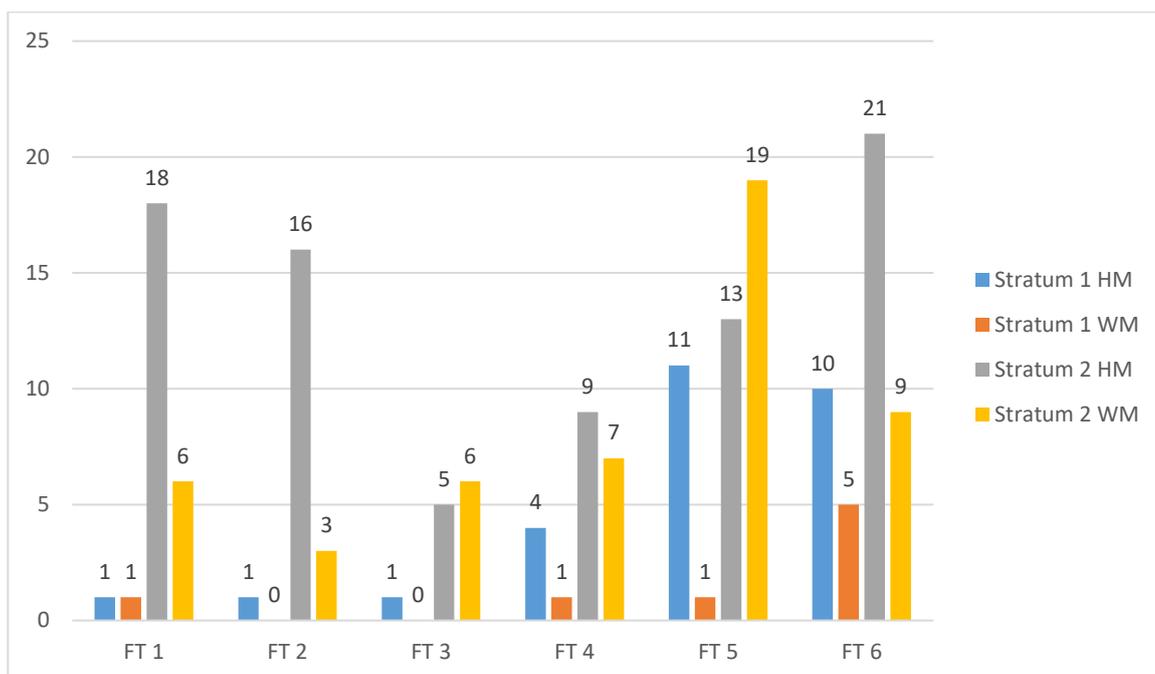


Figure 6-24 The distribution of fabrics according to strata and manufacture techniques from the South-west excavation, season 2.

In (Table 6-30 and Figure 6-24) above show the reasonable distribution of fabrics between the various strata of the South-west excavation; all fabrics in stratum 1 are present in lower quantity than in stratum 2. Of particular note is the scarcity of wheel-made pottery in stratum 1, despite its greater presence in stratum 2. Fabrics 1, 2 and 3 are together very poorly represented in the upper stratum. On the other hand, while hand-made production is high in all fabrics in stratum 2, especially in fabrics 1, 2, 5 and 6, wheel-made production, although less for all fabrics except fabric 5, is more significant. In general, hand-made production in the South-west excavation is more common than wheel-made, but both techniques were in common use. The greater representation of wheel-made material in the lower, earlier stratum 2 may indicate a broad shift towards consumption of hand-made over wheel-made vessels in the later part of our period of interest, although this conclusion remains inevitably speculative in the light of the small sample sizes and imperfect stratigraphic recording. Moreover, the comparatively low quantity of sherds in this part of Al-Ukhudud may reflect its location, which is far from the walled area, or may be due to the limited excavated depth, as mentioned in the preliminary report (Al-Zahrani et al, 2001).

6.4.2 Building 39 Excavation

According to the preliminary report for building 39 (B39) (Al-Zahrani et al, 2001), its uppermost layer, which continued to a depth of 80 cm, consisted of fallen stones, mud and pottery sherds (Stratum 1). The second 25 cm-thick layer contained sand, mud, charcoal, animal bones, small

stones and pottery sherds (Stratum 2). A burned layer appeared in squares A and F of this unit, consisting of ash, charcoal and burned date pits (Stratum 3). The thickness of this burned layer was c.10 cm, and it was located on Layer 4, a gypsum floor which appeared in all rooms (Stratum 4). Below the gypsum floor, as already noted, was evidence of an earlier phase of occupation; therefore, the excavation continued to a depth of 4.4 m from the surface until it reached red soil including small stones and remains of animal bones and plant materials, without evidence of any artefacts (Stratum 5). The distribution of pottery within the stratigraphic sequence of B39 may reflect the nature of the architectural complex. In B39, vessels including jars and bowls were found beside the burned ash layer, in particular in square F, indicating that this part of B39 may have been utilised as a cooking area (Al-Zahrani et al, 2001). Furthermore, some vessels and large sherds discovered in square D of this unit may indicate that these areas were used for food storage (Al-Zahrani et al, 2001). From the recorded data, we can see that the body sherds in B39 came only from (Stratum 1 and Stratum 2), and less rim and base sherds from the same strata (Table 6-31).

Table 6-31 Pottery distribution based on stratigraphy, weight and thickness from B39 excavation in season 2.

Vessel part	Stratum 1. Sherd count	Average sherd weight (g.)	Average wall thickness (mm.)	Stratum 2. Sherd count	Average sherd weight (g.)	Average wall thickness (mm.)
Body (B)	578	156.6	7.2	1096	132.3	6.9
Rim (R)	78	124.6	6.4	132	114.3	5.5
Base (BA)	29	375.2	7.9	36	299.7	7.5
Body with handle (BH)	1	101	7	-	-	-
Handle (H)	1	23	5	1	36	8
Total	687	-	-	1265	-	-
The average weight for all sherds (g)						151.4
The average wall thickness for all sherds (mm)						6.8

In general, the pottery from B39 mostly thick-walled and heavy, which may indicate that these sherds belong to large-sized vessels, similar to the general features of sherds from the South-west excavation.

The distribution of fabrics in the building 39 (B39) excavation within the walled area is significantly different to the pottery fabrics of the South-west excavation, specifically in terms of the large

quantity of sherds of fabrics 4, 5 and 6 in stratum 1 and fabrics 2, 4, 5, and 6 in stratum 2, with both strata dominated by hand-made technique.

Table 6-32 The distribution of fabrics according to manufacture technique from B39 excavation, season 2.

Fabric	Stratum 1		Total sherds	Stratum 2		Total sherds
	Hand-made	Wheel-made		Hand-made	Wheel-made	
FT 1	24	3	27	32	7	39
FT 2	56	12	68	201	16	217
FT 3	8	4	12	24	5	29
FT 4	192	31	223	282	57	339
FT 5	205	40	245	423	65	488
FT 6	95	17	112	129	24	153
Total	580	107	687	1091	174	1265

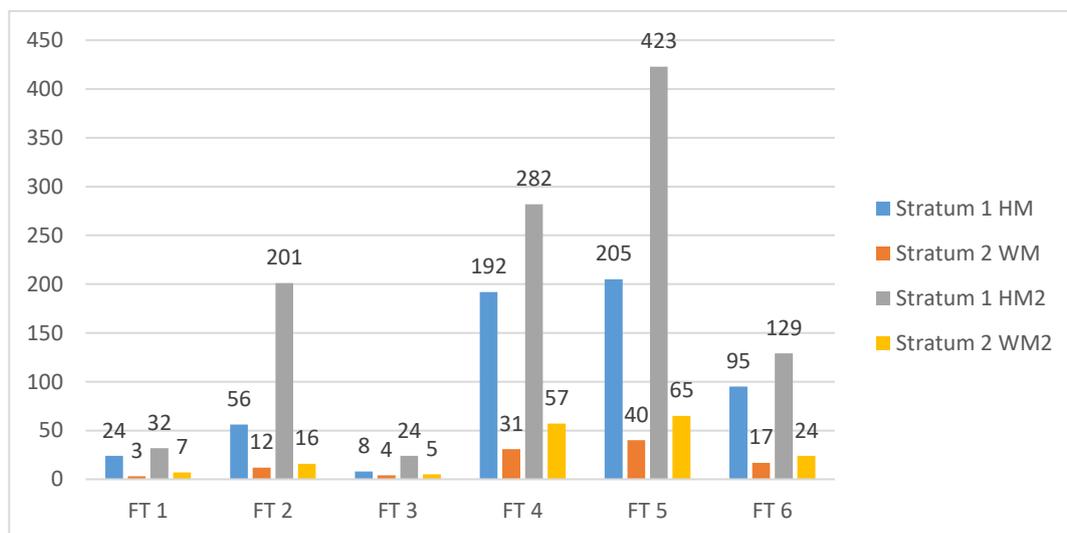


Figure 6-25: The distribution of fabrics according to strata and manufacture techniques from B39 excavation, season 2.

In (Table 6-32 and Figure 6-25) above show that the hand-made technique is most common in the B39 excavation in all fabrics in both strata; the quantities of wheel-made found more comparing with assemblages from both strata in the South-west excavation. In terms of fabric distribution, we can see that fabrics 2, 4, 5 and 6 in stratum 1 represent the largest number of hand-made fragments, with fewer wheel-made sherds; however, in stratum 2, the fabric distribution is different

and represents more hand-made sherds in almost all fabrics except fabric 1 and 3, whereas wheel-made sherds are less with more lower quantities in fabrics 1 and 3. Fabric 5 is common in both strata; we suggested this fabric based on Arnold's model as a local fabric, sourced within a distance of 9 km; Arnold's model is discussed in detail below in this chapter (section 6.6, point 6.6.3). In B39, the high quantity of sherds is probably due to the depth of excavation, but perhaps also due to high ceramic consumption within the walled area. The high proportions of hand-made pottery from both strata indicates that this technique was used frequently despite the existence of some wheel-made fragments; both techniques were used for pottery discovered from B39, but the higher proportion of hand-made manufacture in the earlier stratum 2 may have chronological implications.

6.4.3 North Excavation

The North excavation revealed a stratigraphic sequence consisting of the uppermost surface layer of mud, soil, pottery sherds and small rocks, continuing to a depth of 20cm. The second layer consisted of red sand, pieces of mud, animal bones, small rocks, and pottery sherds, and continued to a depth of 195cm from the surface. The third layer comprised ash and charcoal without any pieces of pottery; the thickness of this layer was between 5 and 15cm. It is important to note the difficulties of interpretation associated with this layer based on the published report: the third layer was found across the complete excavation area; but the layer does not in fact appear in the whole section illustrations of the North excavation in this report (Al-Zahrani et al, 2001, fig. 12) except in some specific parts of the excavation, where it is connected with the previous level. The digging continued downward to confirm that there were no further walls until hitting the natural soil at a depth of 2.5 m.

The pottery distribution in the North excavation was large in quantity with greater quantity revealed from stratum 1 covering all vessel parts (Table 6-33).

Table 6-33 Pottery distribution based on stratigraphy, weight and thickness from North excavation in season 2.

Vessel part	Stratum 1. Sherd count	Average sherd weight (g.)	Average wall thickness (mm.)	Stratum 2. Sherd count	Average sherd weight (g.)	Average wall thickness (mm.)
Body (B)	593	59.8	5.5	399	45.8	4.9
Rim (R)	109	73.6	5.5	50	78.6	5
Base (BA)	101	173.4	7.1	32	130.7	6.4
Body with handle (BH)	3	34.7	3	-	-	-
Handle (H)	20	56.5	6.6	7	59.9	7
Total	826	-	-	488	-	-
The average weight for all sherds (g)						79.2
The average wall thickness for all sherds (mm)						5.7

From the above table, we can see that in both strata the body, rim and other parts are relatively similar in average weight and thickness, which may indicate that these sherds are in general from medium to small-sized vessels. However, the bases are notably different in average sherd weight and wall thickness, and the average of bases here is higher from both strata, which is similar to the same situation in previous excavations. The sherds discovered from the North excavation indicate high levels of human activity here, even though this excavation was not close to the walled enclosure, which revealed a large number of sherds as well. Moreover, the diversity of pottery revealed from the North excavation may reflect the nature of this architectural area, which was probably used as a place of an open space of commercial or similar activity.

The fabric distribution in the North excavation is a little different to the distribution of fabrics in the South-west excavation and B39 in terms of manufacture techniques.

Table 6-34 The distribution of fabrics according to manufacture technique from the North excavation, season 2.

Fabric	Stratum 1		Total sherds	Stratum 2		Total sherds
	Hand-made	Wheel-made		Hand-made	Wheel-made	
FT 1	16	33	49	5	21	26
FT 2	21	28	49	2	14	16
FT 3	30	53	83	14	33	47
FT 4	93	163	256	69	136	205
FT 5	125	197	322	53	111	164
FT 6	35	32	67	16	14	30
Total	320	506	826	159	329	488

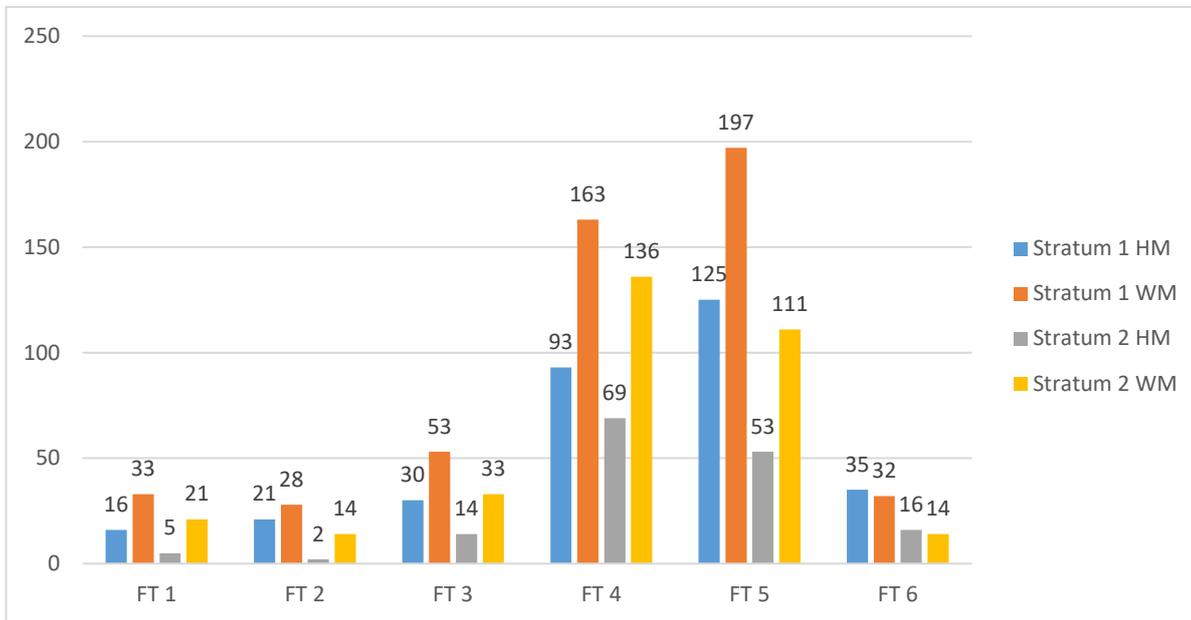


Figure 6-26: The distribution of fabrics according to strata and manufacture techniques from the North excavation, season 2.

From (Table 6-34 and Figure 6-26), we can see that a transition of pottery production techniques may have occurred in the North excavation. Both strata contain both hand- and wheel-made sherds, but a significant change is the increase in wheel-made production specifically for fabrics 4 and 5. In both strata and both techniques, fabrics 1, 2, 3 and 6 are less common. In light of the above, we can say that while both productions are found in all strata and in all fabrics, the percentage of sherds based on stratigraphy and fabric distribution are different between the South-west, B39 and North excavations. Thus, we can assume that both techniques perhaps were used side by side during certain periods, but at the same time the hand-made technique was used more than wheel-made, particularly in the South-west and B39. Pottery consumption was concentrated

more in the North excavation and B39 although these two areas are not close to each other, and in general, the highest distribution of hand-made pottery was from stratum 2 in fabrics 2, 4, 5 and 6.

6.4.4 Decoration and Surface Treatment of Pottery from Season 2

6.4.4.1 Decoration

Decoration, surface treatment and to lesser extent use wear are also relevant to this study for understanding the development of people and community in terms of production and consumption, and the relationships with surrounding areas in terms of trade and exchange. Decoration and surface treatment are an integral part of pottery study in terms of understanding the level of creativity of the society, the reflection of decoration elements and the methods of surface treatment. Some decorative elements appear on the external surface of some of the sherds discovered from the 1996 excavations. Various decorative techniques were used on the pottery from season 2, including “applied or added clay to the surface” (AP). Another technique involving the use of “potter’s finger-nail or finger-tip to make impressions pushed onto the surface of the vessel” (FN or FT) created inward circles on the added clay. This type of decoration was usually applied to large vessels, especially on the body. These decorative elements were found on both hand-made and wheel-made pottery in all fabrics except fabric 3. Often sherds decorated by AP or FN/FT do not carry any other decorative elements. These types of decoration are found in other archaeological sites in South Arabia, such as Hajar Bin Humeid (Ven Beek, 1961) and Jurash in Asir (Zarins et al, 1981; Al-Ghamdi, 1995, 1996). Incised decoration (IC) is another technique found on many sherds, including rims, bases and non-diagnostic sherds, and was used to create several elements, such as incised wavy, vertical, horizontal and curved lines. Moreover, the incised technique created triangles, ovals, squares, rhombuses and diamond elements. This technique appeared on all the fabric types, but the difference here is that, generally, this technique was applied on medium-sized sherds with more than one element on the surface of the sherd, which may reflect the development of new decorative elements on the same sherd. Saliency (SA) is a technique producing prominent elements on the sherd’s surface. This technique appears on rims and non-diagnostic sherds, and was used to generate triangles, small lines and oval elements. This technique (SA) was used on both hand- and wheel-made sherds in fabrics 1, 3, 4, 5 and 6. Slashed decoration (SL) is a technique that was applied on some pottery from Al-Ukhud to create decorative elements. These elements are parallel to some decorative elements found at other South Arabian sites, such as Baihan (Doe, 1971) and Hajar Bin Humeid (Van Beek, 1969). This type of technique is found only in fabrics 1 and 6 for hand- and wheel-made non-diagnostic sherds. Most of these decorative techniques did not appear alone on the sherds’ surface, but appeared along

with another technique, which shows the ability of potters to utilize several techniques on one vessel.

6.4.4.2 Surface Treatment

The surface treatment of Al-Ukhudud's pottery from season 2 has been treated as part of the manufacturing technique. Surface treatments of pottery retrieved in this season were applied sometimes to both surfaces, but mostly there is only evidence for treatment of the exterior surface, indicating a preponderance of closed forms. The most common method of treatment is the application of a coating, whether beige or black paint, usually applied to the exterior surface, although we can find some sherds that have beige or black paint coating on both surfaces. Slip, usually red, is another method of surface treatment especially on exterior surfaces, and a few sherds were identified that were slipped on both surfaces. Mostly, red slip was used for rim sherds to cover the entire external surface, and the upper part of the inner rim. A few sherds from this season, especially from the excavations in building 39 (B39) and the North excavation, exhibited traces of black residue on the interior surface. This may indicate the use of these vessels for cooking, or for saving foods or liquids, and signpost the potential of these fragments for scientific analysis of lipids in the future, allowing us potentially to clarify questions of diet and cuisine.

6.4.5 Excavation of Units 42 and 44

We will consider the pottery discovered in 2000 during the third season from units 42 and 42. Here, as mentioned above, significant damage was caused both by the spreading roots of some huge trees, and due to human activity, removing archaeological material. These actions negatively impacted some features of these units and its associated stratigraphy. As mentioned in chapter four, squares 1, 2, 3 and 4 were located outside the architectural units, and are this called 'out of units 42 and 44', while squares 6 – 20 were within the units, and are thus called 'units 42 and 44'.

6.4.6 Out of Units 42 and 44 Excavation

The pottery from out of units 42 and 44 was retrieved from the debris attached to the units' wall from the east and north-east side of the units. This debris consists of an uppermost surface layer. Then, excavation uncovered a layer of large to small stones mixed up with pieces of mud and clay or sand and fragments of pottery, and after that a layer of solid mud until the natural soil (Al-Zahrani et al, 2002). The preliminary report mentioned squares 1, 2, 3 and 4 as a location of debris caused by the damaging this area as mentioned above. All recorded pottery from this excavation was retrieved from the debris (Table 6-35) according to the available data.

Table 6-35 Pottery distribution based on stratigraphy, weight and thickness from out of units 42 and 44 excavation in season 3.

Vessel part	Debris			Stratum 1	Stratum 2	Stratum 3	Stratum 4
	Sherd Count	Average sherd weight (g.)	Average wall thickness (mm.)				
Body (B)	5	32.4	3.6	-	-	-	-
Rim (R)	22	92.8	4.1	-	-	-	-
Base (BA)	8	51.1	2.6	-	-	-	-
Body with handle (BH)	-	-	-	-	-	-	-
Handle (H)	1	13	1	-	-	-	-
Total	36	-	-	-	-	-	-
The average weight for all sherds (g)							47.3
The average wall thickness for all sherds (mm)							2.8

Only a small amount of pottery was found out of units 42 and 44, coming only from the debris relating to destructive factors that occurred in part of this unit as mentioned above.

Perhaps due to the small size of the assemblage, the distribution of fabrics from here was more limited, and concentrated in fabrics 3, 4, 5, and 6 in hand-made production, with all fabrics represented in wheel-made production (Table 6-36 and Figure 6-27). In terms of stratigraphy, in the debris layer, wheel-made pottery was present in more quantity than hand-made production, as shown in the table and chart below, but generally, this excavation revealed a much lower quantity than the season 2 excavation or the excavation that took place inside units 42 and 44 from the same season.

Table 6-36 The distribution of fabrics according to manufacture technique from out of units 42 and 44 excavation, season 3.

Fabric	Debris		Total sherds
	Hand-made	Wheel-made	
FT 1	-	5	5
FT 2	-	3	3
FT 3	1	2	3
FT 4	8	9	17
FT 5	1	3	4
FT 6	2	2	4
Total	12	24	36

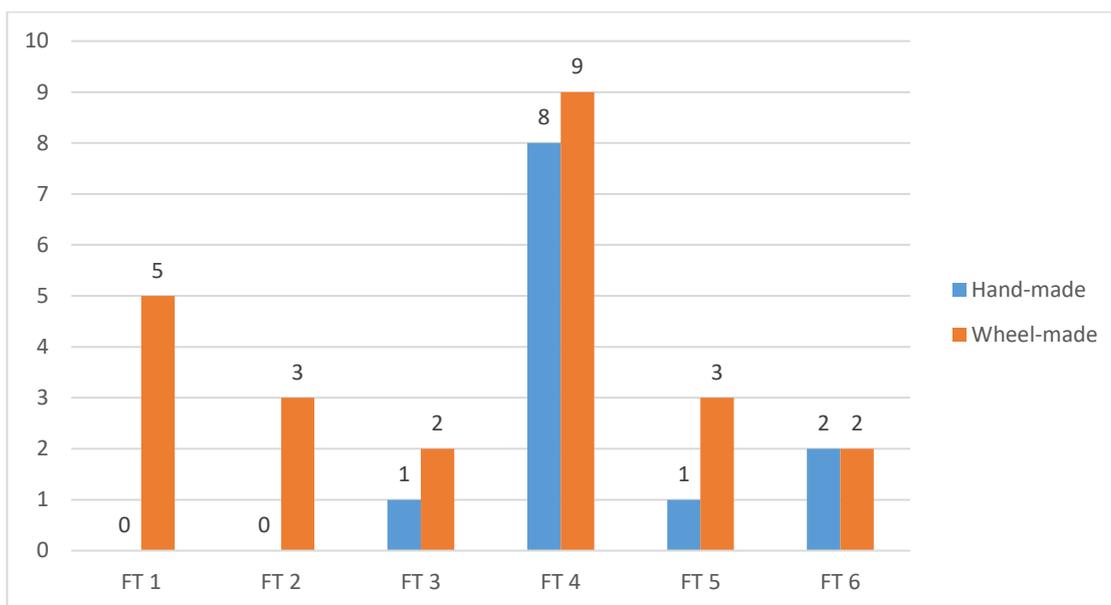


Figure 6-27: The distribution of fabrics according to strata and manufacture techniques from out of units 42 and 44 excavation, season 3.

6.4.7 Decoration and Surface Treatment

6.4.7.1 Decoration

The most common decorative technique in this group is incised (IC), which cuts through the exterior surface of the vessel; most commonly, this takes the form of incised wavy lines under some rim sherds. The decorative sherds here are few: only one hand-made non-diagnostic sherd and one wheel-made rim. These two sherds belong to fabrics 3 and 4 respectively.

6.4.7.2 Surface Treatment

In contrast to the minimal decorative features, surface treatments are common in this material. Sherds are commonly coated in beige paint on the external surface, with some sherds coated on both surfaces. Red slip was applied on some sherds to the external and internal surfaces, and one sherd has dark red slip on both surfaces. Green glaze was applied on only one non-diagnostic sherd on its external surface, indicating a relatively late date in the early Islamic period, probably around 6th to 8th century A.D., as some wheel-made sherds from Al-Ukhduh were dated to this period (discussed above in the Al-Ukhduh pottery chronology in chapter four) (Al-Zahrani et al, 2001; Al-Ibrahim et al, 1985, 1986).

6.4.8 Excavation of Units 42 and 44

In this section, I will present the pottery discovered within units 42 and 44, or from squares 5 to 20 as mentioned above. In units 42 and 44, the stratigraphy is presented based on three sections A, B and C (Al-Zahrani et al, 2002).

In section A, the uppermost layer (Layer 1) was a debris layer mixed with medium to small rocks, soft soil with few pottery sherds. Layer 2 consisted of mud and sand mixed with a few animal bones, ash and pottery sherds. Layer 3 was a thin-burned layer of charcoal and ash, and Layer 4 comprised solid mud with some pottery sherds mixed with charcoal and ash until the appearance of the natural soil (see above Figure 4-34).

In section B, Layer 1 was a debris layer comprising medium to large rocks, pieces of mud and gypsum, sand, small plant materials and pottery sherds. Layer 2 consisted of a gypsum floor, and Layer 3 contained mud, sand, rocks, ash, animal bones and large pottery sherds. Layer 4 consisted of mud mixed with small rocks and some pottery sherds, and the deepest layer was the natural soil (see above Figure 4-36).

In section C, after removing the surface debris (Layer 1), the gypsum floor layer appeared straight away. Layer 3 was a debris layer consisting of sand mixed with rocks, pottery sherds and organic materials. Layer 4 was mud and sand mixed with ash, charcoal and animal bones and a few pottery sherds. A thin burned layer appeared and contained loose mud mixed with some ash, charcoal, small rocks and pottery sherds; the deepest layer contained mixed solid and loose mud, and then reached the natural soil (see above Figure 4-38).

Units 42 and 44 yielded many pottery sherds similar to the excavations that took place in season 2 (Table 6-37). The pottery distribution within this unit is high in almost all layers.

We can see that all levels revealed large numbers of non-diagnostic sherds with similar averages of weight and body thickness. However, the bases show the lowest number of sherds, but the highest average of weight, with relatively close wall thickness. According to the table below, then, we can suggest that the majority of these sherds may have belonged to large or medium-sized bowls or jars.

Table 6-37 Pottery distribution based on stratigraphy, weight and thickness from units 42 and 44 excavation in season 3.

Vessel part	Debris			Stratum 1			Stratum 2			Stratum 3			Stratum 4		
	Sherd Count	Average sherd weight (g.)	Average wall thickness (mm.)	Sherd Count	Average sherd weight (g.)	Average wall thickness (mm.)	Sherd Count	Average sherd weight (g.)	Average wall thickness (mm.)	Sherd Count	Average sherd weight (g.)	Average wall thickness (mm.)	Sherd Count	Average sherd weight (g.)	Average wall thickness (mm.)
Body (B)	373	82.9	5.6	1181	67.9	5.2	877	73.5	5.5	612	122.4	5.2	156	23.8	6.1
Rim (R)	199	115.9	5.6	158	92.3	4.9	109	102.7	5.2	59	107.4	5.3	21	56.2	3.8
Base (BA)	83	255.4	6.7	83	214.7	6.2	57	222.4	6.9	19	295.2	5.58	2	348	8
Body with handle (BH)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Handle (H)	-	-	-	2	38.5	5	1	12	5	-	-	-	-	-	-
Total	655	-	-	1424	-	-	1044	-	-	690	-	-	179	-	-
The average weight for all sherds (g)													131.2		
The average wall thickness for all sherds (mm)													5.6		

The distribution of fabrics in the units 42 and 44 excavation was not significantly different to season 2 or the out of the units 42 and 44 excavations in terms of the diversity of quantities or the concentration of sherds in certain fabrics or stratigraphic levels. In (Table 6-38 and Figure 6-28) below show that fabrics 2, 4 and 5 were most common, which is quite similar to the distribution of fabrics in season 2. In general, hand-made production was dominant in almost all the strata in this unit. Fabrics 4 and 5, identified as local fabrics, formed the highest production especially in the debris layer, stratum 1 and stratum 2, in both production techniques. In stratum 2, the largest quantity of pottery was hand-made in fabrics 2, 4 and 5, but in stratum 3, fabrics 2 and 5 provided the large number of hand-made sherds. Regarding wheel-made production, fabrics 4 and 5 represented the highest number of fragments discovered from the debris, stratum 1, stratum 2 and stratum 3. A lower quantity of sherds was found in stratum 4 in almost all fabrics; moreover, the absence of pottery from both manufacture techniques in fabric 1 in the debris layer and stratum 1, fabric 3 in stratum 3 and fabric 1 in stratum 4 is notable. The large quantities of pottery in this unit across all fabrics may be due to the depth of the excavation that was done in the unit. Regarding the pottery and its manufacture, hand-made and wheel-made pottery use continued alongside each other through all the stratigraphy, with some increase and decrease in production quantities, and the heaviest presence was in stratum 1 and 2 for both techniques. Thus, this area confirms that the walled area is richer in pottery consumption than other areas, as demonstrated explicitly in B39 as well as units 42 and 44, both located within the walled enclosure at Al-Ukhdud.

Table 6-38 The distribution of fabrics according to manufacture technique from units 42 and 44 excavation, season 3.

Fabric	Debris		Total sherds	Stratum 1		Total sherds	Stratum 2		Total sherds	Stratum 3		Total sherds	Stratum 4		Total sherds
	Hand-made	Wheel-made		Hand-made	Wheel-made		Hand-made	Wheel-made		Hand-made	Wheel-made		Hand-made	Wheel-made	
FT 1	2	-	2	15	-	15	5	3	8	1	5	6	2	-	2
FT 2	27	3	30	289	28	317	364	8	372	167	12	179	27	3	30
FT 3	5	3	8	3	3	6	2	3	5	-	2	2	4	1	5
FT 4	140	149	289	278	163	441	150	86	236	80	63	143	29	33	62
FT 5	148	128	276	438	175	613	256	133	389	223	116	339	50	25	75
FT 6	32	18	50	26	6	32	23	11	34	17	4	21	3	2	5
Total	354	301	655	1049	375	1424	800	244	1044	488	202	690	115	64	179

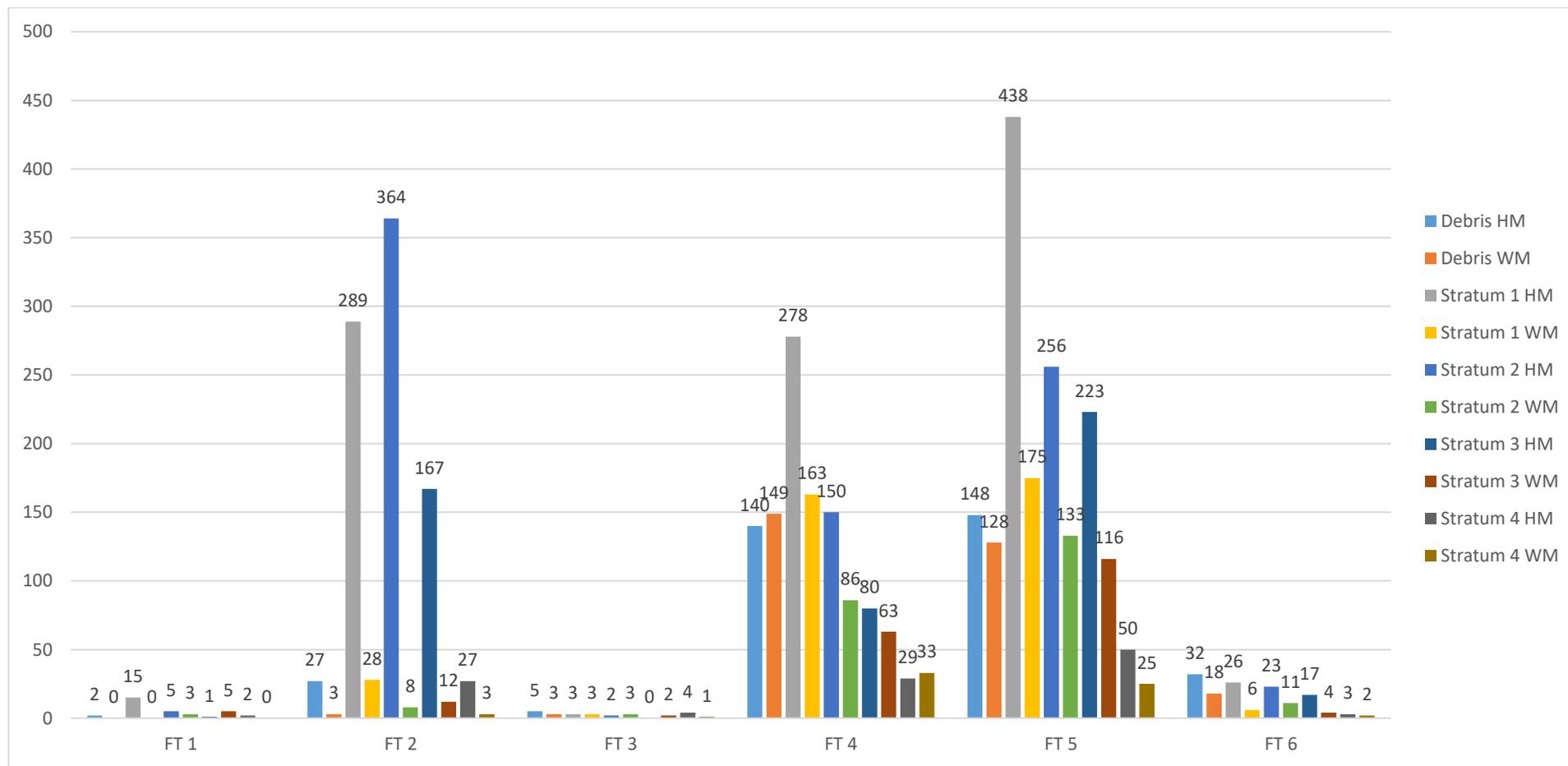


Figure 6-28: The distribution of fabrics according to strata and manufacture techniques from units 42 and 44 excavation, season 3.

6.4.9 Decoration and Surface Treatment

6.4.9.1 Decoration

In terms of decoration, the pottery discovered from units 42 and 44 has similar decorative elements to those mentioned above. Incised decoration (IC) was found on both hand- and wheel-made non-diagnostic and rim sherds retrieved from these units, and was applied only to fabric 1, 4 and 5; the applied or added clay technique (AP) was found on hand- and wheel-made non-diagnostic and rim sherds of fabrics 1, 4 and 5; and salience (SA) was applied for hand-made non-diagnostic sherds of fabric 4. A new technique found in this unit is painted patterns (PT), which creates vertical and horizontal lines using dark red paint. This technique was applied to hand-made non-diagnostic sherds of fabric 4. The decorative elements on the pottery from this unit are similar to the elements mentioned above for the pottery from season 2 (1996).

6.4.9.2 Surface Treatment

Surface treatments for pottery found in units 42 and 44 are quite similar to the surface treatments of pottery revealed from other excavations at Al-Ukhud. In this unit, the most common surface treatment is a coating of beige paint on the exterior surface, but in some sherds the coating covers both surfaces. Other coating colours recorded are brown, yellow and greenish, all on exterior surfaces, and these coats were found on hand- and wheel-made non-diagnostic sherds belonging to fabrics 2, 3 and 4. Another surface treatment technique is slip, usually on exterior surfaces. The most common slip colour is red, but we found some sherds slipped in dark red or black. Some sherds have two surface treatment techniques, with red slip on the exterior surface, and a coat of beige paint on the interior surface. Also, from this unit, we see a new technique of surface treatment on some sherds, which is the use of glaze. Green glaze and whitish glaze were applied to a few wheel-made non-diagnostic sherds found in units 42 and 44 on only the external surface, and a few sherds were glazed in green on external and internal surfaces. These sherds belong to fabrics 4 and 5. The use of glaze indicates a later chronological date for a subset of this assemblage we mentioned above. The green glazed pottery found in Al-Ukhud was similar to sherds found in Al-Mabiyat site at Al-Ula, and dated to the 'Abbasid period (Al-Zahrani et al, 2001), and more discussion on this presented in Chapter Seven, Section 7.2.1.4.

Some of the sherds excavated during this season have black residue on the internal surface, and for some sherds, on the external surface as well. This may indicate that some sherds from this season were used as cooking pots or for preparing or storing foods or liquids. In addition, some sherds

showed traces of the potter's fingers on both surfaces; these commonly appear more clearly on the internal surface.

In the light of the above, we can see the variation of hand- and wheel-made pottery discovered from different excavations at Al-Ukhdud, where some later strata presented more hand-made sherds than the earlier ones, but the shift in manufacture techniques occurred in the North excavation. Whereas in the excavation of units 42 and 44 hand-made pottery was more common than wheel-made, but wheel-made techniques were represented in the South-west excavation in greater proportion than the hand-mades, in particular in the lower stratum, which may indicate a shift of consumption to hand-made over wheel-made pottery. Both techniques may be used alongside each other in a specific period at the site of Al-Ukhdud. In addition, the most common fabrics found in Al-Ukhdud's pottery were 2, 4, and 5 based on their distribution in assemblages from each excavation; the other fabrics presented in sometimes high quantities but lower than the fabrics mentioned above.

6.5 Al-Ukhdud Pottery Chronology and Typology

The exact chronology of Al-Ukhdud archaeological site in Najran is still subject to argument (Zarins et al, 1981). The date between 500 B.C and 235 A.D, discussed in chapter three above, is based on the results of a handful of C14 radiocarbon analyses of organic samples revealed from the 1980 2x2m sounding (Zarins et al 1980, 1983). The archaeological site of Al-Ukhdud is one of the largest sites in South Arabia, but there are no detailed studies that can present much information on its historical and social context or economic activity at the site. Many excavations have taken place in Al-Ukhdud during the last two decades; however, all resulting publications are brief preliminary reports that do not adequately address the chronological aspects of the site (Zarins et al, 1983; Al-Zahrani et al, 2001, 2002, 2005, 2006, 2012). All published reports that discuss the chronology of Al-Ukhdud through archaeological finds such as pottery, coins and inscriptions are dependent on these C14 analyses. Despite the large quantity of pottery discovered from Al-Ukhdud, the ceramic studies published to date are limited in scope and insufficiently detailed (Zarins et al, 1983; Al-Zahrani et al, 2001). We can therefore say that these reports do not allow us to integrate the situation of the ancient economy for the site its people, and its development through time. As argued above, the chronology of Al-Ukhdud covers a longer period than is recognised in the preliminary reports from the second half of the 1st millennium B.C. to the early Islamic period, and the dating could possibly extend forward to cover the 1st millennium B.C. to the medieval Islamic period. This proposed range of dates is based on the study of ceramics from limited excavation in 1982. In this section, therefore, I will analyse the chronology of the site and its ceramic assemblage

by means of a process of comparison between Al-Ukhudud's pottery and pottery assemblages from other sites in the region. The aim of this process is to assess similarities between the characteristics of Al-Ukhudud's pottery, and other, better dated assemblages of pottery in order to understand the date range of pottery production and consumption within Al-Ukhudud. To this end, for both seasons 1996 and 2000, I have divided the recorded pottery based on hand-made and wheel-made manufacture techniques, and within those group, identified types based on formal and technical similarities. The tables below (Table 6-39, Table 6-59, Table 6-89, Table 6-94) present the hand- and wheel-made types and their numbers created by the researcher from seasons 2 and 3. As we can see, some types from season 2 do not have parallels from season 3. Subsequently, I have described each type individually according to the main characteristics of the type, including form, ware fabric and firing, manufacture technique, finish and decoration. Then, I have provided detailed chronological comparative study for each type with similar formal types from different pottery studies in the Arabian Peninsula, supported by the chronological tables included in Appendix 8, which indicate the date range of all types based on formal similarities with other publications. The comparison of types with other regional corpora was based on the pottery assemblages from season 2, with related types from season 3 then paralleled to bases from season 2. I have mentioned in the tables below several vessel part types, in particular, rim and base sherds from both seasons 2 and 3 with short letters to distinguish each type, for instance, type HMR-A in the (Table 6-39), type WMR-A in the (Table 6-59), type HMB-A in the (Table 6-89) and type WMB-A in the (Table 6-94). I would like here to clarify what these letters mean:

HMR-A: HM: Hand-made, R: Rim and A: the name of the type

WMR-A: WM: Wheel-made, R: Rim and A: the name of the type.

HMB-A: HM: Hand-made, B: base and A: the name of the type.

WMB-A: WM: Wheel-made, B: base and A: the name of the type.

The above clarifications apply to all other types of rims and bases mentioned in the tables below whether hand- or wheel-made.

6.5.1 Vessel Part: Rim Sherds. Hand-made

Table 6-39 Rim types of hand-made pottery identified by Pottery Reference Number (PRN) from seasons 2 and 3.

Season	Type HMR-A	Season	Type HMR-B	Season	Type HMR-C	Season	Type HMR-D
2	1357, 2452, 2156, 1338, 1335, 2453, 1311, 1308.	2	1167, 1323.	2	2084, 1284, 1306, 1239, 1264.	2	1310, 2448, 1039, 1037.
3	2307, 1451, 1423, 1460, 1437, 1419.	3	None.	3	1400, 1465, 1517, 1458, 1443, 2306, 1256, 1432.	3	1524, 4689, 3616, 1392, 4850, 2241, 4852, 4851, 1476, 1391, 1447.
Season	Type HMR-E	Season	Type HMR-F	Season	Type HMR-G	Season	Type HMR-H
2	1402, 1132, 1160.	2	1092, 1111.	2	1153, 1103, 1098, 1255, 1217, 1101, 1485, 1025, 1394, 1232, 1142.	2	1031, 3277, 2185, 1329, 1356, 2735, 1095, 1483, 1306, 1137, 3125, 1482.
3	4661, 1456, 1530, 1490, 1461.	3	None.	3	1106, 1535.	3	1508, 1429, 1365, 1521, 1510, 1414, 1454, 1380, 1513, 4491, 1488, 1484, 1381, 1467, 1507, 1494.
Season	Type HMR-I	Season	Type HMR-J	Season	Type HMR-K	Season	Type HMR-L
2	1051, 2191, 1298.	2	1228, 1334, 1028.	2	1355, 1342, 1304, 1149, 1639, 3278, 2699.	2	2437, 1971, 1349, 1038, 2449, 1006.
3	None.	3	1487, 1459, 1424, 1425, 1500.	3	1457.	3	None.
Season	Type HMR-M	Season	Type HMR-N	Season	Type HMR-O	Season	Type HMR-P
2	1363, 1177.	2	3124, 1325, 1337.	2	1027, 1024.	2	2187, 1034, 1033, 3192, 2451, 2450, 1640, 1007, 1353, 1324.
3	None.	3	1527, 1435, 1389, 1379, 1450, 4399, 2616.	3	None.	3	None.
Season	Type HMR-Q	Season	Type HMR-R	Season	Type HMR-S		
2	1341.	2	1026.	2	1322.		
3	None.	3	None.	3	1492, 1436, 1528, 1505, 1442.		

Type HMR-A

Season 2: (1357, 2452, 2156, 1338, 1335, 2453, 1311, 1308).

Season 3: (2307, 1451, 1423, 1460, 1437, 1419).

Form: Large to small bowls with everted outward rim. Open form. The external and /or internal body surface is slightly irregular in most examples, probably be related to the manufacture technique. Rim diameter is 16 – 34cm. The wall thickness varies within range of 11 - < 21 mm or more.

Ware: This type appears in fabrics 1, 2, 3, 4 and 5. Generally, the fabric is fine, and laminated with some voids. Hard-fired oxidised edges, and unoxidised core. The clay colour is olive yellow (5Y 6/6); red (2.5YR 5/8); reddish brown (2.5YR 4/4); very pale brown (10YR 8/2); red (10R 5/8); light red (2.5YR 6/8); red (7.5R 5/8); yellowish red (5YR 5/6); and red (2.5YR 4/8).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on external surface for two sherds; the remainder are uncoated.

Decoration: The decoration applied on some sherds is incised (IC) wavy lines on the external surface and under the outer rim. Additional, examples feature incised lines connecting together as triangular shapes on the external surface.

Illustrations: Plate 1 – 5, Appendix 10.

Date range: This type probably dates from the 1st millennium B.C. to the 6th or 7th century A.D., and in some sherds the date can extend to probably the 'Abbasid period (Table 1, Appendix 8).

Pottery distribution of type HMR-A based on stratigraphy as shown in the (Table 6-40) below concentrated in strata 1 and strata 2 in both seasons, but it is important to consider that this distribution does not represent the nature of finding location or the whole archaeological site and its connection within Al-Ukhudud site and surrounding area.

Table 6-40 Type HMR-A pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	B39	2	5	-	-
	NE	1	-	-	-
3	Units 42 and 44	4	1	1	-

Type HMR-B

Season 2: (1167, 1323).

Form: Jars with simple rounded rim. Closed form. The body is open at the middle of the vessel, and slightly irregular especially on the internal surface, probably due to manufacture technique. Rim diameter is 16 – 21 cm. The body thickness is 11 - < 21 mm or more.

Ware: This type appears in fabrics 4 and 6. The fabric is fine, hard-fired and oxidised. The colour of the clay is red (10R 5/8); and weak red (10R 4/2).

Technique: Hand-made (HM).

Surface treatment:

Uncoated on both surfaces.

Decoration: The decoration on the external surface of sherd no. 1167 is incised (IC) wavy and horizontal lines around the middle of the vessel.

Illustrations: Plate 6, Appendix 10.

Date range: This type dated from the 1st millennium B.C. or the 9th century B.C. to the middle Islamic period around 8th century A.D. (Table 2, Appendix 8).

The distribution of type HMR-B as shown in the table below (Table 6-41) concentrated on strata 2 in season 2.

Table 6-41 Type HMR-B pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	-	1	-	-
	B39	-	1	-	-

Type HMR-C

Season 2: (2084, 1284, 1306, 1239, 1264).

Season 3: (1400, 1465, 1517, 1458, 1443, 2306, 1256, 1432).

Form: Small to large bowls with slightly to sharply everted rounded rim. The rim is thickened in some sherds, in particular 1306 and 1239. The walls are straight. Rim diameter is 14 – 42 cm. Wall is 7 - < 15 mm.

Ware: This type appears in fabrics 2, 3, 4 and 5. The fabric is fine with a few, small voids in general or less commonly with larger voids; it is hard-fired with oxidised edges and unoxidised core. The clay colour is red (10YR 5/6 – 5/8); red (2.5YR 5/6); very dark grey (5YR 3/1); light red (2.5YR 6/8); and red (7.5YR 5/6).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on external surface for sherd nos. 2084 and 1239. On the internal surface, there is a coat of red paint on the rim only. Other sherds uncoated.

Decoration: Incised (IC) wavy and horizontal lines on external surface.

Illustrations: Plate 7 – 10, Appendix 10.

Date range: The date range covers a period from the beginning of 1st millennium B.C. to middle Islamic period or probably the late Islamic period (Table 3, appendix 8). Stratigraphic distribution of type HMR-C as shown in the table below (Table 6-42) is commonly in stratum 1 and less in stratum 2 in both seasons.

Table 6-42 Type HMR-C pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3		Stratum 4	
		Count	Count	Count		Count	
2	NE	4	-	-		-	
	B39	1	-	-		-	
3	Units 42 and 44	7	1	-		-	

Type HMR-D

Season 2: (1310, 2448, 1039, 1037).

Season 3: (1524, 4689, 3616, 1392, 4850, 2241, 4852, 4851, 1476, 1391, 1447).

Form: Jar with rounded thickened rim. Closed form. The body is curved and opens under the rim. The internal surface in some sherds is irregular especially in the middle perhaps due to production technique. Rim diameter is 14 – 24 cm. The body thickness is quite similar, the thickness is 15 - < 21 mm or more.

Ware: This type appears in fabrics 1, 2, 4, 5 and 6. fabric is fine to irregular with large, widely space irregularities; it is hard-fired and oxidised. The colour of the clay is pale yellow (5Y 8/4); reddish brown (2.5YR 4/4); and red (7.5YR 5/8 – 2.5Yr 5/6).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on external surface only.

Decoration: None.

Illustrations: Plate 11 – 15, Appendix 10.

Date range: The date range extends from the 1st millennium B.C. and early 1st millennium A.D. (Table 4, appendix 8). Stratigraphic distribution of type HMR-D as shown in (Table 6-43) concentrated in stratum 2 only in season 2. The distribution of pottery in season 3 is concentrated in stratum 1, 2 and 3 for pottery revealed from units 42 and 44, and from out of units 42 and 44 the pottery distributed in stratum 1.

Table 6-43 Type HMR-D pottery distribution.

Season	Finding location	stratum 1	stratum 2	stratum 3	stratum 4
		Count	Count	Count	Count
2	B39	-	2	-	-
	SWE	-	2	-	-
3	Units 42 and 44	5	3	1	-
	Out of units 42 and 44	2	-	-	-

Type HMR-E

Season 2: (1402, 1132, 1160).

Season 3: (4661, 1456, 1530, 1490, 1461).

Form: Small bowls with straight, vertical rounded rim, and sharp low shoulder. Open form. The body is straight with a slight curve on the internal surface, and perhaps related to the manufacture technique. Rim diameter is 10 – 16cm. The body thickness is between 7 - < 13 mm.

Ware: This type appears in fabrics 1, 3 4, 5 and 6. The fabric is smooth to fine with small closely voids, hard-fired and oxidised. The clay colour is red (10R 5/8 – 4/8); light red (10R 6/8); and dark reddish brown (2.5YR 3/3).

Technique: Hand-made (HM).

Surface treatment:

Uncoated on both surfaces.

Decoration: None.

Illustrations: Plate 16 – 17, Appendix 10.

Date range: The date range covers a period from late of 1st millennium B.C. or half of 1st millennium B.C. to around 13th century A.D (1st millennium A.D) (Table 5, Appendix 8).

Stratigraphic distribution of type HMR-E based as shown in (Table 6-44) concentrated more in strata 1 in both seasons. There is a small percentage can be seen of pottery distribution in stratum 2 in season 2 and in stratum 3 in season 3.

Table 6-44 Type HMR-E pottery distribution.

Season	Finding location	stratum 1	stratum 2	stratum 3	stratum 4
		Count	Count	Count	Count
2	NE	2	1	-	-
3	Units 42 and 44	4	-	1	-

Type HMR-F

Season 2: (1092, 1111).

Form: Small to medium bowls with flattened rounded outward and inward rim. Open form. The body is thick near the rim and thinner but with small exterior thickening under the rim directly. The body is straight. Rim diameter is 12 - 20 cm. The body thickness is 7 - < 9 mm.

Ware: This type appears in fabrics 1 and 5. The fabric is smooth to fine. Hard-fired oxidised. The colour of the clay is red (2.5YR 4/8); and yellowish red (5YR 5/6).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on external surface for sherd number 1111, and uncoated internal surfaces.

Decoration: Incised (IC) outward lines, ovals and circles elements on the external surface.

Incised curved lines under the rim.

Illustrations: Plate 18, Appendix 10.

Date range: Based on the chronological table, the date range covers a period from the 11th century B.C. to c. 600 A.D. (Table 6, appendix 8).

Stratigraphic distribution of type HMR-F based as shown in (Table 6-45) concentrated in stratum 1 in season 2 especially in North excavation of Al-Ukhudud archaeological site.

Table 6-45 Type HMR-F pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	2	-	-	-

Type HMR-G

Season 2: (1153, 1103, 1098, 1255, 1217, 1101, 1485, 1025, 1394, 1232, 1142).

Season 3: (1106, 1535).

Form: small to large bowls with flattened straight to rounded rim. Open form. The body is straight for both surfaces, with a slight curve on the internal surface of some sherds probably due to manufacture technique. Rim diameter is 14 – 32 cm. The body thickness is 7 - < 21 mm or more.

Ware: This type appears in fabrics 1, 2, 4, 5 and 6. The fabric is smooth, fine to irregular with large voids in some sherds, hard-fired, with oxidised edges and unoxidised core. The clay colour is red (10R 5/6); light red (2.5YR 6/8); yellowish red (5YR 5/8); red (2.5YR 4/6); red (2.5YR 5/8); red (10R 5/8); red (10R 5/8 – 4/8); reddish brown (2.5YR 5/4); weak red (7.5R 4/4) and light red (10R 6/8).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on external and internal surfaces.

Slip, black slip on both surfaces.

Some sherds are coated on external surface, and other are plain surfaces.

Decoration: One sherd exhibits incised (IC) horizontal, curved lines on the middle of external surface, and oval elements on the external surface as well.

Illustrations: Plate 19 – 22, Appendix 10.

Date range: The date range covers a period from the 1st millennium B.C. and 9th century B.C. to Islamic or later Islamic period. There is a similarity between sherds from type G and rims from Tayma site, in the north of Saudi Arabia (Table 7, appendix 8).

Stratigraphic distribution of type HMR-G as shown in (Table 6-46) concentrated in stratum 1 and stratum 2 from the North excavation in season 2, and one sherd belongs to strata 2 from same season but from South-west excavation. However, the pottery distribution from season 3 is less than season 2, and the pottery distribution for same type is equal in stratum 1 and stratum 3.

Table 6-46 Type HMR-G pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4	
		Count	Count	Count	Count	Count
2	NE	6	4	-	-	
	SWE	-	1	-	-	
3	Units 42 and 44	1	-	1	-	

Type HMR-H

Season 2: (1031, 3277, 2185, 1329, 1356, 2735, 1095, 1483, 1306, 1137, 3125, 1482).

Season 3: (1508, 1429, 1365, 1521, 1510, 1414, 1454, 1380, 1513, 4491, 1488, 1484, 1381, 1467, 1507, 1494).

Form: Large to small bowls with simple rounded, slightly inward thickened rim. Open form. The body is curved and open from the top near the rim, and narrow from the bottom. Some sherds have irregular body surfaces whether external or internal; this may be due to the production technique. Rim diameter is 7 – 36 cm. The body thickness is 7 - < 21 mm or more.

Ware: This type appears in fabrics 1, 2, 3, 4, 5 and 6. Fine to irregular and conchoidal fabric with small closely spaced irregularities. It is hard-fired with oxidised edges, and unoxidised core. The clay colour is reddish brown (5YR 5/4); light red (7.5YR 6/8); red (10R 5/6 – 4/8); light reddish brown (2.5YR 6/4); red (2.5YR 5/8); white (10R 8/1); red (2.5YR 4/8); red (10R 5/8); light red (2.5YR 6/8); light red (2.5YR 6/8); light red (10R 7/8); yellowish red (5YR 5/6 – 5/8); and yellowish red (5YR 5/8).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on external and internal surfaces for some sherds.

Slip, red slip on both surfaces for some sherds as well.

Decoration: One sherd is decorated with curved lines near the rim.

Illustrations: Plate 23 – 30, Appendix 10.

Date range: The date extends from the 1st millennium B.C. to late Islamic period because the similarities between rims in this type and rims from different sites located in South or South-west Arabia (Table 8, appendix 8).

Stratigraphic distribution of type HMR-H as shown in (Table 6-47) concentrated mostly in stratum 1 and stratum 2 in both seasons 2 and 3. One sherd in season 3 was discovered in stratum 3.

Table 6-47 Type HMR-H pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	4	3	-	-
	SWE	-	1	-	-
	B39	2	2	-	-
3	Units 42 and 44	7	5	1	-
	Out of units 42 and 44	3	-	-	-

Type HMR-I

Season 2: (1051, 2191, 1298).

Form: Small to medium bowl with flattened, slightly outward everted rim. Open form. The body is straight and curved near the bottom towards closed base. The internal surface is slightly irregular; perhaps related to the manufacture technique. Rim diameter is 16 – 19 cm. The thickness of the body is 9 - < 13 mm.

Ware: This type appears in fabrics 4, 5 and 6. Fine fabric with small, close voids, hard-fired and oxidised. The colour of the clay is yellowish red (5YRR 5/8); red (10R 5/6 – 4/8); and reddish brown (10R 5/6).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on external surfaces for only one sherd.

Decoration: None.

Illustrations: Plate 31 – 32, Appendix 10.

Date range: The date of this type covers a period from the end of 1st millennium B.C. to the mid 4th century A.D. due to the similarities between this type's pottery and pottery from Al-Madam site, Sharjah, UAE (Table 9, appendix 8).

Stratigraphic distribution of type HMR-I as shown in (Table 6-48) concentrated completely in stratum 1 in seasons 2, in particular from the South-west and North excavations.

Table 6-48 Type HMR-I pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	2	-	-	-
	SWE	1	-	-	-

Type HMR-J

Season 2: (1228, 1334, 1028).

Season 3: (1487, 1459, 1424, 1425, 1500).

Form: small to large bowls with rounded rim, and sharp low shoulder. Open form. Rim diameter is 13 – 30 cm. The body is almost straight, vertical from both surfaces. The thickness is 9 - < 13 mm.

Ware: This type appears in fabrics 3 and 4. Fine fabric with small, close voids, hard-fired and oxidised. The colour of the clay is red (10R 5/8); dusky red (2.5YR 3/2); and red (2.5YR 5/8).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on external surfaces for only one sherd.

Decoration: None.

Illustrations: Plate 33 – 35, Appendix 10.

Date range: The date range covers a period from the 9th century B.C. to Islamic period (Table 10, appendix 8). Stratigraphic distribution of type HMR-J as shown in (Table 6-49) concentrated in stratum 1 in the North excavation, but more sherds in stratum 2 in Building 39 and South-west excavation. In season 3, the pottery distribution is mostly equal in stratum 1 and stratum 3.

Table 6-49 Type HMR-J pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	1	-	-	-
	B39	-	2	-	-
	SWE	-	1	-	-
3	Units 42 and 44	3	-	2	-

Type HMR-K

Season 2: (1355, 1342, 1304, 1149, 1639, 3278, 2699).

Season 3: (1457).

Form: Medium to large bowls with outward double thickened rim. Open form. Both surfaces are irregular due to the manufacture technique. Rim diameter is 14 – 40 cm. The thickness is more in the upper part of the rim, medium in the middle part and thinning downward, at 11 - < 21 mm or more.

Ware: This type appears in fabrics 1, 4, 5 and 6. The fabric is fine with small closely voids to irregular or/ and laminated with large wide voids or sometimes layered. It is hard-fired oxidised and unoxidised fired. The colour of the clay is reddish brown (2.5R 4/4); reddish grey (3.5YR 3/1); yellowish red (5YR 5/6); very pale brown (10YR 8/3); reddish black (7.5YR 2.5/1); white (10YR 8/1); and red dark (2.5YR 3/6).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on external surface.

Uncoated on the internal surface.

Decoration: All the decorations on the external surface. Incised (IC) wavy lines are present under the rim and impressed circles under the rim and near the middle of the body, made by potter's finger-nail or finger-tip pushing onto the surface of the vessels.

Illustrations: Plate 36 – 39, Appendix 10.

Date range: The date range probably extends from early 1st millennium B.C. to probably 13th or 14th century A.D because the formal similarities between this type and some sherd from Salūt (SS4) in Oman, and Al-Hijr in Al-Ula, Saudi Arabia (Table 11, appendix 8).

Stratigraphic distribution of type HMR-K based as shown in (Table 6-50) concentrated in stratum 1 in the North excavation and building 39, and in stratum 2 in building 39 as well. In season 3, the pottery distribution is in stratum 1.

Table 6-50 Type HMR-K pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	3	-	-	-
	B39	1	2	-	-
3	Units 42 and 44	1	-	-	-

Type HMR-L

Season 2: (2437, 1971, 1349, 1038, 2449, 1006).

Form: Jar with outward bevelled thickened rim. Closed form. The thickness of rim is variable. Rim diameter is 16 – 22 cm. The body is thinner and more open than the rim. The thickness of body is 11 - < 19 mm.

Ware: This type appears in fabrics 1, 2, 4, 5 and 6. The fabric in these sherds is variable, fine, irregular to laminating with more large voids and layers. In some sherds, the clay is fragile and crumbly through the fresh fracture. Hard-fired oxidised and irregular unoxidised. The clay colour is yellowish red (5YR 5/8); red to dark reddish grey (10R 5/8 – 4/1); red (2.5YR 5/8); pale yellow (5Y 7/3); red (2.5YR 4/6 – 4/8); and red (10R 4/8).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on external surface only.

Slip, red slip on external surface of one sherd.

All sherds are uncoated or slip on internal surface.

Decoration: None.

Illustrations: Plate 40 – 41, Appendix 10.

Date range: The date range covers a period from the beginning of the 1st millennium B.C. to the early 1st millennium A.D. We found quite formal similarities to Al-Ukdud's pottery in some sites located in South Arabia or surrounding area (Table 12, appendix 8).

Stratigraphic distribution of type HMR-L as shown in (Table 6-51) concentrated in stratum 1 in the North excavation and building 39, and in stratum 2 in building 39 as well. In season 3, the pottery distribution is in stratum 1.

Table 6-51 Type HMR-L pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	1	-	-	-
	B39	2	1	-	-
	SWE	-	2	-	-

Type HMR-M

Season 2: (1363, 1177).

Form: Large bowls with double thickened rounded rim. Open form. The body is straight on the interior surface, and flares outward under the rim. Rim diameter is 40 – 46 cm. The body thickness is 13 - < 17mm.

Ware: This type appears in fabric 1 and 6. The fabric is fine with small voids laminated or layered. Hard-fired oxidised edges, and unoxidised core. The clay colour is red (2.5YR 5/8); dark grey (10R 4/1); and black (10YR 2/1) for the unoxidised one.

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on both surfaces, and uncoated on interior surface for one sherd.

Decoration: Saliency (SA) lines with oval shape on external surface.

Illustrations: Plate 42, Appendix 10.

Date range: The date covers a period from the 11th century B.C to early Islamic period around 600 A.D. from archaeological sites in South Arabia, particularly in Yemen and Central of Saudi Arabia (Table 13, appendix 8).

Stratigraphic distribution of type HMR-M as shown in (Table 6-52) concentrated in stratum 1 in the North excavation and building 39, and in stratum 2 in building 39 as well. In season 3, the pottery distribution is in stratum 1.

Table 6-52 Type HMR-M pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	-	1	-	-
	B39	-	1	-	-

Type HMR-N

Season 2: (3124, 1325, 1337).

Season 3: (1527, 1435, 1389, 1379, 1450, 4399, 2616).

Form: Small to large bowl with slightly bilateral taper rim. Open form. The body of these sherds is irregular from both surfaces due to the manufacture technique. Rim diameter is 16 – 36 cm. The body thickness is 7 - < 21 mm or more.

Ware: This type appears in fabrics 1, 2, 3, 4 and 5. The fabric is fine with small closely voids, laminated or layered. It is hard-fired oxidised edges, and unoxidised core. The colour of the clay is red (10YR 5/6 - 5/8); yellowish red (5YR 5/6); and light red (10YR 6/8).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on external surface for one sherd.

Uncoated on both surfaces for other sherds.

Decoration: None.

Illustrations: Plate 43 – 46, Appendix 10.

Date range: The date range extends from around 12th century A.D. This date shows similar rim sherds from different sites to rim sherds of this type (Table 14, appendix 8).

Stratigraphic distribution of type HMR-N as shown in (Table 6-53) concentrated in stratum 2 in the North excavation, building 39 and South-west excavation in season 2. However, in season 3, the pottery distribution is in stratum 1 and stratum 3 in units 42 and 44 and out of units 42 and 42.

Table 6-53 Type HMR-N pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	-	1	-	-
	B39	-	1	-	-
	SWE	-	1	-	-
3	Units 42 and 44	3	-	2	-
	Out of units 42 and 44	2	-	-	-

Type HMR-O

Season 2: (1027, 1024).

Form: small bowl with rounded tapered rim. Open rim. The body is straight, open at the top, and narrowing towards the base. Rim diameter is 5 – 12 cm. The body thickness is 9 - < 21 mm or more.

Ware: This type appears in fabric 2 and 6. The fabric is fine with small closely voids, and hard-fired oxidised. The clay colour is light brown (7.5YR 6/3); and red (2.5YR 5/8).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint for one sherd on external surface.

The internal surfaces are uncoated.

Decoration: None.

Illustrations: Plate 47, Appendix 10.

Date range: The date range covers a period from half of the 1st millennium B.C. to early 1st millennium A.D. As mentioned above, the long date range here because the similarity of type M is close to some sherds from sites in Arabian Peninsula (Table 15, appendix 8).

Stratigraphic distribution of type HMR-O as shown in (Table 6-54) concentrated in stratum 2 in the South-west excavation in season 2.

Table 6-54 Type HMR-O pottery distribution.

Season	Finding location	Stratum 1		Stratum 2		Stratum 3		Stratum 4	
		Count	Count	Count	Count	Count	Count	Count	Count
2	SWE	-	-	2	100%	-	-	-	-

Type HMR-P

Season 2: (2187, 1034, 1033, 3192, 2451, 2450, 1640, 1007, 1353, 1324).

Form: medium to large bowls with thickened rounded flattened rim. Open form. The body is thick from the rim to the middle of the body, and thinner near the base. The body is irregular in most sherds on both surfaces, perhaps related to the manufacture technique. Rim diameter is 18 – 40 cm. The body thickness is 11 - < 21 mm or more.

Ware: This type appears in fabrics 1, 2, 3, 4, 5 and 6. The fabric is fine with small closely voids irregularities; conchoidal fabric resembling thick broken glass with ripple marks; and irregular fabric with large more widely space irregularities. Hard-fired oxidised edges, and unoxidised core. The clay colour is red (10R 5/6); reddish brown (5YR 5/4); dark grey (7.5YR 4/1); red (2.5YR 4/6 – 4/8); red (10R 4/8); red (2.5YR 4/6 – 4/8); very pale brown (10YR 8/3); pale yellow (5Y 7/3); red (2.5YR 5/8); and pale yellow (5Y 7/3).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on external and internal surfaces.

Coated, beige paint on internal surface of one sherd.

Some sherds are plain or uncoated on both surfaces.

Decoration: None.

Illustrations: Plate 48 – 50, Appendix 10.

Date range: The date range covers a period from the 1st millennium B.C. to early Islamic period, and some parallels dated to early 1st millennium A.D. This period can extend a little bit to the end of 2nd millennium B.C. based on some similarities from Central and eastern Arabia (Table 16, appendix 8).

Stratigraphic distribution of type HMR-P as shown in (Table 6-55) concentrated in stratum 1 and stratum 2 in the North excavation, building 39 and South-west excavation in season 2. However,

in season 3, the pottery distribution is in stratum 1 and stratum 3 in units 42 and 44 and out of units 42 and 42.

Table 6-55 Type HMR-P pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	2	1	-	-
	B39	2	2	-	-
	SWE	-	3	-	-

Type HMR-Q

Season 2: (1341).

Form: Large bowls with labial flange rim. Opened form. The body is thick at the rim to the middle of the body, and thinner near the base. The body is irregular in most sherds on both surfaces, and this could be related to the manufacture technique. Rim diameter is 30 cm. The body thickness is 21 mm or more.

Ware: This type appears in fabric 4. The fabric is fine with small closely voids irregularities; conchoidal fabric. It is hard-fired oxidised edges, and unoxidised core. The clay colour is red (10R 5/6); reddish brown (5YR 5/4); dark grey (7.5YR 4/1); red (2.5YR 4/6 – 4/8); red (10R 4/8); red (2.5YR 4/6 – 4/8); very pale brown (10YR 8/3); pale yellow (5Y 7/3); red (2.5YR 5/8); and pale yellow (5Y 7/3).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on external and internal surfaces.

Coated, beige paint on internal surface of one sherd.

Some sherds are plain or uncoated on both surfaces.

Decoration: None.

Illustrations: Plate 51, Appendix 10.

Date range: The date range covers a period from half of the 1st millennium B.C. to 11th century A.D. based on similarity between type HM-Q and other sherds from different sites near Al-Ukhudud and surrounding area (Table 17, appendix 8).

Stratigraphic distribution of type HMR-Q as shown in (Table 6-56) concentrated in stratum 1 from building 39 in season 2.

Table 6-56 Type HMR-Q pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	B39	1	-	-	-

Type HMR-R

Season 2: (1026).

Form: Medium bowls with external everted rim. Open form. Generally, the body is thick from the rim to the middle of the body, and thinner near the base. The body is irregular in most sherds from both surfaces, perhaps related to the manufacture technique. Rim diameter is 24 cm. The body thickness is 11 - < 13 mm.

Ware: This type appears in fabric 1. The fabric in this type is fine fabric with small closely voids, hard-fired oxidised edges, and unoxidised core. The clay colour is red (10R 5/6); reddish brown (5YR 5/4); dark grey (7.5YR 4/1); red (2.5YR 4/6 – 4/8); red (10R 4/8); red (2.5YR 4/6 – 4/8); very pale brown (10YR 8/3); pale yellow (5Y 7/3); red (2.5YR 5/8); and pale yellow (5Y 7/3).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on external and internal surfaces.

Coated, beige paint on internal surface of one sherd.

Some sherds are plain or uncoated on both surfaces.

Decoration: None.

Illustrations: Plate 52, Appendix 10.

Date range: The date range extends from the later half of the 1st millennium B.C. to 13th or 14th century A.D. This date is far, but the close similarity between rims and other rim sherds from different site makes this comparison expand to cover this date (Table 18, appendix 8).

Stratigraphic distribution of type HMR-R as shown in (Table 6-57) concentrated in stratum 2 in the South-west excavation in season 2.

Table 6-57 Type HMR-R pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	SWE	-	1	-	-

Type HMR-S

Season 2: (1322).

Season 3: (1492, 1436, 1528, 1505, 1442).

Form: Small to medium bowls with rounded internal inverted rim. Open form. The body is thick from the rim to the middle, and thinner near the base. The body is irregular in most sherds on both surfaces, and perhaps related to the manufacture technique. Rim diameter is 18 – 40 cm. The body thickness is 11 - < to 21 mm or more.

Ware: This type appears in fabrics 1 and 6. The fabric is fine fabric with small closely voids It is Hard-fired oxidised edges, and unoxidised core. The clay colour is red (10R 5/6); reddish brown (5YR 5/4); dark grey (7.5YR 4/1); red (2.5YR 4/6 – 4/8); red (10R 4/8); red (2.5YR 4/6 – 4/8); very pale brown (10YR 8/3); pale yellow (5Y 7/3); red (2.5YR 5/8); and pale yellow (5Y 7/3).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on external and internal surfaces.

Coated, beige paint on internal surface of one sherd.

Some sherds are plain or uncoated on both surfaces.

Decoration: None.

Illustrations: Plate 53 – 55, Appendix 10.

Date range: The date range extends from the 1st millennium B.C. to the first centuries A.D. based on comparative process between rim sherds from type S and rim sherds from different sites in Arabia (Table 19, appendix 8).

Stratigraphic distribution of type HMR-S as shown in (Table 6-58) concentrated only in stratum 1 in the North excavation. However, in season 3, the pottery distribution concentrated in stratum 1 and stratum 2 in units 42 and 44.

Table 6-58 Type HMR-S pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	1	-	-	-
3	Units 42 and 44	3	2	-	-

6.5.2 Vessel Part: Rim Sherds. Wheel-made

Table 6-59 All rim types of wheel-made pottery identified by Pottery Reference Number (PRN) from seasons 2 and 3.

Season	Type WMR-A	Season	Type WMR-B	Season	Type WMR-C	Season	Type WMR-D
2	1326, 2153, 2186, 3127, 3128, 3286, 3565.	2	1259, 1486, 1512, 1226, 1281, 1120, 1139, 1127, 1123.	2	1206, 1178, 1105, 1112, 1212, 1181.	2	3195, 3191.
3	1471, 1428, 4267, 1512, 1390, 1531, 1529, 1422, 4268, 1418, 2271, 1477.	3	None.	3	None.	3	1046, 1485, 1405.
Season	Type WMR-E	Season	Type WMR-F	Season	Type WMR-G	Season	Type WMR-H
2	1277, 1246, 1148, 1423, 1513, 2154.	2	1290, 1003, 1514.	2	1221, 1205, 1004, 1035.	2	1315, 1305, 2190, 1346, 3193, 1036.
3	1427, 2304, 1464, 1417, 1473, 1478.	3	None.	3	None.	3	1042, 1041, 1406, 1455, 1426, 1445, 1448, 1366, 3245.
Season	Type WMR-I	Season	Type WMR-J	Season	Type WMR-K	Season	Type WMR-L
2	1340, 1548, 1401, 1345, 1145, 1116, 1851, 1237, 1229, 1850, 1210.	2	1293, 1313, 1295, 1170, 1849, 1361.	2	1331, 1327, 2741, 1314.	2	1266, 1235, 1236.
3	None.	3	1469.	3	1015, 1399.	3	3244, 1516, 1534, 1472, 1385, 1393.
Season	Type WMR-M	Season	Type WMR-N	Season	Type WMR-O	Season	Type WMR-P
2	1269, 1224.	2	1114, 1158, 1200.	2	1097, 1350, 1256.	2	1142, 1336.
3	None.	3	None.	3	1420, 1398.	3	1522, 1364, 1394.

To be continued 6.5.2 Vessel part: Rim sherds. Wheel-made.

Season	Type WMR-Q	Season	Type WMR-R	Season	Type WMR-S	Season	Type WMR-T
2	1183, 1352, 1332, 1351.	2	1192, 1321, 2184, 1389, 1487, 1481.	2	1301, 1362, 1358, 1347, 1348, 1319, 1317, 1316, 1307, 1240, 1213, 1480, 2150, 1851, 1847, 2736.	2	1318, 1328, 1309, 1839.
3	None.	3	None.	3	1011, 1368, 1402, 1523, 1397, 1536, 1002, 1509, 1502, 1016, 4492, 4639, 1526, 1515, 1511, 1462, 1452.	3	2305, 2315, 4501, 1028.
Season	Type WMR-U	Season	Type WMR-V	Season	Type WMR-W	Season	Type WMR-X
2	1032, 1227.	2	1165, 1283.	2	1114, 1127, 1067, 1146, 1001.	2	1162, 1161, 1131, 1262, 1163, 1117, 1118, 1144, 1157, 1479, 1231.
3	1377, 1269, 4193, 1371.	3	3243.	3	1491.	3	None
Season	Type WMR-Y	Season	Type WMR-Z	Season	Type WMR-AA	Season	Type WMR-BB
2	1183, 1195, 1202, 1215, 1333, 1238, 1182 1159, 1642, 1100, 1278, 1254, 1251.	2	1184, 1910.	2	1838.	2	1343.
3	3807, 1483, 1506, 1374 1403, 1107, 1103, 1375, 1496, 1404, 1497, 1493, 1475, 1466, 1463.	3	None.	3	None.	3	1533.
Season	Type WMR-CC						
2	1211, 1634, 1633, 1194.						
3	4500, 1395, 1441, 4400.						

Type WMR-A

Season 2: (1326, 2153, 2186, 3127, 3128, 3286, 3565).

Season 3: (1471, 1428, 4267, 1512, 1390, 1531, 1529, 1422, 4268, 1418, 2271, 1477).

Form: Medium to large bowls with double thickened rounded rim. Open form. The external surface is slightly outwardly curved, and the internal surface is slightly inwardly curved near the top of the rim; the body under the rim is straight. Rim diameter is 26 – 40 cm. The body thickness is 13 - < 21 mm or more.

Ware: This type appears in in fabrics 1, 3, 4, 5 and 6. The fabric is fine, with small closely voids irregularities; and laminated and layered. It is hard-fired oxidised and unoxidised core. The clay colour is light reddish brown (2.5YR 6/4); red (10R 5/6); reddish brown (2.5YR 5/3); yellowish red (5YR 5/8); red (10R 5/8); and dark red (2.5YR 3/6).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on external surface for some sherds.

Slip, red slip on both surfaces.

Some sherds are uncoated on both surfaces.

Decoration: Incised (IC) wavy lines on external surface.

Illustrations: Plate 56 – 60, Appendix 10.

Date range: The date range covers a period from the 1st millennium B.C. to early 1st millennium A.D., and this long period relates to close similarity between type A and sherds from sites close to Al-Ukhudud (Table 20, appendix 8).

Stratigraphic distribution of type WMR-A as shown in (Table 6-60) concentrated only in stratum 1 and stratum 2 in the North excavation and building 39 in season 2. In season 3, the pottery distribution concentrated in stratum 1, stratum 2 and stratum 3 in units 42 and 44.

Table 6-60 Type WMR-A pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	2	1	-	-
	B39	2	2	-	-
3	Units 42 and 44	3	5	4	-

Type WMR-B

Season 2 (1259, 1486, 1512, 1226, 1281, 1120, 1139, 1127, 1123).

Form: Small to medium bowls with simple rounded, slightly everted rim. Open form. Some sherds have slightly everted rim and curved body. Rim diameter is 12 – 25 cm. The body thickness is 5 - < 11mm.

Ware: This type appears in fabrics 2, 3, 4, 5 and 6. The fabric is simply smooth, flat, undifferentiated; fine, with small closely spaced irregularities; and irregular, with larger, more widely spaced irregularities. Hard-fired oxidised. The clay colour is red (10R 5/8); red (2.5YR 5/6); red (10R 4/8); red (2.5YR 5/8); and reddish brown (5YR 5/4).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on both surfaces for some sherds.

Slip, red slip on both surfaces for some sherds.

Some sherds are uncoated on both surfaces.

Decoration: Incised (IC) wavy, horizontal lines, and oval elements on external surface.

Incised (IC) wavy and italic lines on external surface.

Incised (IC) lines under the rim on external surface.

Illustrations: Plate 61 -63, Appendix 10.

Date range: The date range of type WM-B is from the 7th century B.C. to 16th century A.D., and this is related to similarities with some sherds from different archaeological sites in Arabia, such as North Arabia (Table 21, appendix 8).

Stratigraphic distribution of type WMR-B as shown in (Table 6-61) concentrated in stratum 1 and stratum 2 in the North excavation in season 2.

Table 6-61 Type WMR-B pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	7	2	-	-

Type WMR-C

Season 2 (1206, 1178, 1105, 1112, 1212, 1181).

Form: Small to medium bowls with outward everted rim. Open form. The body is straight, flared and slightly inverted under the rim. Rim diameter is 12 – 20 cm. The body thickens is 5 mm - < 9 mm.

Ware: This type appears in fabrics 2, 3, 4, 5 and 6. The fabric is simply smooth, flat, undifferentiated, and hard-fired oxidised. The clay colour is red (2.5YRR 5/8); red (10R 4/8); red (2.5YR 5/8); dark reddish brown (2.5YR 3/3); and red (10R 5/8).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on both surfaces for some sherds.

Coated, beige paint on external surface only.

Coated, beige or greenish paint on external surface.

Decoration: Incised (IC) curved and horizontal lines on external surface.

Incised (IC) horizontal lines under the rim on the external surface.

Illustrations: Plate 64, Appendix 10.

Date range: The date range covers a period from the latter part of 1st millennium B.C. to the early of 1st millennium A.D. We can see similarities between type C and other rim sherds from some sites in Arabia (Table 22, appendix 8).

Stratigraphic distribution of type WMR-C as shown in (Table 6-62) concentrated in stratum 1 and stratum 2 in the North excavation in season 2.

Table 6-62 Type WMR-C pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	2	4	-	-

Type WMR- D

Season 2: (3195, 3191).

Season 3: (1046, 1485, 1405).

Form: Small to medium bowls with bevelled external rim. Open form. The internal surface of one sherd is outward or slightly thick from the middle. Rim diameter is 14 – 18 cm. The body thickens is from 7 - < 11 mm.

Ware: This type appears in fabric 4 and 5. The fabric is fine, with small closely voids irregularities; and irregular, with larger, more widely spaced irregularities and hard-fired oxidised. The clay colour is red (10R 5/8); and yellowish red (5YR 5/8).

Technique: Wheel-made (WM).

Surface treatment:

Coated, black paint on both surfaces.

Slip, red slip on external surface.

Decoration: None.

Illustrations: Plate 65 – 66, Appendix 10.

Date range: The date range covers a period from the first half of 1st millennium B.C. to around 15th century A.D. or Islamic period (Table 23, appendix 8).

Pottery distribution of type WMR-D as shown in (Table 6-63) concentrated in only stratum 1 in the North excavation in season 2, and units 42 and 44 in season 3.

Table 6-63 Type WMR-D pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	B39	2	-	-	-
3	Units 42 and 44	3	-	-	-

Type WMR-E

Season 2: (1277, 1246, 1148, 1423, 1513, 2154).

Season 3: (1427, 2304, 1464, 1417, 1473, 1478).

Form: Medium to large bowls with outward semi-circular rim. Open form. Generally, the body is straight from both sides. Rim diameter is 18 – 40 cm. The body thickens is 7 - < 13 mm.

Ware: This type appears in fabric 3, 4, 5, and 6. The fabric is fine, with small closely spaced voids and irregularities; and irregular, with larger, more widely spaced irregularities. Hard-fired oxidised, and unoxidised core. The clay colour is red (10R 5/8); red (10R 5/6); reddish brown (2.5YR 5/4); red (2.5YR 5/6); and dark grey (5YR 4/1).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on external surface.

Uncoated on the internal surface for all sherds.

Decoration: Incised (IC) wavy lines under the rim on external surface.

Incised (IC) horizontal lines on the external surface.

Illustrations: Plate 67 – 70, appendix 10.

Date range: The date range covers a period from 6th century B.C. to around Islamic period or Post-'Abbasid period (9th/ 10th century A.D.). In this type, we can see similar rim sherds from Al-Ukhudud compare with other sherds from different sites (Table 24, appendix 8).

Stratigraphic distribution of type WMR-E as shown in (Table 6-64) concentrated in stratum 1 and stratum 2 in the North excavation in season 2, and in stratum 1 and stratum 2 in units 42 and 44 in season 3.

Table 6-64 Type WMR-E pottery distribution.

Season	Finding location	Stratum 1		Stratum 2		Stratum 3		Stratum 4	
		Count		Count		Count		Count	
2	NE	3		3		-		-	
3	Units 42 and 44	3		3		-		-	

Type WMR-F

Season 2 (1290, 1003, 1514).

Form: medium to large bowls with double thickened squarish rim. Open form. The top of the rim is irregular, and the body is straight. Rim diameter is 30 – 36 cm. The body thickens is 11 - < 13 mm.

Ware: This type appears in fabrics 1 and 3. The fabric is fine, with small closely voids irregularities, and hard-fired oxidised, and unoxidised core. The clay colour is weak red (10R 4/4); reddish brown (5YR 4/6); and reddish brown (5YR 4/1).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on both surfaces.

Decoration: None.

Illustrations: Plate 71, appendix 10.

Date range: The date range covers a period from the mid Of 12th century B.C. to the 6th century A.D. (Table 25, appendix 8).

Stratigraphic distribution of type WMR-F as shown in (Table 6-65) concentrated in stratum 1 and stratum 2 in the North excavation and in stratum 1 in South-west excavation in season 2.

Table 6-65 Type WMR-F pottery distribution.

Season	Finding location	Stratum 1		Stratum 2		Stratum 3		Stratum 4	
		Count		Count		Count		Count	
2	NE	1		1		-		-	
	SWE	1		-		-		-	

Type WMR-G

Season 2 (1221, 1205, 1004, 1035).

Form: Small to medium bowls with rounded bead rim. Open form. The body flares at the top and narrow towards the bottom. Rim diameter is 14 – 30 cm. The body thickens is between 7 - < 11 mm.

Ware: This type appears in fabrics 1, 4 and 5. The fabric is simply smooth, flat, undifferentiated; and fine, with small closely space irregularities. Hard-fired oxidised. The clay colour is red (10R 5/8); reddish brown (2.5YR 5/4); red (2.5YR 4/8); and light red (2.5YR 6/8).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on external surface.

Slip, red slip on both surfaces.

Decoration: Incised (IC) wavy lines on the external surfaces and under the rim.

Illustrations: Plate 72, Appendix 10.

Date range: The date range expands from the end of the 1st millennium B.C. to the first centuries A.D or early Islamic period (Table 26, appendix 8).

Stratigraphic distribution of type WMR-G as shown in (Table 6-66) concentrated in stratum 1 and stratum 2 in the North excavation and in stratum 1 in South-west excavation in season 2.

Table 6-66 Type WMR-G pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	1	1	-	-
	SWE	-	2	-	-

Type WMR-H

Season 2: (1315, 1305, 2190, 1346, 3193, 1036).

Season 3: (1042, 1041, 1406, 1455, 1426, 1445, 1448, 1366, 3245).

Form: Small to large bowls with simple bilateral tapered rim. Open form. The internal surface is irregular. Rim diameter is 13 – 28 cm. The body thickens is from 7 - < 21 mm or more.

Ware: This type appears in fabrics 3, 4, 5, and 6. The fabric is fine, with small closely voids irregularities, and hard-fired oxidised and unoxidised core. The clay colour is dark reddish grey (10R 4/1); yellowish red (5YR 5/8); red (10R 5/6); red (2.5YR 5/8); red (10R 5/8); and dark reddish grey (2.5YR 4/1).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on both surfaces.

Coated, dark paint on external surface.

Coated, beige paint on internal surface only.

Decoration: None.

Illustrations: Plate 73 – 77, appendix 10.

Date range: The date range expands from the 1st millennium B.C. to the middle of Islamic period.

This period is based on parallels from different sites in Saudi Arabia (Table 27, appendix 8).

Stratigraphic distribution of type WMR-H as shown in (Table 6-67) concentrated in stratum 1 and stratum 2 in the North excavation and in stratum 1 in South-west excavation in season 2.

Table 6-67 Type WMR-H pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	2	1	-	-
	SWE	-	2	-	-
	B39	1	1	-	-
3	Units 42 and 44	5	1	-	-

Type WMR-I

Season 2 (1340, 1548, 1401, 1345, 1145, 1116, 1851, 1237, 1229, 1850, 1210).

Form: Medium to large bowls with straight thickened to thin rounded rim. Open form. The body is straight in most sherds, and slightly restricted towards the bottom of few sherds. Rim diameter is 18 – 30 cm. The body thickness is 5 - < 17 mm.

Ware: This type appears in fabrics 1, 2, 4, 5 and 6. The fabric is simply smooth, flat, undifferentiated; fine, with small closely voids irregularities; irregular, with larger, more widely space irregularities; and laminated, a layered. Hard-fired oxidised. The clay colour is dusky red (10R 3/3); red (2.5YR 5/8); red (2.5YR 5/6); dark reddish brown (5YR 3/4); light red (7.5R 6/6); red (10R 4/8); red (10R 5/8); light red (10R 6/8); and very pale brown (10YR 8/2).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on both surfaces.

Coated, beige paint on external surface only.

Slip, red slip on both surfaces.

Decoration: Incised (IC) small triangles on the external surface under the rim.

Large incised (IC) horizontal lines on external surface under the rim.

Incised (IC) horizontal lines on external surface.

Incised (IC) small triangles on external surface.

Illustrations: Plate 78 – 80, Appendix 10.

Date range: The date range expands from the middle of 1st millennium B.C. to the early Islamic period (600 to 800 A.D.) (Table 28, appendix).

Stratigraphic distribution of type WMR-I as shown in (Table 6-68) concentrated in stratum 1 and stratum 2 in the North excavation and in stratum 1 and stratum 2 in building 39.

Table 6-68 Type WMR-I pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NW	4	5	-	-
	B39	1	1	-	-

Type WMR-J

Season 2: (1293, 1313, 1295, 1170, 1849, 1361).

Season 3: (1469).

Form: Small to medium bowls with everted labial flange rim. Closed form. The body is curved, and some sherds have extremely inward internal surface. Rim diameter is 12 – 26 cm. The body thickness is 7 - < 11 mm.

Ware: This type appears in fabrics 1, 4, 5 and 6. The fabric is fine, with small closely voids irregularities, and hard-fired oxidised and unoxidised core. The clay colour is red (2.5R 4/8); yellowish red (5YR 5/8); red (10R 5/8); and reddish brown (2.5YR 4/4).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on both surfaces.

The majority of sherds are uncoated.

Decoration: Incised (IC) wavy lines on external surface.

Illustrations: Plate 81 - 83, Appendix 10.

Date range: The date range expands from 7th or 8th century B.C. to the 12th century A.D. (Table 29, appendix 8).

Stratigraphic distribution of type WMR-J as shown in (Table 6-69) concentrated in stratum 1 and stratum 2 in the North excavation and in strata 2 in building 39 in season 2. In season 3, the pottery distribution concentrated in stratum 1 in units 42 and 44.

Table 6-69 Type WMR-J pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	2	3	-	-
	B39	-	1	-	-
3	Units 42 and 44	1	-	-	-

Type WMR-K

Season 2: (1331, 1327, 2741, 1314).

Season 3: (1015, 1399).

Form: Jar with slightly everted thickened rim. Closed form. The body is straight near the rim, and everted at the middle and downward. Rim diameter is 12 – 22 cm. The body thickens is 9 - < 21 mm or more.

Ware: This type appears in fabrics 1, 4 and 5. The fabric is fine, with small closely voids irregularities, and hard-fired oxidised. The clay colour is red (2.5YR 6/8); reddish brown (2.5YR 5/8); red (10R 5/8); and reddish brown (10R 4/8).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on external surface.

The internal surface is uncoated for all sherds.

Decoration: None.

Illustrations: Plate 84 – 86, appendix 10.

Date range: The date range expands from the 1st millennium B.C to Byzantine period (6th century to early 7th century A.D). The date range in this type expands in some parallels to the 1st millennium A.D. especially sherds from Zubaidah site, at Saudi Arabia (Table 30, appendix 8).

Stratigraphic distribution of type WMR-K as shown in (Table 6-70) concentrated in stratum 1 and stratum 2 in the North excavation and in stratum 1 in building 39 in season 2. In season 3, the pottery distribution concentrated in stratum 1 in units 42 and 44 and out of units 42 and 44.

Table 6-70 Type WMR-K pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	1	2	-	-
	B39	1	-	-	-
3	Units 42 and 44	1	-	-	-
	Out of units 42 and 44	1	-	-	-

Type WMR-L

Season 2: (1266, 1235, 1236).

Season 3: (3244, 1516, 1534, 1472, 1385, 1393).

Form: Large to medium bowls with hocked rim. Open form. The body is straight and slightly irregular. Rim diameter is 24 – 32 cm. The body thickens is 7 - < 17 mm.

Ware: This type appears in fabric 3, 4, 5 and 6. The fabric is simply smooth, flat, undifferentiated; and fine, with small closely voids irregularities. It is hard-fired and oxidised. The clay colour is red (10R 5/8); and red (10R 4/8).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on external surface.

Coated, beige paint on both surfaces.

Slip, red slip on internal surface on one sherd.

Decoration: Incised (IC) horizontal lines on external surface.

Illustrations: Plate 87 – 89, Appendix 10.

Date range: The date range expands from the beginning of 1st millennium B.C to around 600 A.D. The date range expands in some parallels to the 1st millennium A.D. especially sherds from Zubaidah site at Saudi Arabia (Table 31, appendix 8).

Stratigraphic distribution of type WMR-L as shown in (Table 6-71) concentrated in stratum 1 in the North excavation in season 2. In season 3, the pottery distribution concentrated in stratum 1 and stratum 2 in units 42 and 44 and out of units 42 and 44.

Table 6-71 Type WMR-L pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3		Stratum 4	
		Count	Count	Count		Count	
2	NE	3	-	-		-	
3	Units 42 and 44	2	2	-		-	
	Out of units 42 and 44	2	-	-		-	

Type WMR-M

Season 2 (1269, 1224).

Form: small bowls with outward flaring rim. Open form. The body is open from the top and narrow at the bottom. Rim diameter is 10 – 12 cm. The body thickens is 5 - < 7 mm.

Ware: This type appears in fabrics 4 and 6. The fabric is fine, with small closely voids irregularities, and hard-fired and oxidised. The clay colour is red (10R 5/8).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on external surface.

Uncoated on internal surface.

Decoration: Incised (IC) vertical and horizontal lines, incised triangles and squares on external surface.

Illustrations: Plate 90, Appendix 10.

Date range: The date range covers a period from the 1st millennium B.C to early 1st millennium A.D. especially sherds from Zubaidah site in Saudi Arabia (Table 32, appendix 8).

Stratigraphic distribution of type WMR-M as shown in (Table 6-72) concentrated in stratum 1 in the North excavation in season 2.

Table 6-72 Type WMR-M pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	2	-	-	-

Type WMR-N

Season 2 (1114, 1158, 1200).

Form: Large to medium bowls with well-rounded everted to hocked rim. Closed form. The body is straight and opened under the rim. Rim diameter is 18 – 34 cm. The body thickens is between 11 - < 17 mm.

Ware: This type appears in fabrics 4 and 5. The fabric is simply smooth, flat, undifferentiated; and fine, with small closely voids irregularities. It is hard-fired and oxidised. The clay colour is red (2.5YR 5/8); red (2.5YR 5/6); and red (7.5R 5/8).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on external surface on internal surface, particularly, under the rim.

Decoration: Incised (IC) curved lines under the rim on external surface.

Illustrations: Plate 91, Appendix 10.

Date range: The date range covers a period from 6th century B.C to Islamic period, and some rim sherds from archaeological site in East of Saudi Arabia dated to long period to mid Islamic period (Half of 11th A.D. to 16th century A.D.) (Table 33, appendix 8).

Stratigraphic distribution of type WMR-N as shown in (Table 6-73) concentrated in stratum 1 in the North excavation in season 2.

Table 6-73 Type WMR-N pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	2	1	-	-

Type WMR-O

Season 2: (1097, 1350, 1256).

Season 3: (1420, 1398).

Form: Medium bowls with slightly bevelled rim. Opened form. The body is open at the top and curved, narrow near the base. Rim diameter is 18 – 22 cm. The body thickens is 7 - < 19 mm.

Ware: This type appears in fabrics 1, 2, 4 and 6. The fabric is simply smooth, flat, undifferentiated; and fine, with small closely voids irregularities, and hard-fired and oxidised. The clay colour is red (2.5YR 5/8); light yellow brown (10R 6/4); and red (10R 5/8).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on both surfaces.

Slip, red slip on both surfaces for one sherd.

Decoration: Incised (IC) straight horizontal lines on external surface.

Illustrations: Plate 92 – 93, appendix 10.

Date range: The date range covers a period from first half of 1st millennium B.C to the Islamic period (Early 'Abbasid period). This is based on close similarities between this type and other parallels from Murwab, Qatar (Table 34, Appendix 8).

Stratigraphic distribution of type WMR-O as shown in (Table 6-74) concentrated in stratum 1 in the North excavation and stratum 2 in building 39 in season 2. In season 3, the pottery distribution concentrated in stratum 1 in units 42 and 44 and out of units 42 and 44.

Table 6-74 Type WMR-O pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	2	-	-	-
	B39	-	1	-	-
3	Units 42 and 44	1	-	-	-
	Out of units 42 and 44	1	-	-	-

Type WMR-P

Season 2: (1142, 1336).

Season 3: (1522, 1364, 1394).

Form: Jar with simple outward rounded rim. Open form. The body is curved under the rim. Rim diameter is 6 – 10 cm. The body thickens is 7 - < 19 mm.

Ware: This type appears in fabrics 1, 2, 3 and 6. The fabric is fine, with small closely voids irregularities; with larger widely spaced irregularities. It is hard-fired and oxidised. The clay colour is red (10R 4/6); and red (2.5YR 5/8).

Technique: Wheel-made (WM).

Surface treatment:

Slip, red slip on external surface.

Decoration: None.

Illustrations: Plate 94–95, Appendix 10.

Date range: The date range covers a period from around the 11th century B.C. to 9th century A.D. (Early 'Abbasid period) based on close similarities between this type and other parallels from Murwab, Qatar (Table 35, appendix 8).

Stratigraphic distribution of type WMR-P based as shown in (Table 6-75) concentrated in stratum 2 in the North excavation and building 39 in season 2. In season 3, the pottery distribution concentrated in stratum 1 in units 42 and 44 and out of units 42 and 44.

Table 6-75 Type WMR-P pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	SWE	-	1	-	-
	B39	-	1	-	-
3	Units 42 and 44	2	-	-	-
	Out of units 42 and 44	1	-	-	-

Type WMR-Q

Season 2 (1183, 1352, 1332, 1351).

Form: Small to large bowls with top thickened flaring rim. Open form. The body is straight and slightly curved under the rim. Rim diameter is 14 – 36 cm. The body thickens is 5 - < 11 mm.

Ware: This type appears in fabrics 3, 4 and 6. The fabric is fine, with small closely voids irregularities. It is hard-fired oxidised and unoxidised core. The clay colour is dark reddish brown (2.5YR 3/4); red (2.5YR 5/8); and reddish brown (5YR 4/3).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on both surfaces.

Coated, beige paint on external surface on two sherds.

Slip, red slip on internal surfaces for two sherds.

Decoration: None.

Illustrations: Plate 96, Appendix 10.

Date range: The date range covers a period from half of the 1st millennium B.C. to the 6th century A.D or Islamic or/ early Islamic period through the comparison with other parallels from sites located close to Al-Ukhudud (Table 36, appendix 8).

Stratigraphic distribution of type WMR-Q as shown in (Table 6-76) concentrated in stratum 2 in the North excavation and building 39 in season 2. In season 3, the pottery distribution concentrated in stratum 1 in units 42 and 44 and out of units 42 and 44.

Table 6-76 Type WMR-Q pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	2	-	-	-
	B39	-	2	-	-

Type WMR-R

Season 2 (1192, 1321, 21284, 1389, 1487, 1481).

Form: Small to medium bowls with rounded, double thickened rim. Open form. The body is thick in one sherd and closed at the base of all sherds. Rim diameter is 11 – 20 cm. The body thickens is from 7 - < 21 mm.

Ware: This type appears in fabrics 2, 3, 5 and 6. The fabric is fine, with small closely voids irregularities; with more widely space irregularities. It is hard-fired oxidised and unoxidised core. The clay colour is red (2.5YR 4/8); weak red (10R 4/2); red (10R 5/6); yellowish red (5YR 5/8); red (2.5YR 5/6); and (10R 5/8)/.

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on both surfaces.

Coated, beige paint on external surface for one sherd.

Slip, red slip on internal surfaces for one sherd.

Decoration: None.

Illustrations: Plate 97–98, appendix 10.

Date range: The date range expands from the beginning of the 1st millennium B.C. to early 1st millennium A.D. (Table 37, Appendix 8).

Stratigraphic distribution of type WMR-R as shown in (Table 6-77) concentrated in stratum 1 and stratum 2 in the North excavation in season 2.

Table 6-77 Type WMR-R pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	3	3	-	-

Type WMR-S

Season 2: (1301, 1362, 1358, 1347, 1348, 1319, 1317, 1316, 1307, 1240, 1213, 1480, 2150, 1851, 1847, 2736).

Season 3: (1011, 1368, 1402, 1523, 1397, 1536, 1002, 1509, 1502, 1016, 4492, 4639, 1526, 1515, 1511, 1462, 1452).

Form: Small to large bowls with narrow to simple rounded rim. Open form. The body is curved and narrow at the base. Rim diameter is 13 – 30 cm. The body thickens is 5 - < 13 mm.

Ware: This type appears in fabrics 1, 2, 3, 4, 5, and 6. The fabric is simply smooth, flat, undifferentiated; fine, with small closely voids irregularities; and irregular with more widely space irregularities; and laminated, and layered. It is Hard-fired oxidised and unoxidised core. The clay colour is red (10R 5/8); black (10YR 2/1); reddish brown (2.5YR 4/4); light grey (10YR 7/1); red (2.5YR 5/8); red (2.5YR 5/6); reddish brown (5YR 6/6); reddish brown (5YR 6/8); light red (7.5R 6/6); light red (2.5YR 6/8); and very pale brown (10YR 8/2).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on external surface.

Coated, beige paint on both surfaces.

Slip, red slip on internal surfaces.

Some sherds are uncoated.

Decoration: None.

Illustrations: Plate 99–109, Appendix 10.

Date range: The date range expands from the 1st millennium B.C. to around 9th or 10th century A.D. This long date is due to similarities between this type with other parallels from different sites in Arabia. (Table 38, appendix 8).

Stratigraphic distribution of type WMR-S as shown in (Table 6-78) concentrated in stratum 1 and stratum 2 in the North excavation and building 39 in season 2. In season 3, the pottery distribution is concentrated in all stratum in units 42 and 44 and concentrated in stratum 1 in out of units 42 and 44.

Table 6-78 Type WMR-S pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	3	8	-	-
	B39	4	1	-	-
3	Units 42 and 44	7	4	2	1
	Out of units 42 and 44	5	-	-	-

Type WMR-T

Season 2: (1318, 1328, 1309, 1839).

Season 3: (2305, 2315, 4501, 1028).

Form: Medium to large bowls with flattened curved rim. Open form. The top of rim is flat, and the body is slightly curved. Rim diameter is 20 – 34 cm. The body thickens is 9 - < 15 mm.

Ware: This type appears in fabrics 1, 4 and 5. The fabric is fine, with small closely voids irregularities, hard-fired oxidised and unoxidised. The clay colour is light red (10R 6/8); dark reddish grey (2.5YR 4/1); reddish brown (5YR 4/4); and red (10R 5/8).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on external surface.

Slip, red slip on internal surfaces.

The majority of sherds are uncoated.

Decoration: None.

Illustrations: Plate 110 – 111, Appendix 10.

Date range: The date range expands from the beginning of 1st millennium B.C. to the early 1st millennium A.D., and some comparative process reach the date of 13th century A.D (Table 39, appendix 8).

Stratigraphic distribution of type WMR-T as shown in (Table 6-79) concentrated in stratum 1 and strata 2 in the North excavation and building 39 in season 2. In season 3, the pottery distribution is concentrated in all stratum in units 42 and 44 and concentrated in stratum 1 in out of units 42 and 44.

Table 6-79 Type WMR-T pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	2	2	-	-
3	Units 42 and 44	1	2	1	-

Type WMT-U

Season 2: (1032, 1227).

Season 3: (1377, 1269, 4193, 1371).

Form: Medium to small bowls with outward external taper rim. Open form. The rim of one sherd triangular top, and the body of the other sherds are straight. Rim diameter is 16 – 24 cm. The body thickens is 9 - < 13 mm.

Ware: This type appears in fabrics 1, 2, 4, 5 and 6. The fabric is fine, with small closely voids irregularities and hard-fired and oxidised. The clay colour is red (2.5YR 5/8); and red (10R 5/8).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on external surface for one sherd.

The internal surfaces are uncoated.

Decoration: Incised (IC) circles and wavy lines, and oval elements on external surface.

Illustrations: Plate 112–114, Appendix 10.

Date range: The date range covers a period from the 1st millennium B.C. to the late Islamic period (Table 40, appendix 8).

Stratigraphic distribution of type WMR-U as shown in (Table 6-80) concentrated in stratum 1 in the North excavation and stratum 2 in building 39 in season 2. In season 3, the pottery distribution

concentrated in stratum 1 and stratum 2 in units 42 and 44 and concentrated in stratum 1 in out of units 42 and 44.

Table 6-80 Type WMR-U pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	1	-	-	-
	SWE	-	1	-	-
3	Units 42 and 44	1	1	-	-
	Out of units 42 and 44	2	-	-	-

Type WMR-V

Season 2: (1165, 1283).

Season 3: (3243).

Form: Medium bowls with high-shouldered rounded rim. Open form. The body is curved. Rim diameter is 26 – 28 cm. The body thickens is 7 - < 11 mm.

Ware: This type appears in fabric 4. The fabric is fine, with small closely voids irregularities and hard-fired oxidised. The clay colour is light red (10R 6/6); and red (10R 5/8).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on both surfaces for one sherd.

Slip, red slip on both surfaces for one sherd.

Decoration: Incised (IC) horizontal lines on the external surface.

Illustrations: Plate 115–116, appendix 10.

Date range: The date range covers a period from the 7th or 6th century B.C to the Islamic period (Early 'Abbasid period) (Table 41, Appendix 8).

Stratigraphic distribution of type WMR- V as shown in (Table 6-81) concentrated in stratum 1 in the North excavation and stratum 2 in building 39 in season 2. In season 3, the pottery distribution concentrated in stratum 1 and strata 2 in units 42 and 44 and concentrated in stratum 1 in out of units 42 and 44.

Table 6-81 Type WMR-V pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	1	1	-	-
3	Units 42 and 44	1	-	-	-

Type WMR-W

Season 2: (1114, 1127, 1067, 1146, 1001).

Season 3: (1491).

Form: Small to medium bowls with sharply outward everted rim. Open form. The body is straight and opened at the top and narrow at the base. Rim diameter is 9 – 22 cm. The body thickens is < 5 13 mm.

Ware: This type appears in fabrics 1, 2, 3, 5 and 6. The fabric is fine, with small closely voids irregularities; with more widely spaced irregularities. It is hard-fired and oxidised. The clay colour is white (2.5YR 8/1); yellowish red (5YR 4/6); light red (2.5YR 6/8); black (5YR 2.5/1); and red (2.5YR 4/8).

Technique: Wheel-made (WM).

Surface treatment:

Slip, red slip on both surfaces for one sherd.

Glazed, greenish paint on both surfaces for on sherd.

The majority of sherds are uncoated.

Decoration: None.

Illustrations: Plate 117–119, Appendix 10.

Date range: The date range covers a period from the half of the 1st millennium B.C. to the Islamic period around 7th or 8th or 9th century A.D (Table 42, appendix 8).

Stratigraphic distribution of type WMR-W as shown in (Table 6-82) concentrated in stratum 2 in the North excavation and strata 2 in south-west excavation in season 2. In season 3, the pottery distribution is concentrated in stratum 1 in units 42 and 44.

Table 6-82 Type WMR-W pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	-	1	-	-
	SWE	-	4	-	-
3	Units 42 and 44	1	-	-	-

Type WMR-X

Season 2: (1162, 1161, 1131, 1262, 1163, 1117, 1118, 1144, 1157, 1479, 1231).

Form: Small to medium bowls with rounded rim, with slightly external outward edge. Open form. The body is straight and decorated by curved lines on the external surface for some sherds. Rim diameter is 10 – 40 cm. The body thickens is 5 - < 13 mm.

Ware: This type appears in fabrics 1, 2, 3, 4, 5 and 6. The fabric is simply smooth, flat, undifferentiated; and fine, with small closely voids irregularities. It is hard-fired oxidised. The clay colour is red (10R 5/8); red (2.5YR 5/6); red (2.5YR 5/8); red (2.5YR 4/8); light red (7.5R 6/6); light red (5YR 6/8); and yellowish red (5YR 5/8).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on both surfaces for some sherds.

Slip, red slip on both surfaces for one sherd.

Some sherds are uncoated.

Decoration: Incised (IC) horizontal lines under the rim on external surface.

Incised (IC) small lines of triangles and slashed (SL) lines of oval elements on external surface.

Incised (IC) horizontal lines and oval elements on external surface.

Incised (IC) horizontal lines, circles, triangles and small squares on the external surface.

Illustrations: Plate 120–122, Appendix 10.

Date range: The date range covers a period from the 1st millennium B.C. to early 1st millennium A.D (Table 43, appendix 8).

Stratigraphic distribution of type WMR-X as shown in (Table 6-83) concentrated in stratum 2 in the North excavation and stratum 2 in south-west excavation in season 2. In season 3, the pottery distribution concentrated in stratum 1 in units 42 and 44.

Table 6-83 Type WMR-X pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	9	2	-	-

Type WMR-Y

Season 2: (1183, 1195, 1202, 1215, 1333, 1238, 1182, 1159, 1642, 1100, 1278, 1254, 1251).

Season 3: (3807, 1483, 1506, 1374, 1403, 1107, 1103, 1375, 1496, 1404, 1497, 1493, 1475, 1466, 1463).

Form: Small to medium bowls with simple flattened rim. Open form. The rim of some sherds is thicker, and some are thinner. The body is straight and open at the top, and narrow at the base. Rim diameter is 6 – 20 cm. The body thickens is from < 5 mm to 17 - < 19 mm.

Ware: This type appears in fabrics 3, 4, 5 and 6. The fabric is simply smooth, flat, undifferentiated; and fine, with small closely voids irregularities. It is hard-fired and oxidised. The clay colour is red (10R 5/8); red (2.5YR 5/8); reddish brown (2.5YR 4/4); light red (10R 6/8); light red (2.5R 6/8); light red (7.5R 6/8), yellowish red (5YR 4/6) and red (10R 5/6).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige or reddish paint on external surface, and coated, beige paint on internal surface.

Coated, beige paint on both surfaces for some sherds.

Coated, beige paint on external surface.

Coated, red or black paint on external surface.

Decoration: Incised (IC) curved and lines on external surface.

Illustrations: Plate 123 – 131, Appendix 10.

Date range: The date range covers a period from the 1st millennium B.C. to the 12th to 15th century A.D. This date range based on similarities parallels from in Jazan, South of Saudi Arabia, such as Al-Sirrayn and 'Ulyab sites (Table 44, appendix 8).

Stratigraphic distribution of type WMR-Y as shown in (Table 6-84) concentrated in stratum 2 in the North excavation and stratum 2 in south walled area in season 2. In season 3, the pottery distribution concentrated in stratum 1 in units 42 and 44.

Table 6-84 Type WMR-Y pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	8	5	-	-
3	Units 42 and 44	9	2	-	-
	Out of units 42 and 44	4	-	-	-

Type WMR-Z

Season 2 (1184, 1910).

Form: Small bowls with rounded incurved rim. Closed form. The body is straight and slightly curved under the rim. Rim diameter is 6 – 12 cm. The body thickens is 7 - < 15 mm.

Ware: This type appears in fabrics 1 and 4. The fabric is simply smooth, flat, undifferentiated; and fine, with small closely voids irregularities. It is hard-fired and oxidised. The clay colour is light red (10R 6/8); and dark reddish brown (10R 4/1).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on both surfaces.

Decoration: Incised (IC) horizontal and wavy lines on the top and middle of the external surface.

Illustrations: Plate 132, Appendix 10.

Date range: The date range covers a period from 11th century B.C. or (1st millennium B.C.) to around early Islamic period (Table 45, appendix 8).

Stratigraphic distribution of type WMR-Z as shown in (Table 6-85) concentrated in stratum 1 and stratum 2 in the North excavation in season 2.

Table 6-85 Type WMR-Z pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	1	1	-	-

Type WMR-AA

Season 2 (1838).

Form: Small bowl with double thickened inverted rim. Closed form. The top of rim is thicker, and the body is straight. Rim diameter is 12 cm. The body thickens is 13 - < 15 mm.

Ware: The type appears in fabric 5. The fabric is fine, with small closely voids irregularities and hard-fired and oxidised. The clay colour is red (2.5YR 5/8).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on external surface.

The internal surface is uncoated.

Decoration: None.

Illustrations: Plate 133, Appendix 10.

Date range: The date range covers a period from the mid 11th century B.C. or (1st millennium B.C.) to early Islamic period (Table 46, appendix 8).

Stratigraphic distribution of type WMR-AA as shown in (Table 6-86) concentrated in stratum 1 in the North excavation in season 2.

Table 6-86 Type WMR-AA pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	1	-	-	-

Type WMR-BB

Season 2: (1343).

Season 3: (1533).

Form: Jars with double thickened everted rim. Closed form. The body is straight, and open under the rim to the bottom of the jar. Rim diameter is 14 cm. The body thickens is 11 - < 13 mm.

Ware: This type appears in fabrics 1 and 6. The fabric is fine, with small closely voids irregularities. It is hard-fired and oxidised. The clay colour is reddish brown (2.5YR 4/4).

Technique: Wheel-made (WM).

Surface treatment:

Uncoated on both surfaces.

Decoration: None.

Illustrations: Plate 134 - 135, Appendix 10.

Date range: The date range covers a period from mid 11th century B.C. or (1st millennium B.C.) to Islamic period (9th and/or 10th century A.D). This date range based on similar parallels found in Yemen (Table 47, appendix 8).

Stratigraphic distribution of type WMR-BB as shown in (Table 6-87) concentrated in stratum 2 in building 39 in season 2.

Table 6-87 Type WMR-BB pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	B39	-	1	-	-

Type WMR-CC

Season 2: (1211, 1634, 1633, 1194).

Season 3: (4500, 1395, 1441, 4400).

Form: Small to large bowls with everted semi-cylinder rim. Open form. The body is straight, and open at the top and narrow at the base. Rim diameter is 12 - 30 cm. The body thickens is 5 - < 15 mm.

Ware: This type appears in fabrics 4 and 5. The fabric is simply smooth, flat, undifferentiated, and fine, with small closely voids irregularities and hard-fired and oxidised. The clay colour is red (2.5YR 5/6); red (10R 5/8); and red (2.5YR 5/8).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on external surface for two sherds, and the internal surface is uncoated.

Other sherds are uncoated on both surfaces.

Decoration: Incised (IC) horizontal lines under the rim on external surface.

Incised (IC) curved lines on external surface on the middle of the body.

Illustrations: Plate 136 – 138, Appendix 10.

Date range: The date range covers a period from the beginning of 1st millennium B.C. and early 1st millennium A.D (Table 48, appendix 8).

Stratigraphic distribution of type WMR-CC as shown in (Table 6-88) concentrated in stratum 2 in building 39 in season 2.

Table 6-88 Type WMR-CC pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	1	3	-	-
3	Units 42 and 44	2	-	2	-

6.5.3 Vessel Part: Base Sherds. Hand-made

Table 6-89 All base types of hand-made pottery identified by Pottery Reference Number (PRN) from seasons 2 and 3.

Season	Type HMB-A	Season	Type HMB-B	Season	Type HMB-C
2	1009, 1015, 1141, 1150, 1017, 1174, 1201, 1166, 1330, 1552, 1360, 1271, 1566, 1562, 1169, 1257, 1289, 1549.	2	1550, 1296, 1170, 1383, 1359, 1356, 1255.	2	2192, 1297, 1029.
3	1470, 1421, 1474, 1525, 1519.	3	None.	3	4700, 4660, 1288, 1495, 1444, 1486.
Season	Type HMB-D				
2	2606, 1011, 1013, 2473, 2161, 1016, 1312, 1571, 1585, 1641, 1014, 1008, 1010, 1012, 2490, 2243, 2438.				
3	1504, 1415, 1440, 1895, 1003.				

This section represents hand and wheel-made bases, and this group of bases that share formal similarities, but do not necessarily represent a single 'type' as we would normally regard it.

Type HMB-A

Season 2: (1009, 1015, 1141, 1150, 1017, 1174, 1201, 1166, 1330, 1552, 1360, 1271, 1566, 1562, 1169, 1257, 1289, 1549).

Season 3: (1470, 1421, 1474, 1525, 1519).

Form: Large to small, very low, flat base with a straight, square and curved foot, and slightly concave base. This type is characterised by outward inclined sides and straight sides up. The body surface of these bases is irregular because of the manufacture technique. Base diameter is 7–40cm. The body thickness is 5 - < 21 mm or more.

Ware: This type appears in fabrics 1, 2, 4, 5 and 6. The fabric is smooth, flat, undifferentiated; fine with small closely voids irregularities; with more spaced irregularities; and laminated and layered. It is soft hard to hard-fired oxidised and unoxidised core. The clay colour is red (10R 4/8); reddish brown (2.5YR 4/4); red (10R 5/8); light red (10R 6/8); red (2.5YR 5/8); red (7.5R 5/8); red (10R 5/6); yellowish red (5YR 5/6); olive yellow (5Y 6/6); reddish black (7.5YR 2.5/1); white (10YR 8/1); and red (2.5YR 3/6).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on both surfaces, and coated beige paint on external surface for some sherds.

Slip, red slip on internal surface.

The majority of sherds are uncoated.

Decoration: Incised (IC) horizontal or curved lines on external surface for one sherd, and uncoated sherds.

Illustrations: Plate 139 – 144, Appendix 10.

Date range: The date range covers a period from the 1st millennium B.C. to early 1st millennium A.D (Table 49, appendix 8).

Stratigraphic distribution of type HMB-A as shown in (Table 6-90) concentrated in stratum 1 and stratum 2 in the North excavation and stratum 2 in south-west excavation. In season 3, the pottery distribution concentrated in stratum 1 and stratum 2 in units 42 and 44.

Table 6-90 Type HMB-A pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	11	4	-	-
	SWE	-	3	-	-
3	Units 42 and 44	3	2	-	-

Type HMB-B

Season 2: (1550, 1296, 1170, 1383, 1359, 1356, 1255).

Form: Small to medium, very low, flat base, with a slightly concave base, and with a thick to small rounded foot. This type is characterised by slightly curved and flared outward-inclined sides. Some bases have irregular, curved interior surface. Base diameter is 11 – 24 cm. The body thickness is 5 - < 21 mm or more.

Ware: This type appears in fabrics 3, 4, and 5. The fabric is fine with small, closely voids irregularities, with larger, more widely voids irregularities; and laminated and layered. It is hard-fired oxidised edges and unoxidised core. The clay colour is red (2.5YR 5/6); red (2.5YR 4/6); red (10R 5/6); pale olive (5Y 6/4); olive yellow (5Y 6/6); red (2.5YR 5/8); and very pale brown (10YR 8/3).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on both surfaces for one sherd.

The majority of sherds are uncoated.

Decoration: None.

Illustrations: Plate 145 – 146, Appendix 10.

Date range: The date range covers a period from the beginning of the 1st millennium B.C. to the middle Islamic period (Table 50, appendix 8).

Stratigraphic distribution of type HMB-B based on stratigraphy as shown in the table below (Table 6-91) concentrated only in strata 1 in the North excavation in season 2.

Table 6-91 Type HMB-B pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	7	-	-	-

Type HMB-C

Season 2: (2192, 1297, 1029).

Season 3: (4700, 4660, 1288, 1495, 1444, 1486).

Form: Small low ring base with rounded foot; concave bases. This type is characterised by flared outward-inclined sides. The external surface is irregular, and the internal surface is smooth. Base diameter is 9 – 10 cm. The body thickness is 7 - < 15 mm.

Ware: This type appears in fabrics 3, 4, 5 and 6. The fabric is fine with small, closely voids irregularities to irregular with more voids, irregularities. It is Hard-fired and oxidised. The clay colour is red (10R 4/8); dusky red (2.5YR 3/2); and red (10R 5/8).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on both surfaces.

Uncoated on internal surfaces for two sherds.

Decoration: None.

Illustrations: Plate 147 – 149, Appendix 10.

Date range: The date range covers a period from the 1st millennium B.C. to early 1st millennium A.D. This long date range is based on similar parallels found Zubaidah site in Saudi Arabia (Table 51, appendix 8).

Stratigraphic distribution of type HMB-C as shown in (Table 6-92) concentrated in stratum 1 in the North excavation and stratum 2 in south walled area in season 2. In season 3, the pottery distribution concentrated in stratum 1 and stratum 3 in units 42 and 44.

Table 6-92 Type HMB-C pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	2	-	-	-
	SWE	-	1	-	-
3	Units 42 and 44	4	-	3	-

Type HMB-D

Season 2: (2606, 1011, 1013, 2473, 2161, 1016, 1312, 1571, 1585, 1641, 1014, 1008, 1010, 1012, 2490, 2243, 2438).

Season 3: (1504, 1415, 1440, 1895, 1003).

Form: Small to medium high to very high ring base with rounded to doubled thickened rounded and squarish foot and concave base. This type is characterised by flared outward inclined sides, and straight vertical sides. In general, the surface of these sherds is irregular especially from external side, and this is related to the manufacture technique. Base diameter is 12 – 28 cm. The body thickness is 9 - < 21 mm or more.

Ware: This type appears in fabrics 2, 4, 5 and 6. The fabric is fine with small, closely voids irregularities, and some sherds small voids irregularities, and laminated. It is hard-fired oxidised, and unoxidised internal edge. The clay colour is red (10R 5/8); yellowish red (5YR 5/6); light red (10R 6/8); reddish brown (2.5YR 5/3); pale yellow (5Y 7/3); red (2.5R 5/8); red (7.5R 5/8); very pale brown (10YR 8/3); red (10R 4/8); olive (5Y 4/5); weak red (10R 4/4); and dark reddish brown (10R 4/1).

Technique: Hand-made (HM).

Surface treatment:

Coated, beige paint on external and internal surfaces.

Slip, red slip on both surfaces.

Some sherds have coating, beige paint or red slip on single sherd.

Decoration: None.

Illustrations: Plate 150 – 157, Appendix 10.

Date range: The date range covers a period from the 1st millennium B.C. to mid 7th century A.D (Table 52, appendix 8).

Stratigraphic distribution of type HMB-D as shown in (Table 6-93) concentrated in stratum 1 and stratum 2 in the North excavation and stratum 2 in South-west excavation, in season 2. In season 3, the pottery distribution concentrated in stratum 1 and stratum 2 in units 42 and 44.

Table 6-93 Type HMB-D pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	5	1	-	-
	SWE	-	7	-	-
	B39	3	1	-	-
3	Units 42 and 44	4	1	-	-

6.5.4 Vessel Part: Base Sherds. Wheel-made

Table 6-94 All base types of wheel-made pottery identified by Pottery Reference Number (PRN) from seasons 2 and 3.

Season	Type WMB-A	Season	Type WMB-B	Season	Type WMB-C
2	1093, 1173, 1197, 1320, 1294, 1286, 1273, 1249, 1290, 1570, 1132, 1181, 1167, 1149, 1146, 1104, 1101, 1969, 1809, 1762, 1139, 1311.	2	1763, 1561, 1554, 1764, 1848, 1846, 2082, 2489, 1121, 1156, 1272, 1551, 1289, 1292, 1237, 1355, 1354, 1353, 1352, 1162, 1123, 1171, 2488, 1155, 1222, 1288, 1299, 1302, 1240, 1143, 1116, 1115, 1030, 1282, 1312, 1279, 1422, 1291, 1150, 1128, 1107, 1168.	2	3310, 1094, 1168, 1478, 1358, 1357, 1005.
3	1369, 1367, 4726, 1489, 1532.	3	None.	3	1642, 3615, 1279, 2272, 1514, 1520, 1503, 1370, 1376, 1537, 1384, 1386, 1401, 1433, 1372.
Season	Type WMB-D				
2	1638, 1392, 2193, 1141, 1845, 2194.				
3	4740, 4741, 4764, 1396.				

Type WMB-A

Season 2: (1093, 1173, 1197, 1320, 1294, 1286, 1273, 1249, 1290, 1570, 1132, 1181, 1167, 1149, 1146, 1104, 1101, 1969, 1809, 1762, 1139, 1311).

Season 3: (1369, 1367, 4726, 1489, 1532)

Form: Medium to small, very low and flat base with squarish curved foot. Some sherds have slightly concave bases. This type is characterised by flared outward inclined sides. The both surfaces are straight with a few irregular parts especially on the interior side. Base diameter is 4 – 26 cm. The body thickness is 5 - < 21 mm or more.

Ware: This type appears in fabrics 1, 2, 3, 4, 5 and 6. fabric is smooth, flat, undifferentiated; and fine with small closely voids irregularities; and irregular in some sherds with more small voids. It is hard-fired oxidised edges, and unoxidised core. The clay colour is light red (2.5YR 6/8); reddish brown (2.5YR 4/3); red (2.5YR 4/8); red (10R 5/8); red (7.5R 5/8); red (10R 5/6); reddish brown (2.5YR 4/4); dark reddish brown (2.5YR 5/8 – 3/3); red (2.5YR 5/8); red(2.5YR 5/6); yellowish red (5YR 4/6); dark reddish grey (10R 4/1); and red (2.5YR 5/8).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on both surfaces on two sherds.

Coated, beige paint on external surface on few sherds.

Slip, red slip on internal surface for one sherd.

The majority of sherds are uncoated.

Decoration: The decoration is on an external surface, and consists of Incised (IC) curved lines near the base and curved small lines.

The majority of bases are uncoated.

Illustrations: Plate 158 – 165, Appendix 10.

Date range: The date range covers a period from the 1st millennium B.C. to late Islamic period based on close similarities between this type and other bases from different sites in Arabia (Table 53, appendix 8).

Stratigraphic distribution of type WMB-A as shown in (

Table 6-95) concentrated in stratum 1 and stratum 2 in the North excavation and stratum 2 in South-west excavation in season 2. In season 3, the pottery distribution concentrated in stratum 1 in units 42 and 44 and out of units 42 and 44.

Table 6-95 Type WMB-A pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	12	5	-	-
	SWE	-	5	-	-
3	Units 42 and 44	1	-	2	-
	Out of units 42 and 44	2	-	-	-

Type WMB-B

Season 2: (1763, 1561, 1554, 1764, 1848, 1846, 2082, 2489, 1121, 1156, 1272, 1551, 1289, 1292, 1237, 1355, 1354, 1353, 1352, 1162, 1123, 1171, 2488, 1155, 1222, 1288, 1299, 1302, 1240, 1143, 1116, 1115, 1030, 1282, 1312, 1279, 1422, 1291, 1150, 1128, 1107, 1168).

Form: Small to medium, very low and flat base, with a slightly concave centre, and with a thick rounded outward and square foot. This type is characterised by a straight, slightly curved and flared outward inclined sides. The exterior surface for most of sherds are flat, but the internal surface is irregular and curved. Base diameter is 2 – 18 cm. The body thickness is 5 - < 21 mm or more.

Ware: This type appears in fabrics 1, 2, 3, 4 and 5. The fabric is simply smooth, flat, undifferentiated; and fine with small closely voids irregularities; and irregular with more widely voids irregularities. It is hard-fired and oxidised. The clay colour is reddish brown (2.5YR 5/4); red (2.5YR 5/8); red (7.5YR 5/8); red (10R 4/8); red (10R 5/8); red (10R 5/6); dark reddish brown (10R 4/1); light red (2.5YR 6/6); yellowish red (5YR 5/6); red (2.5YR 5/6); light yellowish brown (10YR 6/4); red (7.5YR 5/6); red (10R 4/6); very pale brown (10YR 7/4); reddish brown (5YR 5/4); yellowish red (5YR 4/6); light red (10R 6/8); red (2.5YR 5/8); pale brown (10YR 6/3); brown (7.5YR 4/4); reddish brown (2.5YR 4/4); and light brown (7.5YR 6/4).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on external surfaces on some sherds.

Slip, red slip on internal surfaces on some sherds.

Coated, pale black paint on external surface.

One sherd coated on both surfaces.

One sherd coated on internal surface by beige paint.

Slip, red slip on both surfaces for one sherd.

Decoration: Incised (IC) small lines near the base on external surface.

Horizontal incised small to thin lines on external surface.

Incised circles, small ovals, and small curved lines on external surface.

Illustrations: Plate 166 – 178, Appendix 10.

Date range: The date range covers a period from the 1st millennium B.C. to late middle Islamic period or the 1st millennium A.D (Table 54, appendix 8).

Stratigraphic distribution of type WMB-B as shown in (Table 6-96) concentrated in stratum 1 and stratum 2 in the North excavation area and stratum 2 in South-west excavation and stratum 1 in building 39 in season 2.

Table 6-96 Type WMB-B pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	25	9	-	-
	SWE	-	6	-	-
	B39	2	-	-	-

Type WMB-C

Season 2: (3310, 1094, 1168, 1478, 1358, 1357, 1005).

Season 3: (1642, 3615, 1279, 2272, 1514, 1520, 1503, 1370, 1376, 1537, 1384, 1386, 1401, 1433, 1372).

Form: Small low ring base with rounded and squarish foot, and concave bases. This type is characterised by flared outward inclined sides. The surfaces of these sherds are smooth and flat. Base diameter is 6 – 14 cm. The body thickness is from 7 - < 15 mm.

Ware: This type appears in fabrics 1, 2, 3, 4, 5 and 6. The fabric is simply smooth, flat, undifferentiated; and fine with small closely voids irregularities. It is hard-fired and oxidised. The clay colour is red (7.5YR 5/8); red (2.5YR 4/8); red (2.5YR 5/6); black (5YR 2.5/1); red (10R 4/6); reddish brown (5YR 5/4); and yellowish red (5YR 5/6).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on external surface.

Slip, red slip on internal surface.

A few sherds are uncoated.

Decoration: None.

Illustrations: Plate 179 – 185, Appendix 10.

Date range: The date range covers a period from the beginning of the 1st millennium B.C. to the early 1st millennium A.D (Table 55, appendix 8).

Stratigraphic distribution of type WMB-C as shown in (Table 6-97) concentrated in stratum 1 and stratum 2 in the North excavation, stratum 2 in South-west excavation and stratum 1 in building 39 in season 2. In season 3, the pottery distribution concentrated in stratum 1, stratum 2 and stratum 3 in units 42 and 44 and stratum 1 in out of units 42 and 44.

Table 6-97 Type WMB-C pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	3	2	-	-
	SWE	-	1	-	-
	B39	1	-	-	-
3	Units 42 and 44	5	4	1	-
	Out of units 42 and 44	5	-	-	-

Type WMB-D

Season 2: (1638, 1392, 2193, 1141, 1845, 2194).

Season 3: (4740, 4741, 4764, 1396).

Form: Small to medium, high to very high ring base with square, rounded, thick rounded foot, and concave base. This type is characterised by straight vertical sides and flared outward inclined sides. The surface is smooth and straight, with a few sherds that have slightly curved external surfaces. Base diameter is 10 – 20 cm. The body thickness is 11 - < 21 mm or more.

Ware: This type appears in fabrics 2, 3, 4, 5 and 6. The fabric is fine with small closely voids irregularities, and hard-fired and oxidised. The clay colour is yellowish red (5YR 5/6); red (10R 5/8); reddish brown (2.5YR 5/4); and pale brown (10YR 6/3).

Technique: Wheel-made (WM).

Surface treatment:

Coated, beige paint on both surfaces for two sherds.

Slip, red slip on internal surface for one sherd.

The rest of sherds are uncoated.

Decoration: None.

Illustrations: Plate 186 – 188, Appendix 10.

Date range: The date range covers a period from the 1st millennium B.C. to the early 1st millennium A.D (Table 56, appendix 8).

Stratigraphic distribution of type WMB-D as shown in (Table 6-98) concentrated in stratum 1 and stratum 2 in the North excavation, stratum 2 in South-west excavation in season 2. In season 3, the pottery distribution concentrated in stratum 1 and stratum 3 in units 42 and 44, and stratum 1 in out of units 42 and 44.

Table 6-98 Type WMB-D pottery distribution.

Season	Finding location	Stratum 1	Stratum 2	Stratum 3	Stratum 4
		Count	Count	Count	Count
2	NE	3	2	-	-
	SWE	-	1	-	-
3	Units 42 and 44	1	-	2	-
	Out of units 42 and 44	1	-	-	-

6.6 Analysing the Data

6.6.1 Identifying Patterns of Chronological Variation of Trade

The process of comparative study undertaken above relied on identifying formal and technical similarities between Al-Ukhudud's pottery and that from other regional archaeological sites, providing a network of data that can clarify chronological and regional ceramic distribution. Based on this process, we found that some sherds could not be dated to a precise period, but nonetheless indicate close formal similarities between pieces from Al-Ukhudud and other sites. The comparative study of the pottery shows the connections between sites, in particular those located in the southern Arabian Peninsula, such as Hajar Bin Humeid, Marib and Hureidha in Yemen. Even though the chronology of these sites is sometimes earlier than that of Al-Ukhudud, they did coexist during the first half of the 1st millennium B.C. until the 4th or 6th century A.D; moreover, the location of these sites on or close to trade routes between South and North Arabia connects them to Al-Ukhudud. Other sites yielded close parallels to sherds from Al-Ukhudud dated as early as the late 2nd millennium B.C to the middle or even late Islamic period. This wide range includes parallels from some sites south of Al-Ukhudud such as Jurash, and in South Arabia, such as Al-Quraya, Abyan, Al-Qaraw, the northern border region of Zinjibar, Shihr, Ad-Durayb, Wadi Yala, Shabwa, and Shibam in Yemen. In addition, connection existed with sites located in south-western Arabia in Oman, such as Tawi Silaim, Salut at Wadi Bahla, Am Durrah, at Wadi Aghda', 'Amlah, Wadi Al-'Ayn, Saruj at Izki, upper Wadi Halfayn at the Suma'il, northern coast of Oman, and the United Arab Emirates, such as Al-Dur at Umm Al-Qaiwain, Ras Al-Khaimah, Al-Madam and Mleiha at Sharjah and Al-Mataf, Ras al-Khaimah, and in Central Arabia, such as Al-Kharj, (Al-Yamamah), Al-Aflaj, Zubaidah at Al-Qasim province and Qaryat Al-Faw at Wadi Ad-Dawasir. These sites dated to a similar period as Al-Ukhudud, and were thus probably related to each other considering their locations on or near the land trade route from South to North Arabia. The comparative study further shows the relationship between Al-Ukhudud and sites in the Eastern province, east of Saudi Arabia based on similar pottery found in Al-Khobar and Thaj, and dated between 300 B.C. and 3rd/4th century A.D. The connection between Al-Ukhudud and other sites continues even with sites located in the northwest and North of Saudi Arabia, such as Al-Khuraybah, Al-'Ula, Mada'in Salih in the northwest, and Qasr Al-Hamra', Tayma, Dumat Al-Jandal in the north. Even further afield, parallels with Al-Ukhudud's pottery were found in the archaeological site of Tepe Yahya at Iran, dated to 1000-500 B.C., and some parallels from Tepe Yahya dated to period II from 500-200 B.C. based on the similarity between sherds from this site and pottery from Al-Ukhudud. The comparison process also revealed similarities with pottery from

Umm Al-Jimal in Jordan. The similarity between pottery from Al-Ukhudud and that of other regional sites whether South, Central, East, West or North Arabia may give an indication of the existence of commercial connections between sites, particularly in the historic periods that occurred through the development and flourishing of Al-Ukhudud. Following this analysis, we can divide the chronological period of Al-Ukhudud as follows below in (Table 6-99):

Table 6-99 Timeline of Al-Ukhudud pottery based on the comparative study of the assemblage retrieved from seasons 2 and 3 according to manufacture techniques.

Hand-made pottery production	Wheel-made pottery production
11 th century B.C. to c. 600 A.D.	11 th century B.C. to 9 th / 10 th century A.D.
The beginning of 1 st millennium B.C. to early 1 st millennium A.D.	1 st millennium B.C. to early 1 st millennium A.D.
The early 1 st millennium B.C. to the mid-4 th century A.D.	1 st millennium B.C. to 1 st centuries A.D. or middle Islamic period (600 or 800 A.D.).
1 st millennium B.C. to 1 st century A.D.	7 th or 6 th century B.C. to early Abbasid period.
9 th century B.C. to Islamic period.	6 th century B.C. to Abbasid period (9 th / 10 th century A.D.).
Middle of 1 st millennium B.C. to 11 th century A.D.	1 st half of 1 st millennium B.C. to around 15 th century A.D.
Latter half of 1 st millennium B.C. to 13 th or 14 th century A.D.	

The table above shows the date of Al-Ukhudud pottery that discovered from seasons 2 and 3 based on manufacturing techniques, and these dates are a summary of the comparative study of the pottery presented above in this research and mentioned in appendix 8. Hand-made pottery may have been used a little earlier in Al-Ukhudud comparing with the wheel-made pottery, but through the comparative study of Al-Ukhudud assemblages we can say that hand and wheel-made pottery might be known and used in a close period or alongside at the same time, but the date of 11th century B.C or the 1st millennium B.C. are a little wide chronological range of relevance to this study, and probably has problematically poor dating resolution.

6.6.2 Identifying Patterns of Spatial Variation of Trade

As mentioned in previous chapters, this study is the only study to date that addresses the pottery from Al-Ukhdud in any level of detail. All previous studies were based on preliminary excavation reports without any depth of information about the pottery or the relationship between the site and its community in terms of pottery production and consumption or the trade and exchange, as the archaeological site of Al-Ukhdud is located on the trade route that links South and North Arabia.

The location of the archaeological site of Al-Ukhdud in southern Arabia and its relationship with other sites, in particular South Arabian settlements, such as Hajar Bin Humeid, Hureidha, Marib and other sites in Yemen, or neighbouring ones, such as Jurash in Asir made the site of Al-Ukhdud significant to many ancient Arab kingdoms. The importance of the site was clear in many South Arabian inscriptions (Jamme, 1962; Al-Otaibi, 2006; Al-Ansary and Al-Marreh, 2003, Dayton and Dayton, 1978/ 1979) that describe numerous military campaigns targeting ancient sites including Al-Ukhdud. These indicate that the campaigns were not simply military in purpose, but also aimed to take control of sites located in strategic positions. The location of Al-Ukhdud is a focal point for the sites of southern Arabia because it was one of the last South Arabian sites located on the trade routes before entering the centre of the Arabian Peninsula and travelling to/from East and North Arabia.

In this study, and through the comparative process of pottery analysis, we found that the diversity or spatial variation is closely related to trade relations and exchange between the ancient community at Al-Ukhdud and other neighbouring communities. These relationships and trade connections often assisted the development of the community, the diversity of its pottery production, and the prosperity of its commercial movements, which reflects on the extent to which local society was influenced by, or influenced surrounding communities and societies, in particular those that were contemporary in date, and located on or close to the trade routes.

One connection between Al-Ukhdud and other South Arabian settlements is clear through the presence of a type of pottery characterised by a thick and coarse fabric-mixed with straw (Fabric 1, 2, 4 and 5 in the typology above) with simple decoration of wavy lines and dots (Zarins et al, 1981). This ceramic type has been found in most sites in southern Arabia including Hajar Bin Humeid, Marib, Hureidha, Hadramawt, Shihr, Wadi Yala, Shabwa, Shibam in Yemen, Jurash in Asir and 'Aththar and Sihi sites in Jazan, Saudi Arabia. The similarities that appear on pottery can indicate different types of relationship between sites, and trade and exchange can play an important role in this relationship especially for sites located on trade routes. Al-Ukhdud's trade relationship was not

limited to Yemen, but expanded to include other parts of South Arabia, specifically the archaeological sites of Wadi Samad, Tawi Sa'id, South of Sohar, and Salut, Wadi Bahla in Oman. Even though some sites in Oman date to an earlier period than does Al-Ukhudud, the similarities in pottery from these sites with some of Al-Ukhudud's pottery may strongly signal connection between these sites. Moreover, and in terms of trading relationships, Al-Ukhudud is linked with other archaeological sites on the eastern side of the Arabian Peninsula and close to Oman, such as Qarn Bint Saud in Al-Ain, Rumeilah, Al-Madam in Sharjah and Ras Al-Khaimah in the United Arab Emirates. Although some sites in the UAE again dated to an earlier period than Al-Ukhudud, connections were nonetheless found based on formal similarities between types from Al-Ukhudud and those from these other sites. Furthermore, Al-Ukhudud's commercial relationship was not limited only to the South Arabian sites, but also expanded to connect with communities in the central and northern Arabian Peninsula. We can say that the trading relationship between Al-Ukhudud and other sites in central Arabia was strong and clear, especially with those archaeological settlements located on the trade routes. As noted above, Al-Ukhudud's pottery showed some relationships with the assemblage from Qaryat Al-Fāw, which is contemporary with Al-Ukhudud. Additionally, the trade connections of Al-Ukhudud with the wider Arabian Peninsula appeared in different sites across Arabia. Similar ceramic patterns were found in the sites of Al-Kharj and Al-Yamāmah to those of Al-Ukhudud, and date to period close to Al-Ukhudud; moreover, sherds from the site of Al-'Ayun, Layla, Al-Aflaj and Zubaidah were similar to some sherds discovered from Al-Ukhudud. These similarities indicate that the trade relationships of Al-Ukhudud were strong, and that trade and exchange between settlements in the Arabian Peninsula was active in that period.

As mentioned above, a characteristic type of southern Arabian pottery is thick and coarse, made of clay mixed with straw (Table 6-8 to Table 6-14) and see (Appendix 7), but the excavations at Al-Ukhudud have yielded new pottery made of well-levigated clay, with good quality surface treatment and thinner walls, and using a new wheel-made manufacturing technique. This development in pottery production may be an indicator of the commercial relations between Al-Ukhudud and other archaeological sites in the Arabian Peninsula, and moreover, the impact of trade movement on pottery production through the effects of new techniques of producing pottery that were transferred by these trade connections between archaeological sites in the Arabian Peninsula, either from or to the site of Al-Ukhudud (Al-Zahrani, 2004, 2014).

The trade relationship between the archaeological site of Al-Ukhudud and other settlements in the Arabian Peninsula is also evidenced in some archaeological sites in north-western Arabia, by similarities in pottery, in particular from Al-Khuraybah, Al-Ula, Mada'in Salih, Daddan, Al-Mabiyat,

Al-Hijr, Tel Al-Katheeb at Al-'Ula in Al-Madinah region, and the archaeological site of Al-Bad' and Maqna. The influence of the trade route is not restricted to the movement of commercial convoys and transport of goods; such convoys must surely have played a significant role in transporting ideas, creativities and innovation in manufacture between communities from South, Central to North Arabia. Thus, we find that the community effects were not limited between the archaeological sites of Arabia, especially between those located on or close to trade routes. Some coated and uncoated pottery from Al-Ukhudud is similar to types discovered in the Eastern province, particularly from the archaeological site of Thaj, Al-Khobar and Al-Daffi in Al-Jubail. Since the trade route crosses the Arabian Peninsula and extends to the North, connecting with the archaeological remains of other commercial centres, the impacts continue between societies due to the strong activity of land trade and its creation of prosperity in the period that preceded the emergence of maritime trade routes. In the study above, similarities were noted between Al-Ukhudud's pottery and particular sherds from sites in North Arabia. These sites belong to various periods, and some are contemporary with Al-Ukhudud despite the distance between them. In particular, in Tayma, some sherds classified as having a coarse fabric and dated to a period contemporary with Al-Ukhudud, probably reflect the influence of pottery production in Al-Ukhudud to some extent similar to the pottery production in Tayma, despite their spatial separation. In addition, similarities are found between Al-Ukhudud's assemblage and those from archaeological sites such as Al-Bujidi, Qasr Al-Hamra', Rujoum Sasa in Tayma, Qurayya, Al-Raslaniya, Kaf in Tabuk, Al-Tuwayr and Dumat Al-Jandal in Al-Jawf. Most of these archaeological sites are located in the North of Arabia, and there is the potential for direct impact between these sites and those in southern Arabia. As mentioned above, the influence of trade is not restricted to a certain area or limited only to the transport of goods between communities, rather the trade route can play a significant role in transporting new styles, creativity, thought and knowledge to different areas and to different communities or archaeological settlements.

6.6.3 Identifying Patterns of Local Pottery

A major aspect of studying pottery is understanding production conditions, whether local or non-local, because this recognition will assist us to understand the relationships between the society of Al-Ukhudud and other communities in terms of economic activities and the value of trade and exchange between communities. This understanding will also help us to recognise the nature of the trade routes and the role that pottery played in trade at that time (Figure 6-29, Figure 6-30, Figure 6-31, Figure 6-32).

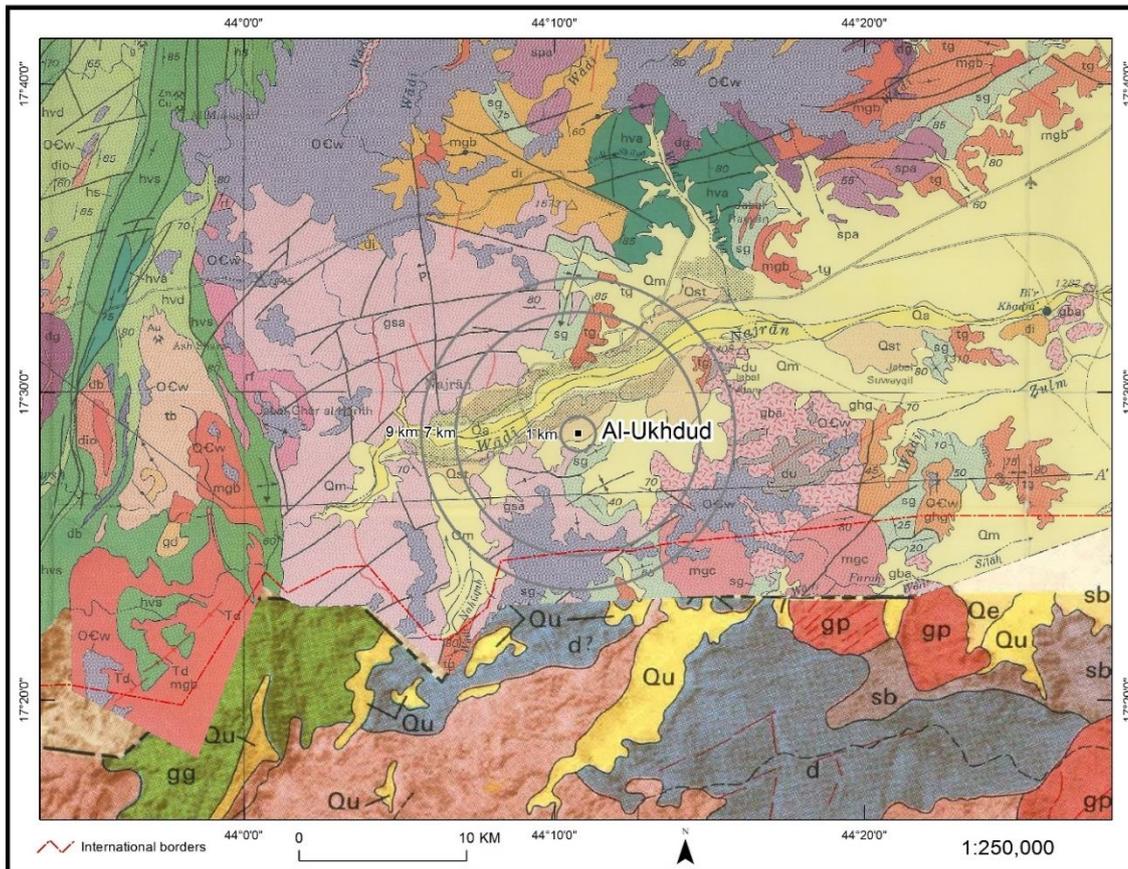


Figure 6-29: Geological map of the study area showing the location of Al-Ukhduh; the concentric circles represent regions within 1km, 7km and 9km from the site, as referred to within Dean Arnold's model of ceramic production (Arnold, 1985).

(United States Geological Survey, 1983; Ministry of Petroleum and Minerals resources, 1985). This map combines geological maps for Najran and Yemen. Edited by Mr. Humud Al-Anazi.

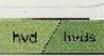
DESCRIPTION OF MAP UNITS	
SEDIMENTARY, VOLCANIC, AND METAMORPHIC ROCKS	
 Qa	ALLUVIUM—Gravel and sand in major wadi flood plains
 Qs	DOLLAN SAND DEPOSITS—Trendlines indicate dune crests
 Qst	TERRACE DEPOSITS—Wash silt containing minor sand and gravel
 Qm	ALLUVIUM, UNDIVIDED—Alluvium, colluvium, terrace gravel, gravel-plain deposits, and minor eolian sand
 Bb	BASALT—Riwaq and plugs; includes minor andesite in plugs
 Tl	TALFEE
 Qcw	WAJID SANDSTONE—Quartz arenite
PROTEROZOIC LAYERED ROCKS	
 sq	QUARTZOFELDSPATHIC SCHIST AND PARASCHISTS—Includes minor garnetiferous gneiss and schist, amphibolite, conformable tonalite, and white marble; age uncertain
HILABAN GROUP	
 hvd hvds	METADACITE—hvd, pyroclastic and volcanoclastic rocks, including crystal-tuffic tuff and epiblastic sedimentary rocks; hvds, schistose basaltic rocks, interpreted to correlate with unit hvd but including some conformable bodies and dikes of tonalite-dioritic composition
 hs hsm	METASEDIMENTARY ROCKS—Schist, slate, metagraywacke, metauff, and minor marble (m)
 mva	METAVOLCANIC AND METASEDIMENTARY ROCKS—Inter-layered
 mva	META-ANDESITE AND METABASALT—Flow rocks and flow breccia
INTRUSIVE ROCKS	
 Td	BASALT OR ANDESITE DIKES
	FELSIC DIKES—Includes aplite
	MAFIC DIKES
 rd	RHYODACITE—Conformable bodies near Habawnah
 rf	RHYOLITE-DACITE FELS
GRANITE-SYENITE SUITE	
 spa	PYROXENIC SYENITE AND PYROXENIC ALKALI FELDSPAR GRANITE—Massive to weakly foliated
 gsa	SODIC AMPHIBOLE GRANITE—Chiefly alkali feldspar granitic with alkali granite facies; generally massive
 mgc	COARSE-GRAINED MONZOGANITE—Generally massive
 mgb	BIOTITE MONZOCANITE—Locally gneissic or schistose
 gba	BIOTITE-AMPHIBOLE MONZOGANITE—Contains some ferrobasaltic(?) locally gneissic or schistose
UNASSIGNED MAFIC ROCKS	
 du	UNDIVIDED DIORITE, GRANODIORITE, TONALITE, AMPHIBOLITE, AND GREENSCHIST—Irregular large xenoliths in gneissic south of Wadi Najra
GABBRO AND DIORITE	
 go	OLIVINE GABBRO—Massive
 dg	HORNBLende DIORITE AND GABBRO—Massive to foliated
 di	BIOTITE-HORNBLende DIORITE AND GABBRO—Includes some mixed granitic rocks
TONALITE-GRANITE SUITE	
 gd	BIOTITE GRANODIORITE—Includes some quartz monzodiorite; massive
 gdt	GRANODIORITE AND TONALITE—Gneissic
 ghg	HORNBLende GRANITE GNEISS—Characterized by hornblende megacrysts
 hga tg	AASHIBA GNEISS COMPLEX—hga, biotite-hornblende granodiorite to monzogranite gneiss containing common microcline porphyroblasts and local migmatite; tg, biotite tonalite to granodiorite gneiss containing less common microcline porphyroblasts and local migmatite
 di	METADIABASE—Minor sills and dikes
TONALITE-MORITE SUITE	
 tb	BIOTITE TONALITE—Chiefly foliated and gneissic
 tbh	BIOTITE-HORNBLende TONALITE—Includes quartz diorite, trondhjemite, and gabbro; generally massive
 djo	METADIORITE AND METAGABBRO—Massive to foliated

Figure 6-30 The description of the key element units for the Najran geological map.

(Ministry of Petroleum and Minerals resources, 1985).

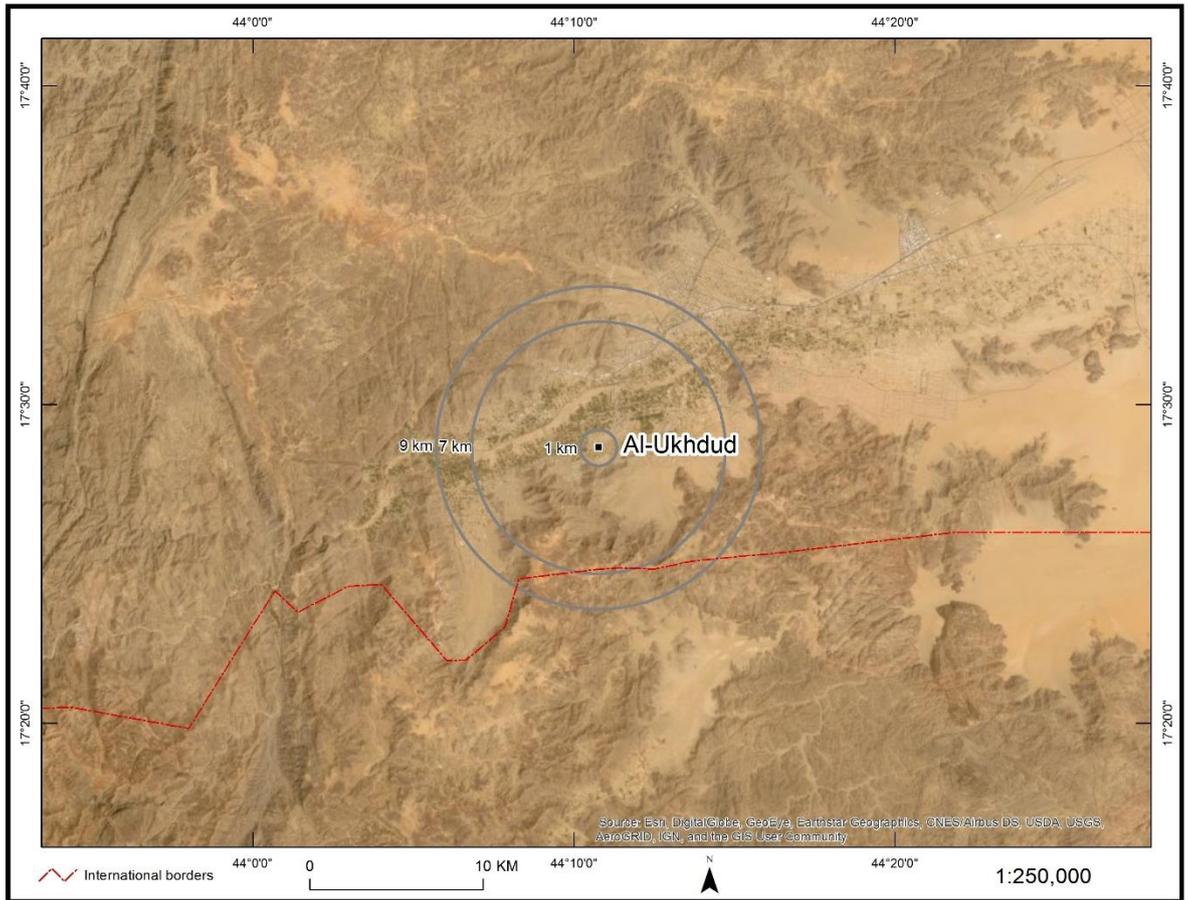


Figure 6-32: Satellite image of the study area locating Al-Ukhudud within concentric circles representing distance relevant to Arnold’s model.

Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, ING, and the GIS User Community.

In this section, I will compare the pottery revealed from Al-Ukhudud during 1996 and 2000 in light of the geology of the southern part of the Arabian Peninsula, including Najran and North Yemen. This examination will apply the Arnold Model (Arnold, 1985) in order to understand the sourcing of raw materials for pottery production in order to distinguish between domestic, regional and long-distance trade and exchange of pottery.

Arnold model is based on a distance calculation for obtaining clay for pottery production. He concluded that 84% of potters used clays found within 1 km of their territories, while the maximum distance for clay resource extraction is 7 km when making pottery for themselves, their communities or for trade. This relates to people living or working in agricultural communities, rather than hunter-gatherers. The maximum distance of 7 km is also the distance that potters travel

to search for suitable clay for making pottery. Arnold's study applied to 111 cases studies. Arnold also considered that some potters look for specific types of clays for their pottery production, such as certain types of temper to produce specific cooking pots. He found that such potters would travel up to 9 km to select the specific material for their pottery manufactures. The distance of 9 km in search of specific temper applied to 31 cases studies, or 97% (Arnold, 1985). In light of this, we can say that the location of raw materials utilised for making pottery is important to recognise which pottery is local and which may be non-local. Within the maximum distance of 9 km, pottery is manufactured locally, while above this distance, pottery is likely to be imported. This study will now assess whether we may distinguish between Al-Ukhudud's pottery, whether local or non-local, to understand the volume and movement of trade and exchange between Al-Ukhudud and other sites in Arabian.

6.6.3.1 Al-Ukhudud's Pottery Fabrics and their Geological Context

The process of applying Arnold's model to the geological map of the study area showed that the distance of 9 km covers a small area of the geological map of Yemen. Thus, it was necessary to combine two geological maps together at the same scale at the border line between Saudi Arabia and Yemen, which was done using GIS. According to Arnold's model, the 9 km area on the two geological maps includes some geological element units, which are listed in (Table 1 and Table 2, Appendix 9).

Fabric 1: Limestone, Voids and Rare to Sparse Mica.

This fabric includes some sedimentary rocks, such as limestone and quartz. The sedimentary rocks in the geological map of the study area are located within 7 km based on Arnold's model, such as terrace deposits (Qst) or river-terrace deposits (Qu), alluvium (Qm), alluvium (Qa), wajid sandstone (Ocw) and eolian sand deposits (Qs), which indicates local production. Another inclusion is straw or grass, which is an organic material available near the site, where agricultural fields depend on the water from Wadi Najran. The use of grass or straw is common in Al-Ukhudud pottery and South Arabia ceramics more generally (Zarins et al, 1981), and it seems that these materials were used as a temper to strength the clay. Shell was also found in this fabric, and this indicates that the potters in Al-Ukhudud utilised the sand deposits from the Wadi Najran where we can find some shells or some shells with small gravels. Small black grains, identified as black iron ore, also can be found in the deposits of sedimentary rocks. The less common inclusion is mica found in some sherds. All the inclusions mentioned above for fabric 1 are located within 7 km of Al-Ukhudud according to Arnold's

model. Thus, we can assume that this fabric is local and all the pottery production belonging to it is also likely to be made locally.

Fabric 2: Limestone, Voids and Grog.

This fabric contains some inclusions similar to the inclusions mentioned above in fabric 1, such as limestone, straw or grass, quartz, rare mica and shell. A new inclusion here is what we have identified as calcite, and this inclusion can be found in sedimentary rocks. Based on the geological map of the study area, sedimentary rocks are located within 7 km and 9 km according to Arnold's model. Another inclusion was described as fine and soft grains, which could be volcanic rock based on the geological map, and this type of rock is again located within 7 km and called quartzofeldspathic schist and paragneiss (SG), but the percentage of this type of rock on the map according to Arnold's method is small when compared with a large proportion of the same type located outside the 9 km circle. The same inclusion that could be volcanic rock could be a non-local inclusion if we suggest that it should be identified as basalt (Tb). In this fabric, a new inclusion appeared in some sherds, which is mudstone, and belongs to sedimentary rocks located within the 7 km on the geological map of the study area. Thus, we can say on balance that this fabric is also a local fabric and the pottery is locally produced in general.

Fabric 3: Limestone, Voids and Black Grains.

This fabric is similar to the above fabrics in terms of inclusions, so that we can see quartz, limestone, black grains, straw or grass, clay pellets and shell. All these inclusions are found within a distance of 9 km based on Arnold's model. Regarding the mica and black grains, based on the geological map of the study area, these two inclusions can belong to the 9km distance, but with only a small percentage in terms of covering area. Sodic amphibole granite (GSA) or granite rock contains a high percentage of mica, so if the mica is a frequent inclusion, we can say that it is non-local and brought from outside, because the rock GSA presents more outside the 9 km based on the geological map, and the same situation arises with the volcanic rock. In fabric 3, we have black grains as well, which could be organic or carbonaceous matter, and the use of these organic materials is probably to make the clay strong or to give the clay certain characteristics that helps the potters to produce certain types of pottery. In fabric 3, we can suggest that this fabric is local, and the production of pottery is locally made, but we can also give rise to the possibility of local and non-local production in terms of some inclusions imported from outside the distance of Arnold's model.

Fabric 4: Limestone, Voids and Quartz.

In fabric 4, the inclusions are frequent and similar to some previous inclusions mentioned above, such as limestone, quartz, straw or grass and shell. The difference here in this fabric is the common use of limestone and quartz, and all of these inclusions belong to sedimentary rocks as mentioned for fabric 1. The new inclusion here is decomposed calcareous particles, which are created depending on the firing temperature during the process of manufacture. Fabric 4 and the pottery belonging to this fabric is thus likely to be locally production.

Fabric 5: Limestone, Voids and Decomposed Calcareous Particles.

This fabric is also comparable to previous fabrics and in particular fabric 4 in terms of inclusions, such as limestone, quartz, shell, mica, decomposed calcareous particles, straw or grass and clay pellets. However, the difference between this fabric and the previous one is in the frequency of inclusions, specifically limestone and quartz, which are very common to common inclusions. These two inclusions belong to sedimentary rocks, which are concentrated within the range of the geological area of the archaeological site of Al-Ukhdu from 1 km to 9 km according to Arnold's method. Therefore, we can suggest that this is a local fabric, and the pottery production classified under fabric 5 is likely to be made locally.

Fabric 6: Mica, Limestone and Voids.

In fabric 6, mica inclusions are quite clear and medium sized. Geologically, mica is common in volcanic rocks, and based on Arnold's model, these type of rocks, such as sodic amphibole granite (GSA), Quartzofeldspathic schist and paragneiss (SG) and Undivided diorite, granodiorite, tonalite, amphibolite, and greenschist (DU) are located within the range of his method, but the highest percentage of GSA is located outside the distance of 9 km. Another inclusion is black grains, identified probably as ferro-magnesian, which is also belonging to volcanic rocks. Other inclusions are similar to the inclusions mentioned above in some fabrics, and these fabrics are classified under sedimentary rocks in the geological map of the study area. Organic materials, which can be carbonaceous matter, were also found in this fabric, but the frequency is low. Thus, the presence of this element may be to provide certain character to the clay in order to allow the potters to form and produce specific types of pottery with a particular degree of quality. To conclude, we can say this is a non-local fabric or a combination between local and non-local inclusions.

In the light of the above, we can suggest that all the fabrics that we have analysed from the pottery retrieved from season 2 and season 3, and applied to this study, are local fabrics based on the geological map and the distribution of rocks after we have applied Arnold's method, which

concluded that the inclusions brought within a distance of 9 km are local materials, while those from further than 9 km are non-local materials. However, we can make an exception for fabric 6 based on its inclusions and say that fabric 6 included local and non-local materials within and outside the distance of 9km, while we cannot disregard the possibility of some non-local elements in vessels of fabric 3, although the situation is less clear than for fabric 6.

Chapter 7 Pottery Distribution and Economic Evidence at Al-Ukhudud

7.1 Introduction

The pottery discovered from Al-Ukhudud during seasons 2 and 3 has been presented in chapter four and analysed in chapter six. In this chapter, I will concentrate on the interpretation of these ceramic data, and their implications in terms of the relationship between pottery production, consumption and exchange at Al-Ukhudud. I will conclude with some remarks on the nature of the regional economy from the perspective of the ceramic evidence presented above, and offer some suggestions for future research directions.

7.2 Proposing Interpretations

Studying archaeological artefacts can provide significant information about communities, including social, political and economic data. The study of Al-Ukhudud's pottery in this research started from a desire to know more about these features, particularly economic activity in Al-Ukhudud and the region in general. Therefore, the aims and objectives of this research were based on understanding the nature of trade and economic exchange in Al-Ukhudud and determining the impact of communication between the local population and surrounding societies by means of analysing and characterising ceramic assemblages. An additional aim was to understand the economic system of Al-Ukhudud's society through the identification of traded vs local pottery, with implications for the movement of people, materials and goods within and beyond the region, and the influence of transportation on interaction and connectivity. Lastly, I aimed to better understand and contrast patterns of trade, whether local or non-local, and the consumption of local materials found in Al-Ukhudud from c.500 B.C to c.600 A.D in terms of analysing and understanding the distribution of materials in the site.

Although the excavations at Al-Ukhudud covered only a small proportion of the site, the abundance of pottery discovered in general indicates large-scale pottery consumption. This study focused on material recovered both from the walled enclosure and outside it. The quantity of pottery discovered from the excavated areas within the walled enclosure is higher compared with the pottery revealed from the South-west and North excavations in season 2, and this may indicate

more intensive or prolonged activity inside the walled enclosure. As mentioned above, all the excavations within the walled enclosure concentrated only on its eastern side; therefore, we do not have sufficient data concerning the rest of the walled enclosure, or more importantly, the rest of the fenced archaeological area, to draw conclusions as to the overall organisation of the settlement. Instead, this concluding chapter will focus on discussion of the following questions:

1. What evidence does the pottery provide for the presence of differential pottery supply/consumption in the various areas of the site we have examined? Can we identify different patterns of spatial distribution that might speak to particular activities or localised trends?
2. Can we identify how pottery production and consumption may have change through time at the site, despite the low-resolution stratigraphic record?

In what follows, these questions will be investigated with reference to the horizontal and vertical distribution of different technologies, fabrics and forms, and the results will be compared with assemblages from other sites in the region.

It is important to emphasise that, although the pottery presented in chapter six was retrieved from different strata, not all the strata contained pottery; for instance, the B39 excavation uncovered five strata, but pottery was discovered only in stratum 1 and stratum 2. Of course, it is clear that Stratum 2 from one excavated area does not correspond in terms of archaeological stratigraphy to Stratum 2 in another area, nor is the analysis of material through this point intended to imply any such straightforward relationship. Nonetheless, the strata numbers assigned by the excavators represent relative vertical relationships within each excavation, and provide an (admittedly imprecise) index for relative depths within areas. Until such time as more accurate excavations take place, there is no other mechanism through which to approach this confused question.

7.2.1 The Spatial Distribution of Ceramics

7.2.1.1 Technological Distribution: Hand-made vs Wheel-made Pottery

The technological distribution of Al-Ukhdud's pottery includes both hand- and wheel-made production, and based on comparative study of the pottery, we can say that hand- and wheel-made pottery was used in close periods or at the same time but with different production rates (Figure 7-1). Based on the tables presented in chapter six (see above Table 6-16, Table 6-17, Table 6-18, Table 6-19, Table 6-20, Table 6-21, Table 6-22, Table 6-23, Table 6-24, Table 6-25, Table 6-26, Table

6-27, Table 6-28, Table 6-29, Table 6-30, Table 6-31, Table 6-33, Table 6-35, Table 6-37), we can see the comparative quantities of both techniques. Generally, in all excavations except the North excavations, hand-made production was present in a larger quantity than wheel-made pottery. Comparison with the proportions of manufacture techniques in the Hajar Bin Humeid assemblage (discussed above in chapter four) is of interest: Van Beek (1969) noted that the majority of South Arabian pre-Islamic pottery in Hajar Bin Humeid is hand-made, and only 4% of its sherds were manufacture by wheel, a figure significantly lower than any of the areas examined in Al-Ukhud, and implying that some different processes of production and supply were at work in these two sites. We will now consider these distributions in more detail, area by area.

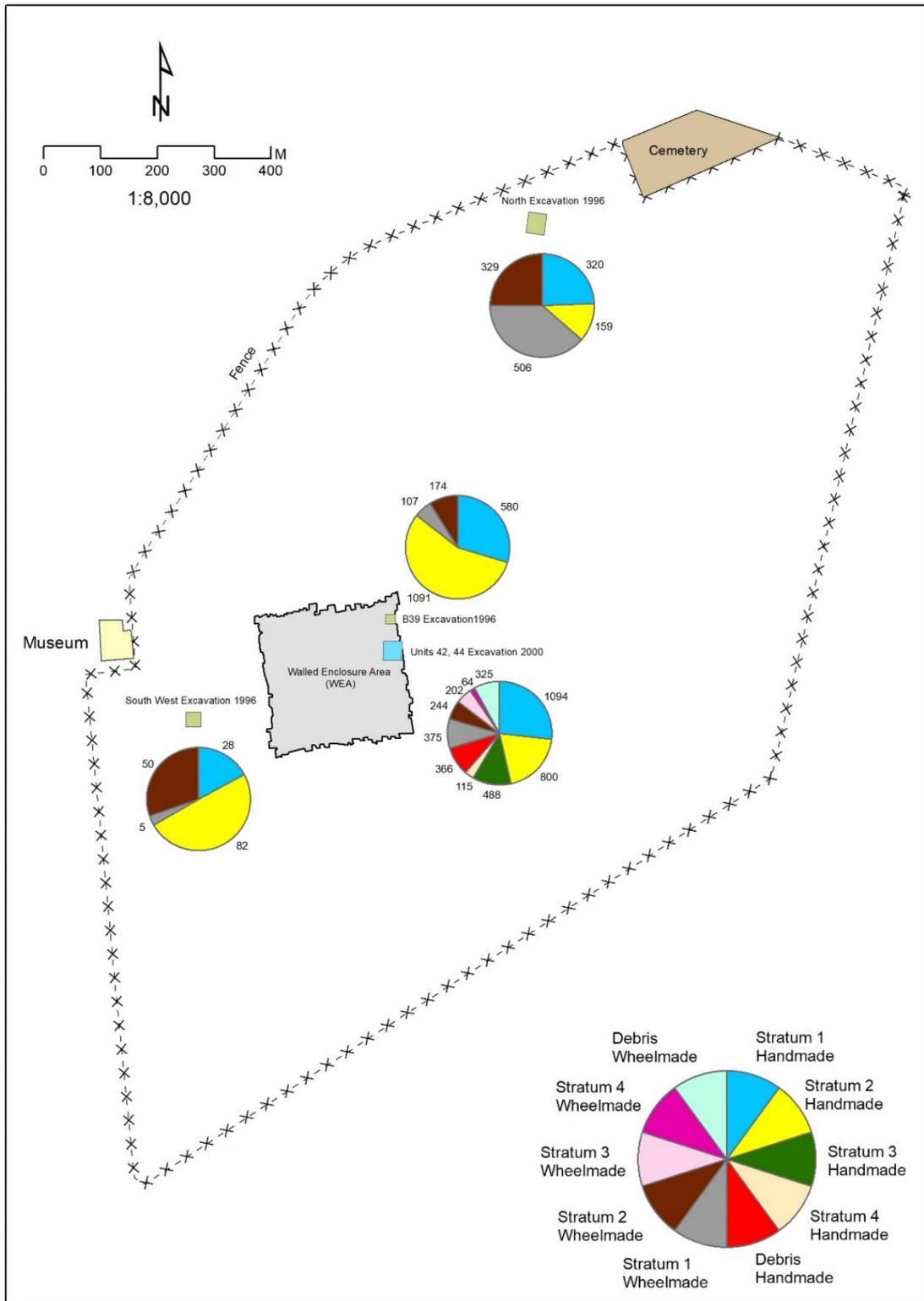


Figure 7-1 Map of HM vs WM distribution in all excavations of seasons 2 and 3.

South-west excavation:

In the South-west excavation, hand-made production dominates over wheel-made vessels throughout, but especially in stratum 1, likely to reflect later activity in this area. This may reflect the fact that activity in this area probably ended or was reduced prior to the later period within which wheel-made material seems to have come to dominate (discussed below for the North excavation, an area which continued in use into the early Islamic period and beyond). Alternatively or additionally, the importance of this part of the site was probably reduced in comparison to the walled enclosure in later times (Table 7-1), given that it consists of small units located at some distance from the walled enclosure where more activities of the inhabitants of Al-Ukhudud took place. Having said that, the overall proportion of hand-mades to wheel-mades is very similar to the assemblage excavated from Units 42 and 44; both these corpora have a lower proportion of hand-mades than does the B39 assemblage. Clearly, there are significant variations in consumption practice regarding these technologies across the site, with B39 and the North excavations at opposite ends of the range. This pattern may have both chronological and functional explanations.

Table 7-1 Quantification of HM & WM pottery based on strata of the South-west excavation, season 2.

Strata	No. of Hand-made	Hand-made %	No. of Wheel-made	Wheel-made %	Total
Stratum 1	28	85%	5	15%	33
Stratum 2	82	62%	50	38%	132

Walled enclosure excavations:

Looking at the excavations within the walled enclosure from both seasons, we realise that the highest quantity of hand-made pottery was discovered in both Stratum 1 and 2 of B39, and with high proportions also in the later parts, Debris, Stratum 1, 2 and 3, of units 42, 44 excavations (Table 7-2, Table 7-3). In fact, hand-made production dominates both excavations; however, the higher proportion of hand-made material appears overall in the B39 excavation. In units 42, 44 excavation, a proportion of hand-made pottery approaching those seen in B39 excavation comes only from the central layers, particularly Stratum 1, 2 and 3. In term of wheel-made production from both excavations, the highest and lowest layers of units 42, 44 excavation have elevated levels of wheel-made production in comparison to the middle levels Stratum 1, 2, and 3 in the same excavation.

The very low proportion of wheel-made pottery from B39 is striking. There may be hints of change through time in the data for units 42, 44 excavation, where there is a slightly increased dominance of hand-made pottery in the middle Stratum 1, 2 and 3, with more wheel-made production in the surface debris and Stratum 4. If this a chronological trend, the relationship between the choice of hand-made vs wheel-made pottery over time is more than a straightforward unidirectional trend, indicating complex patterns of availability and/or consumption through Al-Ukhdud's history.

Table 7-2 Quantification of HM & WM pottery based on strata of B39 excavation, season 2.

Strata	No. of Hand-made	Hand-made %	No. of Wheel-made	Wheel-made %	Total
Stratum 1	580	84%	107	16%	687
Stratum 2	1091	86%	174	14%	1265

Table 7-3 Quantification of HM & WM pottery based on strata of units 42, 44 excavation, season 3.

Strata	No. of Hand-made	Hand-made %	No. of Wheel-made	Wheel-made %	Total
Debris	366	53%	325	47%	691
Stratum 1	1094	74%	375	26%	1469
Stratum 2	800	77%	244	23%	1044
Stratum 3	488	71%	202	29%	690
Stratum 4	115	64%	64	36%	179

Due to the limited excavated area, it is difficult to argue for specific reasons for this shift of technological production, but, observing that hand-made production in Al-Ukhdud was common, we might suggest that this technique was the preferred technology for the local community of Al-Ukhdud for the main part of its history. As just noted, the changing proportions of hand-made and wheel-made pottery discovered in units 42, 44 in all levels may reflect a more complex development of technological practices on the site than a simple evolutionary shift from one technology to

another. Additionally, we can probably say that the higher proportion of wheel-made pottery in units 42, 44 in the Debris layer may reflect deposition on the surface in later periods as seen in the North excavation, and this might indicate that the walled area was no longer so intensively used at the time when this material was deposited. A final important point relates to the differences in character seen between the two excavations inside the walled enclosure: even though B39 and units 42, 44 are spatially closely related to each other, the differences between them are reasonably clear, despite uncertainty as to whether these patterns should be interpreted chronologically and/or functionally.

North excavation:

In contrast, the North excavation, some distance from the walled enclosure, presented a higher proportion of wheel-made than hand-made pottery in both strata (Table 7-4). The proportion of wheel-made production in stratum 2 is slightly higher than in stratum 1, indicating that the contrast with other excavated areas discussed above continues throughout the depth of this excavation. The implication is that, during the later phases of activity at this site, these technologies were in broadly simultaneous use; alternatively, stratum 2 went through deposits covering a longer period, obscuring change through time, and we cannot be sure unless more accurate excavations are conducted to provide a clear vision of the strata. Generally, we should be careful when dealing with small numbers of relatively poorly defined deposits because sometimes they do not present the reality of the excavated areas.

Overall, though, the dominance of wheel-made production in both strata of the North excavation presumably indicates that the decline of hand-made production to the levels seen here took place after activity had reduced to the northern part of the site.

Table 7-4 Quantification of HM & WM pottery based on strata of the North excavation, season 2.

Strata	No. of Hand-made	Hand-made %	No. of Wheel-made	Wheel-made %	Total
Stratum 1	320	39%	506	61%	826
Stratum 2	159	33%	329	67%	488

In addition to this pattern, clear differences in the quality of the pottery from this area were noted during analysis. Although many sherds exhibited the thick walls, minimal surface treatment and coarse fabrics and surface finishes seen elsewhere, we noted some sherds of high quality in terms of well-levigated clay, careful surface treatment, thinner walls, and decorative elements from here. Given the presence of the congregational mosque in this part of the site, the explanation for these differences seems highly likely to be a chronological one. This is supported further by the presence of glazed wares in these assemblages; these and other wares surely reflect the impact of trade and exchange with surrounding communities along the trade routes to the north. We do not yet have reliable evidence to indicate that Al-Ukhudud's pottery was used to transport goods such as frankincense and myrrh, which can be challenging for overland trade because of the weight and size of the vessels, and the possibility of breakage; as an alternative, pottery may have been traded as a commodity in itself (as with the Islamic-era glazes), by merchants or potters themselves. However, the evidence that we have helps us to suggest that the influence of other communities in Arabia expanded through the trade routes based on the impact of new features on Al-Ukhudud's pottery. Equally, the presence of a higher proportion of wheel-made vessels in local fabrics indicates a shift towards the use of wheels in local production: developments were occurring around Al-Ukhudud, and imports clearly do not alone account for the increase in wheel-made ceramics, as we will now investigate in more detail.

7.2.1.2 Imported Pottery vs Local Production

As seen in chapter six above, the comparative study of Al-Ukhudud's pottery recovered during seasons 2 and 3 identified formal similarities between Al-Ukhudud's assemblage and pottery from sites in the areas surrounding Al-Ukhudud or from other sites in Arabia. This comparative study was applied to types from Al-Ukhudud, identifying parallels from different sites with the same features. These similarities can offer clear evidence of the impact of connections between local communities and external populations. The comparative process in general shows that the similarity between types can be dated to an early, and long, period, but it is difficult to argue more precisely due to the absence of a clear chronological sequence for the framework of the development of South Arabian culture and archaeology (Beeston, 1984). The classification of Al-Ukhudud's pottery and the identification of the fabrics of the pottery addressed in this project are a significant matter because a key contribution of this study is the creation of a scientific ceramic fabric series – the first in the region – and the identification of local and non-local fabrics through the application of Arnold's ceramic resource model (Arnold, 1985). Pottery fabrics were examined visually and under the

microscope according to model best-practice guidelines. The resulting assemblage and data set is the first time such large numbers of sherds have been scientifically examined in the region, and hence represent a methodological significant step forward in Arabian ceramic studies (Figure 7-2). We conclude that most of Al-Ukhduḍ’s ceramic fabrics are local and could have been sourced within 9 km of the site, which means that the local community must have been producing pottery to meet its needs, using the material that was available in the surrounding environment (see above Figure 6-29, Figure 6-32).

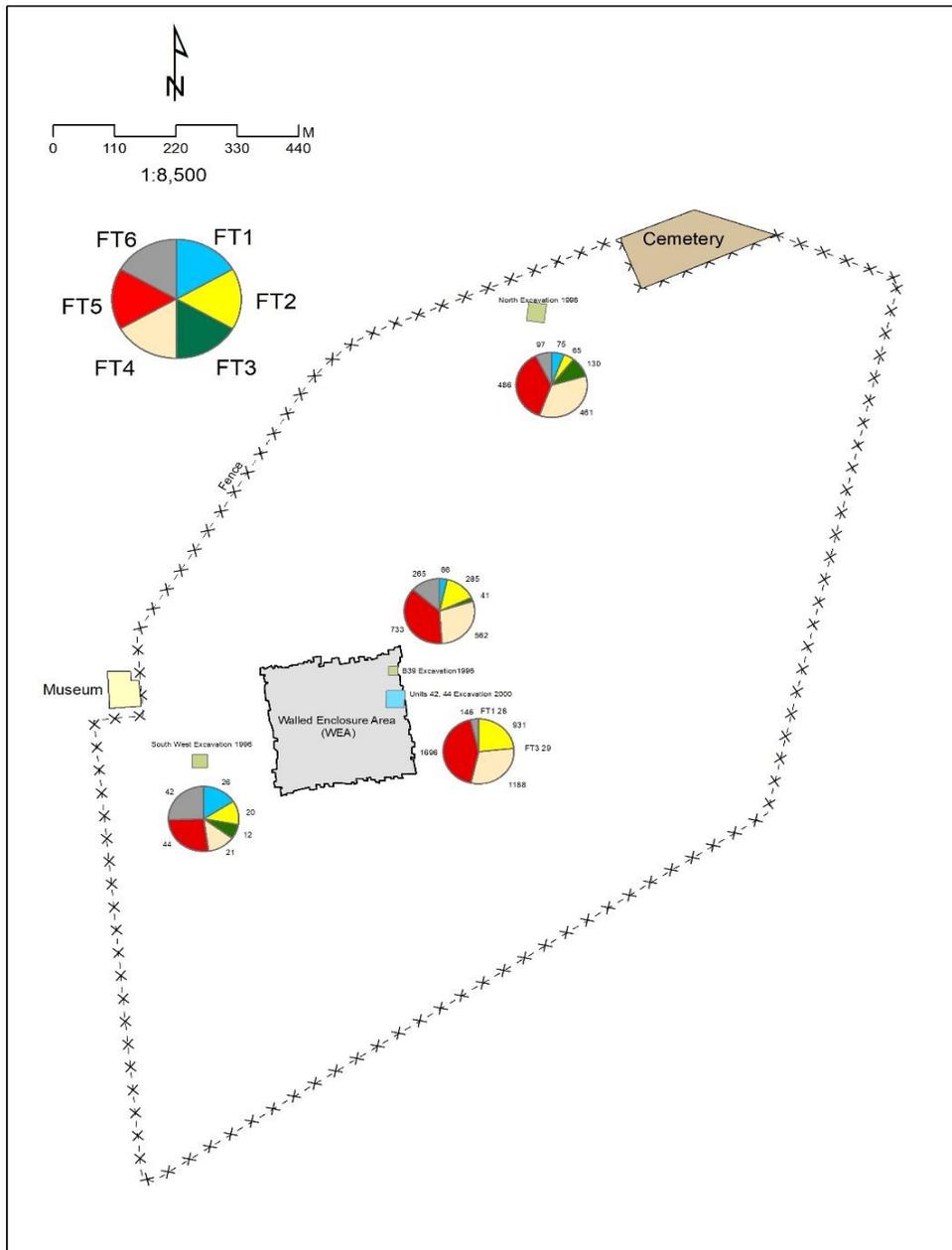


Figure 7-2: Map of the distribution of all fabrics from both excavations of season 2 and 3.

However, the identification of fabric 6 and fabric 3 as possible non-local fabrics is of significance, and might indicate either that potters in Al-Ukhudud used non-local materials, or a mixture of local and non-local materials, to produce certain types of pottery with certain types of inclusions, or that these fabrics were produced at a greater distance from the site, most likely as imported pottery. This could imply a role for trade having an impact on pottery production or consumption, as trade conveys could deliver external materials, ceramics and influences for new methods of pottery production to the local community. Another point relating to non-local fabrics is that the proportion of hand-made vessels in fabric 6 is higher than in fabric 3, which could be an indication of the development of pottery production, and the use of new materials brought from outside the vicinity of the site to produce pottery to meet the needs of local society at Al-Ukhudud.

Table 7-5 Summary of non-local fabric distribution between outside and inside the walled enclosure.

Fabric	Outside walled enclosure						Inside walled enclosure					
	South-west excavation			North excavation			B39 excavation			Units 42, 44 excavation		
	Count	Out of total	%	Count	Out of total	%	Count	Out of total	%	Count	Out of total	%
FT 3	12	165	7.3%	130	1314	9.9%	41	1952	2.1%	29	4028	0.7%
FT 6	42	165	25.5%	97	1314	7.4%	265	1952	13.6%	146	4028	3.6%

Table 7-5 above shows that a higher proportion of non-local/imported fabrics, probably equivalent to traded goods, are present outside the walled enclosure than inside it, based on the distribution of non-local fabrics 3 and 6. The South-west excavation presents the greatest percentage (7.3% of its sherds being of fabric 3, and more notably, 25.5% of fabric 6). This is high compared with the percentage of the same fabrics inside the walled enclosure, although here, the difference between B39 and units 42, 44 continues to be notable, with higher proportions of non-local fabrics in B39 (Figure 7-3). We might very tentatively connect the high proportion of non-local pottery in the South-west excavation as reflecting the potential location of markets/trading activity on the periphery of settlements, as discussed above in chapter three. The lower proportion of non-local fabrics inside the walled enclosure is of note: access to imported goods is often regarded as a privilege of the elite, and this is at odds with interpretation of the walled enclosure as the most important/ elite part of the site (although we cannot rule out chronological factors underlying this

trend). The data strikingly reinforce the patterns already observed of differences in ceramic consumption between B39 and units 42, 44, despite their close proximity within the walled enclosure. To the high proportion of hand-mades in B39 discussed above can be added a greater proportion of non-local fabrics than is seen in units 42, 44. It is again frustratingly difficult to tie these differences to chronological vs functional factors, but we should note the broad similarity both in form and interpretation offered by the excavators of these complexes, meaning that the ceramic evidence has potentially revealed differences not overtly expressed in the architecture. The relatively higher proportions of fabric 3 to fabric 6 in the North excavations is likewise of note, and its likely to reflect the continued use of this clay/these imported vessels into later times.

In terms of comparison with the Hajar Bin Humeid assemblage, the only data Van Beek provides is the percentages of the pottery based on a combination of fabric inclusions and surface treatments (1969: 89-98). Van Beek provides proportions of pottery by inclusion type in his publication. He noted that 83.5% of sherds are dominated by straw; 9% by steatite; 8% by mixed lithographic inclusions; and only 0.2% by sand. Since all these inclusions are locally available in the vicinity of Hajar Bin Humeid, Van Beek's data lacks the resolution required to identify local vs imported pottery. Given the difference in approach to fabric and finishing recording between that study and the present one, sadly no direct comparison is possible, a reality that further supports the use of systematic and scientific approaches to ceramic recording in the region in the future.

Table 7-6 Quantification and percentage of hand- and wheel-made manufactures in non-local fabrics 3 and 6 from all the analysed excavations.

Fabric	No. of	%	No. of	%	Total (N)
	Hand-made		Wheel-made		
FT 3	97	46%	115	54%	212
FT 6	409	74%	144	26%	553

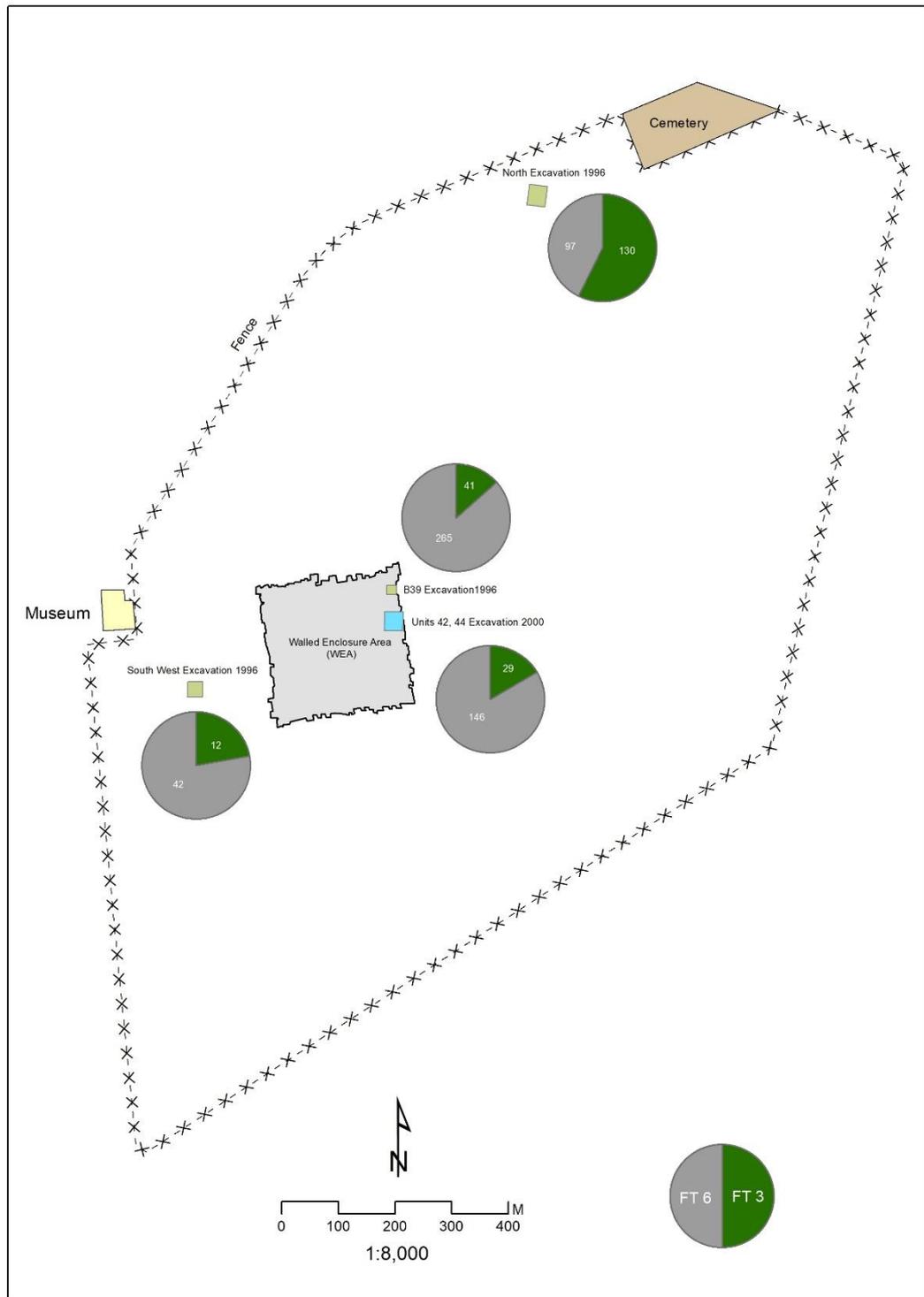


Figure 7-3 Map of the distribution of non-local fabrics 3 and 6 in all excavations of seasons 2 and

3.

7.2.1.3 Formal Diversity

As mentioned above in chapter six, the highest proportions of sherds of unidentified form came from within the walled enclosure areas, especially in the B39 and units 42, 44 (see above Table 6-6 Table 6-7, and below Table 7-7).

The high proportion of sherds of unidentified form in some assemblages might reflect the presence of more vessels of closed form, since these produce fewer diagnostic sherds on breakage, and thus yield more unidentified forms on recording. The combination of a higher percentage of jar forms with the lowest percentage of unidentified forms in the South-west excavations might also support this suggestion. Regarding other forms, in particular small, medium and large bowls, the excavations revealed relatively large quantities of these forms. These are not distributed evenly across all areas: the South-west excavations had the highest proportion of bowls (26%), while B39 had only 13% bowl forms. Also taking into consideration the much less distinct figures of 22% for the North excavations and 20% for units 42, 44, we can see reduced evidence for bowl use within the walled enclosure (Figure 7-4). Moreover, small bowls were commoner in the South-west, and less significantly in the North excavations; the higher proportions of large bowls within the walled enclosure excavations are probably not significant. If we consider small bowls as an index of drinking and/or more individual/particular styles of dining practice, we can identify distinct differences at least between the South-west excavations and the walled enclosure excavations.

To return to comparison with material from Hajar Bin Humeid, Van Beek's study focused on 591 pieces, which is 21% of the whole assemblage; these were identified exactly because they are complete forms (Van Beek, 1969: 82), which are unavailable from Al-Ukhudud. In the Hajar Bin Humeid project, the formal types are bowls, jars, and less common forms and bases, which are similar to some forms of Al-Ukhudud's pottery, but Van Beek unfortunately does not provide any proportions of different forms in his assemblage, rendering detailed comparison impossible.

Table 7-7 Quantification of formal types from the excavations of season 2 and season 3.

Formal type	Outside walled enclosure				Inside walled enclosure			
	South-west excavation		North excavation		B39 excavation		Units 42, 44 excavation	
	No. of sherds	%	No. of sherds	%	No. of sherds	%	No. of sherds	%
Unidentified form	113	69%	1022	78%	1677	86%	3208	80%
Jar	9	5%	3	0%	8	1%	20	0%
S. bowl	24	15%	143	11%	75	4%	370	9%
M. bowl	14	9%	121	9%	126	6%	305	8%
L. bowl	4	2%	26	2%	66	3%	125	3%
Total	164	100%	1315	100%	1952	100%	4028	100%

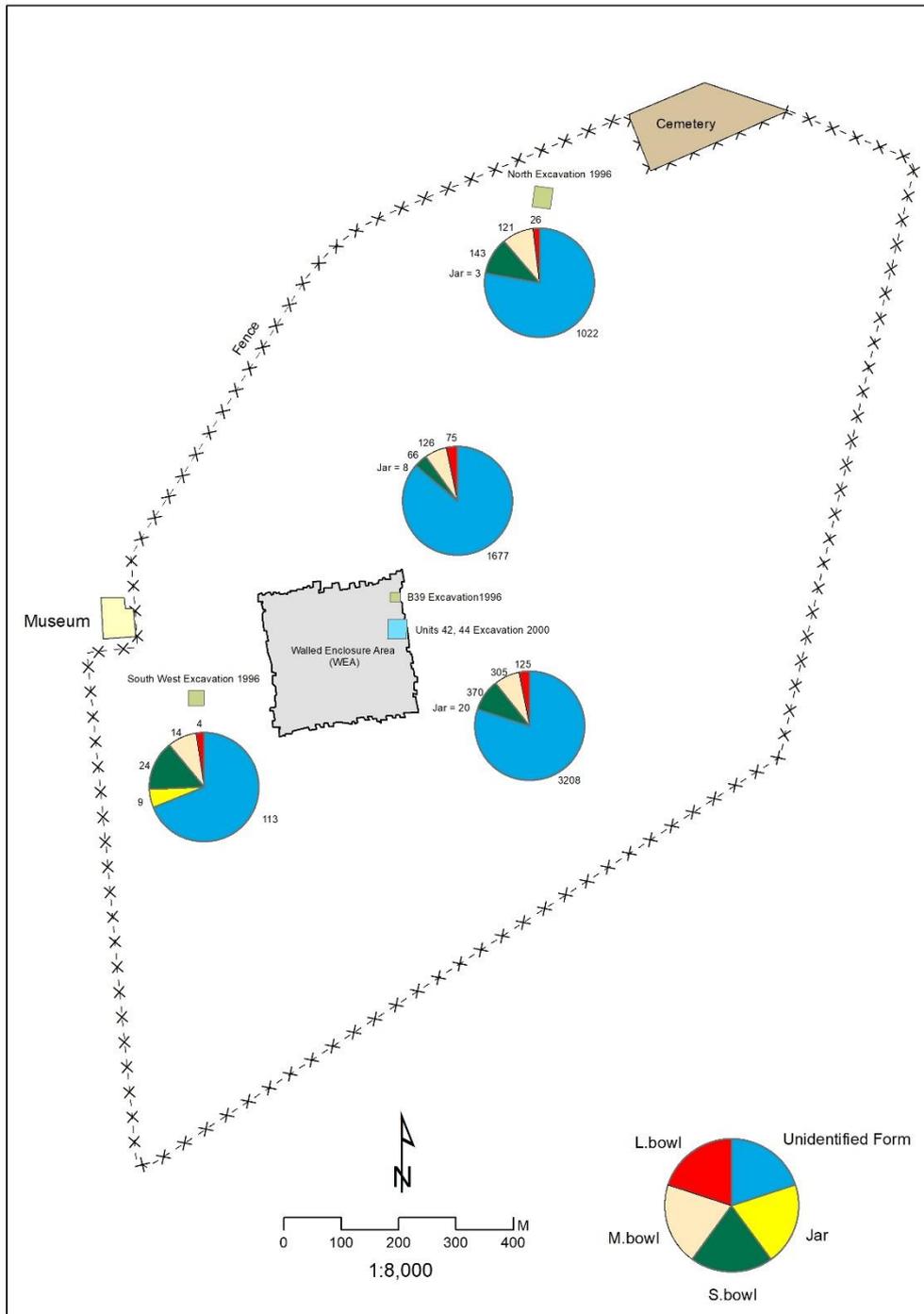


Figure 7-4 Map of the distribution of formal types discovered from all excavations in seasons 2 and 3.

7.2.1.4 Change Through Time

The archaeological excavations in Al-Ukhudud and the artefacts discovered and studied from the site provide some chronological patterns. The data presented in this research confirmed continued

activity in Al-Ukhudud to Byzantine and early Islamic times, in particular in the North excavation. In this part of Al-Ukhudud, the glazed pottery found dated to this late phase of activity. Glazed sherds represent only 0.3% of the total number of sherds that this study addressed, and this small proportion represents sixteen sherds from inside the walled enclosure area, which is 0.2%, and seven sherds from outside enclosure, which is 0.09%. In terms of manufacture technique and fabric, thirteen glazed sherds are wheel-made, whereas ten glazed sherds are hand-made, and they belong to Al-Ukhudud local fabrics, such as FT1, FT2, FT4 and FT5. The glazed pottery can thus indicate not only that the site of Al-Ukhudud was active during the Islamic period, but that it may have been a production site for local glazes. Glazed pottery has been discovered in Arabia in different locations, but the majority has been retrieved from site in North, North-west, and East Arabia (Ingraham et al, 1981). Quantities of glazed pottery have been found in several archaeological sites in Arabia that date to the Islamic period between 9th and 15th century A.D. (Al-Thenyan, 2006: 170-175). In the North of Saudi Arabia, glazed pottery found in sites located in Rafḥa and Līnha cities is dated to the 'Abbasid period, similar to the sherds found in Al-Ukhudud (Gilmore et al, 1982: 20-21). In the East of Arabia, glazed pottery termed "Gulf Glazed Ware" was discovered from Failak island in Kuwait, and dated to the Islamic period between 7th and 10th century A.D. (Di Miceli, 2019: 136-137; Mierzejewska, 2019: 170-171). As mentioned above, the presence of the mosque in the North excavation is clear evidence that settlement here continued into the Islamic era, particularly the 'Abbasid period. However, in the site of Al-Ukhudud, no Sassanian pottery glazes were found during the excavations.

Beyond the clear presence of later activity in the northern area, the challenges of unpicking the site's chronology are considerable. Given the limitations of the excavation methodology, it is difficult to understand the stratigraphy of these excavations so as to be able to provide an accurate date range for each stratum and its artefacts. Clearly, the South-west excavation and B39 excavation were in use earlier than the North excavation; some similarities in artefacts between these excavations could suggest that they might have been contemporaneous. Likewise, the B39 excavation and units 42, 44 excavation, located inside the walled enclosure and close to each other, have elements of the same architectural layout, suggesting a close chronological relationship between these two units, although this contrasts with the ceramic differences between these two areas noted above. Because of the insufficient stratigraphic data, it remains a huge challenge to accommodate and understand whether these trends reflect chronological differences or functional ones.

The trends of change through time do appear in the stratigraphy of individual excavations, but these are not straightforward evolutionary developments. In terms of technology, the data presented above indicates different trends in proportions of hand-mades vs wheel-mades from deeper strata to shallower ones across excavations. The South-west excavations show a shift towards hand-made wares in the upper level, while in the North excavations and in B39, the proportions remain relatively constant across strata, dominated by wheel-mades and hand-mades respectively. As already noted, units 42, 44 excavations a non-linear trend with a higher proportion of hand-made wares in the middle strata. If we accept that the change in manufacturing technique between wheel-made and hand-made may reflect the influence of connections between the local community of Al-Ukhudud and other individuals through trade and exchange, we can see that this was not a simple unidirectional development.

Regarding form, the data presented below (Table 7-8) indicate different trends in proportions of formal types through the excavated strata outside and inside the walled enclosure. Generally, the trends regarding changing form through time in Al-Ukhudud's pottery are not very distinctive, which is in part due to the large percentage of sherds that were fragmented and not identified to a specific form type in all strata of all areas from the excavations of both seasons 2 and 3. However, there seems to be considerable uniformity in proportions of formal types in different strata, in particular in the North and B39 excavations, and in the upper strata in the units 42, 44 excavation. The strongest trend is represented in the units 42, 44 excavation, where the deepest stratum has the lowest proportion of diagnostics of all types, with a constant increase in the proportion of bowl forms in each stratum towards and including the surface debris, which provided the highest percentage of identifiable forms. However, this may reflect issues of preservation as much as it reflects significant changes to the formal composition of the assemblage through time, given that jar forms result in fewer diagnostic sherds than do bowls. It is also important to note the South-west excavation, where we can see a clear shift from the deeper/earlier stratum with a higher percentage of bowls to a higher/later stratum with more jars. In this excavation, stratum 1 has by far the highest proportion of jars compared to anywhere else in the excavations of seasons 2 and 3, and the proportion of bowl forms is relatively high in stratum 2; but since the total size of this assemblage is very low, at only 24 and 140 sherds respectively, and not all forms were present in this excavation in both strata, we cannot conclude too much information from this area. Therefore, having looked at this data, we cannot really distinguish any trends that have potentially clear and meaningful chronological implications. As we mentioned above, the importance of the archaeological site of Al-Ukhudud and its strategic location on overland trade routes requires us to

investigate more in the future with more concern on scientific excavations and accurate examination of the materials, especially pottery associated with archaeological stratigraphy, and we hope the dataset presented here will form the basis of useful comparison in the future.

As discussed above and in Appendices 3 and 4, this research identified ceramic types based on manufacture techniques, fabric and form. These types can provide more analytical information regarding chronology, especially when compared with other materials from the surrounding area in South Arabia. Comparing some of the more distinctive types to nearby pottery from the region can allow for further archaeological studies that can be made in the future on pottery from the site of Al-Ukhudud or other sites in the neighbouring area in South Arabia. Here, we will consider two examples pointing the direction towards future analysis.

First example is Type HM-C (small, medium and large bowls with slightly to sharply everted rounded rim), which was identified from B39 and North excavations, and from units 42, 44 excavation. In the B39 and North excavations, the distribution of sherds from this type was only in stratum 1, and in the units 42, 44 excavation, the distribution of sherds from the same type appeared only in strata 1 and 2 (plate 7; plate 8; plate 9; plate 10). The second example is Type HM-L (jars with outward bevelled thickened rim), which was identified from South-west, B39 and North excavations. The distribution of this type was in stratum 2 in the South-west excavation, and in stratum 1 in both B39 and North excavations (plate 40; plate 41).

These two examples of types from Al-Ukhudud have rim forms which are similar in shape to some sherds found at the archaeological site of Makaynūn in Ḥaḍramawt, Yemen, from sounding I levels I to XV (Mouton et al, 2006). Type HM-C was found in stratum 1 in B39 and North areas, whereas the same type was found in strata 1 and 2 in units 42, 44 area. The chronology of these strata in Al-Ukhudud can probably be dated from the 6th to 4th century B.C. or to the 7th/ 5th century B.C. based on the similarity between this type and bowls found in the site of Makaynūn (Mouton et al, 2006: 239-240, Fig 9: 9). Therefore, we can suggest that stratum 2 in B39 and North areas is likely to pre-date activity in stratum 2 in the area of units 42, 44. Type HM-L appeared in stratum 1 in B39 and North excavations, and in stratum 2 in South-west excavation. The chronological sequence of these strata at Al-Ukhudud can be dated to the 2nd century B.C. based on comparison with a parallel bowl found in the archaeological site of Makaynūn (Mouton et al, 2006: 240, Fig 9: 11). Hence, we can say that the lowest stratum 2 in the B39 and North areas likely witnessed early activity compared with stratum 2 in the South-west area.

Looking at the two types presented above in terms of their chronology, we can argue that inside the walled enclosure area there is some consistency between B39 and units 42, 44 in terms of the appearance of similarly dated Types in Stratum 1. The units 42, 44 excavation comprised five excavated levels, as opposed to two in the B39 excavation, so each stratum is on average thinner; thus, we are really seeing a pattern of general equivalence. In the lower strata of B39 and units 42, 44 excavations, we might consider these levels as likely to represent the period earlier than (or at latest, contemporaneous with) the date of HM-C, i.e., mid-1st millennium B.C. Therefore, to further examine the pottery from those layers would be a future step in order to assess this possibility. Outside the walled enclosure area and in terms of its chronology, we can argue that the North area remains challenging, and it may be there is little to do with the chronology here, since both early (HM-C) and late (glazed) types are discovered together in Stratum 1. The significant future step here is to give a priority to this area for more stratigraphically controlled excavations to provide clear chronological sequences through the analysis of pottery. In the South-west area, the presence of HM-L in the lowest level may indicate that this sequence is later in date and activity overall than those inside the walled enclosure area. We might thus conclude that these preliminary dating attempts of Al-Ukhudud's stratigraphy would seem to confirm that the core of early activity in the archaeological site of Al-Ukhudud (mid-1st millennium B.C.) is indeed within the walled enclosure area (although it is not exclusively so, given the presence of layer types, perhaps intermixed or redeposited within later layers, in the North area). While in later times, activity within the site spread to surrounding areas including the South-west area (c. 2nd century B.C.) and in the North area (continuing into the Islamic period).

Table 7-8: Quantification of the distribution of formal types in all strata of the excavated areas in season 2 and 3.

Formal Type	Outside walled enclosure								Inside walled enclosure													
	South-west excavation				North excavation				B39 excavation				Units 42, 44 excavation									
	Stratum 1		Stratum 2		Stratum 1		Stratum 2		Stratum 1		Stratum 2		Debris		Stratum 1		Stratum 2		Stratum 3		Stratum 4	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Unidentified form	14	58.3%	99	70.7%	616	74.6%	406	83.1%	580	84.4%	1097	86.7%	468	58.7%	1115	82.1%	1013	84.8%	537	89.5%	75	96.1%
Jar	9	37.5%	-	-	2	0.2%	1	0.2%	4	0.6%	4	0.3%	4	0.5%	7	0.5%	8	0.7%	1	0.2%	-	-
S. bowl	-	-	24	17.1%	102	12.3%	41	8.4%	28	4.1%	47	3.7%	182	22.8%	100	7.4%	65	5.4%	22	3.6%	1	1.3%
M. bowl	1	4.2%	13	9.3%	88	10.7%	33	6.7%	48	7%	78	6.2%	103	12.9%	94	6.9%	81	6.8%	25	4.2%	2	2.6%
L. bowl	-	-	4	2.9%	18	2.2%	8	1.6%	27	3.9%	39	3.1%	40	5.1%	42	3.1%	28	2.3%	15	2.5%	-	-
Total	24	100%	140	100%	826	100%	489	100%	687	100%	1265	100%	797	100%	1358	100%	1195	100%	600	100%	78	100%

Finally, we will consider the situation for imported vs local material. We see clear trends for changing proportions of imported/ non-local fabrics in all areas. While the South-west and B39 excavations show a decline in the percentages of non-local fabrics from deeper to shallower strata, units 42, 44 and the North excavations show the opposite trend, with marked increases (Table 7-9). Thus, the highest proportion of non-local fabrics in the South-west excavation is found in lower levels; on the other hand, the highest proportion of the same fabrics is found in upper levels in the North excavation. Both excavations are located outside the walled enclosure, and a long distance from each other. The variation of the proportions of non-local fabrics in these two locations may indicate earlier use of imported fabrics in the South-west excavation than the North excavation, but this did not continue as the same proportion in the upper level, perhaps indicating that this area was no longer so intensively used. In contrast, in the North excavation the high proportion of non-local fabrics specifically in the upper level may reflect an increase in the use of imports, reflecting both a later date than the South-west excavation, and also active trade and connections with surrounding societies. The patterns of imported fabrics inside the walled enclosure again present strong contrast between B39 and units 42, 44 excavations. We can see from Table 7-9 that the B39 excavation presented high proportions for non-local fabrics in the lower level, whereas the imported fabrics in units 42, 44 excavation appeared in higher proportion towards the surface. Both locations are inside the walled enclosure and close to each other, but the analysis presented here strongly emphasises their differences.

Overall, the above trends present an intriguing sketch of the potential complexity of changing patterns and priorities through time across the site for ceramic production, distribution and consumption, and indicate that change and development continued through time in Al-Ukhdud but to various degrees. Without doubt, the complex and unclarity of archaeological stratigraphies in the Al-Ukhdud excavations for season 2 and 3 made it difficult to argue for clear conclusions about the trends of change that occurred in the site, and shifts to the use of imported fabrics. However, from the data presented in this research we can see the potential influence of trade and exchange on Al-Ukhdud and its population, with signposts towards future focus of investigation.

Table 7-9 Quantification of non-local fabrics (FT3 and FT6) in all excavated areas in season 2 and 3.

Strata	Outside walled enclosure								Inside walled enclosure								
	South-west excavation				North excavation				B39 excavation				Units 42, 44 excavation				
	FT3	%	FT6	%	FT3	%	FT6	%	FT3	%	FT6	%	FT3	%	FT6	%	
Debris	-	-	-	-	-	-	-	-	-	-	-	-	-	11	38%	54	37%
Stratum 1	1	8%	12	29%	83	64%	67	69%	12	29%	112	42%	6	21%	32	22%	
Stratum 2	11	92%	30	71%	47	36%	30	31%	29	71%	153	58%	5	17%	34	23%	
Stratum 3	-	-	-	-	-	-	-	-	-	-	-	-	-	2	7%	21	14%
Stratum 4	-	-	-	-	-	-	-	-	-	-	-	-	-	5	17%	5	4%
Total	12	100%	42	100%	130	100%	97	100%	41	100%	265	100%	29	100%	146	100%	

7.3 A Preliminary Conception of the Economic Activity in the Region

Some scholars have argued that the development of trade and exchange in the Arabian Peninsula was due to the trade routes that linked the source of incense production in South Arabia with markets in Central or North Arabia, while bringing other products to southern Arabia (Doe, 1971, Al-Saud, 1997). Because of that, it is argued, South Arabian communities developed and formed a central point for distribution of frankincense (Van Beek, 1960).

Certainly, as discussed above, the impact of trade routes is reflected in the formation of some political entities in South Arabia around the 1st millennium B.C, and these entities depended on trade and exchange as one source of their economic prosperity (Doe, 1971; Zarins et al, 1981; Al-Saud, 1997). Najran was not far from these political entities, and was a key node of these trade routes. The significance of these routes decreased because new maritime trade routes developed around 1st century B.C. during the region of Himyar, which became an independent kingdom of Qatabān. Therefore, political influence and economic power shifted into the highlands and the sea and to the societies located close to the new trade routes, leading to an era of commercial maritime kingdoms or mountain kingdoms (De Maigret, 2009). We might expect to see evidence of some of these developments reflected in the archaeology of the site, including its ceramics.

In light of the above, and giving the presence of the site of Al-Ukhudud on the land trade routes extending from South to North Arabia, and the high proportions of pottery discovered from the season 2 and 3 excavations, we do see some evidence that allows us to comment on aspect of connectivity, trade and exchange. First, we do not see a straightforward impact of increased connectivity with surrounding communities resulting from trade and exchange in the form of a consistent upturn in proportions of imported pottery. Second, with the current data from Al-Ukhudud, we could instead argue that the local community relied more on local production, and showed considerable ceramic self-sufficiency. Although there are some non-local products, the town nonetheless seems to have been supplying most of its ceramic needs locally, with relatively low proportions of imported pottery across the excavated areas. Third, in the South-west part of the site, there were tentative indications of data patterning that we might speculatively suggest as a signal of external locations of trade and exchange activities, more than the internal locations; but this needs further investigation in the future in order to understand the nature of these possibilities. Finally, in the North excavation, there are some distinct indications of changes, specifically with regard to the supply of ceramics in the later period, reflecting the fact that this part of the site

continued in use into the early Islamic period and beyond. As we noted previously, we need further detailed investigations on the site and its material to understand the nature of the site and the local community, particularly trade and exchange with other individuals.

Overall, the specific nature of the economy of South Arabia remains somewhat ambiguous due to the lack of sources that give an explicit account of its nature, even with many surviving South Arabian inscriptions that mention events that occurred in South Arabia, or particular cities or trade routes or parts of trade routes. However, the data presented in this thesis show the beginning of a way to better characterise economic and social activity in and around Al-Ukhudud, and it is clear that further analysis can be undertaken to develop these strands, especially if coupled with more stratigraphically controlled excavations methodologies.

7.4 Conclusion and Future Work

The core of this research project is understanding the nature of pre-Islamic pottery discovered from the archaeological site of Al-Ukhudud, and its implications for the trade and exchange in South Arabia through the categorisation of the pottery assemblage based primarily on fabrics to identify local and non-local pottery to link them to the economic perspective of southern Arabia. This site is one of the most important settlements located on the overland trade routes between the south and north of the Arabian Peninsula. The limitation of data in terms of the archaeological work at Al-Ukhudud and the publication of both the site itself and its pottery, and the archaeology of the wider region, presents a challenge to present a complete portrait of the site or the area around it. Nonetheless, this research is the first detailed study of pottery from the archaeological site of Al-Ukhudud and from South Arabia in general, and it is a first step, creating a fundamental base effort in order to address socio-economic questions in a systemic and scientific way using a large quantity of sherds. This study has demonstrated the value of scientific approaches applied to assemblages from a single site; adoption of the methodologies in use here at multiple sites would create a paradigm shift in ceramic analysis in the region, with significant implications in terms of the sorts of questions that might be addressed.

The large quantification of pottery addressed in this study and retrieved only from two seasons reflected the high consumption of pottery in this site, and the similarities in comparison between Al-Ukhudud's pottery with that from different sites in the region reflected the levels of connection between the community of Al-Ukhudud and surrounding societies, and the influence of the land trade routes. Another significant aspect of the impact of trade and exchange on the pottery

production and consumption in Al-Ukhudud was the detailed and scientific analysis of the fabrics, demonstrating that fabrics FT3 and FT6 were non-local, based on Arnold's model, and probably indicate the effect of the trade and exchange. We cannot deny that more detailed studies on the pottery of Al-Ukhudud and south Arabia can provide us with a new vision to understand the nature of southern Arabian society and economy.

The community of Al-Ukhudud was a productive society, as was demonstrated by the quantities of pottery presented in this study, the diversity of formal types distinguished in this research, and the dominance of local production (as well as the agricultural productivity of the region outlined in chapter three above). The formal diversity of Al-Ukhudud's pottery indicate that the local community was probably in an advanced stage of connection with surrounding communities, especially those located on the land trade routes in south, central, or southwestern Arabia, or even with those located in north Arabia. More excavations at the archaeological site of Al-Ukhudud and detailed studies of pottery as mentioned above will greatly assist our understanding of the nature of these sites and the societies of southern Arabia, and these archaeological works will provide further help to understand the nature of trade in south Arabia and the relationships in trade and exchange between south Arabian communities and the link with the archaeological settlements especially those located on the overland trade routes.

Generally, the study of the pottery of South Arabia is still in very early stages in terms of archaeological study, especially when compared, for instance with studies of South Arabian inscriptions, which provide us with a large of information about the South Arabian communities particularly with regards to conflicts with other Kingdoms in South Arabia. However, the same inscriptions do not offer us detailed information about the nature of the economy of South Arabia, and the trade relations with the conveys that were departing from South to North Arabia, and the advantages of the land trade routes to these sites. In order to develop the potential of this specialism, future work should address some of the issues that have limited the current study. Most importantly, there is a clear need for any future excavations to adopt more precise stratigraphic methodologies such as single-context recording, such that it becomes possible to address the chronological shortcoming of our understanding of the wider assemblage of the region. Additionally, a more systemic approach to recording ceramics (and finds) need to be adopted across the region, in order to allow quantified comparative studies to be undertaken, and more geological and other scientific analyses adopted as standard. Further pottery study from South Arabian archaeological sites should pay attention to recording regionality of forms and fabrics, create new

databases of unique and common features and updating the information that exists on pottery of the Arabian Peninsula.

Appendix 1 Pottery Record Form

(Front page).

Site name: _____

Season: _____

Table 1 Pottery record form.

PRN	RNSA	Current location	Creation date	Finding Location	Square	Layer/Depth	Vessel part	WT (g.)	TH. code	Diam. (cm)	% Pres.	Mfg. Tech.	Form Type	Dec. Posi.	Dec. Element	Fabric type	Use ware

Recorder Name: _____

Date: _____

Sheet _____ of _____

List of abbreviations

- PRN:** Pottery record number. - **RNSA:** Registration number in Saudi Archaeology archives. - **WT:** Weight (gram).
Th: Thickness code. - **Dia:** Diameter (cm). - **% Pres:** Percentage.

Pottery Record Form

(Back page)

Site name: _____

Season: _____

Table 2 Pottery record form.

PRN	RNSA	Surface treatment (External)	Surface treatment (Internal)	Primary decoration	Secondary Decoration	Dec. position	Draw No.	Photo No.

Recorder Name: _____

Date: _____

Sheet _____ of _____

List of abbreviations

PRN: Pottery record number. - **RNSA:** Registration number in Saudi Archaeology archives. - **WT:** Weight (gram).

Th: Thickness code. - **Dia:** Diameter (cm). - **% Pres:** Percentage.

Table 3 Description of the key categories in the pottery record form.

Data category	Description
PRN	The four-figure Pottery Record Number, given by the researcher to each data point.
RNSA	The registration number in the Saudi Archaeological archive.
Finding location	The basic location where materials were found in the site, such as within the walled area, Units 42 and 44 etc.
Square	The square number within the site grid.
Layer (stratigraphy)/ Depth	The layer from which the sample was collected, and the depth in cm. (only some samples indicate this information).
Vessel part	The type of sherd, such as body, rim, base or handle.
Measurements	Sherd weight, body thickness, rim diameter and diameter percentage.
Manufacture technique	The technique used to produce the vessel, i.e. hand-made, wheel-made, a combination of hand- and wheel-made.
Form type	The form of the vessel, such as jar, bowl, etc.
Surface treatment	The finish of each sherd surface (burnishing, coatings, etc.)
Fabric type	The fabric from which each sherd was made (from fabric descriptions compiled by the researcher).
Decoration	The decoration present on the sherd, including its position, the method of its technique and its nature.

Appendix 2 Wall Thickness Codes

1= < 5 mm

2= 5 – < 7 mm

3= 7 - < 9 mm

4= 9 - < 11 mm

5= 11 - < 13 mm

6= 13 - < 15 mm

7= 15 - < 17 mm

8= 17 - < 19 mm

9= 19 - < 21 mm

10= 21 mm or more

Appendix 3 List of Al-Ukhdud Rim Forms – Hand-made

Table 1 List of rim forms, Hand-made.

Type code	Summary
Type HM-A	Everted outward rim.
Type HM-B	Simple rounded rim.
Type HM-C	Slightly to sharply everted rounded rim.
Type HM-D	Rounded thickened rim.
Type HM-E	Straight vertical rounded rim and sharp low shoulder.
Type HM-F	Flattened rounded outward and inward rim.
Type HM-G	Flattened straight to rounded rim.
Type HM-H	Simple rounded, slightly inward thickened rim.
Type HM-I	Flattened slightly outward everted rim.
Type HM-J	Rounded rim, and sharp low shoulder.
Type HM-K	Outward double thickened rim.
Type HM-L	Outward bevelled thickened rim.
Type HM-M	Double thickened rounded rim.
Type HM-N	Slightly bilateral taper rim.
Type HM-O	Rounded tapered rim.
Type HM-P	Thickened rounded flattened rim.
Type HM-Q	Labial flange rim.
Type HM-R	External everted rim.
Type HM-S	Rounded internal inverted rim.

Appendix 4 List of Al-Ukhdud Rim Forms – Wheel-made

Table 1 List of rim forms – Wheel-made.

Type code	Summary
Type WM-A	Double thickened rounded rim.
Type WM-B	Simple rounded, slightly everted rim.
Type WM-C	Outward everted rim.
Type WM-D	Bevelled external rim.
Type WM-E	Outward semicircular rim.
Type WM-F	Double thickened squarish rim.
Type WM-G	Rounded bead rim.
Type WM-H	Simple bilateral taper rim.
Type WM-I	Straight thickened to thin rounded rim.
Type WM-J	Everted labial flange rim.
Type WM-K	Slightly everted thickened rim.
Type WM-L	Hocked rim.
Type WM-M	Outward flaring rim.
Type WM-N	Well-rounded everted to hocked rim.
Type WM-O	Slightly bevelled rim.
Type WM-P	Simple outward rounded rim.
Type WM-Q	Top thickened flaring rim.
Type WM-R	Rounded, double thickened rim.
Type WM-S	Narrow to simple rounded rim.
Type WM-T	Flattened curved rim.
Type WM-U	Outward external taper rim.
Type WM-V	High-shouldered rounded rim.
Type WM-W	Sharply outward everted rim.
Type WM-X	Rounded rim, with slightly external outward edge.
Type WM-Y	Simple flattened rim.
Type WM-Z	Rounded incurved rim.
Type WM-AA	Double thickened inverted rim.
Type WM-BB	Double thickened everted rim.
Type WM-CC	Everted semi-cylinder rim.

Appendix 5 Surface Treatments and Codes Position

A- Surface Treatment

Coated.

Beige paint.

Brown paint.

Black paint.

Dark brown paint.

Red paint.

Greenish paint.

Pale red paint.

Whitish paint.

Glazed.

Green glazed.

Pale yellow glazed.

Slip.

Red slip.

Black slip.

B- Position

1= On both interior and exterior surfaces.

2= Exterior surface only.

3= Interior surface only.

Appendix 6 Fabric Type Recording form and Core Firing Codes

A- Fabric Type Recording Form

Table 1 Fabric type recording form

Sherd No.			
SITE NAME	METHODOLOGY	LENS POWER	CLAY COLOUR

INCLUSIONS:

NO.	TYPE	SIZE	FREQUENCY	SORTING	ROUNDNESS
1.					
2.					
3.					
4.					
5.					

HARDNESS	
FRACTURE	
MANUFACTURE	

FABRIC DESCRIPTION	

FABRIC CODE	
FABRIC TYPE NAME	

RECORDER:

DATE: / /

B- Core Firing Code

Oxidised (OX)

OX; red, orange, or reddish- brown.

OX; pale orange, pale yellow or tan-buff.

OX; white or off-white.

Unoxidised (UN)

UN: pale grey, grey, dark grey, black.

Oxidised exterior and interior; unoxidised core (OXUN)

Mixture of Oxidised (OX) and Unoxidised (UN)

IR: irregularly-fired, and whichever colours.

Appendix 7 Microscope Fabric Types Description

Table 1 Summary of fabric 1 inclusions.

Fabric type number	FT 1
Fabric type name	Limestone, voids and rare to sparse mica.

Microscope Fabric description				
Inclusions	Frequency	Size	Rounding	Sorting
Limestone.	Moderate to sparse (15% _ 7%).	Medium to coarse 0.25–0.5 mm to 0.5 mm -0.1 mm.	Subrounded to rounded.	Moderately-sorted to poorly-sorted
Voids (could be limestone).	Moderate to sparse (15% _ 7%).	Medium, to very coarse 0.25 mm - 0.5 mm to larger than 1.0 mm.	Angular to Subangular.	Moderately-sorted to poorly-sorted.
Voids (could be shell).	Moderate (10%)	Medium 0.25 mm – 0.5 mm.	Angular.	Poorly-sorted
Voids (could be straw or grass).	Moderate to sparse (10% _ 3%).	Medium 0.25 mm – 0.5 mm.	Angular to subangular.	Moderately-sorted to poorly-sorted.
Small grains (could be black iron ore).	Moderate (10%).	Fine to medium 0.1 mm - 0.25 mm to 0.25 mm – 0.5 mm.	Subrounded to rounded.	Moderately-sorted to poorly-sorted.
Mica.	Sparse (7% - 5%).	Fine to medium 0.1 mm – 0.25 mm to 0.25 mm – 0.5 mm.	Angular to subangular.	Moderately-sorted to poorly-sorted.
Quartz.	Sparse (5%).	Medium to coarse 0.25 mm - 0.5 mm to 0.5 mm – 1.0 mm.	Subrounded to rounded.	Poorly-sorted

Table 2 Summary of fabric 2 inclusions.

Fabric type number	FT 2			
Fabric type name	Limestone, voids and grog.			
Microscope Fabric description				
Inclusions	Frequency	Size	Rounding	Sorting
Limestone.	Very common to sparse (30% _ 5%).	Medium to coarse 0.25 mm - 0.5mm to 0.5 mm – 1.0 mm.	Angular to subrounded.	Well-sorted to poorly-sorted.
Voids (could be straw or grass).	moderate to spare (15% _ 5%)	Medium, to coarse 0.25 mm - 0.5mm to 0.5 mm – 1.0 mm.	Angular to subangular.	Moderately-sorted to poorly-sorted.
Quartz.	Moderate to sparse (15% _ 3%).	Medium to coarse 0.25 mm - 0.5 mm to 0.5 mm – 1.0 mm.	Subrounded to rounded.	Moderately-sorted to poorly-sorted.
Mica.	Moderate (10%).	Fine to medium (0.1 mm – 0.25 mm to 0.25 mm - .5 mm).	Angular to subangular.	Moderately-sorted to poorly-sorted.
Voids (could be limestone or calcite).	Moderate to spares (10% _ 5%).	Medium, to very coarse 0.25 mm - 0.5 mm to larger than 1.0 mm.	Angular to rounded.	Moderately-sorted to poorly- sorted.
Voids (could be shell).	Moderate to spares (10% _ 5%).	Medium to coarse 0.25 mm - 0.5 mm to 0.5 mm – 1.0 mm.	Angular to Subangular.	Poorly-sorted.
Fine grains, soft (could be volcanic rock probably black iron ore or carbonised matter.	Moderate to spares (10% _ 7%).	Medium 0.25 mm - 0.5 mm to 0.5.	Subangular to rounded.	Moderately-sorted to poorly- sorted.
Grog, clay pellets or mudstone.	Moderate to rare (10% _ 2%).	Medium 025 mm – 05 mm.	Subangular to rounded.	Moderately-sorted to poorly-sorted.

Table 3 Summary of fabric 3 inclusions.

Fabric type number	FT 3
Fabric type name	Limestone, voids and black grains.

Microscope Fabric description				
Inclusions	Frequency	Size	Rounding	Sorting
Quartz.	Common to rare (20% _ 1%).	Medium to coarse 0.25 mm - 0.5mm to 0.5 mm – 1.0 mm.	Subrounded to rounded.	Well-sorted to poorly-sorted.
Limestone.	Common to sparse (25% _ 3%)	Medium, to coarse 0.25 mm - 0.5mm to 0.5 mm – 1.0 mm.	Subrounded to rounded.	Well-sorted to poorly-sorted.
Voids (could be limestone).	Moderate to sparse (10% _ 5%).	Medium to coarse 0.25 mm - 0.5 mm to 0.5 mm – 1.0 mm.	Angular to rounded.	Moderately-sorted to poorly-sorted.
Black grains (could be volcanic rock).	Moderate to rare (10% _ 2%).	Fine to medium 0.1 mm – 0.25 mm to 0.25 mm - .5 mm.	Angular to rounded.	Moderately-sorted to poorly-sorted.
Mica.	Moderate to rare (10% _ 2%).	Fine to medium 0.1 mm - 0.25 mm to 0.25 mm – 0.5 mm.	Angular to subangular.	Moderately-sorted to poorly- sorted.
Voids (could be straw or grass).	Moderate to sparse (10% _ 3%).	Medium to coarse 0.25 mm - 0.5 mm to 0.5 mm – 1.0 mm.	Angular to Subangular.	Poorly-sorted.
Soft clay-like (could be clay pellets).	Moderate to rare (10% _ 2%).	Fine to medium 0.1 mm- 0.25 mm to 0.25 mm – 0.5 mm.	Rounded.	Moderately-sorted to poorly-sorted.
Voids (could be shell).	Moderate to rare (10% _ 2%).	Medium to coarse 0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm.	Very angular to angular.	Poorly-sorted.
Black grains (could be organic or carbonaceous matter).	Spare to rare (7% _ 1%).	Medium 0.25 mm - 0.5mm.	Subangular to rounded.	Moderately-sorted to poorly-sorted.

Table 4 Summary of fabric 4 inclusions.

Fabric type number	FT 4
Fabric type name	Limestone, voids and quartz.

Microscope Fabric description				
Inclusions	Frequency	Size	Rounding	Sorting
Limestone.	Very common to common (30% _ 20%).	Medium to coarse 0.25 mm - 0.5 mm to 0.5 mm - 1.0 mm.	Angular to subrounded.	Moderately-sorted.
Quartz.	Common to sparse (20% _ 7%).	Medium to coarse 0.25 mm - 0.5 mm to 0.5 mm - 1.0 mm.	Subrounded to rounded.	Moderately-sorted.
Voids (could be decomposed calcareous particles).	Moderate (10%).	Coarse 0.5 mm - 1.0 mm.	Angular to subangular.	Poorly-sorted.
Voids (could be straw or grass).	Moderate to sparse (10% _ 7%).	Coarse to very coarse 0.5 mm – 1.0 mm to larger than 1.0 mm.	Angular.	Poorly-sorted.
Voids (could be shell).	Moderate (10%).	Medium to coarse 0.25 mm - 0.5 mm to 0.5 mm – 1.0 mm.	Angular to subangular.	Poorly-sorted.
Voids (could be limestone).	Sparse (5%).	Medium to coarse 0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm.	Angular to subangular.	Poorly-sorted.

Table 5 Summary of fabric 5 inclusions.

Fabric type number	FT 5
Fabric type name	Limestone, voids and decomposed calcareous particles.

Microscope Fabric description				
Inclusions	Frequency	Size	Rounding	Sorting
Limestone.	Very common to sparse (30% _ 5%).	Medium to coarse 0.25 mm - 0.5 mm to 0.5 mm - 1.0 mm.	Subrounded to rounded.	Moderately-sorted to poorly-sorted.
Quartz.	Common to sparse (20% _ 7%).	Medium to coarse 0.25 mm - 0.5 mm to 0.5 mm - 1.0 mm.	Subrounded to rounded.	Moderately-sorted to poorly-sorted.
Voids (could be shell).	Moderate to rare (15% _ 2%).	Coarse to very coarse 0.5 mm - 1.0 mm to larger than 1.0 mm.	Angular to subangular.	Poorly-sorted.
Mica.	Moderate to sparse (10% _ 5%).	Fine to medium 0.1 mm – 0.25 mm to 0.25 mm - 0.5 mm.	Angular to subangular.	Moderately-sorted to poorly-sorted.
Voids (decomposed calcareous particles).	Moderate to sparse (10% _ 5%).	Medium 0.25 mm – 0.5 mm.	Subangular to subrounded.	Moderately-sorted to poorly-sorted.
Voids (could be limestone).	Moderate to sparse (10% _ 7%).	Medium to very coarse 0.25 mm – 0.5 mm to larger than 1.0 mm.	Angular to rounded.	Moderately-sorted to poorly-sorted.
Voids (could be straw or grass).	Moderate to sparse (10% _ 7%).	Coarse to very coarse 0.5 mm – 1.0 mm to larger than 1.0 mm.	Angular.	Poorly-sorted.
Clay-like (could be grog).	Rare (2%).	Medium 0.25 mm – 0.5 mm.	Subrounded.	Poorly-sorted.

Table 6 Summary of fabric 6 inclusions.

Fabric type number	FT 6
Fabric type name	Mica, limestone and voids.

Microscope Fabric description				
Inclusions	Frequency	Size	Rounding	Sorting
Limestone.	Very common to sparse (30% _ 5%).	Medium to very coarse 0.25 mm - 0.5 mm to larger than 1.0 mm.	Subangular to rounded.	Well-sorted to poorly-sorted.
Mica.	Moderate to sparse (15% _ 3%).	Fine to medium 0.1 mm - 0.25 mm to 0.25 mm - 0.5 mm.	Angular to subangular.	Moderately-sorted to poorly-sorted.
Quartz.	Moderate to sparse (15% _ 5%).	Medium to coarse 0.25 mm - 0.5 mm to 0.5 mm - 1.0 mm.	Subrounded to rounded.	Moderately-sorted to poorly-sorted.
Voids (could be straw or grass).	Moderate to rare (15% _ 2%).	Medium to coarse 0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm.	Angular to subangular.	Moderately-sorted to poorly-sorted.
Voids (could be shell).	Moderate to sparse (15% _ 5%).	Medium to coarse 0.25 mm – 0.5 mm to 0.5 mm – 1.0 mm.	Angular to subangular.	Moderately-sorted to poorly-sorted.
Voids (could be limestone).	Moderate to sparse (10% _ 3%).	Medium to very coarse 0.25 mm – 0.5 mm to larger than 1.0 mm.	Angular to rounded.	Moderately-sorted to poorly-sorted.
Black grains (could be ferro-magnesian or could be volcanic rock).	Sparse (5%).	Medium 0.25 mm – 0.5 mm.	Subrounded.	Poorly-sorted.
Clay-like (could be clay pellets).	Sparse (3%).	Medium 0.25 mm – 0.5 mm.	Subrounded.	Poorly-sorted.
Black grains: organic matter (could be carbonaceous matter).	Rare (2%).	Medium 0.25 mm – 0.5 mm.	Angular.	Poorly-sorted.
Voids (could be calcite).	Rare (1%).	Very coarse: larger than 1mm.	Angular.	Poorly-sorted.

Appendix 8 Chronological Tables

Vessel Part: Rim Sherds. Hand-made

Type HM-A - Rim – Hand-made

Season 2: (1357, 2452, 2156, 1338, 1335, 2453, 1311, 1308).

Season 3: (2307, 1451, 1423, 1460, 1437, 1419).

Table 1 Chronological table of type HM-A, rim, hand-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
2453.	H2850, fig31, strata R. "Bowl 4" (Van Beek, 1969).	10th century B.C.	Hajar Bin Humeid (HBH), Yemen.
2452, 2156, 1357, 1311, 1308.	No. H1870, fig34, strata L. "Jar 6".	7th century B.C.	
	No. H2775, fig51, strata Q. "Jar 4"	9th to 8th century B.C.	
	No. H2740, H2688, fig90, strata Q, and No. H2599, fig90, strata P. "Bowl 1". No. H1833, fig42, strata L. "Bowl 4". (Van Beek, 1969).	9th to 8th century B.C. 7th century B.C.	
1338	H2499, fig45, strata P. "LCF 9".	9th to 8th century B.C.	Hureidha, Ḥaḍramawt, Yemen. Tomb 5, Tomb 6.
1335	H2614, fig50, strata P. "LCF 4".	9th to 8th century B.C.	
	H2827, fig51, strata R. "Jar 2" (Van Beek, 1969).	10th century B.C.	
2453, 2452, 2156, 1335, 1338, 1357, 1311, 1308.	No. 10-15, fig LIV. "Eared bowls in stoneware, type IX". (Thompson, 1944).	Between 7th and 5th century B.C.	Hureidha, Ḥaḍramawt, Yemen. Tomb 5, Tomb 6.
	No. 15, fig LVI. "Sherds, Tomb 5." (Thompson, 1944).		
2452, 2156, 1338, 1357, 2453, 1335, 1311, 1308.	No. t. TA6302, 10, fig3.17a." Bowl". (Hausleiter et al, 2017).	To the late 2nd/early 1st millennium B.C.	Tayma, North of Saudi Arabia.
	No. c, fig10. "Bowl". (Tourtet and Hausleiter, 2018).	2nd – 4th century A.D.	
	No. 2, fig83. "Bowl". (Winnett and Reed, 1970).	Dated to pre-Islamic.	Al-Khuraybah, Al-'Ula, north-western Saudi Arabia.

Continue to Table 1

Al-Ukhud pottery number	Parallels	Chronology/ dating	Archaeological site name
2452, 2156, 1338, 1357, 2453, 1335, 1311, 1308.	No. c, fig1.9. "Bowl, cooking pot". (Graf et al, 2012 and Al-Zahrani, 2013).	Early 1st millennium B.C to around 400/ or 420 A.D. Some sherds dated to Islamic period 10th and 14th century A.D ('Abbasid period)	Jurash, Asir region, south west Saudi Arabia.
2453, 1335.	No. 4, fig 16. "Bowl". (Bibby, 1973).	Dated from 300 B.C. to 100 A.D.	Thaj, East of Saudi Arabia.
2453.	No. b.TA2765.22, c.TA342.28, fig15. "Bowl". (Tourtet et al, 2017 in press).	2nd – 4th century A.D	Tayma, North of Saudi Arabia.
1338, 1335.	No. 4, Y.058, 2, fig6.10/b, Type 33, phase 4. "Bowl". (Hand-made?) (Schiettecatte et al, 2017).	4th century to 2nd century B.C. (C14: 389-204 B.C.)	Al-kharj, (Al-Yamāmah), Central province, Saudi Arabia.
1357, 2452, 1335, 2453, 1311, 1308.	No. c. TA8312,12; No. d. TA8312,20; No. e. TA8312,28, fig2.15/ b. "Bowl" (Hand-made?). (Hausleiter et al, 2018).	2nd to mid 4 th century A.D. (Late Roman pottery).	Tayma, North of Saudi Arabia.
1335, 2453.	No. 57, fig 5.14. "Bowl" (Hand-made?). (Al-Hajri et al, 2018).	Dated to 3rd/ 4th century A.D.	Al-Khobar, Dammam, Eastern province, Saudi Arabia.
1357, 2452, 1338, 1335, 2453, 1311, 1308.	No. a. TA4529.1, fig3.11/ a. "Bowl". (Hausleiter et al, 2018). No. b. TA5262.14; No. c. TA5914.26; No. e. TA5762.16; No. f. TA9522.179; No. h. TA9522.148, fig3.12/ a. "Bowl". (Hausleiter et al, 2018).	12th to 9th century B.C. (Early Iron Age).	Tayma, North of Saudi Arabia.
1335, 2453.	No. 5, fig26. No. 5, 10, 16, 24, fig27. "Bowl". (Zarins et al, 1981).	During the South Arabia period and later in the early Islamic period.	Ḳows (No. 217-108), Red Sea Coast, West of Saudi, Saudi Arabia.

Continue to Table 1

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1335, 2453.	No. 6, fig 22. "Bowl". (Zarins et al, 1980).	Between 2000 B.C and 500 B.C. (Post-Neolithic sites.	Site No. 211-52, in the south-west of Saudi Arabia.
1357, 2452.	No. 14, fig32. No. 10, fig33. "Bowl". (Gilmore et al, 1982).	Late 2nd/ early 1st millennium B.C.	Wadi Tharbah, North of Saudi Arabia.
1357, 2452, 2156.	No. 204, fig 25. "Bowl". (Zarins et al, 1979).	From 200 B.C to 600 A.D. "Hellenistic period".	Al-Aflaj, central of Saudi Arabia.
	No. 6, fig 3. No. 1, fig 4. "Bowl" (Hand-made or Wheel-made?). (De Paepe et al, 2003).	Late 1st century B.C. and the middle of the 2nd century B.C.	Ed-Dur, Umm Al-Qaiwain, UAE.
2453, 2452, 2156, 1335, 1338, 1357, 1311, 1308.	No. 79, 85, 97, 98, fig3. "Bowl". (De Cardi, 1977).	1st millennium B.C.	Am Durrah, at Wadi Aghdā', Oman.
2452, 2156.	No. 83, fig18. "Bowl". (De Cardi et al, 1976).	Dated to 1st millennium B.C.	'Amlah, Wadi Al-'Ayn, Oman.
2453, 2452, 2156, 1335, 1338, 1357, 1311, 1308.	No. p7 and No. p9. "Jar". (Costa, 1988).	Dated to 640 B.C.	Sarūj at Izki, upper Wadi Ḥalfayn, Suma'il, North of Oman.
1357, 2452, 1338.	No. a, fig4; No. a, b, c, fig4.9; No. a, fig4.30; No. a, fig4.33. "Bowl". (Magee, 2004).	From 1000 – 500 B.C., period III, Iron Age.	Tepe Yahya, Iran.
1357, 2452, 2156, 1338, 1335, 2453, 1311, 1308.	No. 1, fig 6. "Bowl". No. 9, fig 6. "Jar". No. 12, 13, 15, 19, fig 7. "Bowl". (Kennet, 1997).	Dated from Sasanian period to the 13th century A.D.	Kush, Ras Al-Khaimah, UAE.
1357, 2452, 2156, 1338, 1335, 2453, 1311, 1308.	No. 5, 21, 22, fig3. No. 37, 39, fig4. No.54, fig4. No. 75, fig6. No. 79, fig7. No. 95, 103, 111, fig8. "Bowl". (Condoluci et al, 2014).	Iron Age period. From 1300 – 650 or 300 B.C.	Salūt, Wadi Bahla, Oman.

Continue to Table 1

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
2156, 1338.	No. 3, fig3. "Bowl". No. 9, fig5. "Jar". (Rutten, 2009).	The 1st century B.C.	Ed-Dur (al-Dur), Umm Al-Qaiwayn, UAE.
1357, 2452.	No. 2, fig2. "Deep bowl". (Karacic et al, 2017).	Early Iron Age (1100 – 600 B.C.).	Sarūq Al-Ḥadīd, northern of the Rub' Al-Khālī, Dubai, UAE.
2156, 1338, 1335, 2453, 1311, 1308.	No. 1, 11, 20, fig2. "Bowl". (Guilbert and Rougeulle, 1997).	Early Islamic period (9th – 11th century A.D.)	Al-Quraya, Abyan, Yemen.
2452, 1335.	No. 8, 14, fig4. "Bowl". (Guilbert and Rougeulle, 1995).	Islamic period, 12th to 13th century A.D.	Al-Qaraw, northern border of Zinjibar, Yemen.
1335, 2453.	No. 16, fig4N. "Bowl". (Hashim, 2007).	Pre-Islamic ceramic.	Al-Ula, Madā'in Sālih, north-west, Saudi Arabia.
1335, 2453.	No. 11, fig5. "Bowl". (Rougeulle, 1999).	From 1000 B.C. to the beginning of the early Islamic period	Šiḥr, east of Yemen, Yemen.
1338, 1335, 2453.	No. 9, 10, fig47. No. 1, fig49. "Bowl". (Boucharlat and Lombart, 1985).	Dated from 900 – 700 B.C	Rumeilah, Al-Ain, UAE.
1357, 2452.	No. 5, fig6. "Bowl". (De cardi et al, 1984).	Dated to the 1st millennium B.C.	Tāwī Silaim, Oman.
1357, 2452, 2156, 1338, 1311, 1308.	No. 9, fig21. "Bowl". No. 2, 8, 9, 10, fig22. "Bowl". (De Maigret, 1988).	Dated from around 11th century B.C. to 5th century B.C.	Wadi Yalā, at Ḥawlān AṬ-Ṭiyāl, Yemen.
1357, 2452, 2156.	No. 20 H3, fig40. "Bowl". (Abu-Duruk and Murad, 1986; Abu- Duruk and Murad, 1985 and Abu-Duruk, 1986). No. 3, 4, 5, fig56. "Bowl". No. 9, 10, fig57. "Bowl". (Abu-Duruk and Murad, 1986; Abu-Duruk and Murad, 1985 and Abu- Duruk, 1986).	Dated from 670 to 540 or 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.

Continue to Table 1

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1357, 2452, 2156.	No. 20 H3, fig40. "Bowl". (Abu-Duruk and Murad, 1986; Abu-Duruk and Murad, 1985 and Abu-Duruk, 1986). No. 3, 4, 5, fig56. "Bowl". No. 9, 10, fig57. "Bowl". (Abu-Duruk and Murad, 1986; Abu-Duruk and Murad, 1985 and Abu-Duruk, 1986).	Dated from 670 to 540 or 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.
1335, 2453.	No. DJ. 09. A. 45-35. No. DJ. 09. A. 48-22. No. DJ. 09. A. 29-6. "Bowl". (Charloux and Loreto, 2014 and Loreto et al, 2012).	Dated from 6th century to 7th century A.D	Dûmat Al-Jandal, Al-Jawf region, North of Saudi Arabia.
1338, 1335, 2453.	No. 1, 7, fig2. "Bowl/ Jar". (De Cardi, 1976).	Middle of the 1st millennium B.C.	Ras Al-Khaimah, UAE.
1335, 2453	No. 78, fig193. "Rounded jar". (Bowen and Albright, 1985).	Mid 7th B.C. to 1st century A.D.	Mārib, Yemen.

Type HM-B - Rim – Hand-made

Season 2: (1167, 1323).

Table 2 Chronological table of type HM-B, rim, hand-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1323, 1167.	H2706, fig111, strata Q. "LCF 9". (Van Beek, 1969).	Dated to 9th – 8th century B.C.	Hajar Bin Ḥumeid (HBH).
1167	No. fig 5. "Jar". (Al-Ghamedi, 1996).	2nd century B.C.- early Islamic period. The chronology of Jurash: Early settlement: 2nd century B.C. Second phase: up to 2nd A.D. Third phase: 3rd A.D. 220-250 A.D. Fourth phase: early Islamic period, around 660/ 661 A.D.	Jurash, Asir region, south-west Saudi Arabia.
1323	No. 5, fig2. "Jar". (Guilbert and Rougeulle, 1995).	Dated to Islamic period. 9th – 10th century A.D.	Jebelain, Abyan oasis, 50 km east of Aden, Yemen.
1323.	No. 65, fig6. "Jar". (Condoluci et al, 2014).	Dated to Iron Age period. From 1300 – 650 or 300 B.C.	Salūt, Wadi Bahla, Oman.
1167, 1323.	No. 5, 16 fig5. "Bowl". No. 6, fig7. "Bowl". (Benoist et al, 1997).	Iron Age II, the end of 2nd millennium to the middle of the 1st millennium B.C. (1100-600 B.C.). Iron Age III, 600-300 B.C.	Al-Madam, Sharjah, UAE
1167, 1323.	No. 5, 7, fig23. "Jar". (De Maigret, 1988).	Dated from 11th to 5th century B.C.	Ad-Durayb, Wādī Yalā, Yemen.
1323.	No. 184, fig28. "Jar". (Aqeel and Breton, 1996).	Dated to the last two levels in Shabwa from 2nd – 3rd century A.D.	Shabwa "Shabwah", Yemen.
1167, 1323.	No. 6, fig16. "Jar". (BaSlamah, 1990).	Dated from 3rd century B.C. to mid 4 th century A.D	Šhibām, Yemen.
1167, 1323.	No. 12, fig17. "Jar". (Boucharlat et al, 1985).	Dated to the Islamic period.	Sharjah, UAE.
	No. 6, fig36. "Jar". No. 5, fig22. "Jar". (Boucharlat and Mouton, 1986 and Mouton et al, 1997).	Dated from mid 2 nd century B.C. to 1st century B.C.	Mleiha, Sharjah, UAE.

Continue to Table 2

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1167, 1323.	DJ.09.A.46-35, fig6. "Jar". (Charloux and Loreto, 2014).	Dated to the Middle Islamic period around 8th century A.D.	Dûmat Al-Jandal, Al-Jawf region, North of Saudi Arabia.
1167, 1323.	No. fig2. "Jar". No. fig3. "Jar". (Nehme et al, 2010).	Dated to the 5th or to the 6th century A.D.	Madā'in Sālih, Al-Ula, north-western Saudi Arabia.
1167, 1323.	No. 36, fig2.5 a. "Jar". (Loreto et al, 2012).	Dated from the 1st century B.C. to the 1st century A.D.	Al-Ṭuwayr site, Jawf, North of Saudi Arabia.
1167, 1323.	No. 204, fig25. "Bowl". No. 206, fig25. "Jar". (Zarins et al, 1979).	Dated to Pre-Islamic period. From 1st century B.C. to 6th century A.D.	Layla, Al-Aflaj, Cnetral province, Saudi Arabia.
1167, 1323.	No. 8, fig22. "Jar". (Zarins et al, 1980).	Dated to early Islamic period	Waqīr site, Central province, Saudi Arabia.

Type HM-C - Rim – Hand-made

Season 2: (2084, 1284, 1306, 1239, 1264).

Season 3: (1400, 1465, 1517, 1458, 1443, 2306, 1256, 1432).

Table 3 Chronological table of type HM-C, rim, hand-made.

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
2084, 1284, 1306, 1239, 1264.	No. H2611, fig59, strata P. LCF 3. No. H3105, fig105, strata S. Jar 5. (Van Beek, 1969).	9th to 8th century B.C. 11th century B.C.	Hajar Bin Humied (HBH).
2084, 1284.	No. 10, 12, 14, figLIV. "Bowl". (Thompson, 1944).	Dated between 7th and 5th century B.C.	Hureidha (Ḥaḍramawt), Yemen.
2084, 1284, 1306, 1264.	No. J2.1, fig22. "Jar". No. CP4.1, fig23. No. CP4.3, fig23 Cooking pots. (Kennet, 2004).	Dated to period I and II, at Kush from 4th – 8th century A.D. In period III and IV dated to late 11th/ early 12th century A.D.	Al-Mataf, Ras al-Khaimah, UAE.
1306.	No. 11, fig5. "Jar". (Rougeulle, 1999).	From 1000 B.C. to the beginning of Islamic period	Šiḥr, East of Yemen, Yemen.
1284, 1306, 1264.	No. 3, fig3. "Jar". No. 3, 15, fig5. "Jar". (Rutten, 2009).	Dated to the 1st century B.C.	Ed-Dur (al-Dūr), Umm al-Qaiwayn, UAE.
2084, 1284, 1306, 1264.	No. 21, fig3. "Bowl". No. 84, fig7. "Jar". No. 98, fig8. "Jar". No. 104, fig8. "Bowl". (Condoluci et al, 2014).	Dated from 1300 – 650 or 300 B.C.	Salūt, Oman.
1284, 1306.	No. 3, fig5. "Jar". (Taha, 1973).	Probably dated from Hellenistic to Sasanian period.	Meliha, Sharjah, UAE.
1306.	No. 3, 8, fig17. "Jar". (Boucharlat et al, 1985).	Dated to Iron Age and Islamic period.	Sharjah coastal, Sharjah, UAE.
1306.	No. 97, fig3. "Jar". (De Cardi, 1977).	2nd half of the 1st millennium B.C.	Baṭṭāsh, Oman.
1306, 1239.	No. 1, 2, 3, 4, 5, 6, fig4. "Jar". (Phillips, 2005).	Dated from 6th to 5th century B.C.	Al-Hāmid, south-west corner of Jabal Al-Dāmīr, Yemen.

Continue to Table 3

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
2084, 1284, 1306, 1239, 1264.	No. J, fig8. "Jar". (Humphries, 1974).	Dated from Latter half of the 1st millennium B.C. to 13th- 14th century A.D.	BB-15, Wadi Bahla, Oman.
2084, 1284, 1306.	No. Y.057.12, fig6.9/ c. phase 3. "Bowl". (Hand-made?). (Schiettecatte et al, 2017).	Phase3: 4th - 2nd century B.C. (C14: 389-204 B.C.)	Al-kharj, (Al-Yamāmah), Central of Saudi Arabia.
1306, 1264.	No. h. 9853.4, fig2.12/ a. "Jar". (Hand-made?). (Hausleiter et al, 2018).	Dated to last centuries of the 1st millennium B.C.	Tayma, North of Saudi Arabia.
2084, 1284.	No. 7, fig79. "Bowl". (Parr and Ghazder, 1980; and Gazdar, 1982).	Dated from latter part of 2nd millennium B.C to early 1st millennium A.D.	Zubaidah, Al-Qasim province, Central area, Saudi Arabia.
1167.	No. fig 5. "Jar". (Al-Ghamedi, 1996).	2nd century B.C.- early Islamic period. The chronology of Jurash: Early settlement: 2nd century B.C. Second phase: 2nd A.D. Third phase: 3rd A.D. 220-250 A.D. Fourth phase: early Islamic period, around 660/ 661 A.D.	Jurash, Asir region, south-west Saudi Arabia.
2084, 1284, 1264.	No. 335, fig XXXIII. "Bowl". (Osinga, 2017).	Middle/ late Islamic period.	Badiyah, Umm Al-Jimal, Jordan.
1239.	No. QAT.216, fig 12. "Bowl". (Power et al, 2019).	Dated to Iron Age II period. From 1100 – 600 B.C.	Bayt Bin Ati, south-west of Qattara Oasis, Al-Ain, UAE.

Type HM-D - Rim – Hand-made

Season 2: (1310, 2448, 1039, 1037).

Season 3: (1524, 4689, 3616, 1392, 4850, 2241, 4852, 4851, 1476, 1391, 1447).

Table 4 Chronological table of type D, rim, hand-made.

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
2448, 1039, 1037.	No. c. TA8312.30, fig2.15/ a. "Jar". (Hand-mad?). (Hausleiter et al, 2018).	Dated from 2nd to mid 4 th century A.D.	Tayma, North of Saudi Arabia.
2448, 1039, 1037.	No. d, fig3.8/ a. "Jar". (Hand-mad?). (Al-Hajri et al, 2002).	Dated to the late 1st millennium B.C.	Rujoum Sasa site, Tayma, North of Saudi Arabia.
1310.	No. 205, fig25. "Jar". (Zarins et al, 1979).	Dated between 1st century B.C. and 6th century A.D.	Layla, Al-Aflaj, Central of Saudi Arabia.
1310.	No. fig 11. "Jar". (Al-Ghamedi, 1996).	2nd century B.C. - early Islamic period. The chronology of Jurash: Early settlement: 2nd century B.C. Second phase: up to 2nd A.D. Third phase: 3rd A.D. 220-250 A.D. Fourth phase: early Islamic period, around 660/ 661 A.D.	Jurash, Asir region, south-west Saudi Arabia.
2448, 1039, 1037.	No. 10, fig7. "Jar". (Benoist et al, 1997).	Dated to Iron Age III, from 600 – 300 B.C.	Al-Madam, Sharjah, UAE.
2448, 1039.	No. 17, fig7. "Jar". (Kennet, 1997).	Dated to Sasanian period to the 13th century A.D.	Kush, Ras Al-Khaima, UAE.
2448.	No. 13, fig13. "Jar". (Arnon, 2007).	Dated from 8th to 13th century A.D.	Marcus Street, Ramla, Palestine.
2448, 1039, 1037.	No. 98, fig8. "Jar". (Condoluci et al, 2014).	Dated from 1300 to 650 or 300 B.C.	Salūt (SS8), Wādī Bahla, Oman.
2448, 1039, 1037.	No. 4, fig16. "Jar". (BaSlamah, 1990).	Dated from 3rd century B.C. to mid 4 th century A.D.	Šhibām, Yemen.
1310, 2448, 1039, 1037.	No. F9. 14, 15, 16, 17, 18, 19, fig5. "Jar". (El-Hassan and Khabir, in press).	Dated from 3rd century B.C. to the 3rd century A.D.	Qaryat Al-Fāw, Wadi Ad-Dawasir, south-west Riyadh, Saudi Arabia.

Continue to Table 4

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
2448, 1037, 1039.	No. H130 and H128, fig52, strata B. "Jar". No. H64, fig52, strata A. "Jar". No. H3016, fig92, strata S. "Jar". No. H2942, fig92, strata R. "Jar". (Van Beek, 1969).	Dated from Mid 1 st century B.C to 1st century A.D. 2nd – 4th or 5th century A.D. 10th century B.C.	Hajar Bim Humeid (HBH), Yemen.
2448, 1039, 1037.	No. fig 5T.52. "Jar". (Hashim, 2007).	Dated between 600 B.C. and 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.

Type HM-E - Rim – Hand-made

Season 2: (1402, 1132, 1160).

Season 3: (4661, 1456, 1530, 1490, 1461).

Table 5 Chronological table of type E, rim, hand-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1402, 1132, 1160.	No. 7, 8, 9, fig LII, type III. "Bowl". No. 12, fig LII, type V. "Bowl". No. 8, fig LIII, type VIIIA. "Bowl". No. 9, 10, 11, 12, fig LIII, type VIIIB. "Bowl". No. 1, 2, 3, 4, 6, fig LIV, type VI. "Bowl". No. 2, fig LVI. "Bowl". (Thompson, 1944).	Dated between 7th and 5th century B.C.	Hureidha (Ḥaḍramawt), Yemen.
1402, 1132, 1160.	No. 80, 10, D5, fig80. "Bowl". No. 62, 218, D6, fig62. "Bowl". (Al-Shehry, 2014).	Dated to the half of 1st millennium B.C. (6th century B.C and 1st century B.C.).	Daddan, Al-Ula, Al-Madinah, north-western Saudi Arabia.
1402, 1132, 1160.	No. H1905, fig64, strata L. "Bowl". No. H3041, fig91, strata S. "Bowl 6". No. H2982, fig99, strata S. "Jar 1". No. H2777, fig101, strata Q. "Bowl 1". (Van Beek, 1969).	7th century B.C. 11th century B.C. 9th – 8th century B.C.	Hajar Bin Ḥumeid (HBH).
1402, 1132, 1160.	No. 7, 37, room3, trench2A, L6. "Bowl". No. 61, 72, 73, room5, trench2A, L8. "Bowl". (Abu-Duruk, 1986).	Dated to the half of 1st millennium B.C. (around 670 – 540/410 B.C.).	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.
1402, 1132, 1160.	No. 19, fig63. "Bowl". No. 9, 12 fig63. "Bowl". No. 26, fig66. "Bowl". (Bawden et al, 1980).	Dated to latter part of the 1st millennium B.C.	Tayma, North of Saudi Arabia.

Continue to Table 5

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1402, 1132, 1160.	No. e. TA6473.14, fig3.4, a. "Bowl". No. e. TA9334.97, fig3.16, a. "Bowl". (Hausleiter et al, 2018).	Dated to late Bronze Age, around 1200 B.C.	Tayma, North of Saudi Arabia.
1402, 1132, 1160.	No. 4, 5, 13, fig 77. "Bowl". (Zarins and Al-Zahrani, 1985).	Pre-Islamic period (13th century A.D.).	Sihi, Southern Tihama Plain, Jazan province, South of Saudi Arabia.
1402, 1132, 1160.	No. 12, fig56. "Bowl". (Abu-Duruk and Murad, 1985).	Half of the 1st millennium B.C. (around 670-540/410 B.C.)	Qsar Al-Hamrā', Tayma, North of Saudi Arabia.
	No. 30, fig40. "Bowl". (Abu-Duruk and Murad, 1986).	To the half of the 1st millennium B.C. (around 670-540/410 B.C.)	
1402, 1132, 1160.	No. 14, fig5.14. "Bowl". (Al-Hajri et al, 2018).	Dated between 1st century A.D and 8th century A.D.	Al-Khobar, Eastern Saudi Arabia.
1402, 1132, 1160.	No. Y.057.5, type16. "Bowl". (Schiettecatte et al, 2017).	Based on C14 dated to the 15th century A.D. 682-870 A.D. to 1644-1950 A.D.	Al-Yamāmah, Al-Kharj, central area, Saudi Arabia.
1402, 1132, 1160.	No. 4, 6, fig6. "Bowl". (Weisgerber, 1982).	Dated to the 3rd/ 2nd century B.C.	Wadi Samad, Oman.
1402, 1132, 1160.	No. 121, fig37. "Bowl". (Parr et al, 1978).	Dated between 2nd to 3rd century A.D. C14: 115 – 265 A.D.	Rajajil, North of Saudi Arabia. Zubayda site, North of Saudi Arabia.
1402, 1132, 1160.	No. 2, fig49. "Bowl". (Boucharlat and Lombart, 1985).	Dated from 900 – 700 B.C.	Rumeilah period I, Al-Ain, UAE.

Continue to Table 5

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1402, 1132, 1160.	No. F9. 55, fig19. "Bowl". (El-Hassan and Khabir, in press).	Dated between 3rd century B.C. and the 3rd century A.D.	Qaryat Al-Fāw, Wadi Ad-Dawasir, south-west Riyadh, Saudi Arabia.
1402, 1132, 1160.	No. 1, 6, 17, fig11. "Bowl". (De Cardi, 1984).	Dated to 1st millennium B.C.	Ṭāwī Sa'īd, Oman.

Type HM-F - Rim – Hand-made

Season 2: (1092, 1111).

Table 6 Chronological table of type F, rim, hand-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1092,1111.	No. R, fig 11. "Bowl". (Humphries, 1974).	Dated to probably the 7th century B.C.	SH-11, South of Sohar, Oman.
1092, 1111.	No. 1, 2, fig LI, typell. "Bowl". (Thompson, 1944).	Dated between 7th and 5th century B.C.	Hureidha, Ḥaḍramawt, Yemen.
1092, 1111.	No. 3, fig 6. Bowl. (Kennet, 1997).	Dated from Sasanian period to the 13th century A.D.	Kush, Ras Al-Khaimah, UAE.
1092, 1111.	No. 9, fig 51, type 4. "Bowl". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.
1092, 1111.	No. 11, fig 3. "Bowl". (Rutten, 2009).	Dated to the 1st century B.C.	Ed-Dur (al-Dūr), Umm Al-Qaiwayn, UAE.
1092, 1111.	No. 5, 6, fig 22. "Bowl". (De Maigret, 1988).	Dated from around 11th century B.C. to 5th century B.C.	Wadi Yalā, at Ḥawlān Aṭ-Ṭiyāl, Yemen.
1092, 1111.	No. F9. 7, 8, fig 10. "large bowl". No. F9. 11, fig 11. "large bowl". (El-Hassan and Khabir, in press).	Dated from 3rd century B.C. to the 3rd century A.D.	Qaryat Al-Fāw, Wadi Ad-Dawasir, south-west central province, Saudi Arabia.
1092, 1111.	No. H18412, fig106, strata L. "LCF 3". No. H2310, fig110, strata O. "LCF 8". (Van Beek, 1969).	Dated to the 7th century B.C. Dated from 9th to 8th century B.C.	Hajar Bin Ḥumeid (HBH).
1092.	QAT.047, fig 10. "Bowl". (Power et al, 2019).	Dated to Iron Age II period. From 1100 – 600 B.C.	Bayt Bin Ati, south-west of Qattara Oasis, Al-Ain, UAE.

Type HM-G - Rim – Hand-made

Season 2: (1153, 1103, 1098, 1255, 1217, 1101, 1485, 1025, 1394).

Season 3: (1106, 1535).

Table 7 Chronological table of type G, rim, hand-made.

Al-Ukhdu pottery number	Parallels	Chronology/ dating	Archaeological site name
1153, 1103, 1098, 1255, 1217, 1101, 1485, 1025, 1394.	No. 9, 10, 11, 12, 13, fig LIII, type VIIIb. "Deep bowl". (Thompson, 1944).	Dated from 7th to 5th century B.C.	Hureidha, Ḥaḍramawt, Yemen.
1101, 1485, 1025, 1394.	No. 19, 21, fig 24. "Bowl". (Zarins et al, 1980).	Dated to Islamic period.	Site no. 210-48, south-western Saudi Arabia.
1153, 1103, 1098, 1255, 1217, 1101, 1485, 1025, 1394.	No. 30, fig 40. "Bowl". (Abu-Duruk and Murad, 1986).	Dated from 670 to 540/ or 410 B.C.	Qasr Al-Hamrā', Tayma, Saudi Arabia.
1153, 1103, 1098, 1255, 1217, 1101, 1485, 1025, 1394.	No. DJ. 09. A. 45-5, fig2. Level 2." Bowl". No. DJ. 09. A. 38-13, fig5. Level 5. "Bowl". (Charloux et al, 2014 and Loreto et al, 2012).	L5: dated from 2nd century A.D. L2: dated from 15th – 18th century A.D.	Dûmat Al-Jandal, Al-Jawf region, North of Saudi Arabia.
1153, 1103, 1098, 1255, 1217, 1101, 1485, 1025, 1394.	No. H2471, fig33, strata P. "Jar 1". No. H2629, fig55, strata P. "Bowl 1". No. H2628, fig62, strata P. "Bowl 2". No. H2626, fig79, strata P. "Bowl 11". No. H2575, fig99, strata P. "Jar 1" No. H2103, fig75, strata N. "Bowl 5" No. H1849, fig73, strata L. "Bowl 2" No. H2020, fig79, strata M. "Bowl 11". No. H1946, fig79, strata M. "Bowl 11" No. H2982, fig99, strata S, "Jar 1". (Van Beek, 1969).	9th – 8th B.C. 9th – 8th B.C. 7th B.C. 7th B.C. 11th B.C.	Hajar Bin Ḥumeid (HBH).

Continue to Table 7

AI-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1153, 1103, 1098, 1255, 1217, 1101, 1485, 1025, 1394.	No. 9, 12, 19, fig 63. "Bowl". (Bawden et al, 1980).	Dated to latter part of the 1st millennium B.C.	Tayma, North of Saudi Arabia.
1103, 1098, 1217, 1101, 1394.	No. 2, fig 1.10 a. "Bowl". (Al-Zahrani, et al, 2013).	Dated from the 2nd century B.C. to Islamic period around 14th century A.D.	Jurash, Asir, South of Saudi Arabia.
1153, 1255, 1217, 1101, 1485, 1025, 1394.	No. f. TA6302.18, fig3.17b. "Bowl". No. g. TA3592.192, fig3.17b. "Bowl". (Hausleiter et al, 2017).	Belong to early Iron Age in Tayma, between 12th century B.C. and 19th century B.C.	Tayma, North of Saudi Arabia.
1103, 1098, 1255, 1217, 1485, 1025, 1394.	No. 121, fig 37. "Bowl". (Parr et al, 1978).	Dated from 2nd century A.D. to 3rd century A.D. C14: 115-265 A.D.	Zubayda site, North of Saudi Arabia.
1153, 1217, 1485, 1025.	No. 24, fig 3. "Bowl". (De Cardi, 1976).	Dated to the 1st millennium B.C.	Ras Al-Khaimah, UAE.
1101, 1485, 1025, 1394.	No. 3, fig 49. "Bowl". (Boucharlat and Lombart, 1985).	Dated from 900 to 700 B.C.	Rumeilah, Al-Ain, UAE.
1101, 1025.	No 41, fig 4. "Bowl". (Condoluci et al, 2014).	Dated from 1300 to 650/ or 300 B.C.	Salūt, Wadi Bahla, Oman.
1153, 1103, 1098, 1255, 1217, 1101, 1485, 1025, 1394.	No. 74. 1. D5, fig74. "Bowl". No. 80. 10. D5, fig80. "Bowl". (Al-Shehry, 2014).	Dated to the half of 1st millennium B.C (6th century B.C and 1st century B.C.).	Deddān, Al-Ula, Al-Madinah, north-western Saudi Arabia.
1232, 1142.	No. H2127, fig 37, strata N. "Lid 1". No. H2460, fig 48, strata P. "Lid 1". No. H1996, fig 48, strata M. "Lid 1". (Van Beek, 1969).	Dated from 9 th – 8 th century B.C. Dated to 7 th century B.C.	Hajar Bin Humeid, (HBH), Yemen.
1232, 1142.	237, fig XXII. "Lid 1". (Osinga, 2017).	Dated from Umayyad to early 'Abbasid period.	Badiyah, Umm Al-Jimal, Jordan.
1101, 1485, 1025	P03936, P04621, P000821, fig247. (Al-Jahwari, 2013).	Dated to Late Iron Age around 300 B.C. to 200 A.D.	Wadi Andam, Oman.

Type HM-H - Rim – Hand-made

Season 2: (1031, 3277, 2185, 1329, 1356, 2735, 1095, 1483, 1306, 1137, 3125, 1482).

Season 3: (1508, 1429, 1365, 1521, 1510, 1414, 1454, 1380, 1513, 4491, 1488, 1484, 1381, 1467, 1507, 1494).

Table 8 Chronological table of type H, rim, hand-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
2185, 1356, 2735.	No. 1, fig53, types 2. "Bowl". (Al-Saud, 1997).	Dated from 300 B.C. to 300 A.D.	As-Sayh, Central region, north-east Al-Aflaj, Saudi Arabia.
2185, 1329, 2735.	No. K 12-66, fig70. "Bowl". No. J 66-66, fig69. "Bowl". (Al-Talhi et al, 1986).	Dated to Islamic period	Al-Mabiyat site, Al-Ula, Al-Madinah region, north-western Saudi Arabia.
1031, 3277, 2185, 1329, 1356, 2735, 1095, 1483, 1306, 1137, 3125, 1482.	No. H3-20, fig 40. "Bowl". No. H1-21, fig 40. "Bowl". No. H1-26, fig 40. "Bowl". No. H1-27, fig 40. "Bowl". No. H1-10, fig 39. "Bowl". No. H1-2, fig 38. "Bowl". No. H1-4, fig 38. "Bowl". No. H1-6, fig 38. "Bowl". No. H3-9, fig 38. "Bowl". (Abu-Duruk and Murad, 1998).	Dated from 670 to 540/ or 410 B.C.	Oasr Al-Hamra, Tayma, North of Saudi Arabia.
3277, 2185, 1329, 1356, 2735, 1137, 1482.	No. 23, 24, fig 32. "Bowl". (Gilmore et al, 1982).	Dated from late 2nd to early 1st millennium B.C.	Wadi Tharbah, north-west Mada'in Salih, Al-Madinah, north-west of Saudi Arabia.

Continue to Table 8

Al-Ukhduḍ pottery number	Parallels	Chronology/ dating	Archaeological site name
1031, 3277, 2185, 1329, 1356, 2735, 1095, 1483, 1306, 1137, 3125, 1482.	No. 4. Y057.5, type16; No. 5. Y057.17, type6; No. 6. Y057.20, type18, fig6.9d, phase 3. "Bowl". No. 4. Y056.12, type36; No. 5. Y057.58, type36, fig6.9c, phase 3. "Bowl". (Hand-made?) (Schiettecatte et al, 2017).	Phase 3: dated from 4th century to 2nd century B.C. C14: 389 – 204 B.C.	Al-Yamāmah site, Al-Kharj, Central province, Saudi Arabia.
1356, 2735, 1483, 1306, 1137, 1482.	No. 11, 19, fig 10. "Bowl". (Abu-Duruk et al, 2000).	Dated to the 2nd century B.C.	Al-Bujidi site, Tayma, North of Saudi Arabia.
1031, 3277, 2185, 1329, 1356, 2735, 1483, 1306, 1137, 3125, 1482. 1095.	No. fig 5T.44. "Bowl". No. fig5T.47. "Bowl". No. fig5T.48. "Bowl". No. fig 5T.45. "Bowl". (Hashim, 2007).	Dated from 600 B.C. to 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.
1031, 3277, 2185, 1329, 1356, 2735, 1483, 1306, 1137, 3125, 1482. 1095.	No. 1, 6, 7, 23, 36, 37, 46, room3, trench2A, layer 6. "Bowl". No. 50, 51, 52, 53, 63, 64, 65, 70, 72, 79, room5, trench2A, layer8. "Bowl". No. 87, 88, room7, trench3, layer3. "Bowl". No. 12, 25, 30, 45, room3, trench2A, layer6. "Bowl". (Abu-Duruk, 1998).	Dated from 670 B.C. to 540/ or 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.
3125.	No. 7, fig 6. "Bowl". (Kennet, 1997).	Dated from Sasanian to Islamic period. (13th century A.D.)	Kush, Ras Al-Khaimah, UAE.
1356, 2735, 1483, 1306, 1137, 1482.	No. 343, fig XXXIV. "Bowl". (Osinga, 2017).	Dated from middle to late Islamic period.	Badiyah, Umm Al-Jimal, Jordan.
1031, 3277, 2185.	No. f, k, l, fig 6. "Bowl". No. b, fig 9. "Bowl". (Humphries, 1974).	1st millennium B.C. Latter half of the 1st millennium B.C. and 13th-14th century A.D.	Site BB-4. Site BB-15. Wadi Bahla, Oman.

Continue to Table 8

Al-Ukhud pottery number	Parallels	Chronology/ dating	Archaeological site name
<p>1329, 1356, 2735, 1483, 1306, 1137, 3125, 1482.</p>	<p>No. H2496, fig51, strata P. "Bowl 1". No. H2537, H2514, H2448, fig56, strata P. "Bowl 2". No. H2488, fig62, strata P. "Bowl 2". No. H2447, fig64, strata P. "Bowl 1". No. H2511, H2509, fig 64, strata P. "Bowl 2". No. H3089, fig55, strata S "Bowl 2". No. H3167, fig64, strata S "Bowl 2". No. H3038, fig72, strata S. "Bowl 2". No. H3169, H2998, fig88, strata S. "Bowl 1". No. H3154, fig90, strata S. "Bowl 3". No. H2973, fig55, strata R. "Bowl 2". No. H2909, fig62, strata R. "Bowl 3". No. H2964, fig72, strata R. "Bowl 3". No. H2852, fig75, strata R. "Bowl 7". No. H2650, fig56, strata Q. "Bowl 2". No. H2764, fig72, strata Q. "Bowl 1". No. H2414, H2334, H2306, H2302, H2261, fig56, strata O. "Bowl 2". No. H2262, fig57, strata O. "Bowl 3". No. H2394, H2336, fig64, strata O. "Bowl 1". No. H2333, fig64, strata O. "Bowl 2". No. H2365, fig88, strata O. "Bowl 1". (Van Beek, 1969).</p>	<p>Strata P: 9th – 8th century B.C.</p> <p>Strata S: 11th century B.C.</p> <p>Strata R: 10th century B.C.</p> <p>Strata Q: 9th – 8th century B.C.</p> <p>Strata O: 9th – 8th century B.C.</p>	<p>Hajar Bin Humeid (HBH), Yemen.</p>

Continue to Table 8.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1329, 1356, 2735, 1483, 1306, 1137, 3125, 1482.	No. H2237, fig56, strata N. "Bowl 2". No. H2078, fig57, strata N. "Bowl 3". No. H2199, H2147, fig64, strata N. "Bowl 1". No. H2076, fig65, strata N. "Bowl 2". No. H2100, fig65, strata N. "Bowl 3". No. H2160, fig72, strata N. "Bowl 1". No. H2015, fig56, strata M. "Bowl 2". No. H1984, H1948, fig72, strata M. "Bowl 1". No. H1841, fig72, strata L. "Bowl 1". No. H1857, fig100, strata L. "LCF 1". (Van Beek, 1969).	Strata N: 9th – 8th century B.C. Strata M: 7th century B.C. Strata L: 7th century B.C.	Hajar Bin Humeid (HBH), Yemen.
1356, 2735, 1137, 3215.	No. 2, 3, 4, fig 9. "Bowl". (Phillips, 1997).	Dated to latter Iron Age period. Probably from 600 – 300 B.C.	Rafaq 2 site, Wadi Al-Qawr, Oman.
1356, 2735, 1137, 3215.	No. 5, fig 6. "Bowl". (Weisgerber, 1982).	Dated to 3rd / 2nd century B.C.	Wadi Samad, Oman.
1356, 2735, 1137, 3215.	No. 1, 2, fig 4.15. "Bowl". (Sauer and Herr, 2012).	Dated to mid Islamic period IIA (Ayyubid).	Tell Hesban (Heshbon or Hisban), Amman, Jordan.
1356, 2735, 1137, 3215.	No. 13, 21, 22, 23, fig10. "Bowl". (Cleuziou, 1976/ 1977).	Dated to Iron Age period (the 1st millennium B.C.).	Qarn Bint Saud, Al-Ain, UAE.
1356, 2735, 1483, 1306, 1137, 3125.	No. 7e, fig 7. "Bowl". No. 7m, fig 7. "Bowl". (Newton, 2007).	6th – 8th/ 12th – 14th century A.D. 9th – 10th/ 12th century A.D. Generally, site date is from 9th century A.D. to 19th century A.D.	Al-Qisha, West of Sayhut, Maḥra, Yemen.

Continue to Table 8.

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1031, 3275, 2185.	No. 1, fig 6. "Bowl". No. 12, fig 7. "Bowl". (Boucharlat and Lombart, 1983).	Dated from 900 – 700 B.C.	Rumeilah, Level 1, Al-Ain, UAE.
1329, 1356, 2735, 1095, 1483, 1306, 1137, 3125, 1482.	No. F10. 6, fig 12. "Bowl". No. F9. 1, fig 19. "Bowl". No. F9. 53, fig 20. "Bowl". (El-Hassan and Khabir, in press).	Dated from 3 rd century B.C. to the 3 rd century A.D.	Qaryat Al-Fāw, Wadi Ad-Dawasir, south-west central province, Saudi Arabia.
1329, 1356, 2735, 1483, 1306, 1137, 3125, 1482.	No. 16, fig II, type 2b. "Bowl". No. 70, 71, fig VIII, type 8c. "Bowl". (Gazdar, 1982).	Dated to latter part of 2nd millennium B.C. and early 1st millennium A.D.	Zubaidah, Al-Qasim province, Central area, Saudi Arabia.
3277, 2185, 1356, 2735, 1306, 1137.	QAT.028, QAT.034, QAT.310, QAT.022, QAT.020, fig 10. "Bowl". (Power et al, 2019).	Dated to Iron Age II period. From 1100 – 600 B.C.	Bayt Bin Ati, south-west of Qattara Oasis, Al-Ain, UAE.
1329, 1356, 2735, 1483, 1306, 1137, 3125, 1482.	No. 37, 40, fig 10. "Bowl". (Potts et al, 1978).	Dated to late Islamic period from around 16th century to 18th century A.D.	South of the Dhahran Airport, East Saudi Arabia.
1031, 3277, 2185, 1329, 1356, 2735, 1095, 1483, 1306, 1137, 3125, 1482.	No. 5, 6, 7, 8, 9, 10, 11, 12, 13, fig 5.13. "Bowl". (Al-Hajri et al, 2018).	Dated from 3 rd / 4 th century A.D.	Al-Khobar, Dammam, Eastern province, Saudi Arabia.
1356, 2735, 1137, 3215.	No. 4, fig 20. "Bowl". (De Maigret, 1988).	Dated between 11th and 5th century B.C.	Ad-Durayb, Yalā, Wadi Yalā, Yemen.
1031, 3277, 2185, 1329, 1356, 2735, 1095, 1483, 1306, 1137, 3125, 1482	No. 59, 61, 69, 70, 72, 77, 78, fig 6. "Bowl". (Condoluci et al, 2014).	Dated from 1300 – 650/ or 300 B.C.	Salūt, Wadi Bahla, Oman.

Type HM-I - Rim – Hand-made

Season 2: (1051, 2191, 1298).

Table 9 Chronological table of type I, rim, hand-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1051, 2191, 1298.	No. b. TA8312.10, fig2.15 b. "Bowl". No. b. TA8823.9, fig2.12 a. "Bowl". (Hausleiter et al, 2018).	Dated to late Roman period. From 2nd to mid 4 th century A.D. Dated to last centuries of the 1st millennium B.C.	Tayma, North of Saudi Arabia.
1051, 2191, 1298.	No. 6, fig 57. "Bowl". (Abu-Duruk and Murad, 1985).	Dated from 670 – 540/ or 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.
1051, 2191, 1298.	No. H2259, fig103, strata O. "Bowl 4". (Van Beek, 1969).	Dated from 9th – 8th B.C.	Hajar Bin Humeid (HBH), Yemen.
1051, 2191, 1298.	No. 11, fig 5. "Bowl". No. 2, 4, fig 7. "Bowl". (Benoist et al, 1997).	Dated to Iron Age II, the end of 2nd millennium to the middle of the 1st millennium B.C (1100-600 B.C.). Dated to Iron Age III (600-300 B.C.).	Al-Madam, Sharjah, UAE.
1051, 2191, 1298.	No. 8, fig 8. "Bowl". (Phillips, 1997).	Dated to early Iron Age.	Al-Qawr, Oman.
1051, 2191, 1298.	No. 7, 8 fig 2. "Bowl". (De Cardi, 1976).	Dated to the middle of the 1st millennium B.C.	Ras Al-Khaimah, UAE.

Type HM-J - Rim – Hand-made

Season 2: (1228, 1334, 1028).

Season 3: (1487, 1459, 1424, 1425, 1500).

Table 10 Chronological table of type J, rim, hand-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1228, 1334, 1028.	No. 7, 8, fig LII, type III. "Bowl". (Thompson, 1944).	Dated from 7th to 5th century B.C.	Hureidha Tomb 5 and 6, Ḥaḍramawt, Yemen.
1228, 1334, 1028.	No. 41, fig4.14. "Bowl". (Hand-made?). (Al-Hajri et al, 2018).	Dated to 3rd/ 4th century A.D.	Al-Khobar, Dammam, Eastern province, Saudi Arabia.
1228, 1334, 1028.	No. i. TA9522.4; No. k. TA9522.186, fig3.12 b. "Bowl". (Hausleiter et al, 2018).	Dated to early Iron Age.	Tayma, North of Saudi Arabia.
1228, 1334, 1028.	No. H2603, fig91, strata P. "Bowl 7". No. H3140, fig107, strata S. "Bowl 1". (Van Beek, 1969).	Dated to 9th – 8th century B.C. Dated to 11th century B.C.	Hajar Bin Ḥumeid, (HBH), Yemen.
1228, 1334, 1028.	No. 62/218/D6, fig62. "Bowl". (Al-Shehry, 2014).	Dated to the half of 1st millennium B.C (6th century B.C and 1st century B.C.).	Daddan, Al-Ula, Al-Madinah, north-western Saudi Arabia.
1228, 1334, 1028.	No. 3, fig 20. "Jar". (Boucharlat et al, 1985).	Dated probably to Iron Age and Islamic period.	Sharjah coastal, Sharjah, UAE.
1334.	No. c, fig 242. "Bowl". (Al-Jahwari, 2013).	Dated to late Iron Age from 300 B.C. to 200 A.D.	Site No. CS.2.57. Samad, northern Oman, Oman.

Type HM-K - Rim – Hand-made

Season 2: (1355, 1342, 1304, 1149, 1639, 3278, 2699).

Season 3: (1457).

Table 11 Chronological table of type K, rim, hand-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1355, 1342, 1304, 1149, 1639, 3278, 2699.	No. 1, fig LI, type II. "Bowl". (Thompson, 1944).	Dated from 7th to 5th century B.C.	Hureidha Tomb 5 and 6, Ḥaḍramawt, Yemen.
1355, 1342, 1304, 1149, 1639, 3278, 2699.	No. 4, fig 14. "Large Bowl". (Al-Ibrahim and Al-Talhi, 1989).	Dated to early 1st millennium B.C. (Probably 1st century B.C.).	Al-Hijr, Al-Ula, Al-Madinah, north-western Saudi Arabia.
1355, 1342, 1304, 1149, 1639, 3278, 2699.	No. fig 19. "Jar". (Nehme et al, 2010).	Dated to the end of 1st century B.C. to the 1st century A.D.	Madā'in Sālih, Al-Ula, north-western Saudi Arabia.
1355, 1342, 1304, 1149, 1639, 3278, 2699.	No. H2090, fig52, strata N. LCF 3. No. H1809, fig52, strata L. LCF 3. (Van Beek, 1969).	Dated to 9th – 8th century B.C. Dated to 7th century B.C.	Hajar Bin Ḥumeid, (HBH), Yemen.
1324, 1304.	No. c. TA7265.148+TA7265.56, fig3.12 a. "Bowl". (Hausleiter et al, 2017).	Dated to Nabataean/ Early Roman period (1st century A.D or later).	Tayma, North of Saudi Arabia.
1304.	No. 3, fig 6. "Bowl". (Kennet, 1997).	Dated to Sasanian period, 13th century A.D.	Kush, Ras Al-Khaimah, UAE.
1324, 1304.	No. 43, fig 4. "Bowl". (Condoluci et al, 2014).	Dated from 1300 to 650 or 300 B.C.	Salūt (SS4), Wādī Bahla, oman.
1355, 1324, 1304, 1149, 1639, 3278, 2699.	No. 13, fig 5. "Bowl". (Rutten, 2009).	Dated to the 1st century B.C.	Ed-Dur (Al-Dūr), Umm Al-Qaiwayn, UAE.
1355, 1342, 1304, 1149, 1639, 3278, 2699.	No. 5, 10, fig 5. "Large bowl". (Rougeulle, 1999).	Dated from 1000 B.C. to the beginning of the early Islamic period	Šiḥr, east of yemen.
1355, 1342, 1304, 1149, 1639, 3278, 2699.	No. F2, 9, fig6. "Bowl or large bowl". No. F9, 10, fig10. "Bowl or large bowl". No. F9, 11, fig11. "Bowl or large bowl". (El-Hassan and Khabir, in press).	Dated from 3rd century B.C. to the 3rd century A.D.	Qaryat Al-Fāw, Wadi Ad-Dawasir, south-west central province, Saudi Arabia.
1355, 1342, 1304, 1149, 1639, 3278, 2699.	No. 3, 6, fig21. "Bowl". (De Maigret, 1988).	Dated to 11th and 5th century B.C.	Al-Durayb, Yalā, Wadi Yalā, Yemen.

Continue to Table 11

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1355, 1342, 1304, 1149, 1639, 3278, 2699.	No. a, k, fig9. "Bowl". (Humphries, 1974).	Dated to: Phase1: the latter half of the 1st millennium B.C. Phase2: 13th – 14th century A.D.	Site BB15, Wadi Bahla, Oman.
1342, 1639. 1304.	No. a, fig 242. "Bowl". No. d, fig 242. "Bowl". (Al-Jahwari, 2013).	Dated to late Iron Age from 300 B.C. to 200 A.D.	Site No. CS.2.57, Samad, northern Oman, Oman.

Type HM-L - Rim – Hand-made

Season 2: (2437, 1971, 1349, 1038, 2449, 1006).

Table 12 Chronological table of type L, rim, hand-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
2437, 1971, 1349, 1038, 2449, 1006.	No. 1, 3, 4, 6, fig16. "Jar". (Al-Ibrahim and Al-Talhi, 1989).	Dated to the early 1st millennium B.C. (Probably 1st century B.C.).	Al-Hijr, Al-Ula, Al-Madinah, north-west Saudi Arabia.
2437, 1971, 1349, 1038, 2449, 1006.	No. 5, fig 22. "Jar". (Ali, 1990).	Dated from the early 1st century B.C. to 106 A.D.	Al-Khiraiba, Al-Hijr, Al-Ula, Al-Madinah, north-western Saudi Arabia.
2437, 1971, 1349, 1038, 2449, 1006.	No. DJ.09A.45-35, L4, fig4. "Jar". No. DJ.09.A.46-3, L6, fig6. "Jar". (Charloux et al, 2014).	Dated to 8th -15th century A.D. Dated to 8th century A.D.	Dūmat Al-Jandal, Al-Jawf region, North of Saudi Arabia.
2437, 1971, 1349, 1038, 2449, 1006.	No. H3192, fig51, strata S. "Jar 4". No. H2611, fig59, strata P. "LCF 3" No. H2189, fig111, strata M. "LCF 14". (Van Beek, 1969).	Dated to 11th century B.C. Dated to 9th – 8th century B.C. Dated to 7th century B.C.	Hajar Bin Humeid, (HBH), Yemen.
2437, 1971, 1349, 1038, 2449, 1006.	No. 31, 32, room3, trench 2A, layer6. "Jar". (Abu-Duruk, 1998).	Dated from 670 to 540/ or 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.
2437, 1971, 1349, 1038, 2449, 1006.	No. a, d, fig3.8 a. "Jar". (Al-Hajri et al, 2002).	Dated to the late 1st millennium B.C.	Rujoum Sasa site, Tayma, North of Saudi Arabia.
2437, 1971, 1349, 1038, 2449, 1006.	No. 10, fig56. "Jar". No. 16, 19, fig58. "Jar". (Abu-Duruk and Murad, 1985).	Dated from 670 to 540/ or 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.
2437, 1971, 1349, 1038, 2449, 1006.	No. 7, fig79. "Bowl". (Parr and Gazder, 1980; and Gazdar, 1982).	Dated from latter part of 2nd millennium B.C to early 1st millennium A.D.	Zubaidah, Al-Qasim province, Central area, Saudi Arabia.
2437, 1971, 1349, 1038, 2449, 1006.	No. 76, fig3. "Jar". (De Cardi, 1977).	Dated to the 1st millennium B.C.	Am-Dhurra, Wadi Aghdā', Oman.
2437, 1971, 1349, 1038, 2449, 1006.	No. 17, 18, fig 3. "Jar". (De Cardi, 1976).	Dated to the 1st millennium B.C.	Ras Al-Khaimah, UAE.
2437, 1971, 1349, 1038, 2449, 1006.	No. F1. 2, 3, fig 1. "Jar". No. F9. 14, 17, 16, fig5. "Jar". (Al-Hassan and Khabir, in press).	Dated from 3rd century B.C. to 3rd century A.D.	Qaryat Al-Fāw, Wadi Ad-Dawasir, south-west central Saudi Arabia.

Continue to Table 12

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
2437, 1971, 1349, 1038, 2449, 1006.	No. 3, 8, 10, fig 6. "Jar". (Boucharlat and Lombart, 1983).	Dated from 900 – 700 B.C.	Rumeilah, Al-Ain, UAE. Level 1.
2437, 1971, 1349, 1038, 2449, 1006.	No. 84, fig 7. "Jar". No. 98, fig 8. "Jar". (Condoluci et al, 2014).	Dated to Iron Age period. From 1300 – 650 or 300 B.C.	SS7 and SS8, Wadi Bahla, Salūt, Oman.

Type HM-M - Rim – Hand-made

Season 2: (1363, 1177).

Table 13 Chronological table of type M, rim, hand-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1363, 1177.	No. H2794, fig80, strata R. "Jar 4". No. H2346, fig80, strata O. "Jar 4". No. H3011, fig99, strata S. "Jar 2". (Van Beek, 1969).	Dated to 10th century B.C. Dated 9th – 8th century B.C. Dated 11th century B.C.	Hajar Bin Humeid, (HBH), Yemen.
1363, 1177.	No DJ.09.A.48-24, fig3, level 3. "Jar". No. DJ.09.A.29-66, fig4, level 4. "Jar". (Charloux et al, 2014).	Dated from 8th century to 15th century A.D.	Dûmat Al-Jandal, Al-Jawf region, North of Saudi Arabia.
1363, 1177.	No. 5, 6, fig 21. "Large bowl". (De Maigret, 1988).	Dated from 11th to 5th century B.C.	Al-Durayb, Wādī Yalā, Yemen.
1363, 1177.	No. 9, fig 51. Type 4. "Jar". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.

Type HM-N - Rim – Hand-made

Season 2: (3124, 1325, 1337).

Season 3: (1527, 1435, 1389, 1379, 1450, 4399, 2616).

Table 14 Chronological table of type N, rim, hand-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
3124, 1325, 1337.	No. 1, fig 5.5 b. "Bowl". (Al-Saud et al, 2011).	Dated from 300 B.C. to 300 A.D.	Al-'Ayun, Al-Aflaj, Central province, Saudi Arabia.
3124, 1325, 1337.	No. 7, fig21. "Bowl". (Zarins et al, 1981).	Dated to the late of 2nd millennium B.C.	Site no. 216-220, South of Jazan, South of Saudi Arabia.
3124, 1325, 1337.	No. i TA9522.4, fig3.12 b. "Bowl". No. m TA5388.4, fig3.12 b. "Bowl". No. n TA9522.3, fig3.12 b. "Bowl". No. o TA5388.8, fig3.12 b. "Bowl". (Hausleiter et al, 2018).	Dated to early Iron Age.	Tayma, North of Saudi Arabia.
3124, 1325, 1337.	No. 4, 7, fig56. "Bowl". (Abu-Duruk and Murad, 1985).	Dated from 670 to 540/ or 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.
3124, 1325, 1337.	No. 1, 4, 10, fig 103. "Bowl". (Al-Ibrahim et al, 1985).	Dated from 9th century A.D to 12th century A.D.	Al-Mabiyat, Al-Ual, Al-Madinah, North of Saudi Arabia.
3124, 1325, 1337.	No. 82, 84, 85, 86, 88, 89, fig18. "Bowl". (De Cardi, 1976).	Dated to 1st millennium B.C.	'Amlah, Wadi Al-'Ayn, Oman.
3124, 1325, 1337.	No. 78, fig 3. "Bowl". (De Cardi, 1977).	Dated to 1st millennium B.C.	Am-Dhurra, Wadi Aghdā', oman.
3124, 1325, 1337.	No. H1833, fig42, strata L. "Bowl 4". No. H2953, fig44, strata R. "LCF 1". (Van Beek, 1969).	Dated to 7th century B.C. Dated to 10th century B.C.	Hajar Bin Humeid, (HBH), Yemen.
3124, 1325, 1337.	No. 32, 35, 36, fig 4. "Bowl".(De Cardi,1976).	Dated to middle of the 1st millennium B.C.	Ras Al-Khaimah, UAE.
3124, 1325, 1337.	No. 18, 20, fig 49. "Bowl". (Boucharlat and Lombart, 1985).	Dated from 900 – 700 B.C.	Rumeilah period I, Al-Ain, UAE.
3124, 1325, 1337.	No. 91, fig 7. "Bowl". (Boucharlet and Lombard, 1983).	Dated from 900 – 700 B.C.	Rumeilah, period I, Al-Ain, UAE.

Type HM-O - Rim – Hand-made

Season 2: (1027, 1024).

Table 15 Chronological table of type O, rim, hand-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1027, 1024.	No. 56, fig21. "Bowl". No. 128, fig23. "Bowl". No. 195, fig25. "Bowl". (Zarins et al, 1979).	Dated from 1st century B.C to 6th century A.D.	Layla, Al-Aflaj, Central province, Saudi Arabia.
1027, 1024.	No. 53, room5, trench2A, layer8. "Bowl". (Abu-Duruk, 1998).	Dated to the half of 1st millennium B.C. (670 to 540/410 B.C.)	Qasr Al-Hamār', Tayma, North of Saudi Arabia.
1027, 1024.	No. H2514, fig56, strata P. "Bowl 2". No. H2334, H2306, fig56, strata O. "Bowl 2". No. H2909, fig62, strata R. "Bowl 3". (Van Beek, 1969).	Dated from 9th to 8th century B.C. Dated to 10th century B.C.	Hajar Bin Humeid (HBH), Yemen.
1027, 1024.	No. 1, fig 7. "Bowl". (Benoist et al, 1997).	Dated to Iron Age III (600 – 300 B.C.).	Al-Madam, Sharjah, UAE.
1027, 1024.	No. 10, fig2. "Bowl". (De Cardi, 1976).	Dated to the mid of the 1st millennium B.C.	Ras Al-Khaimah, UAE.
1027, 1024.	No. 13, 22, fig7. "Bowl". (Kennet, 1997).	Dated from Sasanian and Islamic period to the 13th century A.D.	Kush, Ras Al-Khaimah, UAE.
1027, 1024.	No. a, b, fig4.6. "Bowl". (Hand-made?). (Magee, 2004).	Dated to period III (to the late second to early 1st millennium B.C.)	Tepe Yahya, Iran.

Type HM-P - Rim – Hand-made

Season 2: (2187, 1034, 1033, 3192, 2451, 2450, 1640, 1007, 1353, 1324).

Table 16 Chronological table of type P, rim, hand-made.

Al-Ukhdu pottery number	Parallels	Chronology/ dating	Archaeological site name
2187, 1034, 1033, 3192, 2451, 2450, 1640, 1007, 1353, 1324.	No. 5, 7, 9, 10, 21, 22, fig LVI. "Bowl (Sherds)". (Thompson, 1944).	Dated between 7th and 5th century B.C.	Tomb 5, Tomb 6, Hureidha (Ḥaḍramawt), Yemen.
2187, 1034, 1033, 3192, 2451, 2450, 1640, 1007, 1353, 1324.	No. 4, 6, fig14. "Bowl". (Al-Ibrahim and Al-Talhi, 1989).	Dated to early 1st millennium B.C. (Probably 1st century B.C.).	Al-Hijr, Al-Ula, Al-Madinah, north-western Saudi Arabia.
2187, 1034, 1033, 3192, 2451, 2450, 1640, 1007, 1353, 1324.	No. a. TA7256.10; No. b TA3450.54, fig3.12 b. "Bowl". (Hausleiter et al, 2017).	Dated to Nabataenan/ early Roman period. (1st century A.D or later).	Tayma, North of Saudi Arabia.
2187, 1034, 1033, 3192, 2451, 2450, 1640, 1007, 1353, 1324.	No. 12, 22, fig22. "Bowl". No. 21, fig24. "Bowl". (Zarins et al, 1980).	Dated to 1st millennium B.C.	Site no. 211-52; site no. 211-45, Central and Southern Province, Saudi Arabia.
2187, 1034, 1033, 3192, 2451, 2450, 1640, 1007, 1353, 1324.	No. a. TA5379.9, fig3.13 a. "Large bowl". (Hausleiter et al, 2018).	Dated to Early Iron Age.	Tayma, North of Saudi Arabia.
2187, 1034, 1033, 3192, 2451, 2450, 1640, 1007, 1353, 1324.	No. 1, 2, 3, fig 6. "Bowl". (Weisgerber, 1982).	Dated to around 3rd/ 2nd century B.C.	Hillfort Maysar-34, Samad, Oman.
2187, 1034, 1033, 3192, 2451, 1640.	No. 8, fig 5. "Bowl". No. 7, fig 7. "Bowl". (Mouton et al, 1997).	Iron Age II (1100-600 B.C.). Iron Age III (600-300/250 B.C.). Probably to the end of the 2nd millennium and to the mid of the 1st millennium B.C.	Al-Madam, Sharjah, UAE.
2187, 1034, 1033, 3192, 2451, 2450, 1640, 1007, 1353, 1324.	No. 13, fig 2. "Bowl". No. 24, fig 3. "Bowl". (De Cardi, 1976).	Dated to mid of the 1st millennium B.C.	Ras Al-Khaima, UAE.
2187, 1034, 1033, 3192, 2451, 2450, 1640, 1007, 1353, 1324.	No. 15, fig 17. "Bowl". No. 12, 17, fig 20. "Bowl". No. 4, fig 21. "Bowl". (Boucharlate et al, 1985).	Dated to Iron Age or probably to Islamic period.	Sharjah coastal, Sharjah, UAE. Site 1-5 (119); site 6-8 (115); site 9-13 (118), Sharjah, UAE
2187, 1034, 1033, 3192, 2451, 1640, 1324.	No. 25, 26, 27, fig 1. "Large bowl". (Cleuziou, 1976/ 1977).	Dated to Iron Age period (the 1st millennium B.C.)	Qarn Bint Saud, Al-Ain, UAE.

Continue to Table 16

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
2187, 1034, 1033, 3192, 2451, 2450, 1640, 1007, 1353, 1324.	No. F2.9, F4.9, fig 6. "Jar". (El-Hassan and Khabir, in press).	Dated from 3rd century B.C. to the 3 rd century A.D.	Qaryat Al-Fāw, Wadi Ad-Dawasir, south-west central province, Saudi Arabia.
2187, 1034, 1033, 3192, 2451, 2450, 1640, 1007, 1353, 1324.	No. 57, fig XLI, type 9a. "Jar". No. 59, fig XLI, type 9b. "Jar". (Gazdar, 1982).	Dated to latter part of 2nd millennium B.C. and to early 1st millennium A.D.	Zubaidah, Al-Qasim peovince, Central area, Saudi Arabia.
1034, 2450, 1007, 1353, 1324.	No. 61, 76, 78, fig 6. "Bowl". (Condoluci et al, 2014).	Dated from 1300 to 650/or 300 B.C.	Salūt (SS7), Wādī Bahla, Oman.
2187, 1034, 1033, 3192, 2451, 1640.	No. 4, 6, fig 2. "Bowl". (Guilbert and Rougeulle, 1997).	Dated to early Islamic period (9th – 11th century A.D.).	Al-Quraya, Abyan, Yemen.
1034, 3192, 1353.	No. a, fig 248. "Bowl". No. b, fig 248. "Bowl". No. c, fig 248. "Bowl". (Al-Jahwari, 2013).	Dated to late Iron Age from 300 B.C. to 200 A.D.	Site No. CS.2.57, Samad, northern Oman, Oman.
2187, 1034, 1033, 3192, 2451, 2450, 1640, 1007, 1353, 1324.	No. 177, 178, 179, 185, fig 28. "Jar". (Aqeel and Breton, 1996).	Dated to the two levels in Shabwa from 2nd – 3rd century A.D.	Shabwa, "Shabwah", Yemen.

Type HM-Q - Rim – Hand-made

Season 2: (1341).

Table 17 Chronological table of type Q, rim, hand-made.

Al-Ukhduḍ pottery number	Parallels	Chronology/ dating	Archaeological site name
1341.	No. 25/ 308/ D.6, fig25. "Bowl". No. 57/ 212/ D.5, fig29. "Bowl". (Al-Shehry, 2014).	Dated to the half of 1st millennium B.C. (6th century B.C. to 1st century B.C.)	Daddan, Al-Ula, Al-Madinah, north-western Saudi Arabia.
1341.	No. H2734, fig79, strata Q. "Jar 1". No. H2739, fig99, strata Q. "Jar 1". No. H2789, fig103, strata Q. "Jar 1". (Van Beek, 1969).	Dated to 9th century B.C. to 8th century B.C.	Hajar Bin Ḥumeid (HBH), Yemen.
1341.	No. CP6.1, fig 20. "Jar". (Kennet, 2004).	Dated to period I and II at Kush from 4th – 8th century A.D. In period III and IV dated to late 11th/ early 12th century A.D.	Kush, Shimal area, Ras al-Khaimah, UAE.
1341.	No. 2, 3, fig 21. "Large bowl". (De Maigret, 1988).	Dated from around 11th century B.C. to 5th century B.C.	Wadi Yalā, at Ḥawlān AṬ-Ṭiyāl, Yemen.

Type HM-R - Rim – Hand-made

Season 2: (1026).

Table 18 Chronological table of type R, rim, hand-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1026.	No. 22, fig 38. "Bowl". (Hand-made?). (Al-Hashash et al, 2001).	Dated from 300 B.C. to 100 A.D.	Thaj, East province, Saudi Arabia.
1026.	No. 3, fig 25, type 6. "Bowl". (Al-Saud, 1997).	Dated from 300 B.C. to 300 A.D.	Al-'Ayun, Al-Aflaj, north-east Riyadh, Central province, Saudi Arabia.
1026.	No. H2151, H2024, fig104, strata M. "Jar 3". (Van Beek, 1969).	Dated to 7th century B.C.	Hajar Bin Ḥumeid, Yemen.
1026.	No. 7, 18, 19, 26, fig5.13. "Bowl". (Hand-made?). (Al-Hajri et al, 2018).	Dated to 3rd/ 4th century A.D.	Al-Khobar, Dammam, Eastern province, Saudi Arabia.
1026.	No. L, fig 9. "Bowl". (Humphries, 1974).	Dated from latter half of the 1st millennium B.C., to 13th – 14th century A.D.	BB-15, Wadi Balha, Oman.
1026.	No. 202, fig XVII. "Bowl" No. 203, 204, fig XVIII. "Bowl" No. 326, fig XXXII. "Bowl" (Osinga, 2017).	Dated to late Umayyad to Early 'Abbasid period. (8th century B.C.). Dated to late Byzantine to early Umayyad. Late 6th – 7th century A.D.	Badiyah, Umm El-Jimal, Jordan.
1026.	No. 11, fig 22. "Jar". (De Maigret, 1988).	Dated from around 11th century B.C. to 5th century B.C.	Wadi Yalā, at Ḥawlān Aṭ-Ṭiyāl, Yemen.

Type HM-S - Rim – Hand-made

Season 2: (1322).

Season 3: (1492, 1436, 1528, 1505, 1442).

Table 19 Chronological table of type S, rim, hand-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1322.	No. 21, fig38. "Jar". (Hand-made?). (Al-Hashash et al, 2001).	Dated from 300 B.C. to 100 A.D.	Thaj, East province, Saudi Arabia.
1322.	No. g. TA8312.23, fig2.15 a. "Jar". (Hausleiter et al, 2018).	Dated to late Roman period (2nd to mid 4 th century A.D.).	Tayma, North of Saudi Arabia.
1322.	No. 35, 36, 40, fig2.5 a. "Jar". (Hand-made?). (Loreto et al, 2012).	Dated from the last century B.C. to the 1st century A.D.	Al-Ṭuwayr site, Dūmat Al-Jandal, Al-Jawf, North of Saudi Arabia.
1322.	No. 15, fig 85. "Jar". (Ingraham et al, 1981).	Dated from the end of 1st millennium B.C. to the first centuries A.D. Nabataean/ Roman.	Al-Bad' and Maqna, North of Saudi Arabia.
1322.	No. 93, fig 3. "Jar". (De Cardi, 1977).	Dated to the 1st millennium B.C.	Am Dhurra, Wadi Aghdā', Oman.

Vessel Part: Rim Sherds. Wheel-made.

Type WM-A - Rim – Wheel-made

Season 2: (1326, 2153, 2186, 3127, 3128, 3286, 3565).

Season 3: (1471, 1428, 4267, 1512, 1390, 1531, 1529, 1422, 4268, 1418, 2271, 1477).

Table 20 Chronological table of type WM-A, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
3127, 3128, 3565.	No. 1, fig 1. "Bowl". No. 4, 5, fig 16. "Bowl". (Al-Thenyan, 2006).	Dated from 12th to 14th century A.D. Dated from 7th to 13th century A.D.	Al-Sirrayn site. 'Aththar site, Red Sea Tihami coastal ports, Jazan, South of Saudi Arabia.
3286, 3565.	No. 9, fig 4. "Bowl". No. 19, fig 20. "Bowl". No. 3, fig 27. "Bowl". (Al-Saud, 1997).	Dated from 300 B.C to 300 A.D.	Al-'Ayun, Al-Aflaj, Central province, Saudi Arabia.
1329.	No. 37, fig 25. "Bowl". No. 41, fig 26. "Bowl". (Al-Zahrani, 2014).	Dated from 6th century B.C. to 5th century A.D.	Thaj, Eastern province, Saudi Arabia.
3565, 2153, 3286, 1326, 3127, 3128, 3286.	No. 69, fig 2. "Bowl". No. 145, fig 24. "Bowl". No. 176, 196, 197, fig 25. "Bowl". No. 225, fig 26. "Bowl". (Zarins et al, 1979).	Dated to per-Islamic period from 1st century B.C. to 6th century A.D.	Layla, Al-Aflaj, Central province, Saudi Arabia.
2186.	No. 22, fig 46. "Bowl". (Bawden, 1979).	Dated to the middle of 1st millennium B.C.	Khief El-Zahrah, Al-Ula, Al-Madinah, north-western Hijaz, Saudi Arabia.
2186, 3286, 3565.	No. 52, fig 34. "Bowl". No. 90, fig 35. "Bowl". No. 93, 99, fig 36. "Bowl". No. 120, fig 37. "Bowl". (Parr et al, 1978).	Dated to Hellenistic period.	Al-Ṭuwayr, Al-Jawf, North of Saudi Arabia.
1326.	No. 33, fig 26. "Bowl". (Zarins et al, 1980).	Dated to per-Islamic period (Byzantine period).	Wadakh, Ad-Dawadami, north-west Saudi Arabia.
1326, 2153, 2186, 3127, 3128, 3286, 3565.	No. 5, 11, 12, 16, 17, fig 81. "Bowl". (Parr and Gazdar, 1980).	Dated from latter part of 2nd millennium B.C. to early 1st millennium A.D.	Zubaidah, Al-Qasim province, central area, Saudi Arabia.
1326, 2153, 2186, 3127, 3128, 3286, 3565.	No. 7, 8, 15, fig 76. "Bowl". (Zarins and Al-Zahrani, 1985).	Dated from 7th to 13th century A.D.	Athar, Jazan, South of Saudi Arabia.

Continue to Table 20

Al-Ukhdu pottery number	Parallels	Chronology/ dating	Archaeological site name
3127, 3128.	No. 8, fig 4. "Bowl". (Al-Ghazzi, 1994).	Dated from 6th century B.C. to 3rd century A.D.	Site no. (211-22), North Al-Khamaseen, Wadi Ad-Dwasir. Central province, Saudi Arabia.
1326, 2153, 2186, 3127, 3128, 3286, 3565	No. a, b, fig 4.23. "Bowl". No. a, fig 4.25. "Bowl". No. a, b, fig 4.27. "Bowl". No. a, fig 5.14. "Bowl". No. a, b, fig 5.43. "Bowl". (Magee, 2004).	Dated to 1st millennium B.C (1000-500 B.C.).	Tepe Yahya, Iran.
1326, 3127, 3565.	No. 202, fig 26. "Bowl". No. 383, 384, fig 43. "Bowl". No. 778, fig 77. "Bowl". (Al-Amer, 1996).	Dated from 3rd century B.C. to 3rd century A.D. Phase 1: 3rd to 1st century B.C. Phase 2: 1st to 3rd century A.D.	Al-Daffi site, Al-Jubail, Eastern province, Saudi Arabia.
1326, 2153, 2186, 3127, 3128, 3286, 3565	No. 25, fig 71. "Bowl". No. 5, fig 84. "Bowl". No. 20 21, fig 87. "Bowl". No. 24, 25, fig 88. "Bowl". No. 7, fig 109. No. 91, fig 110. "Bowl". No. 28, fig 123. "Bowl". (Al-Ghazzi, 1990).	Date from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Riyadh area, Saudi Arabia.
2186, 3127, 3128, 3565.	No. 117, fig XIII, type 3d. "Bowl". No. 84, fig XLVI, type 7. "Jar". (Gazdar, 1982).	Dated from latter part of 2nd millennium B.C. to early 1st millennium A.D.	Zubaidah, Al-Qasim province, central area, Saudi Arabia.
1326, 2153, 3565.	No. 3, 53, fig 2. "Bowl". No. 126, fig 3. "Bowl". No. 65, fig 4. "Bowl". No. 31, 37, fig 7. "Bowl". (Sasaki, 1990).	Dated to Islamic period. From 9th to 10th century A.D.	A'Ali site, Bahrain.

Type WM-B - Rim – Wheel-made

Season 2 (1259, 1486, 1512, 1226, 1281, 1120, 1139, 1127, 1123).

Table 21 Chronological table of type WM-B, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1259, 1486, 1512, 1226, 1281, 1120, 1139, 1127, 1123.	No. 197, fig 15. "Bowl". (Potts et al, 1978).	Dated to early Islamic period (half 7th century to 11th century A.D.).	South of the Dhahran Int. Airport, Eastern province, Saudi Arabia.
1259, 1486, 1512, 1226, 1281, 1120, 1139, 1127, 1123.	No. 5, fig 9. "Bowl". No. 3, fig 25. "Bowl". No. 4, fig 39. "Bowl". (Al-Saud, 1997).	Dated from 300 B.C. – 300 A.D.	Al-'Ayun, Al-Aflaj, Central province, Saudi Arabia.
1259, 1486, 1512, 1226, 1281, 1120, 1139, 1127, 1123.	No. H286x, fig43, strata C2. Bowl S 5, 6. No. H1690, fig104, strata K. Jar 2. No. H1515, fig104, strata J. Jar 2. No. H1874, fig104, strata L. Jar 2. (Van Beek, 1969).	Dated from late 2nd B.C. to mid 1 st century B.C. Dated from 6th – 5th century B.C. Dated to 7th century B.C.	Hajar Bin Humeid (HBH), Yemen.
1259, 1486, 1512, 1226, 1281, 1120, 1139, 1127, 1123.	No. 88, fig 2. "Bowl". No. 54, fig 4. "Bowl". (Sasaki, 1990).	Dated to Islamic period. From 9th to 10th century A.D.	A'Ali site, Bahrain.
1259, 1486, 1512, 1226, 1281, 1120, 1139, 1127, 1123.	No. e, fig 11. "Bowl". (Humphries, 1974).	Dated to the 7th century B.C. latter part of the 1st millennium B.C.	SH-11, South of Sohar, Wadi Bahla, Oman.
1259, 1486, 1512, 1226, 1281, 1120, 1127, 1123.	No. 112, fig 10. "Bowl". No. K4901; No. K4903; No. K4904, fig 34. "Bowl". (Kennet, 2004).	Dated from 14th century A.D to 16th century A.D. Dated between 1st/ early 2nd century A.D and 4th/ 5th century A.D.	Al-Mataf (Julfar), Ras Al-Khaimah, UAE.

Continue to Table 21

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1259, 1486, 1512, 1226, 1281, 1120, 1139, 1127, 1123.	No. 52, fig 80. "Bowl". No. 61, fig 103. "Bowl". No. 28, fig 123. "Bowl". No. 35, fig 124. "Bowl". No. 44, fig 170. "Bowl". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.
1259, 1486, 1512, 1226, 1281, 1120, 1127, 1123.	No. 2, fig 28. "Bowl". No. 5, fig 29. "Bowl". No. 7, 9, 10, fig 36. "Bowl". (Cleuziou, 1978/ 1979).	Dated to Iron Age period, probably to the mid of the 1st millennium B.C.	Hili 8, Al-Ain, UAE.

Type WM-C - Rim – Wheel-made

Season 2 (1206, 1178, 1105, 1112, 1212, 1181).

Table 22 Chronological table of type WM-C, rim, wheel-made.

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1206, 1178, 1105, 1112, 1212, 1181.	No. 8, fig 2.5, Stratum 20. "Bowl". No. 10, fig 2.11, Stratum 18. "Bowl". No. 6, 9, 10, 11, 13, 14, 15, 16, 19, fig 3.24. "Bowl". (Sauer and Herr, 2012).	Dated to mid 12th to early 11th century B.C. Dated to 11th to 10th century B.C. Dated to late Roman I-II (135-235 A.D.).	Tell Hesban (Heshbon or Hisban), Amman, Jordan.
1206, 1178, 1105, 1112, 1212, 1181.	No. DJ.10.C.2013-3, layer 2013. "Jar". (Charloux and Loreto, 2014).	Dated from 2th to 6th century A.D.	Dûmat Al-Jandal, Al-Jawf region, North of Saudi Arabia.
1206, 1178, 1105, 1112, 1212, 1181.	No. 18, fig 66. "Bowl". (Bawden et al, 1980).	Dated to latter part of the 1st millennium B.C.	Tayma, North of Saudi Arabia.
1206, 1178, 1105, 1112, 1212, 1181.	No. 69, fig 73. "Bowl". (Gazdar et al, 1984).	Dated from 300 B.C. to 100 A.D.	Thaj, Eastern province, Saudi Arabia.
1105, 1112, 1212, 1181.	No. fig 4.21. "Storage jar". No. b, fig 5.8. "Bowl". (Magee, 2004).	Dated to 1st millennium B.C (1000-500 B.C.). Dated to Period II from 500-300g /or 200 B.C.	Tepe Yahya, Iran.
1178.	No. b, fig 8. "Bowl". (Tourtet and Hausleiter, 2018).	Dated from 7th to 2th century B.C.	Tayma, North of Saudi Arabia.
1178.	No. h. TA3829.160, fig 13. "Bowl". (Tourtet et al, in press).	Dated from 6th to 2th century B.C.	Tayma, North of Saudi Arabia.
1206, 1178, 1105, 1112, 1212, 1181.	No. 512, fig 53. "Bowl". No. 816, fig 80. "Bowl". No. 828, 830, 831, fig 81. "Bowl". (Al-Amer, 1996).	Dated from 3rd century B.C. – 3rd century A.D. Phase 1: 3rd – 1st century B.C. Phase 2: 1st – 3rd century A.D.	Al-Daffi site, Al-Jubail, Eastern province, Saudi Arabia.
1206, 1178, 1112.	No. 110, 111, fig IX. Cooking pots. No. 188, fig XV. Cooking bowl. (Osinga, 2017).	Dated to early Byzantine period. Dated to late Byzantine period 6th century to early 7th century A.D.	Badiyah, Umm Al-Jimal, Jordan.

Type WM-D - Rim – Wheel-made

Season 2: (3195, 3191).

Season 3: (1046, 1485, 1405).

Table 23 Chronological table of type D, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
3195, 3191.	No. 86, fig 22. "Bowl". No. 90, fig 22. "Bowl". No. 91, fig 22. "Bowl". (Zarins et al, 1979).	Dated to Islamic period. Dated to Hellenistic period (200 B.C. – 600 A.D.).	Layla, Al-Aflaj, Central province, Saudi Arabia.
3195.	No. 21, fig 33. "Bowl". (Gilmore et al, 1982).	Dated to Islamic period ('Abbasid period).	Site no. (205-71), Al-Madinah, north-west Saudi Arabia.
3191.	No. 6, fig 16. "Bowl". (Al-Thenyan, 2006).	Dated from 7 th to 15 th century A.D.	'Aththar, Jazan, South of Saudi Arabia.
3195.	No. 77, fig 65. "Bowl". (Al-Zahrani, 2007).	Dated to Level 1: 1 st half of the 1 st millennium B.C. (11 th – 4 th century B.C.).	Tel Al-Katheeb, Al-Ula, Al-Madinah, north-west Saudi Arabia.
3195.	No. 4, 6, fig 3.21. "Bowl". (Sauer and Herr, 2012).	Dated to Early Roman IV period. (73-135 A.D.).	Tell Hesban (Heshbon or Hisban), Amman, Jordan.

Type WM-E - Rim – Wheel-made

Season 2: (1277, 1246, 1148, 1423, 1513, 2154).

Season 3: (1427, 2304, 1464, 1417, 1473, 1478).

Table 24 Chronological table of type E, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1277, 1246, 1148, 1423, 1513, 2154.	No. 6, fig 3. "Bowl". No. 7, 8, fig 10. "Bowl". No. 3, fig 57. "Bowl". (Al-Saud, 1997).	Dated from 300 B.C. to 300 A.D.	Al-Ayun, Al-Aflaj, Central province, Saudi Arabia.
1277, 1246, 1148, 1423, 1513, 2154.	No. 12, fig 15. "Jar or bowl". No. 20, 21, fig 16. "Jar or bowl". No. 46, fig 27. "Jar or bowl". (Al-Zahrani, 2014).	Dated from 6th century B.C. to 5th century A.D.	Thaj, Eastern province, Saudi Arabia.
1277, 1246, 1148, 1423, 1513, 2154.	No. 10. 170. D5, fig 10. "Jar". No. 14. 48. D.5, fig 14. "Jar". No. 104. 10. D5, fig 104. "Jar". No. 68. 89. D.6, fig 68. "Jar". No. 114. 205. D.6, fig 114. "Jar". (Al-Shehry, 2014).	Dated probably between 6th century B.C. and 1 st century B.C.	Daddan, Al-Ula, Al-Madinah, north-west Saudi Arabia.
1277, 1246, 1148, 1423, 1513, 2154.	No. DJ. 10. C. 2027-8. No. DJ. 10. C. 2027-2. Layer 2027. "Bowl". (Charloux and Loreto, 2014).	Dated from 2nd to 6th century A.D.	Dūmat Al-Jandal, Al-Jawf, North of Saudi Arabia.
1277, 1246, 1148, 1423, 1513, 2154.	No. 13, 18 fig 39. "Bowl". (Abu-Duruk and Murad, 1986).	Dated from 670 to 540/ or 410 B.C.	Qasr Al-Hamrā, Tayma, North of Saudi Arabia.
1277, 1246, 1148, 1423, 1513, 2154.	No. 31, fig 10. "Bowl". No. 103, fig 12. "Bowl". No. 94, fig 12. "Bowl". No. 184, 185, fig 14. "Bowl". (Potts et al, 1978).	Dated to Hellenistic period. Dated to early Islamic period (half of 7th to 11th century A.D.)	Site no. 208-91. Site no. 208-123. Site no. 208-123. Site no. 208-140. Eastern province, Saudi Arabia.

Continue to Table 24

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1277, 1246, 1148, 1423, 1513, 2154.	No. 16, 27, 29, fig 23. "Bowl". (Zarins et al, 1980).	Dated to Islamic period, probably post-'Abbasid.	Site no. (201-15), Al-Mabā'uth, Taif, Western province, Saudi Arabia.
1277, 1246.	No. 25, 38, fig 6. "Bowl". (Sasaki, 1990).	Dated to Islamic period from 9th to 10th century A.D.	A'Ali site, Bahrain.
1513, 2154.	No. 2, 6 7, fig 3. "Bowl". (Arnon, 2007).	Dated from 8th to 13th century A.D.	Marcus Street, Ramla, Palestine.
1513, 2154.	No. 4, fig 1. "Bowl". (Rutten, 2007).	Dated to 1st century B.C.	Ed-Dur, Umm Al-Qaiwain, UAE.
1277, 1246, 1148, 1423, 1513, 2154.	No. K943, fig 7, type 46. "Bowl". (Kennet, 2004).	Dated from the late 9th to early 10th century A.D.	Ras Al-Khaimah, UAE.
1277, 1246, 1148, 1423, 1513, 2154.	No. e, fig 4.17. "Bowl". No. d, fig 5.39. "Bowl". No. b, fig 5.43. "Bowl". No. d, fig 5.44. "Bowl". (Magee, 2004).	Dated to late Iron Age. (500 – 300/ or 200 B.C).	Tepe Yahya, Iran.
1513, 2154.	No. a. TA3964.6; No. e. TA3742.28, fig 3. "Bowl". (Maritan et al, 2017).	Dated from 2nd to 3rd/4th century A.D.	Tayma, North of Saudi Arabia.
1277, 1246, 1148, 1423, 1513, 2154.	No. h. TA3829.160, fig 13. "Bowl". No. c. TA3742.28, fig 15. "Bowl". (Tourtet et al, in press).	Dated from 6th to 2nd/1st century B.C. Dated from 2nd to 4th century A.D.	Tayma, North of Saudi Arabia.
1277, 1246, 1148, 1423, 1513, 2154.	No. 78, fig 16. "Bowl". No. 418, 419, 420, fig 46. "Bowl". No. 512, fig 53. "Bowl". No. 819, fig 80. "Bowl". No. 937, fig 91. "Bowl". No. 1110, fig 111. "Bowl". (Al-Amer, 1996).	Dated from 3rd century B.C. – 3rd century A.D. Phase 1: 3rd – 1st century B.C. Phase 2: 1st – 3rd century A.D.	Al-Daffi site, Al-Jubail, Eastern province, Saudi Arabia.
2154.	No. 3, 8, fig 22. "Bowl". (Mouton et al, 1997).	Dated from mid 2 nd to 1st century B.C.	Mleiha, Sharjah, UAE.
1277, 1246, 1148, 1423, 1513, 2154.	No. 4, 5, fig 23. "Bowl". No. 10, fig 24. "Bowl". (Boucharlat et al, 1998).	Dated from the half of 2nd to 1st century B.C.	Mleiha, Sharjah, UAE.

Continue to Table 24

Al-Ukhduḍ pottery number	Parallels	Chronology/ dating	Archaeological site name
1277, 1246, 1148, 1423, 1513, 2154.	No. 1, 2, 5, fig 13. "Bowl". (Mouton et al, 2001).	Dated from the half of 2nd to 1st century B.C.	Mleiha, Sharjah, UAE.
1277, 1246, 1148, 1423, 1513, 2154.	No. 14, 19, 20, fig 32. "Bowl". No. 104, 106, 107, fig 36. "Bowl". (Parr et al, 1978).	Dated to Hellenistic period. Dated from 2nd to 3rd century A.D. C14: 115 – 265 A.D.	Site no. 201-4 Al-Ṭuwayr. Site no. 206-7. Zubayda site, North of Saudi Arabia.

Type WM-F - Rim – Wheel-made

Season 2 (1290, 1003, 1514).

Table 25 Chronological table of type F, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1290, 1514.	No. 1, fig 3.11. "Jar". No. 1, fig 3.16. "Jar". (Sauer and Herr, 2012).	Hellenistic period (332-63 B.C.). Early Roman II-III period (37 B.C.-73 A.D.).	Tell Hesban (Heshbon or Hisban), Amman, Jordan.
1003.	No. 3, fig 2.7, stratum 20. "Jar". No. 7, fig 3.45. "Jar". No. 4, fig 3.46. "Jar". (Sauer and Herr, 2012).	Iron Age I, mid 12th to early 11th century B.C. Early Byzantine (324-491 A.D.).	
1290, 1514.	No. 420, fig 46. "Jar". (Al-Amer, 1996).	Dated from 3rd century B.C. – 3rd century A.D. Phase 1: 3rd – 1st century B.C. Phase 2: 1st – 3rd century A.D.	Al-Daffi site, Al-Jubail, Eastern Saudi Arabia.
1290, 1514. 1003.	No. 42, fig 147. "Jar". No. 7, fig 186. "Jar". No. 46, fig 99. "Jar". No. 47, fig 100. "Jar". No. 60, fig 134. "Jar". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.
1290, 1514, 1003.	No. DJ.10.C.2008-3, layer 2008. "Jar". No. DJ. 10.C.2008-2, layer 2008. "Jar". (Charloux and Loreto, 2014 and Loreto et al, 2012).	Dated from 2th century to 6th century A.D.	Dûmat Al-Jandal, Al-Jawf region, North of Saudi Arabia.
1003.	No. 47, fig 47. "Bowl". (Al-Zahrani, 2007).	Dated from 11th century B.C. to 1st century A.D.	Tel Al-Katheeb, Al-Ula, Al-Madinah, Saudi Arabia.

Continue to Table 25

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1003.	No. 20, fig 23. "Bowl". (Al-Zahrani, 2014).	6th century B.C. to 5th century A.D. The dated of Thaj: Phase1: 6th B.C – 1st A.D. P1.1. 6th B.C – 4th B.C. P1.2. 3rd B.C. – 1st A.D. Phase2: 1st – 5th A.D P2.1. 1st – 3rd A.D. P2.2. Byzantine/ Sasanian period to Islamic period.	Thaj, Eastern province, Saudi Arabia.

Type WM-G – Rim – Wheel-made

Season 2 (1221, 1205, 1004, 1035).

Table 26 Chronological table of type G, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1221, 1205, 1004, 1035.	No. 1, fig 8, type 3. "Bowl". No. 5, fig 9, type 3. "Bowl". (Al-Saud, 1997).	Dated from 300 B.C. – 300 A.D.	Al-'Ayun, Al-Aflaj, Central province, Saudi Arabia.
1221, 1205, 1004, 1035.	No. fig 12. "Bowl". (Al-Ghamedi, 1996).	Dated from 2nd century B.C. to mid Islamic period (661 A.D.).	Jurash, Asir, South of Saudi Arabia.
1221, 1205, 1004, 1035.	No. H1066, fig 75, strata F1. "Bowl 6". (Van Beek, 1969).	Dated to late 5th to early 3rd century B.C.	Hajar Bin Ḥumeid (HBH), Yemen.
1221, 1205, 1004, 1035.	No. 9, fig 102. "Bowl". (Ibrahim et al, 1985).	Dated from 9th century A.D to 12th century A.D.	Al-Mabiyat, Al-Ual, Al-Madinah, North of Saudi Arabia.
1221, 1205, 1004, 1035.	No. 24, fig 86. "Bowl". (Ingraham et al, 1981),	Dated from the end of the 1st millennium B.C. to the beginning of the first centuries A.D.	Wadi Aynūnah and Wadi Sharmah, Northern province.
1221, 1205, 1004, 1035.	No. p, fig 5. "Bowl". No. d, fig 7. "Bowl". (Whitcomb, 1975).	Dated to early Islamic period (630-1055 A.D.).	Wadi Beni Kharus 1, Oman.
1221, 1205, 1004, 1035.	No. c, fig 11. "Bowl". (Humphries, 1974).	Probably the 7th century B.C.	SH-11, South of Sohar, Oman.
1221, 1205, 1004, 1035.	No. 6, fig 15. "Bowl". No. 7, fig 15. "Bowl". (Phillips, 2005).	From 6th to 5th century B.C.	Al-Hāmid, south-west corner of Jabal Al-Ḍāmir, Yemen.

Type WM-H – Rim – Wheel-made

Season 2: (1315, 1305, 2190, 1346, 3193, 1036).

Season 3: (1042, 1041, 1406, 1455, 1426, 1445, 1448, 1366, 3245).

Table 27 Chronological table of type H, rim, wheel-made.

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1305, 1346.	No. 12, fig 80. "Bowl". (Whitcomb, 1978).	Dated to middle Islamic period.	Al-Ḥasā' oasis, East, Saudi Arabia.
1315, 3193, 1036.	No. 2, fig 17. "Bowl". (Adams et al, 1977).	Dated from 1st century B.C. to 2nd century A.D.	Al-Ṭuwayr site and Dūmat Al-Jandal, North Saudi Arabia.
1315, 1305, 1346, 3193, 1036.	No. 27, fig 20. "Bowl". No. 73, fig 21. "Bowl". No. 140, fig 23. "Bowl". No. 46, fig 24. "Bowl". (Zarins et al, 1979).	Dated From 1st century B.C. to 6th century A.D.	Layla, Al-Aflaj, Cnetral province, Saudi Arabia.
1315, 1305, 2190, 1346, 3193, 1036	No. 19, 20, fig 46. "Bowl". No. 34, fig 47. "Bowl". (Bawden, 1979).	Dated to the middle of 1st millennium B.C.	Khief El-Zahrah, Al-Ula, Al-Madinah, north-western Hijaz, Saudi Arabia.
1315, 1305, 2190, 1346, 3193, 1036	No. 78, 79, fig 65. "Bowl". No. 86, 88, fig 69. "Bowl". No. 93, fig 71. "Bowl". No. 110, fig 81. "Bowl". No. 114, fig 83. "Bowl". (Al-Zahrani, 2007).	Dated to the first half of the 1st millennium B.C. Tell Ak-Katheeb dated: from 11th century B.C. to 1st century A.D.	Tel Al-Katheeb, Al-Ula, Al-Madinah, north-west Saudi Arabia.
1315, 1305, 2190, 1346, 3193, 1036	No. 21, fig 20, type 20. "Bowl". No. 6, fig 15, type 4. "Bowl". (Al-Saud, 1997).	Dated from 300 B.C. to 300 A.D.	Al-'Ayun, Al-Aflaj, north-east Riyadh, Central province, Saudi Arabia.
1315, 1305, 1346, 1036.	No. 49.325.D6, fig 49. "Bowl". No. 50.37.D6, fig 50. "Bowl". No. 143.68.D6, fig 134. "Bowl". (Al-Shehry,2014).	Dated probably between 6th B.C and 1st century B.C.	Daddan, Al-Ula, Al-Madinah, north-west Saudi Arabia.
1315, 1346, 3193, 1036	No. H1470, fig42, strata J. "Bowl 3". No. H842, fig42, strata F2. "Bowl 3". No. 159, fig72, strata C2. "Bowl 1". No. H60, fig72, strata B. "Bowl1".(Van Beek,1969).	Dated from 6th – 5th B.C. Dated from late 5th to early 3rd B.C. Dated from late 2nd B.C. – mid 1st B.C. Dated from mid 1st B.C – 1st A.D.	Hajar Bin Ḥumeid (HBH), Yemen.

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Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1305, 2190.	No. 14, fig 15. "Bowl". (Al-Zahrani, 2014).	Dated from 6th century B.C. to 5th century A.D. The dated of Thaj: Phase1: 6th B.C – 1st A.D. P1.1. 6th B.C – 4th B.C. P1.2. 3rd B.C. – 1st A.D. Phase2: 1st – 5th A.D P2.1. 1st – 3rd A.D. P2.2. Byzantine/ Sasanian period to Islamic period.	Thaj, Eastern province, Saudi Arabia.
1315, 1305, 2190, 1346, 3193, 1036.	No. 1, fig 6. "Bowl". No. 8, 11, 18, 19, 20, 21, 22, 23, fig 10. "Bowl". (Cleuziou, 1976/ 1977).	Dated to Iron Age period (the 1st millennium B.C.)	Qarn Bint Saud, Al-Ain, UAE.
1315, 1346, 3193, 1036.	No. 3, 4, fig 53. "Bowl". No. 1, fig 56. "Bowl". No. 1, 14, 15, fig 57. "Bowl". (Boucharlat and Lombart, 1985).	Dated from 700 – 400 B.C.	Rumeilah II, Al-Ain, UAE.
1315, 1346, 3193, 1036.	No. 287, fig 34. "Bowl". No. 602, fig 59. "Bowl". (Al-Amer, 1996).	Dated from 3rd century B.C. – 3rd century A.D. Phase 1: 3rd – 1st century B.C. Phase 2: 1st – 3rd century A.D.	Al-Daffi site, Al-Jubail, Eastern province, Saudi Arabia.
1315, 1305, 2190, 1346, 3193, 1036	No. 6, fig 3. "Bowl". No. 4, fig 4. "Bowl". No. 8, fig 5. "Bowl". No. 10, 14, 15, fig 6. "Bowl". No. 5, 12, fig 7. "Bowl". No. 7, 10, fig 8. "Bowl". (Rougeulle, 2005).	Dated between 9th and 10th century A.D. (980-1150 A.D.).	Ra's Sharma, East of Al-Shihr, Hadramawt, Yemen.
1315, 1305, 2190, 1346, 3193, 1036	No. 5, fig 3. "Bowl". No. 47, 50, fig 4. "Bowl". No. 67, 70, fig 8. "Bowl". (Condoluci et al, 2014).	Dated from 1300 to 650/ or 300 B.C.	Site SS 1. Site SS 4. Site SS 7. Salūt, Oman.
1315, 3193.	No. 607.02/ P.20; No. 628.01/ K.2.8, fig 6. "Bowl". (Guérin and Al-Naimi, 2008 and 2010).	Dated to 9th century A.D. (Early 'Abbasid period).	Murwab, Qatar.

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Al-Ukhduh pottery number	Parallels	Chronology/ dating	Archaeological site name
1315, 1346, 3193, 1036.	No. 81, fig IX. "Bowl". (Gazdar, 1982).	Latter part of 2nd millennium B.C. to early 1st millennium A.D.	Zubaidah, Al-Qasim province, central area, Saudi Arabia.
1315, 1305, 1346.	QAT.264, fig 20. "Bowl". (Power et al, 2019).	Dated to Iron Age III period. From 600 – 300 B.C.	Bayt Bin Ati, south-west of Qattara Oasis, Al-Ain, UAE.
1315, 1346, 3193, 1036.	No. 4, fig 65. "Bowl". No. 9, fig 65. "Bowl". No. 11, fig 65. "Bowl". (Bawden et al, 1980).	Dated to late 1st millennium B.C. Dated to Iron Age.	Tayma, North of Saudi Arabia.
1315, 1305, 1346, 3193, 1036.	No. 11, fig 67. "Bowl". No. 46, fig 78. "Bowl". No. 10, fig 82. "Bowl". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.
1315, 1305, 1346, 3193, 1036.	No. 11, fig 67. "Bowl". No. 46, fig 78. "Bowl". No. 10, fig 82. "Bowl". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.

Type WM-I – Rim – Wheel-made

Season 2 (1340, 1548, 1401, 1345, 1145, 1116, 1851, 1237, 1229, 1850, 1210).

Table 28 Chronological table of type I, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1401, 1345, 1145, 1851, 1210.	No. 1, fig 41, type 3. "Bowl". No. 4, fig 65, type 3/1. "Bowl". (Al-Saud et al, 2011).	Dated from 300 B.C. – to 300 A.D.	Al-'Ayun, Al-Aflaj, Central province, Saudi Arabia.
1401, 1345, 1145, 1851, 1210.	No. 70, fig 61. "Bowl". No. 91, fig 70. "Bowl". No. 95, 96, fig 72. "Bowl". (Al-Zahrani, 2007).	Dated from 11th century B.C. to 4 th century B.C. The first half of the 1st millennium B.C.	Tel Al-Katheeb, Al-Ula, Al-Madinah, north-west Saudi Arabia.
1340, 1548.	No. 28, fig 20. "Bowl". No. 29, fig 20. "Bowl". (Zarins et al, 1979).	Dated from 200 B.C to 600 A.D, Hellenistic period.	Layla, Al-Aflaj, Cnetral province, Saudi Arabia.
1401, 1345, 1145, 1851, 1210.	No. 25, fig 46. "Bowl". (Bawden, 1979).	Dated to the middle of 1st millennium B.C.	Khief El-Zahrah, Al-Ula, Al-Madinah, north-western Hijaz, Saudi Arabia.
1401, 1345, 1145, 1851, 1210.	No. 77, fig 35. "Bowl". No. 122, fig 37. "Bowl". (Parr et al, 1978).	Dated from 2nd to 3rd century A.D. C14: 115-265 A.D.	Site no. (206-7), Zubayda site, North Saudi Arabia.
1401, 1345, 1145, 1851, 1210.	No. 11, fig 10. "Bowl". (Abu-Duruk et al, 2000).	Dated to the 2nd century B.C.	Al-Bujidi site, Tayma, North of Saudi Arabia.
1401, 1345, 1145, 1116, 1229.	No. 15, 21, fig 23. "Bowl". (Zarins et al, 1980).	Dated to Islamic period, Post 'Abbasid period).	Site no. (210-15), Al-Mubāu'th, Central and South-western Saudi Arabia.
1145, 1850, 1237, 1851.	No. 43. 118. D6, fig 43. "Bowl". (Al-Shehry, 2014).	Dated probably between 6th B.C and 1st century B.C.	Daddan, Al-Ula, Al-Madinah, north-west Saudi Arabia.
1340, 1548.	No. H356, fig68, strata C. "LCF 4". No. H1233, fig75, strata G. "Bowl 4". No. H341, fig 79, strata C1. "Bowl 12". No. K1764, fig103, strata K. "Bowl 3". (Van Beek, 1969).	Dated from late 2nd century B.C. to mid 1 st century B.C. Dated from 5th to early 3rd B.C. Dated from late 2nd to mid 1 st century B.C. Dated from 6th to 5th B.C.	Hajar Bin Humeid, (HBH), Yemen.

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Al-Ukhud pottery number	Parallels	Chronology/ dating	Archaeological site name
1401, 1345, 1145, 1116, 1850, 1237, 1229.	No. H679, fig42, strata E. "Bowl 3". (Van Beek, 1969).	Dated from late 5th to early 3rd century B.C.	Hajar Bin Humeid, (HBH), Yemen.
1850.	No. H698, fig32, strata E. "Bowl 7". No. H1557, fig50, strata J. "LCF 1". (Van Beek, 1969).	Dated from 5th to early 3rd century B.C. Dated from 6th to 5th century B.C.	
1340, 1548. 1850.	No. 6, fig 30. "Bowl". No. 26, fig 62, type 6. "Bowl". No. 60, fig 103, type 10. "Bowl". No. 24, fig 88, type 9. "Bowl". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.
1548.	No. 7, fig 2.9, stratum 20. "Bowl". No. 10, fig 2.18, stratum 18. "Bowl". No. 4, fig 3.29. "Bowl". No. 8, fig 3.82. "Bowl". No. 4, 6, 11, 12, 19, fig 4.1, stratum 6. "Bowl". No. 4, fig 4.2, stratum 6. "Bowl". (Sauer and Herr, 2012).	Mid 12th to early 11th century B.C. Mid 11th to 10th century B.C. Late Roman (235 – 324 A.D.). Late Byzantine (491-565 A.D.). Early Islamic/ (600 – 800 A.D.).	Tell Hesban (Heshbon or Hisban), Amman, Jordan.
1401, 1345, 1851, 1237, 1210.	No. m, fig 6. "Bowl". (Whitcomb, 1975).	Dated to early Islamic period (630-1055 A.D.)	Wadi Beni Kharus 1, Oman.
1401, 1345, 1851, 1237, 1210.	No. d, fig 5.6. "Bowl". (Magee, 2004).	Dated to Iron Age, period II (500 – 300/ or 200 B.C.)	Tepe Yahya, Iran.

Type WM-J – Rim - Wheel-made

Season 2: (1293, 1313, 1295, 1170, 1849, 1361).

Season 3: (1469).

Table 29 Chronological table of type J, rim, wheel-made.

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1293, 1313, 1295, 1170, 1361.	No. 17, fig 31. "Bowl". No. 46, fig 45. "Bowl". No. 50, fig 49. "Bowl". (Al-Zahrani, 2007).	Dated to 6th B.C. to 1st century B.C. Dated to Hellenistic period (300 B.C. to 100 A.D.). Dated to 3rd B.C. to 1st A.D.	Tel Al-Katheeb, Al-Ula, Al-Madinah, north-west Saudi Arabia.
1849.	No. 2, fig 56, type 3. "Jar". No. 3, fig 61, type 3. "Jar". (Al-Saud, 1997).	Dated from 300 B.C. – 300 A.D.	Al-'Ayun, Al-Aflaj, Central province, Saudi Arabia.
1293, 1313, 1295, 1170, 1361.	No. 13, fig XI. "Jar". No. 19, fig XI. "Jar". No. 21, 26, fig XII. "Jar". No. 37, 39, fig XIII. "Jar". No. 38, fig XIV. "Jar". No. 75, 76, fig XVII. "Jar". (Al-Muaikel, 1994).	Al-Ṭuwayr site dated from 1st B.C. to 2nd century A.D. Dûmat Al-Jandal site dated from 6th/or 5 th B.C. to 2nd century A.D.	Al-Ṭuwayr site and Dûmat Al-Jandal, Al-Jawf, North of Saudi Arabia.
1293, 1849, 1361.	No. 7, fig 36. "Bowl". (Al-Dayel et al, 1988).	Dated from 1st century B.C to 2nd century A.D.	Dûmat Al-Jandal, Al-Jawf, North Saudi Arabia.
1293, 1313, 1295, 1361.	No. 91, fig 103. "Bowl". No. 24, fig 103. "Bowl". No. 30, fig 103. "Bowl". (Al-Ibrahim et al, 1985).	Dated from 9th century A.D to 12th century A.D.	Al-Mabiyat site, Al-Ula, Al-Madinah region, north-west Saudi Arabia.
1293, 1849, 1361.	No. H710, fig70, strata E. "Jar 2". No. H506, fig109, strata D. "Jar 4". No. H450, fig110, strata C1. "Jar5". (Van Beek, 1969).	Dated to late 5th – early 3rd century B.C. Dated to 3rd century B.C. Dated to late 2nd – mid 1st B.C.	Hajar Bin Humied, (HBH), Yemen.
1293, 1849, 1361.	No. 14, 15, fig 3. "Bowl". No. 6, 7, fig 4. "Bowl". (De Paepe et al, 2003).	Dated to late 1st century B.C. and the middle of the 2nd century B.C.	Ed-Dur, Umm Al-Qaiwain, UAE.
1293, 1313, 1849, 1361.	No. b, c, fig 5.19. "Bowl". (Magee, 2004).	Dated to Iron Age period (500-300/ or 200 B.C.).	Tepe Yahya, Iran.

Continue to Table 29

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1293, 1313, 1295, 1170, 1849, 1361.	No. 470, fig 49. "Bowl". No. 1041, 1042, 1043, fig 102. "Bowl". No. 1044, 1045, 1048, fig 103. "Bowl". No. 1053, 1054, 1060, fig 104. "Bowl". No. 1195, 1196, fig 119. "Bowl". (Al-Amer, 1996).	Dated from 3rd century B.C. – 3rd century A.D. Phase 1: 3rd – 1st century B.C. Phase 2: 1st – 3rd century A.D.	Al-Daffi site, Al-Jubail, Eastern province, Saudi Arabia.
1313, 1295, 1170.	No. 4, 5, fig 8. "Bowl". (Boucharlat and Lombart, 1983).	Dated to Rumeilah II from 700 – 400 B.C.	Rmeilah, Al-Ain, UAE.

Type WM-K - Rim - Wheel-made

Season 2: (1331, 1327, 2741, 1314).

Season 3: (1015, 1399).

Table 30 Chronological table of type K, rim, wheel-made.

Al-Ukhud pottery number	Parallels	Chronology/ dating	Archaeological site name
1331, 1327.	No. 131, 151, fig 13. "Jar". (Potts et al, 1978).	Dated to Hellenistic period.	Site (208-129), 'Ayn Jawān, East, Saudi Arabia.
1331, 1327, 2741.	No. 27, fig 77. "Bowl". No. 6, fig 81. "Bowl". No. 16, fig 82. "Bowl". (Whitcomb, 1978).	Dated to Islamic period. Dated to late Islamic period.	Al-Ḥasā' oasis, Eastern province, Saudi Arabia.
1331, 1327, 2741, 1314.	No. 25, fig 20. "Jar". No. 75, fig 21. "Jar". No. 135, 136, fig 23. "Jar". No. 168, fig 24. "Jar". (Zarins et al, 1979).	Dated to Hellenistic period. Dated from 1st and 5th century A.D. Dated to per-Islamic period. Dated to Hellenistic period	Site no. (212-53) at Wadi Ad-Dwasir. Site no. (212-63) at Al-Aflaj. Site no. (207-27) at Al-Kharj. Site no. (212-2), Central province, Saudi Arabia.
1331, 1327, 2741.	No. 3, fig 6, type 6. "Jar". No. 8, 9, fig 16. "Jar". No. 10, fig 48, type 3/1. "Jar". (Al-Saud, 1997).	Dated from 300 B.C. – 300 A.D.	Al-'Ayun, Al-Aflaj, Central province, Saudi Arabia.
1331, 1327, 2741.	No. 45, fig 45. "Bowl". No. 104, fig 77. "Bowl". No. 109, fig 81. "Bowl". (Al-Zahrani, 2007).	Dated from 2nd B.C. to 1st A.D. Dated from first half of 1st millennium B.C. (11 th century B.C. to 4 th century B.C.)	Tel Al-Katheeb, Al-Ula, Al-Madinah, north-west Saudi Arabia.
1314.	No. fig 4. "Jar". (Al-Ghamedi, 1996).	2nd century B.C. - early Islamic period. The chronology of Jurash: Early settlement: 2nd century B.C. Second phase: up to 2nd A.D. Third phase: 3rd A.D. 220-250 A.D. Fourth phase: early Islamic period, around 660/ 661 A.D.	Jurash, Asir region, south-west Saudi Arabia.
1331, 1327.	No. DJ.10.C.2022-10, layer 2022. "Bowl". No. DJ.10.C.2033-2, layer 2033. "Bowl". (Charloux and Loreto, 2014).	Dated from 2 nd century to 6th century A.D.	Dûmat Al-Jandal, Al-Jawf region, North of Saudi Arabia.

Continue to Table 30

Al-Ukhduḍ pottery number	Parallels	Chronology/ dating	Archaeological site name
1331, 1327.	No. q, fig 4.17. "Jar". No. b, fig 5.1. "Jar". (Magee, 2004).	Dated to Iron Age (1000-500 B.C.). Dated to Iron Age (500-300/ or 200 B.C.)	Tepe Yahya, Iran.
1331, 1327, 2741, 1314.	No. H156, fig35, strata B. "Jar 6". No. H568, fig52, strata D. "Jar 6". No. H843, fig71, strata F1. "Jar 3". No. H1389, fig81, strata H. "LCF 5". No. H497, fig106, strata D. "LCF 4". (Van Beek, 1969).	Dated from mid 1 st B.C. to 1st A.D. Dated to 3rd century B.C. Dated from late 5th to early 3rd B.C. Dated from 6th to 5th B.C. Dated to 3rd century B.C.	Hajar Bin Ḥumeid (HBH), Yemen.
1331, 1327, 2741.	No. 40, fig 147. "Jar". No. 41, fig 147. "Jar". No. 8, fig 158. "Jar". No. 9, fig 158. "Jar". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.
1331, 1327, 2741.	No. 7, fig 53. "Bowl". No. 8, fig 53. "Bowl". No. 15, fig 58. "Bowl". (Boucharlat and Lombart, 1985).	Dated from 700 – 400 B.C. Rumeilah II.	Rumeilah, Al-Ain, UAE.
1331, 1327, 2741.	No. 2, 3, 4, 6, fig XXXIV, type 1a. "Jar". (Gazdar, 1982).	Latter part of 2nd millennium B.C. and early 1st millennium A.D.	Zubaidah, Al-Qasim province, Central area, Saudi Arabia.
1331, 1327, 2741, 1314.	No. 162, fig XIII. "Jar". No. 163, fig XIII. "Jar". (Osinga, 2017).	Dated to late Byzantine period (6th century to early 7th century A.D.)	Badiyah, Umm Al-Jimal, Jordan.

Type WM-L – Rim – Wheel-made

Season 2: (1266, 1235, 1236).

Season 3: (3244, 1516, 1534, 1472, 1385, 1393).

Table 31 Chronological table of type L, rim, wheel-made.

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1266, 1235, 1236, 1393.	No. 111, fig 23. "Bowl". No. 119, fig 23. "Bowl". No. 127, fig 23. "Bowl". No. 141, fig 23. "Bowl". (Zarins et al, 1979).	Hellenistic period (200 B.C.-600 A.D.). Dated to Islamic period. Dated to Hellenistic period (200 B.C. – 600 A.D.)	Site no. 207-26, Al-Kharj. Site no. 212-75, Al-Kharj, Raghīb. Site no. 207-20, Al-Kharj. Site 207-30, Al-Kharj, Central province, Saudi Arabia.
1266.	No. 32, fig 10. "Bowl". (Potts et al, 1978).	Dated to Hellenistic period.	Site no. 208-91, East, Saudi Arabia.
1266.	No. DJ.10.C.2027-6, layer 2027. "Bowl". (Charloux and Loreto, 2014).	Dated from 2nd to 6th century A.D.	Dūmat Al-Jandal, Al-Jawf, North of Saudi Arabia.
1235.	No. H1732, fig 97, strata K. "Bowl 2". (Van Beek, 1969).	Dated from 6th to 5th century B.C.	Hajar Bin Ḥumeid, (HBH), Yemen.
1266, 1235.	No. 46, fig 19. "Bowl". No. 11, fig 22. "Bowl". No. 47, fig 27. "Bowl". (Al-Zahrani, 2014).	Dated from 6th century B.C. to 5th century A.D. The dated of Thaj: Phase1: 6th B.C – 1st A.D. P1.1. 6th B.C – 4th B.C. P1.2. 3rd B.C. – 1st A.D. Phase2: 1st – 5th A.D P2.1. 1st – 3rd A.D. P2.2. Byzantine/ Sasanian to Islamic period.	Thaj, Eastern province, Saudi Arabia.
1266, 1235.	No. 4, fig 45. "Bowl". No. 5, fig 45. "Bowl". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.
1266, 1235, 1236, 1393.	No. 2, 3, fig 8. "Bowl". No. 69, fig 15. "Bowl". No. 74, fig 16. "Bowl". No. 418, 419, 420, fig 46. "Bowl". No. 476, 478, fig 50. "Bowl". (Al-Amer, 1996).	Dated from 3rd century B.C. – 3rd century A.D. Phase 1: 3rd – 1st century B.C. Phase 2: 1st – 3rd century A.D.	Al-Daffi site, Al-Jubail, Eastern province, Saudi Arabia.

Continue to Table 31

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1266, 1235, 1236.	No. 181, fig XX, type 23a. "Bowl". No. 42, fig XXXVIII, type 8a. "Jar". No. 43, fig XXVIII, type 8a. "Jar". No. 69, fig XLIII, type 11a. "Jar". (Gazdar, 1982).	Dated from latter part of 2nd millennium B.C to early 1st millennium A.D.	Zubaidah, Al-Qasim province, Central area, Saudi Arabia.
1266, 1235.	No. 54, fig 5.14. "Bowl". No. 56, fig 5.14. "Bowl". No. 58, fig 5.14. "Bowl". (Al-Hajri et al, 2018).	Dated to 3rd/ 4th century A.D.	Al-Khobar, Dammam, Eastern province, Saudi Arabia.

Type WM-M – Rim – Wheel-made

Season 2 (1269, 1224).

Table 32 Chronological table of type M, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1269, 1224.	No. 10, 14, 15, fig 2.7, stratum 20. "Bowl". No. 11, fig 2.15, stratum 18. "Bowl". No. 11, fig 2.27, stratum 16B. "Bowl". No. 4, 5, fig 2.33, stratum 16A. "Bowl". No. 10, 16, fig 2.34, stratum 16A. "Bowl". (Sauer and Herr, 2012).	Dated from mid 12 th to early 11th century B.C. Dated from mid 11 th to 10th century B.C. Dated from 8th to 7th century B.C. Dated from 8th to 7th century B.C. Dated from 8th to 7th century B.C.	Tell Hesban (Heshbon or Hisban), Amman, Jordan.
1269, 1224.	No. 37, fig XIII. "Bowl". No. 48, fig XV. "Bowl". No. 99, fig XVIII. "Bowl". (Al-Muaikel, 1994).	Al-Ṭuwayr site dated from 1st century B.C. to 2nd century A.D. Dûmat Al-Jandal site dated from 6th/or 5th century B.C. to 2nd century A.D.	Al-Ṭuwayr site and Dûmat Al-Jandal, Al-Jawf, North of Saudi Arabia.
1269, 1224.	No. d, fig 100. "Bowl". (Costa and Wikinson, 1987).	Dated to early Islamic period.	Arja, Sohar, Oman.
1269.	No. m, fig 11. "Bowl". (Whitcomb, 1975).	Dated to Islamic period (630-1055 A.D.)	Wadi Qant 3, Oman.
1269, 1224.	No. 171, fig XIX, type 19 e. "Bowl". No. 106, fig LII, type 34. "Bowl". (Gazdar, 1982).	Dated to latter part of 2nd millennium B.C. and early 1st millennium A.D.	Zubaidah, Al-Qasim province, Central area, Saudi Arabia.

Type WM-N – Rim- Wheel-made

Season 2 (1114, 1158, 1200).

Table 33 Chronological table of type N, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1114, 1158, 1200.	No. 5, fig 47. "Bowl". No. 14, fig 49. "Bowl". No. 3, fig 61. "Bowl". (Al-Saud, 1997).	Dated from 300 B.C. – 300 A.D.	Al-‘Ayun, Al-Aflaj, Central province, Saudi Arabia.
1114, 1158, 1200.	No. 16, fig 9. "Bowl". No. 40, fig 10. "Bowl". No. 108, fig 12. "Bowl". (Potts et al, 1978).	Dated to Islamic period. Dated to Hellenistic period. Dated to mid Islamic period (Half of 11th A.D. to 16th century A.D.).	Site no. 208-91. Site no. 208-91. Site no. 208-127. South of the Dhahran Int. Airport, East Saudi Arabia.
1114, 1158, 1200.	No. 33, fig 77. "Bowl". (Whitcomb, 1978).	Dated to Islamic period.	Al-Ḥasā’ oasis, Eastern province, Saudi Arabia.
1114, 1158, 1200.	No. DJ.10.C.2022-1. "Bowl". (Charloux and Loreto, 2014).	Dated from 2nd to 6th century A.D.	Dūmat Al-Jandal, Al-Jawf, North of Saudi Arabia.
1158.	No. 35, fig 17. "Bowl". (Al-Zahrani, 2014).	Dated from 6th century B.C. to 5th century A.D. The dated of Thaj: Phase1: 6th B.C – 1st A.D. P1.1. 6th B.C – 4th B.C. P1.2. 3rd B.C. – 1st A.D. Phase2: 1st – 5th A.D P2.1. 1st – 3rd A.D. P2.2. Byzantine/ Sasanian period to Islamic period.	Thaj, Eastern province, Saudi Arabia.
1200.	No. 27, fig 26. "Bowl". (Zarins et al, 1980).	Dated to Islamic period ('Abbasid period).	Site no. 206-79, Wadakh, Ad- Dawādami, Riyadh Saudi Arabia.
1114, 1158, 1200.	No. 2, fig 55. "Bowl". No. 3, fig 55. "Bowl". No. 6, fig 54. "Bowl". (Boucharlat and Lombard, 1985).	Dated to Rumeilah II from 700-400 B.C.	Rumeilah, Al-Ain, UAE.
1114, 1158, 1200.	QAT.278, fig 18 "Jar". (Power et al, 2019).	Dated to Iron Age II period. From 1100 – 600 B.C.	Bayt Bin Ati, south- west of Qattara Oasis, Al-Ain, UAE.

Type WM-O – Rim – Wheel-made

Season 2: (1097, 1350, 1256).

Season 3: (1420, 1398).

Table 34 Chronological table of type O, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1097, 1350, 1256.	No. 74, fig 63. "Bowl". (Al-Zahrani, 2007).	Dated to first half of the 1st millennium B.C. (from 11th century B.C. to 1st century A.D.)	Tel Al-Katheeb, Al-Ula, Al-Madinah, north-west Saudi Arabia.
1097, 1350, 1256.	No. 7, fig 10, type 3. "Bowl". No. 8, fig 10, type 3. "Bowl". No. 1, fig 52, type 1. "Bowl". (Al-Saud, 1997).	Dated from 300 B.C. – 300 A.D.	Al-'Ayun, Al-Aflaj, Central province, Saudi Arabia.
1097, 1350, 1256.	No. 35, fig 10. "Bowl". No. 174, fig 14. "Bowl". (Potts et al, 1978).	Dated to Hellenistic period.	Site 280-91. Site 208-132, South of the Dhahran Int. Airport, Eastern province, Saudi Arabia.
1097, 1350, 1256.	No. 7, 8, 11, 15, 17, fig 78. "Bowl". No. 9, fig 80. "Bowl". (Whitcomb, 1978).	Dated to Islamic period.	Al-Hasā' oasis, Eastern province, Saudi Arabia.
1350, 1256.	No. c. TA3742.28, fig 18. "Bowl". No. d. TA8341.10, fig 15. "Bowl". (Tourtet et al, in press).	Dated from 2nd to 4th century A.D.	Tayma, North of Saudi Arabia.
1097, 1350, 1256.	No. 780, 781, fig 77. "Bowl". No. 937, fig 91. "Bowl". (Al-Amer, 1996).	Dated from 3rd century B.C. – 3rd century A.D. Phase 1: 3rd – 1st century B.C. Phase 2: 1st – 3rd century A.D.	Al-Daffi site, Al-Jubail, Eastern province, Saudi Arabia.
1097.	No. 14, fig 120, type 13. "Bowl". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.
1097, 1350, 1256.	No. 1, 2, fig 7. "Bowl". No. K918, fig 8. "Bowl". No. K733, fig 9. "Bowl". No. 107, fig 11. "Bowl". (Kennet, 2004).	Dated from late 9th century A.D. to 12th century A.D. Dated C14: 1030-1160 A.D. Dated to period I and II at Kush from 4th – 8th century A.D. In period III and IV dated to late 11th/ early 12th century A.D.	Ras Al-Khaimah, UAE. Al-Mataf, Ras AL-Khaima, UAE.

Continue to Table 34

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1097, 1350, 1256.	No. 613.02.K1.12, fig 2. "Bowl". No. 302.03.K1.14, fig 2. "Bowl". No. 617.02.K1.14, fig 2. "Bowl". No. 613.02.K1.18, fig 2. "Bowl". No. 613.02.K1.16, fig 2. "Bowl". No. 613.02.K1.20, fig 2. "Bowl". No. 303.02.K1.20, fig 5. "Bowl". No. 620.04.K1.18, fig 5. "Bowl". (Guérin and Al-Naimi, 2008 and 2010).	Dated to 9th century A.D. (Early 'Abbasid period).	Murwab, Qatar.

Type WM-P – Rim – Wheel-made

Season 2: (1142, 1336).

Season 3: (1522, 1364, 1394).

Table 35 Chronological table of type P, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1142, 1336.	No. H841, fig 35, strata F2. "Jar 6" No. H808, fig 35, strata F2. "Jar 6" No. H640, fig 35, strata E. "Jar 7" No. H800, fig 45, strata F2. "LCF 10" (Van Beek, 1969).	Dated from late 5th to early 3rd century B.C.	Hajar Bin Ḥumeid, (HBH), Yemen.
1142.	No. 7, fig 15, type 4. "Jar". (Al-Saud, 1997).	Dated from 300 B.C. – 300 A.D.	Al-ʿAyun, Al-Aflaj, Central province, Saudi Arabia.
1142, 1336.	No. 1, 3, 4, fig 9. "Jar". (Phillips, 2005).	Dated from 6th to 5th century B.C.	Al-Hāmid, south-west corner of Jabal Al-Ḍāmir, Yemen.
1142, 1336.	No. 7, fig 4. "Jar". (Rougeulle, 1999).	Dated to per-Islamic period.	Šarwayn, South of Mahra, Yemen.
1142, 1336.	No. 618.02.K1.8, fig 2. "Jar". No. 301.02.K1.4, fig 2. "Jar". No. 302.02.K1.6, fig 2. "Jar". No. 628.01.K1.10, fig 2. "Jar". (Guérin and Al-Naimi, 2008 and 2010).	Dated to 9th century A.D. Early ʿAbbasid period.	Murwab, Qatar.
1142, 1336.	No. 2, fig 3. "Jar". No. 6, fig 55. "Jar". No. 19, fig 180. "Jar". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.
1142, 1336.	No. 10, 11, 12, fig 23. "Jar". (De Maigret, 1988).	Dated from around 11 th century B.C. to 5th century B.C.	Wadi Yalā, at Ḥawlān AṬ-Ṭiyāl, Yemen.

Type WM-Q – Rim – Wheel-made

Season 2 (1183, 1352, 1332, 1351).

Table 36 Chronological table of type Q, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1183, 1352, 1332, 1351.	No. 3, fig 2.8, stratum 20. "Bowl". No. 23, fig 2.13 stratum 18. "Krater". No. 7, 8, fig 2.20, stratum 18b. 2Jar". No. 2, 3, fig 3.45. "Jar". (Sauer and Herr, 2012).	Dated to mid 12th to early 11th century B.C. Dated from mid 11th to 10th century B.C. Date to early Byzantine period.	Tell Hesban (Heshbon or Hisban), Amman, Jordan.
1183. 1352.	No. 95, fig 12. "Bowl". No. 261, fig 17. "Bowl". (Potts et al, 1978).	Dated to Hellenistic period. Dated to Islamic period.	Site no. 208-116. Site no. 208-300. South of Dhahran Int. Airport, East of Saudi Arabia.
1332.	No. 64, fig 34. "Bowl". No. 831, fig 35. "Bowl". No. 87, fig 35. "Bowl". (Parr et al, 1978).	Dated between 2nd to 3rd century A.D. C14: 115 – 265 A.D.	Zubayda site, North of Saudi Arabia.
1183, 1352, 1332, 1351.	No. 3, fig 80. "Bowl". No. 14, fig 80. "Bowl". (Whitcomb, 1978).	Dated to Islamic period.	Al-Ḥasā' oasis, Eastern province, Saudi Arabia.
1352, 1332.	No. 11, 12, fig 57. "Bowl". (Abu-Duruk, 1986).	Dated to half of the 1st millennium B.C. from 670 – 540/ or 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.
1183.	No. 55, fig IV. "Jar". No. 91, fig VII. "Jar". No. 98, fig VIII. "Jar". No. 307, fig XXIX. "Jar". (Osinga, 2017).	Dated to Umayyad/ Early Abbasid (8th century A.D.). Dated to late Roman/ Early Byzantine. Dated to Nabataean/ Roman/ Early Byzantine. Dated to Umayyad/ Early Abbasid (8th century A.D.).	Badiyah, Umm Al-Jimal, Jordan.
1183, 1352, 1332.	No. c. TA15614.3, fig 10. "Bowl". No. b. TA4531.1, fig 10. "Bowl". No. c. TA4990.10, fig 13. "Bowl". (Tourtet et al, in press).	Dated from 11th century to 9th century B.C. Dated from 6th century to 2nd/1st century B.C.	Tayma, North of Saudi Arabia.

Continue to Table 36

Al-Ukhduḍ pottery number	Parallels	Chronology/ dating	Archaeological site name
1183, 1352, 1332, 1351.	<p>No. H486, fig 77, strata D. "Bowl 9".</p> <p>No. H410, fig 77, strata C1. "Bowl 9".</p> <p>No. H408, fig 77, strata C1. "Bowl 9".</p> <p>No. H313, fig 78, strata C1. "Bowl 9".</p> <p>No. H1153, fig 84, strata G. "Bowl 1".</p> <p>No. H455, fig 87, strata C1. "LCF 3".</p> <p>No. H194, fig 87, strata C2. "LCF 4"</p> <p>No. H1111, fig 88, strata G. "Bowl 3". (Van Beek, 1969).</p>	<p>Dated to 3rd century B.C.</p> <p>Date to late 2nd century B.C. to mid 1st century B.C.</p> <p>Date to late 5th century B.C. to early 3rd century B.C.</p> <p>Dated to late 2nd century B.C. to mid 1st century B.C.</p> <p>Date to late 5th to early 3rd century B.C.</p>	Hajar Bin Ḥumeid, (HBH), Yemen.
1183.	<p>No. DJ.10.C.2000-2, layer 2000. "Jar".</p> <p>No. DJ.10.C.2033-1, layer 2033. "Jar". (Charloux and Loreto, 2014).</p>	Dated from 2nd to 6th century A.D.	Dûmat Al-Jandal, Al-Jawf region, North of Saudi Arabia.

Type WM-R – Rim – Wheel-made

Season 2 (1192, 1321, 21284, 1389, 1487, 1481).

Table 37 Chronological table of type R, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1192, 1321, 2184, 1389, 1487, 1481.	No. 55, fig XIV. "Bowl". No. 53, fig XV. "Bowl". No. 65, 66, fig XVI. "Bowl". (Al-Muaikel, 1994).	Al-Ṭuwayr site dated from 1st century B.C. to 2nd century A.D. Dûmat Al-Jandal site dated from 6th/or 5th century B.C. to 2nd century A.D.	Al-Ṭuwayr site and Dûmat Al-Jandal, Al-Jawf, North of Saudi Arabia.
1321, 2184, 1487, 1481.	No. 3, fig 55, type 2. "Bowl". No. 1, fig 59, type 4. "Bowl". (Al-Saud, 1997).	Dated from 300 B.C. – 300 A.D.	Al-'Ayun, Al-Aflaj, Central province, Saudi Arabia.
1192, 1321, 2184, 1487, 1481.	No. 8, fig 9. "Bowl". (Al-Thenyan, 2006).	Dated from 12th to 15th century A.D.	Ulyab (Hamdanah), Red Sea Tihami coastal ports, South of Saudi Arabia.
1192, 1321, 2184, 1487, 1481.	No. 70, fig 21. "Bowl". No. 164, fig 24. "Bowl". (Zarins et al, 1979).	Dated to Hellenistic period.	Site no. (207-30). Site no. (211-2), Al-Kharj region, Saudi Arabia.
1192.	No. 13, fig 80. "Bowl". (Ingraham et al, 1981).	Dated from the end of 2nd millennium B.C. to the half of 1st millennium B.C.	Qurayya, Tabuk, North of Saudi Arabia.
1321, 2184.	No. 4, fig 85. "Bowl". No. 7, 8, fig 86. "Bowl". No. 4, 5, 6, fig 87. "Bowl". (Ingraham et al, 1981).	Dated from the end of 1st millennium B.C. to the first centuries A.D. Nabataean/ Roman.	Al-Bad', Maqna, Wadi Aynūnah and Wadi Sharmah, Northern Hijaz, Saudi Arabia.
1192, 1321, 2184, 1389, 1487, 1481.	No. 9, 10, 14, 16, 18, 19, fig 80. "Bowl". No. 3, 5, 12, fig 81. "Bowl". (Parr and Gazdar, 1980).	Dated from latter part of 2nd millennium B.C. to early 1st millennium A.D.	Zubaidah, Al-Qasim province, central area, Saudi Arabia.
1321, 2184, 1487, 1481.	No. H601, fig 31, strata D. "Bowl 4". No. H565, fig 31, strata D. "Bowl 4". No. H996, fig 32, strata F1. "Bowl 9". No. H851, fig 79, strata F2. "Bowl 12". No. H1074, fig 97, strata G. "Bowl 3". (Van Beek, 1969).	Dated to 3rd century B.C. Dated to late 5th century B.C. to early 3rd century B.C.	Hajar Bin Ḥumeid, (HBH), Yemen.

Continue to Table 37

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1192, 1321, 2184.	No. a, fig 4.22. "Bowl". No. a, b, c, d, fig 5.35. "Bowl". No. b, fig 5.36. "Bowl". (Magee, 2004).	Iron Age (1000-500 B.C.). Dated to Iron Age II (500-300/ or 200 B.C.)	Tepe Yahya, Iran.
1192, 1487, 1581.	No. 604, fig 59. "Bowl". No. 613, fig 60. "Bowl". (Al-Amer, 1996).	Dated from 3rd century B.C. – 3rd century A.D. Phase 1: 3rd – 1st century B.C. Phase 2: 1st – 3rd century A.D.	Al-Daffi site, Al-Jubail, Eastern province, Saudi Arabia.
1321, 2184, 1487, 1481.	No. 11, fig 14. "Bowl". No. 11, fig 67, type 7. "Bowl". No. 51, fig 80, type 7:6. "Bowl". No. 10, fig 82. Type 8. "Bowl". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.
1192, 1321, 1487, 1481.	No. 149, 2, 11, fig 2. "Bowl". No. 55, 169, 157, fig 3. "Bowl". No. 5, 96, 142, 19, 8, fig 4. "Bowl". (Sasaki, 1990).	Dated to Islamic period. From 9th to 10th century A.D.	A'Ali site, Bahrain.
1192, 1321, 2184, 1389, 1487, 1481.	No. 1, 3, 5, 6, fig 22. "Bowl". No. 8, 11, fig 23. "Bowl". (De Maigret, 1988).	Dated from around 11th century B.C. to 5th century B.C.	Wadi Yalā, at Ḥawlān Aṭ-Ṭiyāl, Yemen.
1321, 2184, 1389, 1487, 1481.	No. 63, 64, 65, room5, trench2A, layer8. "Bowl". No. 73, room5, trench2A, layer8. "Bowl". (Abu-Duruk, 1998).	Dated from 670 B.C. to 540/ or 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.

Type WM-S – Rim – Wheel-made

Season 2: (1301, 1362, 1358, 1347, 1348, 1319, 1317, 1316, 1307, 1240, 1213, 1480, 2150, 1851, 1847, 2736).

Season 3: (1011, 1368, 1402, 1523, 1397, 1536, 1002, 1509, 1502, 1016, 4492, 4639, 1526, 1515, 1511, 1462, 1452).

Table 38 Chronological table of type S, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1358, 1347, 1319, 1317, 1316, 1480, 2736.	No. 10, fig 4, type 1. "Bowl". No. 4, 6, fig 23, type 5. "Jar". (Al-Saud, 1997).	Dated from 300 B.C. – 300 A.D.	Al-'Ayun, Al-Aflaj, Central province, Saudi Arabia.
1358, 1347, 1319, 1317, 1316, 1480, 2736.	No. DJ.10.C.2022-11. "Jar". No. DJ.10.2022-12. "Jar". (Charloux and Loreto, 2014).	Dated from 2th to 6th century A.D.	Dûmat Al-Jandal, Al-Jawf region, North of Saudi Arabia.
1358, 1347, 1319, 1317, 1316, 1480, 2736.	No. H1153, fig 84, strata G. "Bowl 1". No. H785, fig 85, strata F2. "Bowl 1". No. H1050, fig 88, strata F1. "Bowl 3". No. H1375, fig97, strata H. Bowl 3. (Van Beek, 1969).	Dated from late 5th century to early 3rd century B.C. Dated from 6th to 5th century B.C.	Hajar Bin Humeid, (HBH), Yemen.
1301, 1362, 1307, 1240, 1213, 2150, 1851.	No. 27, fig 17. "Bowl". No. 57, 59, fig 20. "Bowl". No. 4, fig 21. "Bowl". (Al-Zahrani, 2014).	Dated from 6th century B.C. to 5th century A.D. The dated of Thaj: Phase1: 6th B.C – 1st A.D. P1.1. 6th B.C – 4th B.C. P1.2. 3rd B.C. – 1st A.D. Phase2: 1st – 5th A.D P2.1. 1st – 3rd A.D. P2.2. Byzantine/ Sasanian period to Islamic period.	Thaj, Eastern province, Saudi Arabia.
1301, 1362, 1307, 1240, 1213, 2150, 1851.	No. 9, 10, 11, fig 8. "Bowl". (Boucharlat and Lombart, 1985).	Dated to Rumeilah II from 700 – 400 B.C.	Rumeilah, Al-Ain, UAE.
1301, 1362, 1307, 1240, 1213, 2150, 1851.	No. m, fig 6. "Bowl". (Humphries, 1974).	Dated from 8th/ 7th century B.C.	Site BB-4, Wadi Bahla, Oman.
1301, 1362, 1307, 1240, 1213, 2150, 1851.	No. 1, 5, 8, fig 9. "Bowl". (Phillips, 1997).	Dated to later Iron Age period (600-300 B.C.)	Rafaq 2, Wadi Al-Qwr, Oman.

Continue to Table 38

Al-Ukhduḍ pottery number	Parallels	Chronology/ dating.	Archaeological site name
1358, 1347, 1319, 1317, 1847.	No. 11, 12, 13, fig 5. "Bowl". (Guilbert and Rougeulle, 1995).	Dated to Islamic period (9th to 10th century A.D.).	Mawza', Mokha, Yemen.
1347, 2150, 1851, 1847, 2736.	No. a, fig 12. "Bowl". No. b, fig 12. "Bowl". No. c, fig 12. "Bowl". No. e, fig 12. "Bowl". No. i, fig 12. "Bowl". (Whitcomb, 1975).	Dated to late Islamic period.	Wadi Andam, Oman.
1301, 1358, 1347, 1348, 1319, 1317, 2150, 1851, 1847, 2736.	No. 1, fig 7. "Bowl". No. 2, fig 7. "Bowl". No. 3, fig 7. "Bowl". No. 4, fig 7. "Bowl". No. 5, fig 7. "Bowl". No. 8, fig 7. "Bowl". No. 9, fig 7. "Bowl". (Boucharlet et al, 1997).	Dated to Iron Age (1st millennium B.C.).	Muwailah, Sharjah, UAE.
1301, 1362, 1358, 1347, 1348, 1319, 1317, 1316, 1307, 1240, 1213, 1480, 2150, 1851, 1847, 2736	No. 169, 178, 179, fig 24. "Bowl". No. 605, 607, 613, 616, 617, fig 60. "Bowl". No. 938, 946, 947, 948, fig 91. "Bowl". No. 1148, 1155, fig 115. "Bowl". (Al-Amer, 1996).	Dated from 3rd century B.C. – 3rd century A.D. Phase 1: 3rd – 1st century B.C. Phase 2: 1st – 3rd century A.D.	Al-Daffi site, Al-Jubail, Eastern province, Saudi Arabia.
1301, 1362, 1358, 1347, 1348, 1319, 1317, 1316, 1307, 1240, 1213, 1480, 2150, 1851, 1847, 2736	No. 3, 5, fig 18. (Phillips et al, 2005). No. 7, 8, fig 8. (Phillips, 2013).	Dated from 1 st millennium B.C to the half of 1 st millennium B.C.	Kalba, Sharjah, UAE.
1301, 1362, 1358, 1347, 1348, 1319, 1317, 1316, 1307, 1240, 1213, 1480, 2150, 1851, 1847, 2736	No. 1, fig 6. "Bowl". No. 3, fig 6. "Bowl". No. 4, fig 6. "Bowl". No. 8, fig 6. "Bowl". No. 9, fig 6. "Bowl". (Benoist et al, 1997).	Dated to Iron Age (600-300 B.C.).	Al-Madam, Sharjah, UAE.

Type WM-T – Rim – Wheel-made

Season 2: (1318, 1328, 1309, 1839).

Season 3: (2305, 2315, 4501, 1028).

Table 39 Chronological table of type T, rim, wheel-made.

Al-Ukhduḍ pottery number	Parallels	Chronology/ dating	Archaeological site name
1318, 1328, 1309, 1839.	No. 7, fig 2.17, stratum 18. "Bowl". (Sauer and Herr, 2012).	Dated to mid 11 th to mid 10 th century B.C.	Tell Hesban (Heshbon or Hisban), Jordan.
1318, 1328, 1309, 1839.	No. H511, fig 31, strata D. "Bowl 3". No. H755, fig 31, strata E. "Bowl 4". No. H744, fig 31, strata E. "Bowl 4". No. H730, fig 31, strata E. "Bowl 4". No. H601, fig 31, strata D. "Bowl 4". No. H565, fig 31, strata D. "Bowl 4". (Van Beek, 1969).	Dated to 3 rd century B.C. Dated from late 5 th century to early 3 rd century B.C. Dated to 3 rd century B.C.	Hajar Bin Ḥumeid, (HBH), Yemen.
1318, 1328, 1309, 1839.	No. 4, fig 76. "Bowl". (Zarins and Al-Zahrani, 1985).	Dated from 7 th to 13 th century A.D.	Athar, Jazan, South of Saudi Arabia.
1328, 1309, 1839.	No. 1, fig 41, type 3. "Bowl". No. 7, fig 43, type 3. "Bowl". No. 6, fig 47, type 3/1. "Bowl". No. 15, fig 49, type 3/1. "Bowl". (Al-Saud, 1997).	Dated from 300 B.C. – 300 A.D.	Al-'Ayun, Al-Aflaj, Central province, Saudi Arabia.
1318, 1328, 1309.	No. 4, fig 22. "Bowl". No. 3, fig 26. "Bowl". (De Maigret, 1988).	Dated from around 11 th century B.C. to 5 th century B.C.	Wadi Yalā, at Ḥawlān AṬ-Ṭiyāl, Yemen.
1318, 1328, 1309, 1839.	No. 10, fig 56, type 5. "Bowl". No. 29, fig 62, type 6. "Bowl". No. 8, fig 82, type 8. "Bowl". No. 26, fig 88, type 9. "Bowl". No. 15, fig 93, type 10. "Bowl". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.

Continue to Table 39

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1318, 1328, 1309.	No. 51, fig VI, type 6c. "Bowl". No. 107, fig XII, type 12c. "Bowl". (Gazdar, 1982).	Dated to latter part of 2 nd millennium B.C. and early 1 st millennium A.D.	Zubaidah, Al-Qasim Saudi Arabia.

Type WM-U – Rim – Wheel-made

Season 2: (1032, 1227).

Season 3: (1377, 1269, 4193, 1371).

Table 40 Chronological table of type U, rim, wheel-made.

Al-Ukhud pottery number	Parallels	Chronology/ dating	Archaeological site name
1032, 1227.	No. 29, fig 9. "Bowl". No. 30, fig 10. "Bowl". No. 81, fig 11. "Bowl". No. 85, fig 11. "Bowl". No. 94, fig 12. "Bowl". No. 102, fig 12. "Bowl". No. 176, fig 14. "Bowl". (Potts et al, 1978).	Dated to Hellenistic period. Dated to Islamic period. Dated to Hellenistic period.	Site no. 208-91. Site no. 208-91. Site no. 208-113. Site no. 208-115. Site no. 208-123. Site no. 208-134. Eastern province, Saudi Arabia.
1032, 1227.	No. 4, fig 82. "Bowl". (Whitcomb, 1978).	Dated to late Islamic period.	Al-Ḥasā' oasis, Eastern province, Saudi Arabia.
1032, 1227.	No. 16, fig 22. "Bowl". (Zarins et al, 1980).	Dated to early Islamic period	Waqīr site, Central province, Saudi Arabia.
1032.	No. 108, fig 8. "Bowl". (Condoluci et al, 2014).	Dated from 1300 to 650/ or 300 B.C.	Salūt, Oman.
1032, 1227.	No. s, fig 6. "Bowl". No. b, fig 7. "Bowl". No. x, fig 11. "Bowl". No. v, fig 13. "Bowl". (Whitcomb, 1975).	Dated to early Islamic period (630-1055 A.D.). Dated to late Islamic period (1500-1750 A.D.)	Wadi Beni Kharus1. Wadi Andam 32. Wadi Qant 3. Wadi Andam 37, Oman.

Type WM-V – Rim – Wheel-made

Season 2: (1165, 1283).

Season 3: (3243).

Table 41 Chronological table of type V, rim, wheel-made.

Al-Ukhud pottery number	Parallels	Chronology/ dating	Archaeological site name
1165, 1283.	No. 39, fig XIII. "Bowl". (Al-Muaikel, 1994).	Al-Ṭuwayr site dated from 1 st century B.C. to 2 nd century A.D.	Al-Ṭuwayr site, Al-Jawf, North of Saudi Arabia.
1165, 1283.	No. 30, room 3, trench2A, layer 6. "Bowl". (Abu-Duruk, 1998).	Dated from 670 – 540/ or 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.
1165, 1283.	No. 6, fig 82. "Bowl". (Whitcomb, 1978).	Dated to Islamic period.	Al-Ḥasā' oasis, Eastern province, Saudi Arabia.
1165, 1283.	No. 9, fig 58. "Bowl". (Abu-Duruk and Murad, 1985).	Dated from 670 to 540/ or 410 B.C.	Qasr Al-Hamrā, Tayma, Saudi Arabia.
1165, 1283.	No. 74, fig 21. "Bowl". (Zarins et al, 1979).	Dated to Hellenistic period.	Site no. (212-63), Al-Aflaj, central of Saudi Arabia.
1165, 1283.	No. 272, fig 31. "Bowl". No. 945, fig 91. "Bowl". (Al-Amer, 1996).	Dated from 3 rd century B.C. – 3 rd century A.D. Phase 1: 3 rd – 1 st century B.C. Phase 2: 1 st – 3 rd century A.D.	Al-Daffi site, Al-Jubail, Eastern province, Saudi Arabia.
1165, 1283.	No. 301.02.K1.12, fig 6. "Bowl". (Guérin and Al-Naimi, 2008 and 2010).	Dated to 9 th century A.D. (Early 'Abbasid period).	Murwab, Qatar.

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Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1114, 1146.	No. d, fig 7. "Bowl". No. g, fig 7. "Bowl". (Humphries, 1974).	Dated to 8 th / 7 th century B.C.	Site no. BB-4, Wadi Bahla, Oman.
1146.	No. 7, fig 18. "Bowl". (Boucharlat et al, 1985).	Dated to Islamic period.	Sharjah coastal, Sjarjah, UAE.
1127, 1067.	No. 4, fig 16. "Bowl". (Adams et al, 1977).	Dated to the half of the 1 st millennium B.C.	Al-Raslaniya, Kāf, North of Saudi Arabia.

Type WM-X – Rim – Hand-made

Season 2: (1162, 1161, 1131, 1262, 1163, 1117, 1118, 1144, 1157, 1479, 1231).

Table 43 Chronological table of type X, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1162, 1161, 1131, 1262, 1157, 1231.	No. 71, fig XVI. "Bowl". No. 93, fig XVIII. "Bowl". (Al-Muaikel, 1994).	Dated from 1 st to 2 nd century A.D. Dûmat Al-Jandal site dated from 6 th /or 5 th century B.C. to 2 nd century A.D.	Dûmat Al-Jandal, North Saudi Arabia.
1117, 1118, 1144.	No. 4, fig 14. "Bowl". (Al-Thenyan, 2006).	Dated from 9 th to 17 th century A.D.	Haly, Red Sea Tihami coastal ports, Jazan, South of Saudi Arabia.
1162, 1161, 1131, 1262, 1163, 1231.	No. 3, fig 2, type 1. "Bowl". No. 5, fig 3, type 1. "Bowl". No. 2, fig 25, type 6. "Bowl". No. 1, fig 26, type 6. "Bowl". No. 2, fig 33, type 9. "Bowl". (Al-Saud, 1997).	Dated from 300 B.C. – 300 A.D.	Al-'Ayun, Al-Aflaj, Central province, Saudi Arabia.
1162.	No. 68, fig 59. "Bowl". (Al-Zahrani, 2007).	Dated to first half of the 1 st millennium B.C. from 11 th century B.C. to 4 th century B.C.	Tel Al-Katheeb, Al-Ula, north-west Saudi Arabia.
1162, 1161, 1131, 1157.	No. H815, fig 51, strata F2. "Jar 1". No. H242, fig 70, strata C2. "Jar 1". No. H246, fig 78, strata C2. "Bowl 9". No. H1971, fig 78, strata C2. "Bowl 9". (Van Beek, 1969).	Dated from late 5 th century B.C. to early 3 rd century B.C. Dated from late 2 nd century B.C. to mid 1 st century B.C.	Hajar Bin Humeid, (HBH), Yemen.
1162, 1161, 1131.	No. DJ.10.C.2022-3, layer 2022. "Bowl". No. DJ.10.C.2022-4, layer 2022. "Bowl". No. DJ.10.C.2047-2, layer 2047. "Bowl". (Charloux and Loreto, 2014).	Dated from 2 nd century A.D to 6 th century A.D.	Dûmat Al-Jandal site, Al-Jawf, North of Saudi Arabia.
1162, 1161, 1131.	No. 92.338.D.6, fig 92. "Bowl". No. 108.247.D.6, fig 108. "Bowl". (Al-Shehry, 2014).	Dated probably between 6 th B.C and 1 st century B.C.	Daddan, Al-Ula, Al-Madinah, north-west Saudi Arabia.

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Al-Ukhdud pottery number	Parallels	Chronology/ dating.	Archaeological site name
1162, 1161, 1131, 1262, 1163, 1117, 1118.	No. 25, fig 26. "Bowl". No. 31, fig 26. "Bowl". No. 22, 24, fig 26. "Bowl". (Zarins et al, 1980).	Dated to per-Islamic period (Byzantine period).	Wadakh, Ad-Dawadami, north-west Riyadh, Central province, Saudi Arabia.
1162, 1161, 1131, 1262, 1163, 1117.	No. 13, fig I. "Bowl". No. 143, fig XI. "Bowl". No. 147, fig XI. "Bowl". No. 148, fig XI. "Bowl". (Osinga, 2017).	Dated to Nabataean/ Early Byzantine. Dated to late Umqyyad to early 'Addasid (8th century A.D.)	Badiyah, Umm Al-Jimal, Jordan.
1479.	No. 54, fig 10. "Bowl". No. 124, fig 12. "Bowl". No. 140, fig 13. "Bowl". (Potts et al, 1978).	Dated to Hellenistic period.	Site no. (208-101), South of the Dhahran Int. Airport, East Saudi Arabia.
1479. 1162, 1161, 1131, 1262, 1163, 1117, 1118, 1144, 1157, 1231.	No. 23, fig 77. "Bowl". No. 24, fig 77. "Bowl". No. 9, 10, 11, fig 82. "Bowl". No. 3, 10, 11, 12, fig 80. "Bowl". No. 19, fig 84. "Bowl". (Whitcomb, 1978).	Dated to late Islamic I period. Dated to middle Islamic period. Dated to late Islamic II period.	Al-Ḥasā' oasis, Eastern province, Saudi Arabia.
1162, 1161, 1131, 1262, 1163.	No. 6, fig 56. "Bowl". No. 12, fig 56. "Bowl". (Abu-Duruk and Murad, 1985).	Dated from 670 to 540/ or 410 B.C.	Qasr Al-Hamrā, Tayma, Saudi Arabia.
1162, 1161, 1131, 1262, 1163.	No. a, fig 4.26. "Bowl". (Magee, 2004).	Dated to Iron Age (1000-500 B.C.)	Tepe Yahya, Iran.
1162, 1161, 1131, 1262, 1163.	No. g. TA11451.26, fig 12. "Bowl". (Tourtet et al, in press).	Dated from 9th to 5th century B.C.	Tayma, North of Saudi Arabia.
1162, 1161, 1131, 1262, 1163.	No. 279, 281, fig 33. "Bowl". No. 281, 286, 287, fig 34. "Bowl". No. 298, 199, 300, fig 35. "Bowl". No. 328, 332, 333, 334, fig 37. "Bowl". No. 629, 632A, 632B, 634, 635, 636, 637, fig 61. "Bowl". (Al-Amer, 1996).	Dated from 3rd century B.C. – 3rd century A.D. Phase 1: 3rd – 1st century B.C. Phase 2: 1st – 3rd century A.D.	Al-Daffi site, Al-Jubail, Eastern province, Saudi Arabia.

Continue to Table 43

Al-Ukhudud pottery number	Parallels	Chronology/ dating.	Archaeological site name
1162, 1161, 1131, 1262, 1163, 1117, 1118, 1144, 1157, 1231.	No. 1, fig 16. "Bowl". No. 30, fig 43, type 2. "Bowl". No. 4, fig 49, type 4. "Bowl". No. 31, fig 63, type 6. "Bowl". No. 21, fig 87, type 9. "Bowl". No. 7, fig 118, type 13. "Bowl". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.
1479. 1162, 1161, 1131, 1262, 1163, 1117, 1118, 1144, 1157, 1231.	No. 224, fig XXXI, type 52. "Bowl". No. 38, 40, 41, 43, fig V, type 5. "Bowl". No. 76, fig VIII, type bc. No. 113, fig XIII, type 13a. "Bowl". No. 131, fig XV, type 14b. "Bowl". No. 227, fig XXXII, type 56. "Bowl". (Gazdar, 1982).	Dated to latter part of 2nd millennium B.C. and early 1st millennium A.D.	Zubaidah, Al-Qasim province, Central area, Saudi Arabia.

Continue to Table 44

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1195, 1202, 1215, 1333.	No. n. TA8949.2, fig 3.11b. "Bowl". No. j. TA9522.89, fig3.12b. "Bowl". (Hausleiter et al, 2018).	Dated to early Iron Age.	Tayma, North of Saudi Arabia.
1333.	No. 1, fig 7. "Bowl". (Rougeulle et al, 2014; Lesguier and Renel, 2018).	Dated between 13th and 14th century A.D.	Qalhāt, Oman.
1195, 1202, 1215, 1333.	No. 5, fig 1. "Bowl". No. 6, fig 1. "Bowl". No. 8, fig 1. "Bowl". (Tebes, 2013).	Dated to 1st millennium B.C.	North-western Arabia, North of Saudi Arabia.
1183, 1238, 1182.	No. 301.02.K1.14, fig 2. "Bowl". No. 617.05.C.8, fig 7. "Bowl". No. 302.04.K1.10, fig 7. "Bowl". (Guèrin and Al-Naimi, 2008 and 2010).	Dated to 9th century A.D. (early 'Abbasid period).	Murwab, Qatar.
1195, 1202, 1215, 1333.	No. 16, fig 3. "Bowl". No. 47, fig 4. "Bowl". No. 50, fig 4. "Bowl". No. 57, fig 6. "Bowl". No. 68, fig 6. "Bowl". (Condoluci et al, 2014).	Dated from 1300 B.C. to 650/ or 300 B.C.	Site no. SS1. Site no. SS4. Site no. SS4. Site no. SS7. Site no. SS7. Salūt, Wadi Bahla, Oman.
1159, 1642, 1100, 1278, 1254, 1251.	No. H195, fig 37, strata C2. "Lid 1". No. H584, fig 48, strata D. "Lid 1". (Van Beek, 1969).	Dated from late 2 nd century B.C. to mid 1 st century B.C. Dated to 3 rd century B.C.	Hajar Bin Humeid, (HBH), Yemen.

Type WM-Z – Rim – Wheel-made

Season 2 (1184, 1910).

Table 45 Chronological table of type Z, rim, wheel-made.

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1184, 1910.	No. 44, fig 4. "Bowl". (Condoluci et al, 2014).	Dated from 1300 B.C. to 650/ or 300 B.C.	Site no. SS4.Salūt, Wadi Bahla, Oman.
1184, 1910.	No. 605.03.K1.12, fig 2. "Bowl". No. 607.01.K1.20, fig 2. "Bowl". No. 302.02.K1.12, fig 6. "Bowl". (Guérin and Al-Naimi, 2008 and 2010)	Dated to 9th century A.D. (Early 'Abbasid period).	Murwab, Qatar.
1184, 1910.	No. 2, fig 6. "Bowl". No. 3, fig 6. "Bowl". No. 4, fig 6. "Bowl". (Phillips, 2005).	Dated from 6th to 5th century B.C.	Al-Hāmid, south-west corner of Jabal Al-Dāmir, Yemen.
1184, 1910.	No. 1, fig 23. "Bowl". No. 4, fig 23. "Bowl". No. 5, fig 23. "Bowl". No. 7, fig 23. "Bowl". (De Maigret, 1988).	Dated from 11th century B.C. to 5th century B.C.	Wadi Yalā, at Ḥawlān AṬ-Ṭiyāl, Yemen.
1184, 1910.	No. H1296, fig 95, strata H. "Bowl 2". No. H641, fig 95, strata E. "Bowl 2".(Van Beek,1969).	Dated from 6th – 5th century B.C. Dated from late 5th to early 3rd B.C.	Hajar Bin Ḥumeid, (HBH), Yemen.
1184, 1910.	No. 34, fig 24. "Bowl". (Al-Zahrani, 2014).	6th century B.C. to 5th century A.D. The dated of Thaj: Phase1: 6th B.C – 1st A.D. P1.1. 6th B.C – 4th B.C. P1.2. 3rd B.C. – 1st A.D. Phase2: 1st – 5th A.D P2.1. 1st – 3rd A.D. P2.2. Byzantine/Sasanian to Islamic period.	Thaj, Eastern province, Saudi Arabia.
1184, 1910.	No. 28, fig 9. "Bowl". (Potts et al, 1978).	Dated to Hellenistic period.	Site no. 208-91. South of Dhahran East Saudi Arabia.
1184, 1910.	No. 1, fig 29. "Bowl". No. 5, fig 29. "Bowl". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.
1184, 1910.	No. 2, fig 2.36, stratum 16A. "Bowl". (Sauer and Herr, 2012).	Dated to 8th to 7th century B.C.	Tell Hesban (Heshbon or Hisban), Amman, Jordan.

Type WM-AA – Rim – Wheel-made

Season 2 (1838).

Table 46 Chronological table of type WM-AA, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1838.	No. 6, fig 2.14, stratum 18. "Bowl". No. 16, fig 2.16, stratum 18. "Bowl". (Sauer and Herr, 2012).	Dated from mid 11 th to 10th century B.C.	Tell Hesban (Heshbon or Hisban), Amman, Jordan.
1838.	No. 374, fig 42. "Bowl". No. 1035, fig 101. "Bowl". (Al-Amer, 1996).	Dated from 3rd century B.C. – 3rd century A.D. Phase 1: 3rd – 1st century B.C. Phase 2: 1st – 3rd century A.D.	Al-Daffi site, Al-Jubail, Eastern province, Saudi Arabia.
1838.	No. b, fig 6. "Bowl". No. e, fig 6. "Bowl". (Whitcomb, 1975).	Dated to early Islamic period (630-1055 A.D.)	Wadi Beni Kharus 1, Oman.

Type WM-BB – Rim – Wheel-made

Season 2: (1343).

Season 3: (1533).

Table 47 Chronological table of type WM-BB, rim, wheel-made.

Al-Ukhud pottery number	Parallels	Chronology/ dating	Archaeological site name
1343.	No. 5, fig 2.22, stratum 18b. Cooking pot. (Sauer and Herr, 2012).	Dated from mid 11th to 10th century B.C.	Tell Hesban (Heshbon or Hisban), Amman, Jordan.
1343.	No. 1242, fig 124. "Bowl". (Al-Amer, 1996).	Dated from 3rd century B.C. – 3rd century A.D. Phase 1: 3rd – 1st century B.C. Phase 2: 1st – 3rd century A.D.	Al-Daffi site, Al-Jubail, Eastern province, Saudi Arabia.
1343.	No. H61, fig 87, strata A. "LCF 7". (Van Beek, 1969).	Dated from 2nd to 4th or 5th century A.D.	Hajar Bin Ḥumeid, (HBH), Yemen.
1343.	No. 21, fig 21. "Bowl". No. 28, fig 24. "Bowl". No. 46, fig 27. "Bowl". No. 23, fig 31. "Bowl". (Al-Zahrani, 2014).	6th century B.C. to 5th century A.D. The dated of Thaj: Phase1: 6th B.C – 1st A.D. P1.1. 6th B.C – 4th B.C. P1.2. 3rd B.C. – 1st A.D. Phase2: 1st – 5th A.D P2.1. 1st – 3rd A.D. P2.2. Byzantine/ Sasanian period to Islamic period.	Thaj, Eastern province, Saudi Arabia.
1343.	No. 7, fig 5a. "Bowl". (Peli and Téregeol, 2007).	Dated to the 9th and/or 10th century A.D.	Al-Raḍrāḍ (Al-Jabalī), Yemen.
1343.	No. 181, fig 39. "Bowl". (Abu-Duruk and Murad, 1986).	Dated from 670 to 540 or 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.
1343.	No. 62, fig 72. "Cooking pot". No. 78, fig 74. "Cooking pot". (Gazdar, 1984).	Dated from 300 B.C. to 100 A.D.	Thaj, Eastern province, Saudi Arabia.

Type WM-CC – Rim – Wheel-made

Season 2: (1211, 1634, 1633, 1194).

Season 3: (4500, 1395, 1441, 4400).

Table 48 Chronological table of type WM-CC, rim, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1211, 1634.	No. 177, fig XX, type 22. "Bowl". No. 63, fig VII, type 7c. "Bowl". (Gazdar, 1982).	Date to latter part of 2nd millennium B.C. and early 1st millennium A.D.	Zubaidah, Al-Qasim province, Central area, Saudi Arabia.
1634, 1633.	No. H194, fig 87, strata C2. "LCF 4". No. H455, fig 87, strata C2. "LCF 3".	Dated from late 2nd B.C. to mid 1st century B.C.	Hajar Bin Humeid, (HBH), Yemen.
1211, 1194.	No. H1515, fig 104, strata J. "Jar 2". No. H1690, fig 104, strata K. "Jar 2". No. H1598, fig 110, strata J. "LCF 2". (Van Beek, 1969).	Dated from 6th to 5th century B.C.	
1211, 1634, 1194.	No. 8, fig 21. "Bowl". (De Maigret, 1988).	Dated from around 11th century B.C. to 5th century B.C.	Wadi Yalā, at Ḥawlān Aṭ-Ṭiyāl, Yemen.
1633, 1194.	No. 22, fig 5.13. "Bowl". No. 32, fig 5.13. "Bowl". (Al-Hajri et al, 2018).	Dated to 3rd/ 4th century A.D.	Al-Khobar, Dammam, Eastern province, Saudi Arabia.

Vessel Part: Base Sherds. Hand-made.

Type HMB-A – Base – Hand-made

Season 2: (1009, 1015, 1141, 1150, 1017, 1174, 1201, 1166, 1330, 1552, 1360, 1271, 1566, 1562, 1169, 1257, 1289, 1549).

Season 3: (1470, 1421, 1474, 1525, 1519).

Table 49 Chronological table of type HMB-A, base, hand-made.

Al-Ukhdu pottery number	Parallels	Chronology/ dating	Archaeological site name
1009, 1015, 1141, 1150, 1017, 1174, 1201, 1166, 1330, 1552, 1360, 1271, 1566, 1562, 1169, 1257, 1289, 1549.	No. 60, fig 11. "Base (Bowl)". No. 161, fig 13. "Base (Bowl)". (Potts et al, 1978).	Dated to Hellenistic period.	Site no. 208-101. Site no. 208-129-3. Site no. 208-138, Eastern province, between Zawr Lawzān and Ra's al- Qurayy, Saudi Arabia.
1009, 1015, 1141, 1150, 1017, 1174, 1201, 1166, 1330, 1552, 1360, 1271, 1566, 1562, 1169, 1257, 1289, 1549.	No. 19, fig 80. "Base (Bowl)" No. 21, 25, fig 81. "Base (Bowl)" No. 27, fig 83. "Base (Bowl)" (Hand-made?). (Whitcomb, 1978).	Dated to Islamic period.	Al-Ḥasā' oasis, Eastern province, Saudi Arabia.
1009, 1015, 1141, 1150, 1017, 1174, 1201, 1166, 1330, 1552, 1360, 1271, 1566, 1562, 1169, 1257, 1289, 1549.	No. 240, 241, fig 27. "Base (Bowl)". (Hand- made?). (Zarins et al, 1979).	Dated to early Islamic period.	Wadi Hawtah, Central province, Saudi Arabia.
1009, 1015, 1017, 1201, 1169, 1257, 1549.	No. 9, fig 32. "Base (Bowl)". (Gilmore et al, 1982).	Dated from late 2nd to early 1st millennium B.C.	Wadi Tharban, Madain Salih, Al- Madinah, north- west Saudi Arabia.
1017, 1174, 1566, 1169, 1257, 1549.	No. 43, fig 42. "Base (Bowl)". (Al-Zahrani, 2007).	Dated from 11 th century B.C. to 1 st century A.D.	Tel Al-Katheeb, Al- Ula, north-west Saudi Arabia.
1009, 1015, 1017, 1174, 1169, 1257, 1549.	No. H2138, fig47, strata N. "Base (Jar 4)". No. H2011, fig100, strata M. "Base (LCF 1)". (Van Beek, 1969).	Dated from 9 th to 8 th century B.C. Dated to 7 th century B.C.	Hajar Bin Ḥumeid (HBH), Yemen.
1009, 1015, 1141, 1150, 1017, 1174, 1201, 1166, 1330, 1552, 1360, 1271, 1566, 1562, 1169, 1257, 1289, 1549.	No. 51, 211, D.5, fig51. No. 62, 73, D.5, fig62. No. 82, 74, D.5, fig82. No. 95, 161, D.6, fig95. "Base (Bowl)". (Al-Shehry, 2014).	Dated probably between 6 th B.C and 1 st century B.C.	Daddan, Al-Ula, Al- Madinah, north- west Saudi Arabia.

Continue to Table 49

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1009, 1015, 1141, 1150, 1017, 1174, 1201, 1166, 1330, 1552, 1360, 1271, 1566, 1562, 1169, 1257, 1289, 1549.	No. 11, 12, 13, fig LIII, type VIIIb. "Base (Deep bowl)" No. 1, 2, 3, 4, 5, 6, fig LIV, type VI. "Base (Wide bowl)". No. 7, fig LIV, type VII. No. 12, 13, 14, fig LIV, type IX. "Base (Eared bowl)". No. 3, 5, 6, 8, 10, 13, 17, fig LV, type X-XIV. No. 1, 2, 3, 4, fig LVI, type sherds. "Base (Sherds)". (Thompson, 1944).	Dated from 7 th to 5 th century B.C.	Hureidha, Ḥaḍramawt, Yemen.
1009, 1015, 1017, 1174, 1169, 1257, 1549.	No. fig 7. "Base (Bowl)". (Al-Ghamedi, 1996).	Dated from 2 nd century B.C. to mid Islamic period (661 A.D.).	Jurash, Asir, South of Saudi Arabia.
1009, 1015, 1174, 1552, 1360, 1271, 1169.	No. 15, 16, fig 22. "Base (Bowl)". (Al-Zahrani, 2014).	Dated from 6 th century B.C. to 5 th century A.D. The dated of Thaj: Phase1: 6 th B.C – 1 st A.D. P1.1. 6 th B.C – 4 th B.C. P1.2. 3 rd B.C. – 1 st A.D. Phase2: 1 st – 5 th A.D P2.1. 1 st – 3 rd A.D. P2.2. Byzantine/ Sasanian period to Islamic period.	Thaj, Eastern province, Saudi Arabia.
1009, 1015, 1141, 1150, 1017, 1174, 1201, 1166, 1330, 1552, 1360, 1271, 1566, 1562, 1169, 1257, 1289, 1549.	No. fig 6.11. "Base (Bowl)". No. fig 6.12. "Base (Bowl)". No. fig 6.13. "Base (Bowl)". No. fig 6.20. "Base (Bowl)". (Hashim, 2007).	Dated to Hellenistic period.	Thaj and Dhahran, Eastern province, Saudi Arabia.
1141, 1150, 1330, 1566, 1562, 1257, 1289.	No. 15, fig 83. "Base (Bowl)". (Whalen et al, 1988).	Dated to per-Islamic period.	Wadi Fatimah, Jeddah, West of Saudi Arabia.
1141, 1150, 1017, 1174, 1330, 1566, 1562, 1257, 1289, 1549.	No. 24, fig 23. "Base (Bowl)". (Zarins et al, 1980).	Dated to Islamic period (post-'Abbasid).	Site no. 210-15 Al-Mabāu'th, Central and south-western province, Saudi Arabia.

Continue to Table 49

Al-Ukhduḍ pottery number	Parallels	Chronology/ dating	Archaeological site name
1009, 1015, 1141, 1150, 1017, 1174, 1201, 1166, 1330, 1552, 1360, 1271, 1566, 1562, 1169, 1257, 1289, 1549.	No. 5, room3, trench2A, layer6. "Base (Bowl)". No. 9, room3, trench2A, layer6. "Base (Bowl)". No. 16, room3, trench2A, layer6. "Base (Bowl)". No. 20, room3, trench2A, layer6. "Base (Bowl)". No. 23, room3, trench2A, layer6. "Base (Bowl)". No. 33, room3, trench2A, layer6. "Base (Bowl)". No. 36, room3, trench2A, layer6. "Base (Bowl)". No. 50, 52, 54, 55 room5, trench2A, layer8. "Base (Bowl)". No. 67, 68, room5, trench2A, layer8. "Base (Bowl)". (Abu-Duruk, 1998).	Dated from 670 – 540/ or 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.
1009, 1015, 1017, 1174, 1201, 1360, 1169, 1257, 1549.	No. d. TA7265.73; e. TA7265.25; f. TA7265.97, fig3.12 a. "Base (Bowl)". (Hausleiter et al, 2017).	Dated to the 1 st century A.D. (Nabataean/ Early Roman periods onward).	Tayma, North of Saudi Arabia.
1141, 1150, 1017, 1174, 1330, 1566, 1562, 1257, 1289, 1549.	No. 15, fig 82. "Base (Bowl)". (Parr and Gazdar, 1980).	Dated from latter part of 2 nd millennium B.C. to early 1 st millennium A.D.	Zubaidah, Al-Qasim province, central area, Saudi Arabia.
1009, 1015, 1017, 1174, 1201, 1169, 1549.	No. 211, 213, fig XIX. "Base (Storage)". No. 280, fig XXVI. "Base (Cooking bowl)". (Osinga, 2017).	Dated to Umayyad/ Early Abbasid (8 th century A.D.). Dated to mid/ late Islamic period.	Badiyah, Umm Al-Jimal, Jordan.
1009, 1015, 1017, 1174, 1201, 1169, 1549.	No. 211, 213, fig XIX. "Base (Storage)". No. 280, fig XXVI. "Base (Cooking bowl)". (Osinga, 2017).	Dated to Umayyad/ Early Abbasid (8 th century A.D.). Dated to mid/ late Islamic period.	Badiyah, Umm Al-Jimal, Jordan.

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Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1009, 1015, 1141, 1150, 1017, 1174, 1201, 1166, 1330, 1552, 1360, 1271, 1566, 1562, 1169, 1257, 1289, 1549.	No. 2, 3, 7, 12, 24, fig 3. "Base (Bowl)". No. 48, fig 4. "Base (Bowl)". No. 72, fog 6. "Base (Bowl)". (Condoluci et al, 2014).	Dated from 1300 to 650/ or 300 B.C.	Site SS 1. Site SS 4. Site SS 7. Salūt, Oman.
1009, 1015, 1017, 1174, 1201, 1169, 1257, 1549.	No. 7, 8, 11, 13, 23, 24, 25, fig 10. "Base (Bowl)". (El-mahi and Ibrahim, 2003).	Dated to the end of 2 nd millennium B.C. and the beginning of the 1 st millennium B.C.	Manāl site, Wādī Samāyil area, Oman.
1009, 1015, 1017, 1174, 1201, 1169, 1257, 1549.	No. 10, fig 6. "Base (Bowl)". No. 6, 16, fig 7. "Base (Bowl)". (Boucharlat and Lombart, 1983).	Dated to Rumeilah I from 900 – 700 B.C.	Rumeilah, Al-Ain, UAE.
1009, 1015, 1017, 1174, 1201, 1169, 1257, 1549.	No. 1, fig 47. "Base (Bowl)". No. 17, 21, 22, fig 49. "Base (Bowl)". No. 1, 2, 3, 4, fig 51. "Base (Bowl)". No. 3, fig 52. "Base (Bowl)". (Boucharlat and Lombart, 1985).	Dated from 900 – 700 B.C.	Rumeilah, Al-Ain, UAE.
1009, 1015, 1141, 1150, 1017, 1201, 1330, 1169, 1257, 1289, 1549.	No. DJ.09.A.45-4, fig 2. No. DJ.09.A.45-4, fig 2. No. DJ.09.A.48-4, fig 3. No. DJ.09.A.48-40, fig 3. No. DJ.09.A.48-46, fig 3. No. DJ.09.A.29-30, fig 4. "Base (Bowl)". (Charloux and Loreto, 2014).	Dated from 1 st century A.D. to 5 th century A.D.	Dūmat Al-Jandal, Al-Jawf region, North of Saudi Arabia.
1017, 1174, 1169, 1257.	No. A, fig 224. "Bowl". (Al-Jahwari, 2013).	Dated to 1300 B.C.	Wadi Suq, norther Oman, Oman.
1009, 1015, 1017, 1174, 1201, 1169, 1549.	No. 28, 29, 30, fig 3. "Base (Bowl)". (De Cardi, 1976).	Dated to mid of the 1 st millennium B.C.	Ras Al-Khaimah, UAE.
1009, 1015, 1017, 1174, 1201, 1169, 1549.	No. 1, fig 2. "Base (Bowl)". (Karacic et al, 2017).	Early Iron Age (1100 – 600 B.C.).	Sarūq Al-Ḥadīd, northern of the Rub' Al-Khālī, Dubai, UAE.

Type HMB-B – Base – Hand-made

Season 2: (1550, 1296, 1170, 1383, 1359, 1356, 1255).

Table 50 Chronological table of type HMB-B, base, hand-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1296.	No. 9, fig LIV, type pedestalbases. "Base (Bowl)". (Thompson, 1944).	Dated from 7 th to 5 th century B.C.	Hureidha, Ḥaḍramawt, Yemen.
1550, 1356.	No. 25, fig 10. "Base (Bowl)". (El-Mahi and Ibrahim, 2003).	Dated to the end of the 2 nd and the beginning of the 1 st millennium B.C.	Manāl site, Wādī Samāyil area, Oman.
1356, 1255. 1170. 1383. 1550, 1296, 1359.	No. 3, fig 35, type 2. No. 3, fig 49, type 4. No. 3, fig 44, type 3. No. 7, fig 65, type 7. No. 8, fig 69, type 7. No. 10, fig 187, type 17. "Base (Bowl)". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.
1550, 1296, 1170, 1383, 1359, 1356, 1255.	No. 1, 2, 3, 4, 5, 6, 7, fig 19. "Base (Bowl)". No. 1, 2, 3, 4, 5, 6, 8, 11, fig 18. "Base (Bowl)". (De Maigret, 1988).	Dated from around 11 th century B.C. to 5 th century B.C.	Wadi Yalā, at Ḥawlān AṬ-Ṭiyāl, Yemen.
1550, 1296, 1170, 1383, 1356.	No. F9, fig 20. "Base (Bowl)". No. F18, fig 20. "Base (Bowl)". No. F19, F20, F21, fig 21. "Base (Bowl)". No. F53, fig 20. "Base (Bowl)". (El-Hassan and Khabir, in press).	Dated from 3 rd century B.C. to the 3 rd century A.D.	Qaryat Al-Fāw, Wadi Ad-Dawasir, south-west central province, Saudi Arabia.
1170.	No. fig 8. "Base (Bowl)". (Al-Ghamedi, 1996).	2 nd century B.C.- early Islamic period. The chronology of Jurash: Early settlement: 2 nd century B.C. Second phase: up to 2 nd A.D. Third phase: 3 rd A.D. 220-250 A.D. Fourth phase: early Islamic period, around 660/ 661 A.D.	Jurash, Asir region, south-west Saudi Arabia.
1550, 1383, 1356.	No. 111, fig 36. "Base (Bowl)". (Parr et al, 1978).	Dated from 2 nd to 3 rd century A.D.	Site no. 206-7, Zubayda site, North of Saudi Arabia.

Continue to Table 50

Al-Ukhud pottery number	Parallels	Chronology/ dating	Archaeological site name
1296, 1170.	No. 8, fig 77. "Base (Bowl)". (Whitcomb, 1978).	Dated to middle Islamic period	Al-Ḥasā' oasis, Eastern province, Saudi Arabia.
1359, 1356.	No. b, fig 224. "Bowl". (Al-Jahwari, 2013).	Dated to 1300 B.C.	Wadi Suq, norther Oman, Oman.

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Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
2192. 1297. 1029.	No. 16, fig 107, type 11. "Base (Bowl)". No. 12, fig 187, type 17. "Base (Bowl)". No. 11, fig 187, type 17. "Base (Bowl)". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.
1029.	No. 48, fig LXII. "Base (Bowl)". (Gazdar, 1982).	Dated to latter part of 2 nd millennium B.C. and early 1 st millennium A.D.	Zubaidah, Al-Qasim Saudi Arabia.

Type HMB-D – Base – Hand-made

Season 2: (2606, 1011, 1013, 2473, 2161, 1016, 1312, 1571, 1585, 1641, 1014, 1008, 1010, 1012, 2490, 2243, 2438).

Season 3: (1504, 1415, 1440, 1895, 1003).

Table 52 Chronological table of type D, base, hand-made.

Al-Ukhud pottery number	Parallels	Chronology/ dating	Archaeological site name
2606, 1011, 1013, 2473, 1014, 1008, 2490, 2161, 1585, 1010, 1012, 2234.	No. 3, 4, 5, 7, fig L, type II. "Base (Bowl)". No. 5, fig LI, type pedestal bowls. No. 8, fig LI, type III. "Base (Bowl)". No. 1, fig LII, type III. "Base (Bowl)". No. 12, 13, 14, fig LII, type V. "Base (Bowl)". No. 8, fig LIV, type pedestal base. (Thompson, 1944).	Date between 7 th and 5 th century B.C.	Hureidha, Ḥaḍramawt, Yemen. Tomb 5, Tomb 6.
1016, 1312, 1571, 1641, 2438.	No. 74, fig 193. "Base (Bowl)". No. 112, fig 194. "Base (Bowl)". No. 92, fig 194. "Base (Bowl)". No. 93, fig 194. "Base (Bowl)". (Bowen and Albright, 1958).	Date to Mid 7 th B.C. to 1 st century A.D.	Mārib, Yemen.
2606, 1011, 1013, 2473, 2161.	No. 6, fig 21. "Base (Bowl)". (Zarins et al, 1981).	Date to late 2 nd millennium B.C.	Site no. 217-107 Sihi, Jazan, South of Saudi Arabia.
1585, 1014, 1008, 1010, 1012, 2490, 2490, 2438.	No. F15, fig 2. No. F2.15, fig 2. No. F15.411, fig 7. No. F15.412, fig 7. "Base (Bowl)". (El-Hassan and Khabir, in press).	Dated from 3 rd century B.C. to the 3 rd century A.D.	Qaryat Al-Fāw, Wadi Ad-Dawasir, south-west central province, Saudi Arabia.
2606, 1011, 1013, 2473, 2161, 1016, 1312, 1571, 1585, 1641, 1014, 1008, 1010, 1012, 2490, 2243.	No. 2, 3, 4, 5, 6, fig 24. No. 7, 8, 9, fig 24. No. 10, 11, 12, fig 24. No. 4, 5, 6, 7, fig 25. No. 8, 9, 10, fig 25. "Base (Bowl)". (De Maigret, 1988).	Dated from around 11 th century B.C. to 5 th century B.C.	Wadi Yalā, at Ḥawlān AṬ-Ṭiyāl, Yemen.

Continue to Table 52

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
2606, 1011, 1013, 2473, 2161, 1016, 1312, 1571, 1585, 1641, 1014, 1008, 1010, 1012, 2490, 2243.	No. H2556, fig40, strata P. "Base 6". No. H3171, fig40, strata S. "Base 7". No. H2655, fig40, strata Q. "Base 7". No. H2435, fig40, strata O. "Base 8". No. H2106, fig40, strata N. "Base 8". No. H2205, fig41, strata N. "Base 10". No. H2204, fig46, strata N. "Base (Jar 1)". No. H2203, fig46, strata N. "Base (Jar 1)". No. H2188, fig46, strata M. "Base (Jar 1)". No. H3034, fig55, strata R. "Base (Bowl 1)". No. H2885, fig55, strata R. "Base (Bowl 1)". No. H2139, fig58, strata N. "Base (Bowl 5)". No. H2130, fig60, strata N. "Base (LCF 13)". No. H2728, fig69, strata O. "Base 3". No. H2931, fig69, strata R. "Base 3". No. H2376, fig82, strata O. "Base 4". No. H2007, fig82, strata M. "Base 4". No. H2595, fig89, strata P. "Base 1". No. H3178, fig89, strata S. "Base 3". No. H3137, fig89, strata S. "Base 3". No. H1978, fig89, strata M. "Base 5". No. H2008, fig93, strata M. "Base 2". No. H1885, fig93, strata L. "Base 2". (Van Beek, 1969).	Dated from 9 th – 8 th century B.C. Dated to 11 th century B.C. Dated from 9 th – 8 th century B.C. Dated to 7 th century B.C. Dated to 11 th century B.C. Dated to 10 th century B.C. Dated from 9 th – 8 th century B.C. Date to 10 th century B.C. Date from 9 th – 8 th century B.C. Dated to 7 th century B.C. Dated from 9 th – 7 th century B.C. Date to 11 th century B.C. Dated to 7 th century B.C. Dated to 7 th century B.C.	Hajar Bin Humeid, (HBH), Yemen.

Continue to Table 52

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1016, 1312, 1585, 1014.	No. 4, fig 84. "Base (Bowl)". (Zarins and Al-Zahrani, 1985).	Dated to the 2 nd millennium B.C.	Sihi, Southern Tihama Plain, Jazan province, South of Saudi Arabia.
2606, 1011, 1013, 2473, 2161, 1016, 1312, 1571, 1585, 1641, 1014, 1008, 1010, 1012, 2490, 2243.	No. H2758, fig39, strata Q. "Base 2". No. H2183, fig39, strata N. "Base 2". No. H2845, fig39, strata R. "Base 3". No. H2408, fig39, strata O. "Base 5". No. H3115, fig40, strata S. "Base 6". Van Beek, 1969).	Dated from 9 th – 8 th century B.C. Dated to 10 th century B.C. Dated from 9 th – 8 th century B.C. Dated to 11 th century B.C.	Hajar Bin Ḥumeid, (HBH), Yemen.
2606, 1011, 1013, 1585, 1014, 2490.	No. 1, fig 7. "Base (Bowl)". (Phillips, 2005).	Dated from 6 th to 5 th century B.C.	Al-Hāmid, south-west corner of Jabal Al-Ḍāmir, Yemen.

Vessel Part: Base Sherds. Wheel-made.

Type WMB-A – Base – Wheel-made

Season 2: (1093, 1173, 1197, 1320, 1294, 1286, 1273, 1249, 1290, 1570, 1132, 1181, 1167, 1149, 1146, 1104, 1101, 1969, 1809, 1762, 1139, 1311).

Season 3: (1369, 1367, 4726, 1489, 1532).

Table 53 Chronological table of type WMB-A, base, wheel-made.

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1093, 1173, 1294, 1286, 1273, 1249, 1570, 1132, 1181, 1149, 1146, 1104, 1101, 1969, 1809, 1762, 1139, 1311	No. b, e, f, fig 5. "Base (Bowl)" (Durand and Gerber, 2014).	Dated to the Nabataean period (2 nd half of the 1 st century B.C. to early 2 nd century A.D.)	Hegra, Maḏ'in Salih, Al-Madinah, north-west Saudi Arabia.
1173, 1197, 1286, 1273, 1290, 1181, 1167, 1146, 1104, 1969, 1809, 1762, 1139, 1311	No. d, fig 4.4. "Base (Bowl)". No. d, fig 4.6. "Base (Bowl)". (Magee, 2004).	Dated to the 1 st millennium B.C. (1100-600 B.C.)	Tepe Yahya, Iran.
1173, 1197, 1294, 1286, 1273, 1570, 1132, 1181, 1167, 1149, 1146, 1104, 1101, 1969, 1809, 1762, 1139, 1311.	No. f. TA10016.6, fig 8. "Base (Bowl)". No. c. TA2192.19+ TA2192.46; No. f. TA8090.4; No. g. TA3135.49; No. j. TA6670.8; No. k. TA4251.157, fig 11. "Base (Bowl)". No. e. TA8274.16; No. b. TA4531.1, fig 10. "Base (Bowl)". (Tourtet et al, in press).	Dated from 15 th – 11 th century B.C. Dated from 9 th – 5 th century B.C. Dated to 11 th century B.C.	Tayma, North of Saudi Arabia.
1173, 1197, 1294, 1286, 1273, 1570, 1132, 1181, 1167, 1149, 1146, 1104, 1101, 1969, 1809, 1762, 1139, 1311.	No. d, fig 8. "Base (Bowl)". No. b, fig 9. "Base (Bowl)". (Tourtet and Hausleiter, 2018).	Dated from 7 th – 2 nd century B.C. Dated from 2 nd B.C. – 1 st century A.D.	Tayma, North of Saudi Arabia.
1173, 1249, 1286, 1249, 1570, 1132, 1181, 1149, 1146, 1101, 1969, 1809, 1762, 1139, 1311.	No. 20, 21, 22, 23, fig 94. "Base (Bowl)". No. 42, fig 98. No. 43, fig 99. No. 11, fig 106. No. 17, fig 107. No. 19, fig 121. No. 1, fig 135. "Base (Bowl)". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.

Continue to Table 53

Al-Ukhduḍ pottery number	Parallels	Chronology/ dating	Archaeological site name
1093, 1173, 1197, 1320, 1294, 1286, 1273, 1249, 1290, 1570, 1132, 1181, 1167, 1149, 1146, 1104, 1101, 1969, 1809, 1762, 1139, 1311	No. 22, 24, 28, fig 9. "Base (Bowl)". No. 30, 40, fig 10. No. 340, 341, fig 38. No. 430, 438, 439, 440, 441, fig 47. "Base (Bowl)". No. 447, 451, 453, 457, fig 48. "Base (Bowl)". No. 744, 747, 753, fig 74. "Base (Bowl)". No. 956, 958, fig 92. No. 1029, 1030, 1031, fig 101. "Base (Bowl)". (Al-Amer, 1996).	Dated from 3 rd century B.C. – 3 rd century A.D. Phase 1: 3 rd – 1 st century B.C. Phase 2: 1 st – 3 rd century A.D.	Al-Daffi site, Al-Jubail, Eastern province, Saudi Arabia.
1093, 1173, 1197, 1320, 1294, 1286, 1273, 1249, 1290, 1570, 1132, 1181, 1167, 1149, 1146, 1104, 1101, 1969, 1809, 1762, 1139, 1311	No. 1, 2, fig 68. No. 3, 4, fig 69. No. 5, 6, fig 70. No. 7, 8, fig 71. No. 9, 10, fig 72. No. 11, 12, fig 73. No. 13, 14, fig 74. No. 19, fig 77. No. 21, fig 78. No. 23, 24, fig 79. No. 25, fig 80. No. 35, 36, fig 85. "Base (Bowl)". (Al-Onazi, 2006).	Dated probably to mid 8 th century B.C. C14: Early phase: Half of 2 nd millennium B.C. (Late Bronze Age). Latter phase: Mid 8 th century B.C (Early Iron Age)	Şana'īye site, Tayma, North of Saudi Arabia.
1093, 1173, 1197, 1286, 1249, 1181, 1149, 1146, 1104, 1969, 1809, 1762.	No. 3, 13, fig 8. "Base (Bowl)". (Boucharlet and Lombard, 1983).	Dated from 700 – 400 B.C.	Rumeilah, Al-Ain, UAE.
1173, 1249, 1286, 1249, 1570, 1132, 1181, 1146, 1101, 1969, 1809, 1139, 1311.	No. 1, 2, 3, 5, fig 53. No. 5, fig 55. No. 7, fig 56. No. 5, 15, 18, fig 57. No. 2, 3, fig 58. "Base (Bowl)". (Boucharlet and Lombard, 1985).	Dated from 700 – 400 B.C.	Rumeilah, period II, Al-Ain, UAE.
1173, 1249, 1286, 1249, 1570, 1132, 1181, 1146, 1101, 1969, 1809, 1139, 1311.	No. 91, 92, 93, 94, 100, fig 18. "Base (Bowl)". No. 151, 155, 157, 158, 159, 160, fig 20. "Base (Bowl)". (De Cardi et al, 1976).	Dated to the 1st millennium B.C.	'Amlah, Wadi Al-'Ayn, Oman.

Continue to Table 53

Al-Ukhduḍ pottery number	Parallels	Chronology/ dating	Archaeological site name
1273, 1181, 1167, 1146, 1104, 1809.	No. 2a, 2c, fig 15. "Base (Bowl)". (Bibby, 1973).	Dated to Hellenistic period around 300 B.C.-100 A.D.	Thaj, East Saudi Arabia.
1093, 1173, 1197, 1286, 1249, 1149, 1146, 1104, 1969, 1762, 1311	No. e, g, fig 7. "Base (Bowl)". (Whitcomb, 1975).	Dated to late Islamic period. (1500-1750 A.D.).	Wadi Andam, Oman.
1173, 1286, 1273, 1149, 1104, 1969, 1311.	No. 14, 16, fig 5. "Base (Bowl)". (Al-Ghazzi, 1994).	Dated from 6 th century B.C. to 3 rd century A.D.	(211-22), North Al-Khamaseen, Wadi Ad-Dwasir, Saudi Arabia.
1167, 1146, 1104, 1809, 1311.	No. 7, 8, fig 1. "Base (Bowl)". (Tebes, 2013).	Dated to 1 st millennium B.C.	Tayma, North of Saudi Arabia.
1273, 1181, 1167, 1146, 1104, 1809.	No. 1, 3, 4, 5, 6, 9, 11, 13, fig 7. "Base (Bowl)". (Boucharlat et al, 1997).	Dated to Iron Age period	Jabal Buhais, Sharjah, UAE.
1173, 1286, 1273, 1149, 1104, 1969, 1311.	No. 301.04.K1, 18, fig 5. "Base (Bowl)". No. 617.03.L14; No. 301.03.L.12, fig 8. No. 605.02.G28; No. 613.02.G12, fig 10. "Base (Bowl)". (Guérin and Al-Naimi, 2008 and 2010).	Dated to 9 th century A.D. (Early 'Abbasid period). Dated to early 'Abbasid period.	Murwab, Qatar.
1173, 1286, 1197, 1273, 1149, 1104, 1969, 1311.	No. 13, phase 3. fig6.9 b. "Base (Bowl)". No. 8, phase 3. fig6.10 a. "Base (Bowl)". No. 9, phase 4, fig 6.10 b. "Base (Bowl)". (Schiettecatte et al, 2017).	Dated from 4 th century to 2 nd century B.C. C14: 389-204 B.C.	Al-Yamāmah, Al-Kharj, Central province, Saudi Arabia.
1173, 1286, 1273, 1149, 1104, 1969, 1311.	No. d. TA7963.26, fig 2.19. "Base (Bowl)". (Hausleiter et al, 2018).	Dated to Iron Age	Tayma, North of Saudi Arabia.
1173, 1286, 1197, 1273, 1149, 1104, 1969, 1311.	No. 50, 51, fig 71. "Base (Bowl)". No. 65, 67, fig 72. "Base (Bowl)". (Gazdar, 1984).	Dated from 300 B.C. to 100 A.D.	Thaj, Eastern province, Saudi Arabia.
1173, 1286, 1273, 1149, 1104, 1969, 1311.	No. 7, 8, 11, fig 56. "Base (Bowl)". No. 10, 15, 18, fig 58. "Base (Bowl)". (Abu-Duruk and Murad, 1985).	Dated from 670 to 540/ or 410 B.C.	Qasr Al-Hamrā, Tayma, Saudi Arabia.

Continue to Table 53

Al-Ukhduḍ pottery number	Parallels	Chronology/ dating	Archaeological site name
1093, 1173, 1197, 1320, 1294, 1286, 1273, 1249, 1290, 1570, 1132, 1181, 1167, 1149, 1146, 1104, 1101, 1969, 1809, 1762, 1139, 1311	No. 16, fig 29. No. 28, fig 35. No. 32, 33, fig 37. No. 42, fig 42. No. 49, fig 47. No. 57, fig 53. No. 83, 85, fig 67. No. 115, 118, fig 85. No. 121, fig 87. "Base (Bowl)". (Al-Zahrani, 2007).	Dated to level 2: from 5 th century B.C. to 1 st century A.D. Level1: 11 th – 4 th century B.C.	Tel Al-Katheeb, Al-Ula, Al-Madinah, north-west Saudi Arabia.
1093, 1173, 1197, 1320, 1294, 1286, 1273, 1249, 1290, 1570, 1132, 1181, 1167, 1149, 1146, 1104, 1101, 1969, 1809, 1762, 1139, 1311	No. 237, 238, 239, 240, 242, 243, 244, 245, 246, 247, 248, fig XXVII. "Base (Bowl)". No. 267, 268, 278, 281, fig XXVIII. "Base (Bowl)". (Al-Muaikel, 1994).	Al-Ṭuwayr site dated from 1 st century B.C. to 2 nd century A.D. Dûmat Al-Jandal site dated from 6 th /Or 5 th century B.C. to 2 nd century A.D.	Al-Ṭuwayr site and Dûmat Al-Jandal, Al-Jawf, North of Saudi Arabia.
1173, 1286, 1197, 1273, 1149, 1104, 1969, 1311.	No. 16, fig 22. No. 1, fig 28. No. 25, fig 32. "Base (Bowl)". (Al-Zahrani, 2014).	Dated from 6 th century B.C. to 5 th century A.D.	Thaj, East of Saudi Arabia.
1173, 1197, 1273, 1149, 1104, 1969, 1311.	No. 36, 44, room, trench2A, layer 6. "Base (Bowl)". No. 50, 51, 54, 55, 56, 60, 67, 66, 68, 77, 80, room 5, trench2A, layer8. "Base (Bowl)". (Abu-Duruk, 1998).	Dated from 670 – 540/ or 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.
1173, 1197, 1286, 1181, 1146.	No. 76. 52. D5, fig 76. No. 44. 283. D6, fig 44. No. 99. 138. D6, fig 99. "Base (Bowl)". (Al-Shehry, 2014).	Dated from 6 th century B.C. to 1 st century B.C.	Daddan, Al-Ula, Al-Madinah, north-west of Saudi Arabia.
1173, 1286, 1197, 1273, 1149, 1104, 1969, 1311.	No. 1, 2, 3, 5, 6, 12, fig 2.10. Stratum 20. "Base (Bowl)". No. 12, fig 2.27. Stratum 16B. "Base (Bowl)". (Sauer and Herr, 2012).	Dated to mid 12 th to early 11 th century B.C. Dated to 8 th to 7 th century B.C.	Tell Hesban (Heshbon or Hisban), Amman, Jordan.

Continue to Table 53

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
1173, 1197, 1146, 1104,	QAT.196, QAT194, fig 20. "Bowl". (Power et al, 2019).	Dated to Iron Age III period. From 600 – 300 B.C.	Bayt Bin Ati, south-west of Qattara Oasis, Al-Ain, UAE.
1173, 1286, 1273, 1149, 1104, 1969, 1311.	No. 5, 13, 16, 17, fig 76. "Base (Bowl)". (Zarins and Al-Zahrani, 1985).	7 th century A.D to 13 th century A.D.	Athar, Jazan, South of Saudi Arabia.
1173, 1197, 1286, 1181, 1146.	No. 1, fig 1. No. 1, fig 5. No. 2, 3, fig 8. No. 1, fig 22. No. 2, fig 26. "Base (Bowl)". (Al-Saud, 1997).	Dated from 300 B.C. – 300 A.D.	Al-'Ayun, Al-Aflaj, Central province, Saudi Arabia.

Type WMB-B – Base – Wheel-made

Season 2: (1763, 1561, 1554, 1764, 1848, 1846, 2082, 2489, 1121, 1156, 1272, 1551, 1289, 1292, 1237, 1355, 1354, 1353, 1352, 1162, 1123, 1171, 2488, 1155, 1222, 1288, 1299, 1302, 1240, 1143, 1116, 1115, 1030, 1282, 1312, 1279, 1422, 1291, 1150, 1128, 1107, 1168).

Table 54 Chronological table of type WMB-B, base, wheel-made.

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1561, 1554, 1289, 1354, 1123.	No. K1297, fig 14, type 29. "Base (Bowl)". (Kennet, 2004).	Dated from 11 th to 13 th century A.D.	Ras Al-Khaimah, UAE.
2489, 1211, 1272, 1354, 1171.	No. 10, fig 22. "Base (Bowl)". (Mouton et al, 1997).	Dated from mid 2 nd century B.C. to 1 st century B.C.	Mleiha, Sharjah, UAE.
2489, 1211, 1272, 1354, 1171.	No. 2, fig 17. "Base (Bowl)".	Dated to Islamic period.	Sharjah coastal, Sharjah, UAE.
1763, 1561, 1554, 1289, 1292.	No. 17, fig 17. "Base (Bowl)". (Boucharlat et al, 1985).		
1764, 1848, 1289, 1237, 1355.	No. 24, fig 7. "Base (Bowl)". No. 27, fig 7. "Base (Bowl)". (Sasaki, 1990).	Dated to Islamic period, from 9 th to 10 th century A.D.	A'Ali site, Bahrain.
2489, 1121.	No. g, fig 6. "Base (Bowl)".	Dated to 1 st millennium B.C.	Site no. BB-4, Wadi Bahla, Oman.
1171.	No. p, fig 8. "Base (Bowl)". (Humphries, 1974).	Dated from latter half of 1 st millennium B.C to 13 th / 14 th century A.D.	
1763, 1561, 1554, 1354, 1171.	No. 67, fig 34. "Base (Bowl)". (Parr et al, 1978).	Dated from 2 nd to 3 rd century A.D (C14:115-265 A.D.).	Site no. (206-7) Zubayda, North of Saudi Arabia.
2488, 1155, 1222, 1299, 1302, 1240, 1116, 1115, 1312, 1422, 1291, 1128, 1107.	No. 19, 20, fig 79. No. 21, 22, fig 79. No. 20, 24, fig 80. "Base (Bowl)".	Dated to middle Islamic period.	Al-Ḥasā' oasis, Eastern province, Saudi Arabia.
1561, 1554, 1764, 1289, 1292, 1354, 1123.	No. 23, fig 80. "Base (Bowl)". No. 17, 18 fig 81. No. 21, 24 fig 81. "Base (Bowl)".	Dated to middle Islamic period. Dated to late Islamic I period.	
2489, 1121, 1272.	No. 21, fig 80. No. 25, fig 81. No. 27, fig 83. "Base (Bowl)". (Whitcomb, 1978).	Dated to middle Islamic period. Dated to late Islamic I period. Dated to late Islamic II period.	

Continue to Table 54

Al-Ukhud pottery number	Parallels	Chronology/ dating	Archaeological site name
1763, 1561, 1554, 1354, 1171, 1150, 1352. 1561, 1764, 1289, 1123.	No. 4, fig 58. No. 20, fig 58. No. 2, fig 38. No. 5, fig 38. No. 7, fig 38. No. 7, fig 58. No. 21, fig 58. No. 6, fig 38. No. 8, fig 38. "Base (Bowl)". (Abu-Duruk and Murad, 1985; Abu-Duruk and Murad, 1986).	Dated from 670 to 540 or 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.
1222, 1312, 1128, 1107, 1168.	No. 4, fig 38. "Base (Bowl)". (Abu-Duruk and Murad, 1986).	Dated from 670 to 540 or 410 B.C.	Qasr Al-Hamrā', Tayma, North of Saudi Arabia.
2488, 1222, 1299, 1128, 1107, 1150.	No. d. TA7258.18 + TA7265.164, fig 3.11b. "Base (Bowl)". (Hausleiter et al, 2017).	Dated to 1 st century A.D. (Nabataean/ Early Roman period onward).	Tayma, North of Saudi Arabia.
1156, 1551. 1292, 1123. 1162.	No. 24, fig 51. "Base (Bowl)". No. 23, fig 51. No. 25, fig 51. No. 16, fig 51. "Base (Bowl)". (Whalen et al, 1981).	Dated to Islamic period.	Site no. 210-315, Al-Jar port, Al-Madinah, north-west Saudi Arabia.
1846, 1354, 1123. 1289, 1354, 1171.	No. 229, fig 26. "Base (Bowl)". No. 233, fig 27. No. 234, fig 27. "Base (Bowl)". (Zarins et al, 1979).	Dated to Islamic period, 1 st millennium A.D.	Site no. 212-60, As-Sayh, Al-Aflaj, Central province, Saudi Arabia.
1155, 1288, 1143. 1764, 1848, 1846, 1237, 1123.	No. 25, fig 16. No. 16, fig 30. No. 30, fig 33. No. 26, fig 16. No. 30, fig 17. No. 55, fig 20. No. 58, fig 20. No. 40, fig 25. No. 54, fig 27. No. 55, fig 27. "Base (Bowl)". (Al-Zahrani, 2014).	Dated from 6 th century B.C. to 5 th century A.D. The dated of Thaj: Phase1: 6 th B.C – 1 st A.D. P1.1. 6 th B.C – 4 th B.C. P1.2. 3 rd B.C. – 1 st A.D. Phase2: 1 st – 5 th A.D P2.1. 1 st – 3 rd A.D. P2.2. Byzantine/ Sasanian period to Islamic period.	Thaj, Eastern province, Saudi Arabia.

Continue to Table 54

Al-Ukhduḍ pottery number	Parallels	Chronology/ dating	Archaeological site name
1156, 1551, 1155, 1282.	No. H165, fig 115, strata B. "Base (Bowl)". (Van Beek, 1969).	Dated from mid 1 st century B.C to 1 st century A.D.	Hajar Bin Ḥumeid, (HBH), Yemen.
2488, 1302, 1030, 1116, 1115.	No. 7, fig 24. "Base (Bowl)". (Al-Thenyan, 2006).	Dated from 7 th century A.D. to 16 th century A.D.	Al-Sharjah, Red sea Tihami coast ports, Jazan, South of Saudi Arabia.
2489, 1121.	No. 1, fig 5, type 1. "Base (Bowl)". (Al-Saud et al, 2011).	Dated from 300 B.C. – to 300 A.D.	Al-ʿAyun, Al-Aflaj, Central province, Saudi Arabia.
1764.	No. 84, fig 67. "Base (Bowl)". (Al-Zahrani, 2007).	2 nd century B.C. to 1 st century A.D. Phase 2 dating: (5 th B.C. – 1 st A.D.). Phase 1 dating: First half of the 1 st millennium B.C. (11 th B.C. – 4 th B.C.).	Tel Al-Katheeb, Al-Ula, Al-Madinah, north-west Saudi Arabia.
1561, 1554, 1846, 1289.	No. 249, fig XXVIII. "Base (Bowl)".	Al-Ṭuwayr site dated from 1 st B.C. to 2 nd century A.D.	Al-Ṭuwayr site.
1155, 1222, 1299, 1143, 1115, 1312, 1279, 1168.	No. 262, 263, 264, 279, 280, fig XXVIII. "Base (Bowl)". (Al-Muaikel, 1994).	Dūmat Al-Jandal site dated from 6 th /or 5 th B.C. to 2nd century A.D.	Dūmat Al-Jandal, Al-Jawf, North of Saudi Arabia.
1155, 1222, 1299, 1168.	No. 17, 18, 19, fig 3. "Base (Bowl)". (Rougeulle, 2005).	Dated between 9 th and 10 th century A.D. (980-1150 A.D.).	Ra's Sharma, East of Al-Shihr, Hadramawt, Yemen.
1764, 1848, 1289, 1237, 1354, 1123.	No. 66, fig 34. "Base (Bowl)". (Parr et al, 1978).	Dated from 2 nd to 3 rd century A.D (C14:115-265 A.D.).	Site no. (206-7) Zubayda, North of Saudi Arabia.
1763, 1561, 1554. 1764. 1848. 1846, 2489, 1121. 2488.	No. 5, fig LIX, type 1. No. 8, fig LXI, type 2. No. 21, fig LX, type 3. No. 17, 24, fig LX, type 3. No. 35, 36, 37, fig LXI, type 6. "Base (Bowl)". (Gazdar, 1982).	Dated to latter part of 2 nd millennium B.C. and early 1 st millennium A.D.	Zubaidah, Al-Qasim province, Central area, Saudi Arabia.

Continue to Table 54

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1764, 1289, 1355, 1354, 1171.	<p>No. 3, 4, 5, 6, 8, fig 2.19, stratum 18. "Base (Bowl)".</p> <p>No. 16, fig 2.22, stratum 18b. "Base (Bowl)".</p> <p>No. 18, 19, fig 3.19. "Base (Bowl)".</p> <p>No. 4, 5, fig 3.23. "Base (Bowl)".</p> <p>No. 23, 24, 28, 29, 30, 31, fig 3.28. "Base (Bowl)".</p> <p>No. 5, 6, 7, fig 3.42. "Base (Bowl)".</p>	<p>Dated from mid 11th to 10th century B.C.</p> <p>Dated to early Roman period (37 B.C – 73 A.D).</p> <p>Dated to early Roman period (73-135 A.D).</p> <p>Dated to late Roman period (135-235 A.D).</p> <p>Dated late Roman period (235-324 A.D.).</p>	Tell Hesban (Heshbon or Hisban), Amman, Jordan.
1162.	<p>No. 8, fig 3.42.</p> <p>No. 42, fig 3.19.</p> <p>No. 26, fig 3.41.</p>	<p>Dated late Roman period (235-324 A.D.).</p>	
1353, 1272.	<p>No. 25, fig 3.41. "Base (Bowl)".</p>	<p>Dated late Roman period (235-324 A.D.).</p>	
1155, 1222, 1288, 1312, 1168.	<p>No. 16, 17, 20, 21, fig 3.19. "Base (Bowl)".</p> <p>No. 18, fig 3.28. "Base (Bowl)".</p> <p>No. 28, 29, 30, 31, 32, 33, fig 3.41. "Base (Bowl)".</p>	<p>Dated to early Roman period (37 B.C. – 73 A.D.).</p> <p>Dated to late Roman period (135-235 A.D.).</p> <p>Dated to late Roman period (235-324 A.D.).</p>	
1299, 1302.	<p>No. 16, 17, 18, 20, 21, fig 3.28. "Base (Bowl)". (Sauer and Herr, 2012).</p>	<p>Dated to late Roman period (135-235 A.D.).</p>	

Continue to Table 54

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
2082. 1292. 1354. 1764, 1848, 1289. 1762, 1561, 1554, 2082. 2488, 1302, 1116, 1115, 1279, 1422.	No. 15, fig 59, type 6:1. No. 32, fig 63, type 6:4. No. 48, fig 78, type 7. No. 5, fig 81, type 8:1. No. 25, fig 95, type 10. No. 26, fig 113, type 12. No. 28, fig 114, type 12. No. 15, fig 107, type 11. No. 18, fig 121, type 13. No. 6, fig 136, type 14. "Base (Bowl)". No. 27, fig 114, type 12. No. 21, fig 121, type 13. "Base (Bowl)". No. 20, fig 121, type 13. "Base (Bowl)". (Al- Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.

Type WMB-C – Base – Wheel-made

Season 2: (3310, 1094, 1168, 1478, 1358, 1357, 1005).

Season 3: (1642, 3615, 1279, 2272, 1514, 1520, 1503, 1370, 1376, 1537, 1384, 1386, 1401, 1433, 1372).

Table 55 Chronological table of type WMB-C, base, wheel-made.

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
3310, 1094, 1005. 1168, 1358. 1478. 1168, 1357.	No. 1, fig 12, type 4. No. 20, fig 20, type 4. No. 2, fig 36, type 1. No. 1, fig 57, type 4. No. 14, fig 18, type 4. No. 8, fig 24, type 5. No. 2, fig 27, type 7. No. 4, fig 46, type 3/1. No. 9, fig 43, type 3. "Base (Bowl)". (Al-Saud, 1997).	Dated from 300 B.C. to 300 A.D.	Al-'Ayun, Al-Aflaj, north-east Riyadh, Central province, Saudi Arabia.
1168, 1357. 3310, 1168, 1357, 1005. 3310, 1168, 1094, 1478, 1358.	No. 17, fig 5. No. 19, fig 6. No. 17, 19, fig 11. No. 20, fig 12. No. 14, 15, 16, fig 19. No. 21, 24, fig 21. "Base (Bowl)". (Al-Thenyan, 2006).	Dated from 12 th to 14 th century A.D. Dated from 12 th to 15 th century A.D. Dated from 7 th to 13 th century A.D.	Al-Sirrayn site. 'Ulyab (Hamdanah) site. Aththar site, Red sea, Tihami coastal ports, Jazan, South of Saudi Arabia.
3310, 1094, 1168, 1478, 1358, 1357, 1005.	No. 253, 255, 256, 257, fig XXVII. No. 258, fig XXVIII. No. 271, 277, fig XXVIII. No. 266, 269, fig XXVIII. No. 283, fig XXVIII. No. 2909, 292, fig XXIX. "Base (Bowl)". (Al-Muaikel, 1994).	Al-Ṭuwayr site dated from 1 st B.C. to 2 nd century A.D. Dūmat Al-Jandal site dated from 6 th /or 5 th B.C. to 2 nd century A.D.	Al-Ṭuwayr site. Dūmat Al-Jandal, Al-Jawf, North of Saudi Arabia.
3310, 1168, 1358, 1357.	No. 15. 28. D6, fig 15. No. 60. 60, D6, fig 60. "Base (Bowl)". (Al-Shehry, 2014).	Dated to the half of 1 st millennium B.C (6 th century B.C and 1 st century B.C.).	Daddan, Al-Ula, Al-Madinah, north-western Saudi Arabia.
3310, 1168, 1478, 1358, 1005.	No. 23, fig 16. No. 37, fig 18. No. 25, fig 23. No. 20, fig 31. "Base (Bowl)". (Al-Zahrani, 2014).	Dated from 6 th century B.C. to 5 th century A.D.	Thaj, Eastern province, Saudi Arabia.

Continue to Table 55

Al-Ukhdud pottery number	Parallels	Chronology/ dating	Archaeological site name
3310, 1094.	No. 15, fig 10. "Base (Bowl)". (Abu-Duruk et al, 2000).	Dated to the 2 nd century B.C.	Al-Bujidi site, Tayma, North of Saudi Arabia.
1168, 1478.	No. 202 fig 15. "Base (Bowl)". (Potts et al, 1978).	Dated to Hellenistic period.	Site no 208-147. South of the Dhahran Int. Airport, East Saudi Arabia.
3310, 1094, 1168, 1005.	No. 14, fig 78. No. 18, fig 78. No. 21, fig 78. No. 22, fig 79. No. 26, 28, 29, 31, 32, fig 82. "Base (Bowl)". (Whitcomb, 1978).	Dated to middle Islamic period. Dated to late Islamic I period.	Al-Ḥasā' oasis, Eastern province, Saudi Arabia.
3310, 1094, 1168, 1478, 1358, 1357, 1005.	No. e, f, h, l, fig 5. No. m, n, j, x, fig 5. No. z, ff, jj, fig 5. "Base (Bowl)". (Whitcomb, 1975).	Dated to early Islamic period (630-1055 A.D.).	Wadi Beni Kharus 1, Oman.
3310, 1094.	No. 8, fig 7. "Base (Bowl)". (Rougeulle, 2005).	Dated between 9 th and 10 th century A.D. (980-1150 A.D.).	Ra's Sharma, East of Al-Shihr, Hadramawt, Yemen.
3310, 1094, 1168, 1358.	No. 11, fig 7. "Base (Bowl)". No. 21, fig 7. "Base (Bowl)". (Rougeulle, 1999).	Dated to early Islamic period: 9 th / 10 th century A.D.	Šarmā, Eastern Yemen, Yemen.
1358, 1357.	No. 3, fig 196, type 24. "Base (Bowl)". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.
3310, 1094, 1168.	No. F15, fig 20. "Base (Bowl)". No. F9, fig 20. "Base (Bowl)". (El-Hassan and Khabir, in press).	Dated from 3 rd century B.C. to the 3 rd century A.D.	Qaryat Al-Fāw, Wadi Ad-Dawasir, south-west Saudi Arabia.
3310, 1094, 1168, 1005. 1478. 1358, 1357.	No. 35, fig LXI, type 6b. No. 45, fig LXII, type 7b. No. 46, fig LXII, type 7b. No. 51, fig LXII, type 8b. No. 58, fig LXIII, type 9b. No. 59, fig LXIII, type 9b. "Base (Bowl)". (Gazdar, 1982).	Latter part of 2 nd millennium B.C. and early 1 st millennium A.D.	Zubaidah, Al-Qasim province, Central area, Saudi Arabia.

Continue to Table 55

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
1358, 1357. 1478.	No. 170, fig 24. No. 393, fig 44. No. 436, fig 47. No. 394a, fig, 44. "Base (Bowl)". (Al-Amer, 1996).	Dated from 3 rd century B.C. to 3 rd century A.D. Phase 1: 3 rd to 1 st century B.C. Phase 2: 1 st to 3 rd century A.D.	Al-Daffi site, Al-Jubail, Eastern province, Saudi Arabia.
1168, 1358, 1357.	No. h, fig 210. No. k, fig 210. No. m, fig 210. "Base (Bowl)". (Al-Jahwari, 2013).	Dated to Umm An-Nar period (2500-2000 B.C.).	Wadi Andam, Oman.
3310, 1168, 1005. 1358, 1357.	No. H247, fig54, strata C2. "Base 6 (Bowl)". No. H832, fig54, strata F2. "Base 4 (Bowl)". No. H764, fig54, strata E. "Base 4 (Bowl)". No. H548, fig54, strata D. "Base 6 (Bowl)". No. H483, fig83, strata D. "Base 6 (Bowl)". (Ven Beek, 1969).	Dated to late 2 nd century B.C. to mid 1 st century B.C. Dated from late 5 th to early 3 rd century B.C. Dated to 3 rd century B.C.	Hajar Bin Humeid, (HBH), Yemen.

Type WMB-D – Base – Wheel-made

Season 2: (1638, 1392, 2193, 1141, 1845, 2194).

Season 3: (4740, 4741, 4764, 1396).

Table 56 Chronological table of type D, base, wheel-made.

Al-Ukhudud pottery number	Parallels	Chronology/ dating	Archaeological site name
2193, 1141, 1845. 1638. 1392.	No. 36, fig 10. No. 523, fig 55. No. 647, fig 62. No. 788, 794, fig 78. No. 853, fig 82. No. 157, fig 22. No. 787, fig 78. No. 1223, fig 121. No. 234, fig 27. No. 483, fig 50. No. 601, fig 59. No. 648, fig 62. No. 877, fig 84. No. 900, fig 89. No. 960, fig 92. No. 1117, fig 112. No. 1268, fig 125. "Base (Bowl)". (Al-Amer, 1996).	Dated from 3 rd century B.C. to 3 rd century A.D. Phase 1: 3 rd to 1 st century B.C. Phase 2: 1 st to 3 rd century A.D.	Al-Daffi site, Al-Jubail, Eastern province, Saudi Arabia.
1638, 1392.	No. k. TA14908.1, fig 13. "Base (Bowl)". No. b. TA11352.1, fig14. "Base (Bowl)". (Tourtet et al, in press).	Dated from 6 th to 2 nd /1 st century B.C. Date to 2 nd century B.C.	Tayma, North of Saudi Arabia.
2193, 2194. 1638.	No. 56, fig LXIII, type 9a. No. 219, fig XXIX, type 50a. No. 22, fig XXX, type 50b. No. 221, fig XXX, type 50c. No. 53, fig LXII, type 9a. No. 55, fig LXII, type 9a. No. 65, fig LXIV, type 13. "Base (Jar)". (Gazdar, 1982).	Latter part of 2 nd millennium B.C. and early 1 st millennium A.D.	Zubaidah, Al-Qasim province, Central area, Saudi Arabia.

Continue to Table 56

Al-Ukhduḍ pottery number	Parallels	Chronology/ dating	Archaeological site name
1638, 1392, 2193.	No. 18, 19, fig 199, type 25. No. 20, 21, 23, fig 199, type 25. "Base (Bowl)". (Al-Ghazzi, 1990).	Dated from 500 B.C. to 600 A.D.	Al-Kharj, Central province, Saudi Arabia.
1638, 1392, 2193.	No. 288, fig XXIX. No. 291, fig XXIX. No. 293, fig XXIX. "Base (Bowl)". (Al-Muaikel, 1994).	Dûmat Al-Jandal site dated from 6 th /or 5 th B.C. to 2 nd century A.D.	Dûmat Al-Jandal, Al-Jawf, North of Saudi Arabia.
1141, 1845. 2193,	No. 1, fig 27, type 7. No. 8, fig 43, type 3. No. 2, fig 45, type 2. No. 3, fig 46, type 3/1. No. 3, fig 45, type 3. No. 7, fig 47, type 3/1. "Base (Bowl)". (Al-Saud, 1997).	Dated from 300 B.C. to 300 A.D.	Al-'Ayun, Al-Aflaj, north-east Riyadh, Central province, Saudi Arabia.
2193, 2194.	No. 8, fig 24. No. 11, fig 24. No. 12, fig 24. "Base (Bowl)". (De Maigret, 1988).	Dated from around 11 th century B.C. to 5 th century B.C.	Wadi Yalā, at Ḥawlān Aṭ-Ṭiyāl, Yemen.
2193, 2194.	No. H1505, fig 39, strata J. "Base 4 (Bowl)". No. H1133, fig 39, strata G. "Base 4 (Bowl)". No. H498, fig 39, strata D. "Base 5 (Bowl)". No. H84, fig 40, strata A. "Base 7 (Bowl)". No. H548, fig 54, strata D. "Base 4 (Bowl)". No. H1392, fig 69, strata H. "Base 3 (Bowl)". No. H170, fig 69, strata C2. "Base 5 (Bowl)". No. H173, fig 82, strata C. "Base 1 (Bowl)". (Van Beek, 1969).	Dated from 6 th to 5 th century B.C. Dated to latter 5 th to early 3 rd century B.C. Dated to 3 rd century B.C. Dated from 2 nd to 4 th or 5 th century A.D. Dated to 3 rd century B.C. Dated from 6 th to 5 th century B.C. Dated from late 2 nd B.C. to mid 1 st B.C.	Hajar Bin Ḥumeid, (HBH), Yemen.

Continue to Table 56

Al-Ukhduḍ pottery number	Parallels	Chronology/ dating	Archaeological site name
1392.	No. 19, fig 19. "Base (Bowl)". (Zarins et al, 1979).	Dated to Hellenistic period from 200 B.C. to 600 A.D.	Site no. 211-22, Khamaseen, Wadi Ad-Dwasir, Central province, Saudi Arabia.
1845.	No. 10, fig 83. "Base (Bowl)". (Parr and Ghazder, 1980).	Dated from latter part of 2 nd millennium B.C to early 1 st millennium A.D.	Zubaidah, Al-Qasim province, Central area, Saudi Arabia.
2193, 2194.	No. 6, 7, fig 7. "Base (Bowl)". (Rougeulle, 1999).	Dated to early Islamic period.	Šarmā, Ḥaḍramawt coastal, Yemen.
1638, 1392.	No. 4, 5, 6, fig 74. "Base (Bowl)". No. 7, 8, fig 74. "Base (Bowl)". (Zarins and Al-Zahrani, 1985).	Dated to early Islamic period from 7th century to 13th century A.D.	Athar, Jazan, South of Saudi Arabia.
2193, 2194.	No. F12. 13, fig 40. No. F13. 515, fig 45. No. F9. 134, fig 45. "Base (Jar)". (El-Hassan and Khabir, in press).	Dated from 3 rd century B.C. to the 3 rd century A.D.	Qaryat Al-Fāw, Wadi Ad-Dawasir, south-west central province, Saudi Arabia.
2193, 1141.	No. 80, fig 35. "Base (Bowl)". No. 114, fig 36. "Base (Bowl)". (Parr et al, 1978).	Dated from 2 nd to 3 rd century A.D. (C14: 115-265 A.D.)	Site no. 206-7, Zubayda, North of Saudi Arabia.

Appendix 9 Geological Maps Key Element Units

Table 1 Description of Najran geological map units within 9km based on Arnold's model.

Geological elements (units).	Description of Najran geological map elements.
Qst	Terrace deposit: marly silt containing sand and gravel, sedimentary. "A terrace commonly occurs along the margin and above the level of a body of water, marking a former water level" (Bates and Jackson, 1980: 644).
QM	Alluvium: undivided-alluvium, colluvium, terrace gravel, gravel-plain, and minor eolian sand. Alluvium is a loose, unconsolidated soil or sediment that has been eroded. "Sand, silt, and especially mud brought down by rivers in flood and deposited on the temporarily submerged land, the flood-plain or alluvial plain" (Challinor, 1961: 4).
SG	Quartzofeldspathic schist and paragneiss includes minor granetiferous gneiss and schist, amphibolite, comfortable tonalite, and white marble. sedimentary rock.
GSA	Granite style, sodic amphibole granite chiefly alkali feldspar granite with alkali granite facies. Volcanic rock.
QA	Alluvium: gravel and sand in major wadi flood plains. See QM. Sedimentary rock.
TG	Aashiba gneiss complex. Biotite tonalite to granodiorite gneiss containing less common microcline prophyoblasts and local migmatite. Volcanic rock.
OCW	Wajid sandstone. Quartz arenite (Quartzitet) is a sandstone. Sedimentary rock.
GBA	Biotite-amphibole monzogranite contains ferrohastingsite; locally gneissis or schistone. "A widely distributed and important rock-formaing mineral of the mica group" (Bates and Jackson, 1980: 67).
DU	Undivided diorite, granodiorite, tonalite, amphibolite, and greenschist irregular large xenoliths in granite south of Najran. Volcanic rock.
HVA	Meta-andesite and metabasalt flow rocks and flow breccia.
MGC	Coarse-grained monzogranite. Granite-syenite suite. Volcanic rock.
QS	Eolian sand deposit. Sedimentary rock.

Table 2 Description of Yemen geological map units within 9km based on Arnold’s model.

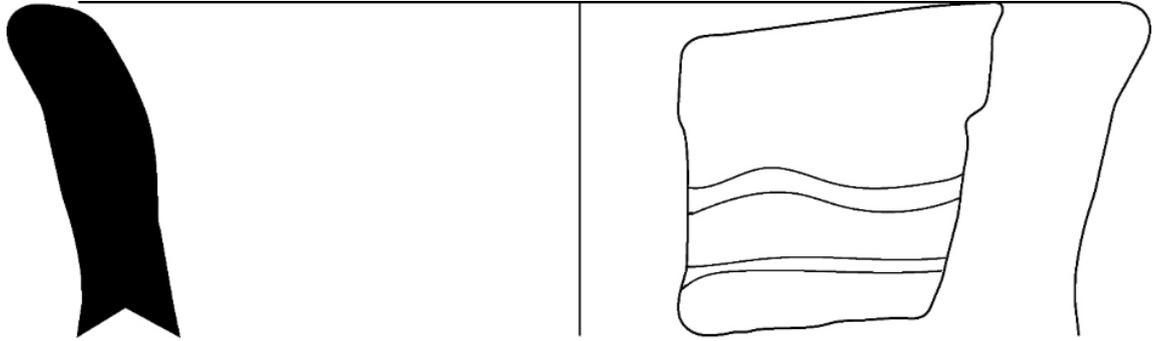
Geological elements (units).	Description of Yemen geological map elements.
D	Diorite. “A coarse-grained intermediate igneous rock composed essentially of plagioclase (oligoclase or andesine) in excess of alkali felspar, and mafic mineral, especially hornblende” (Challinor, 1961: 61). Volcanic rock
QU	River-terrace deposits. Sedimentary rock.
GP	Peralkaline granite. Volcanic rock.
OW	Wajid sandstone. Quartz arenite (Quartzitet) is a sandstone. Sedimentary rock.

Appendix 10 Illustrations

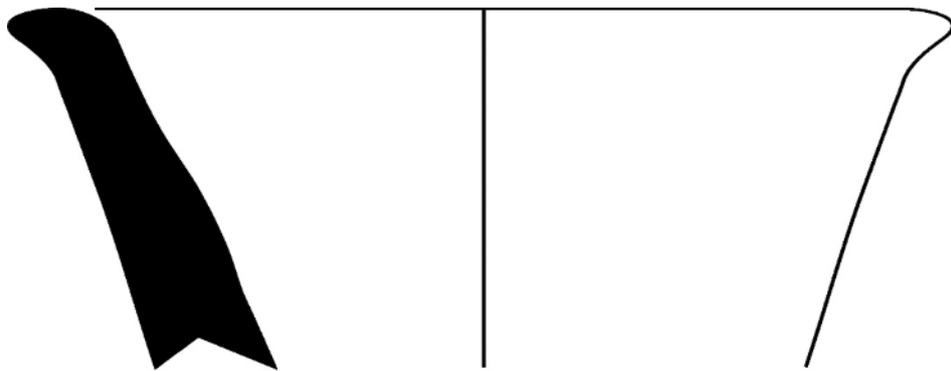
Rim - Hand-made

Plate 1

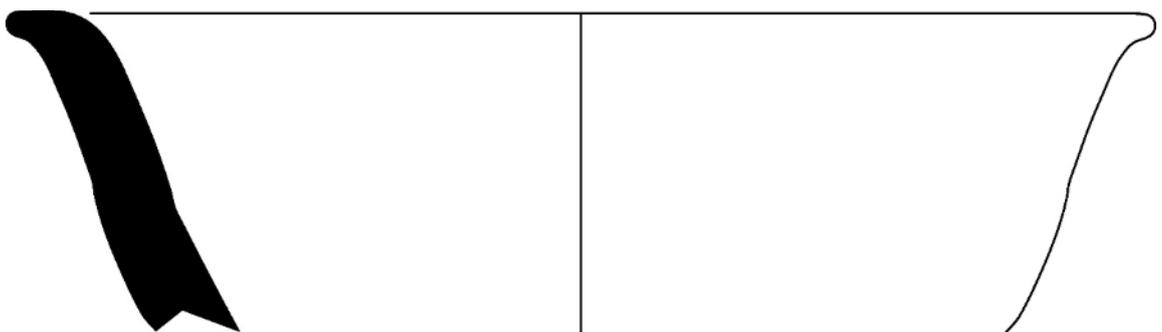
Type HM-A: Rim - Hand-made



S2: 1357



S2: 1338

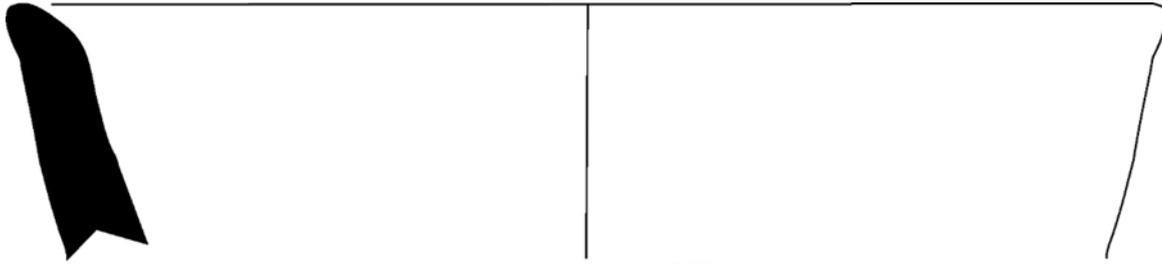


S2: 1335

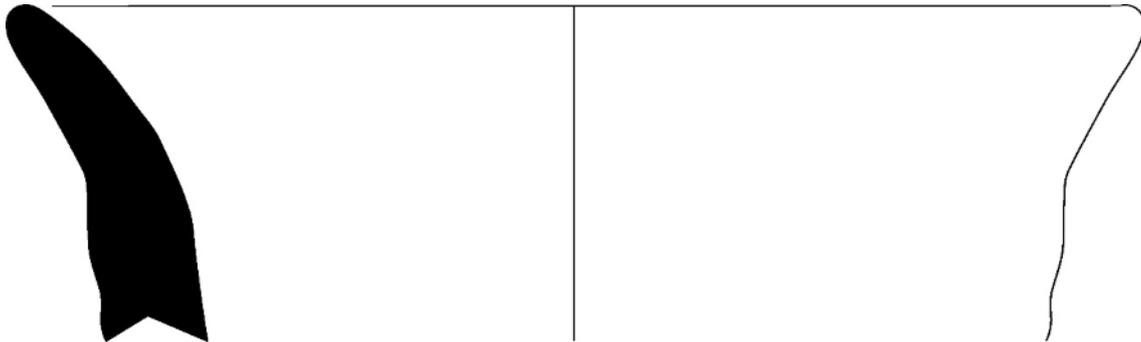


Type HM-A: Rim – Hand-made

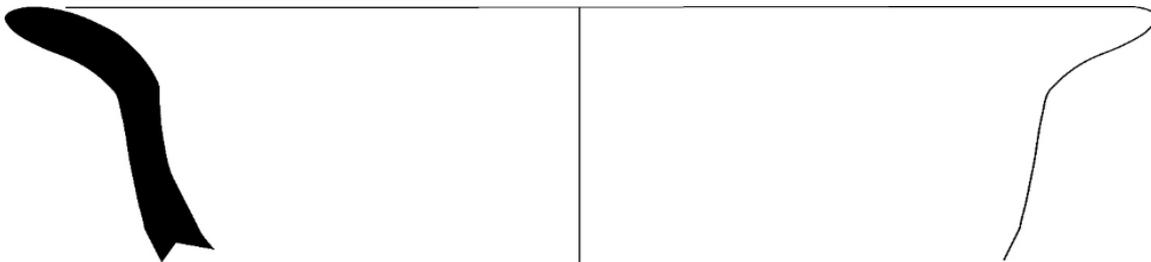
Plate 2



S2: 2452



S2: 2156

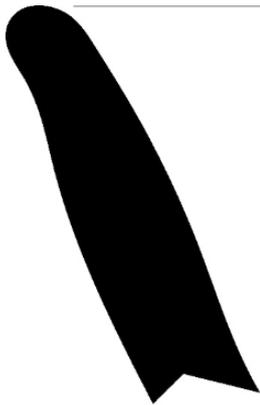


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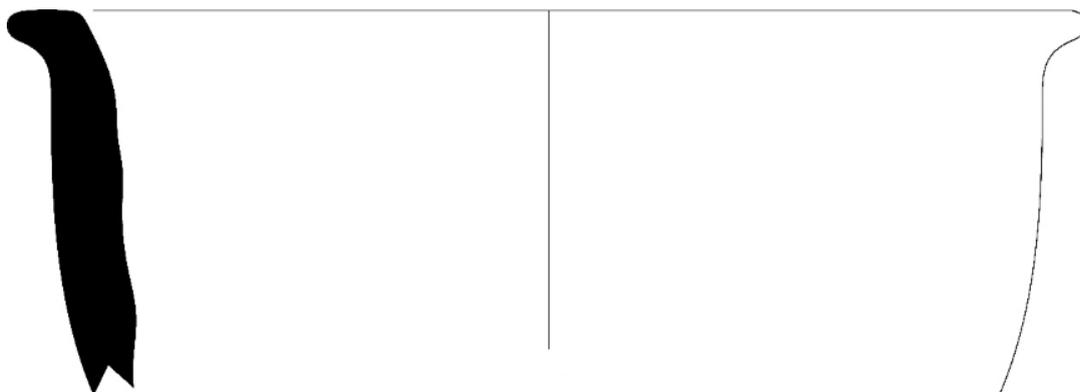


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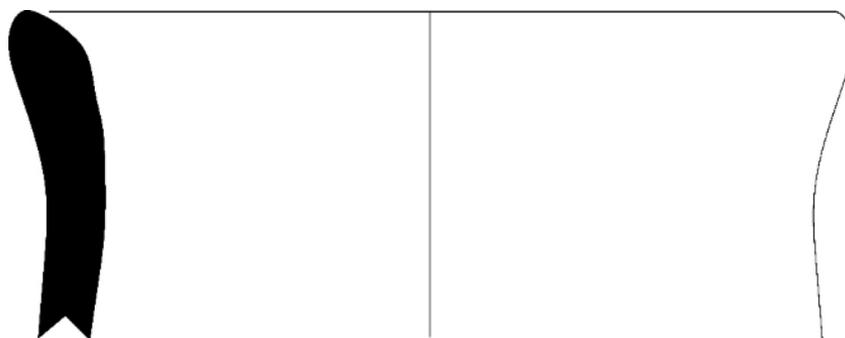


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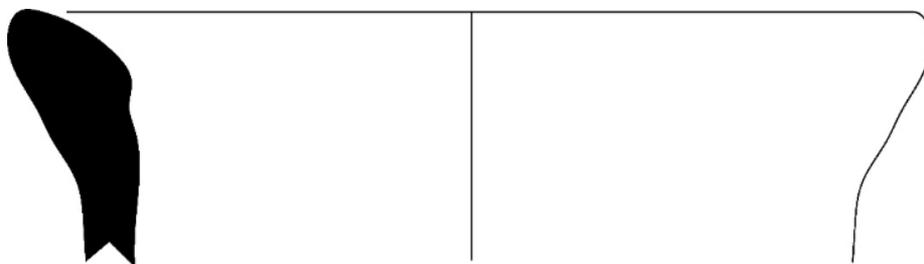




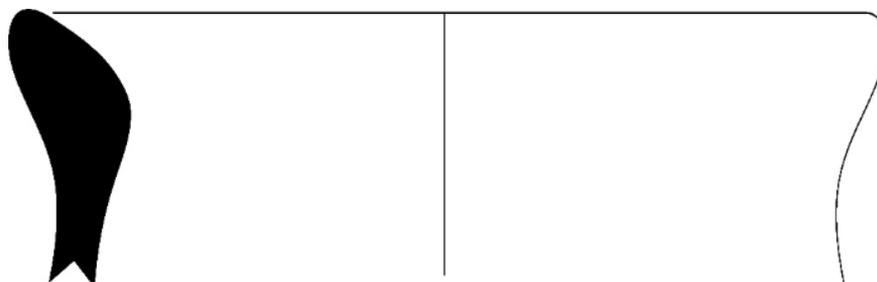
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S3: 1423

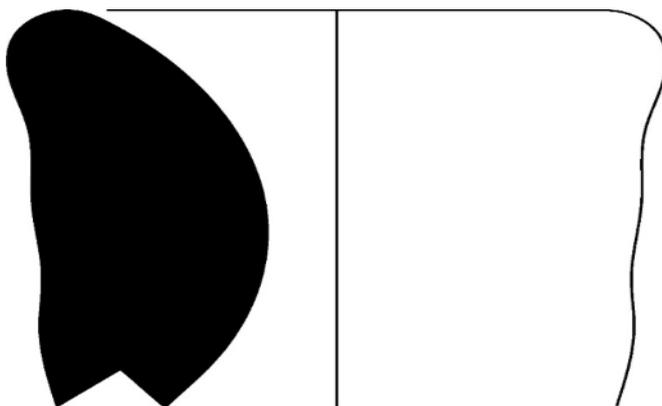


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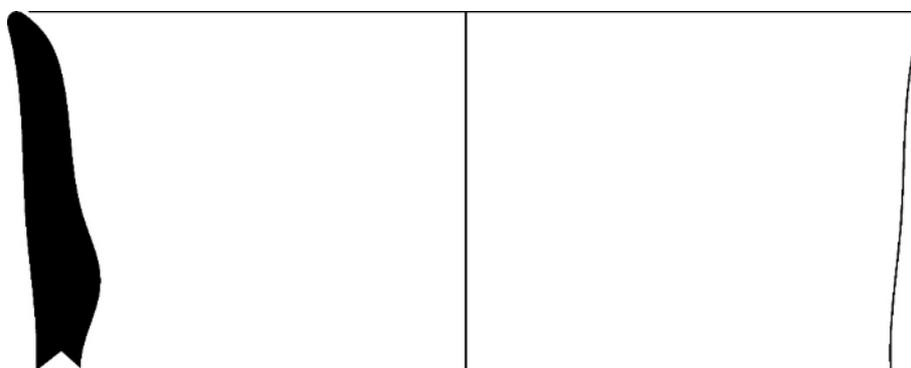


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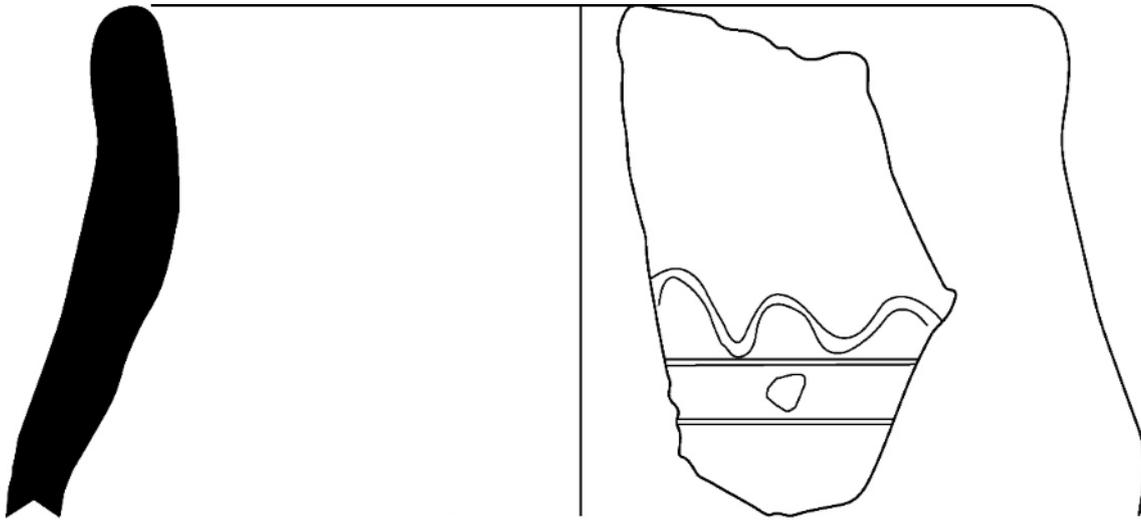


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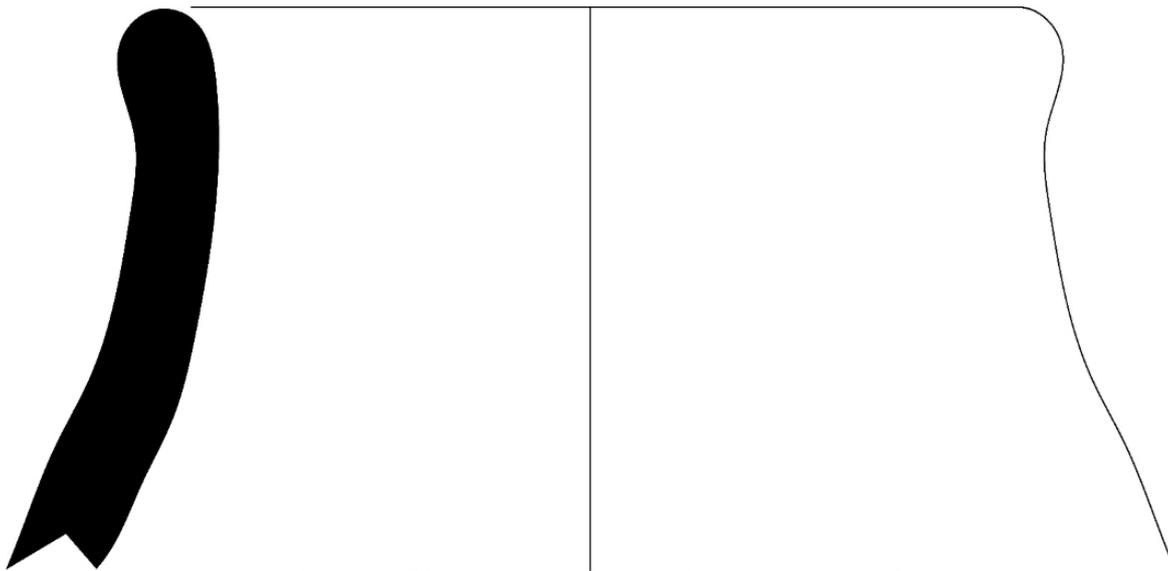


S3: 2307



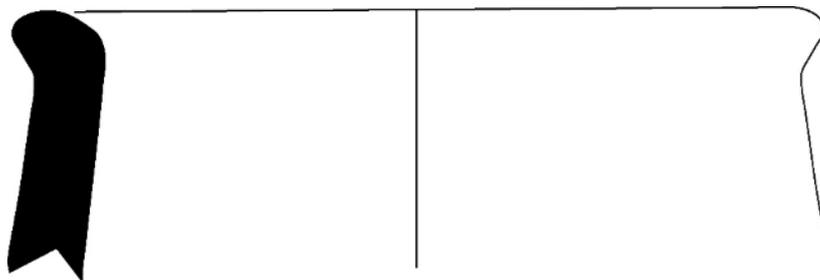


S2: 1167

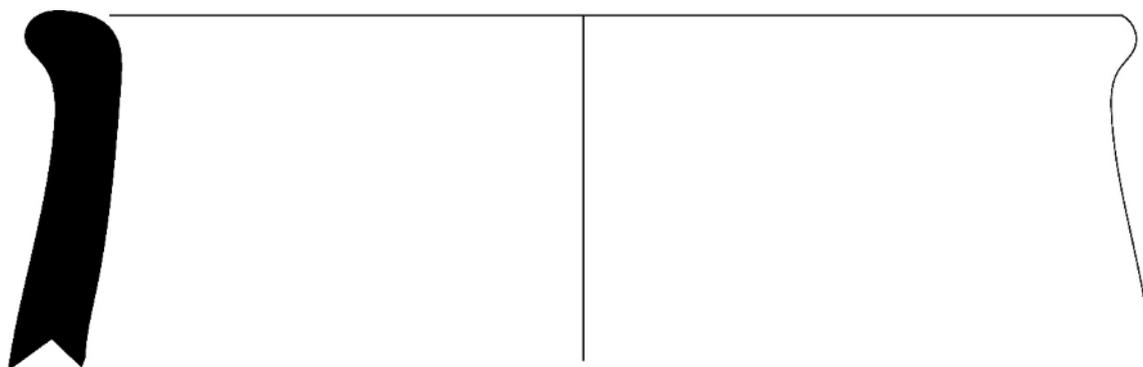


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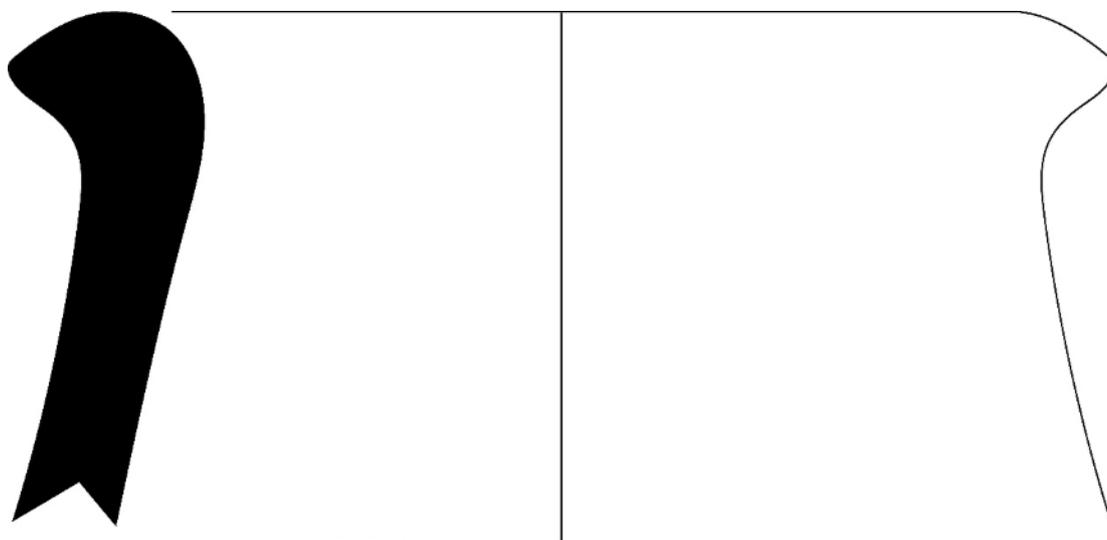




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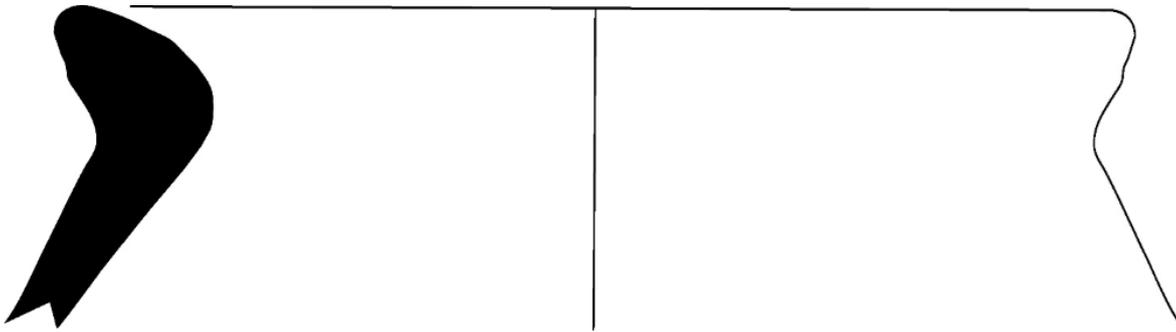


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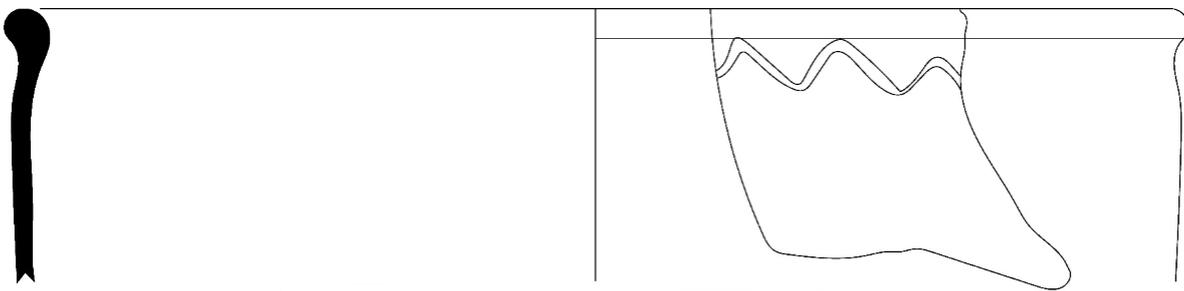


S2: 1306



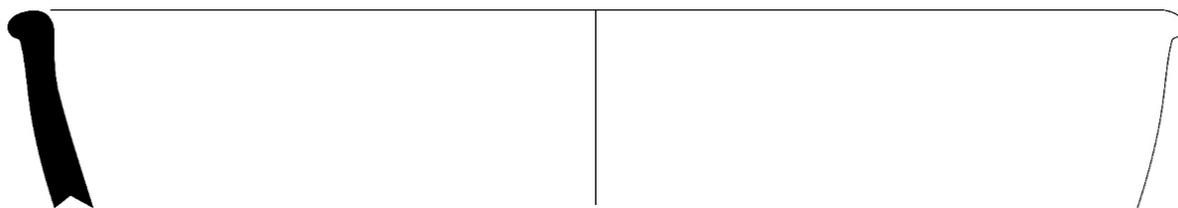


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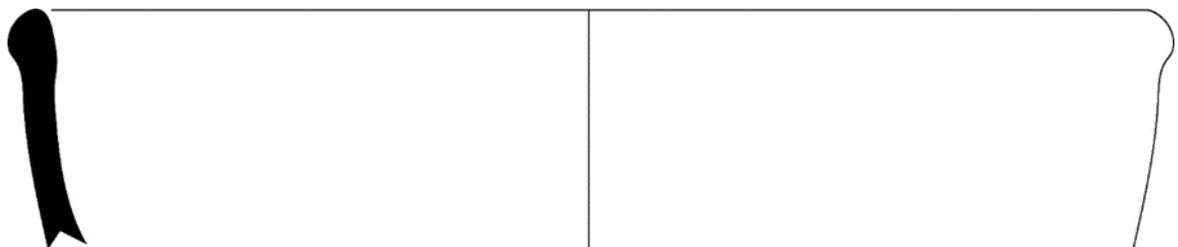


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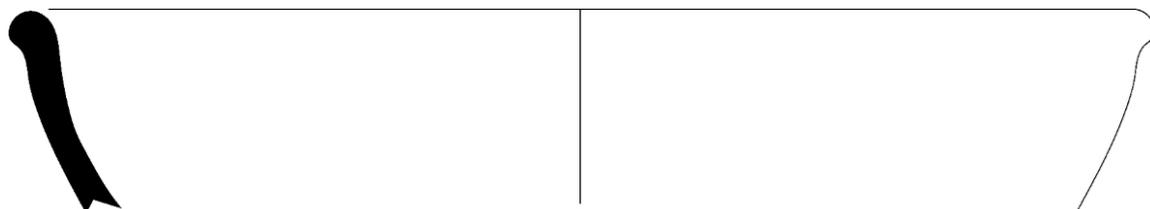




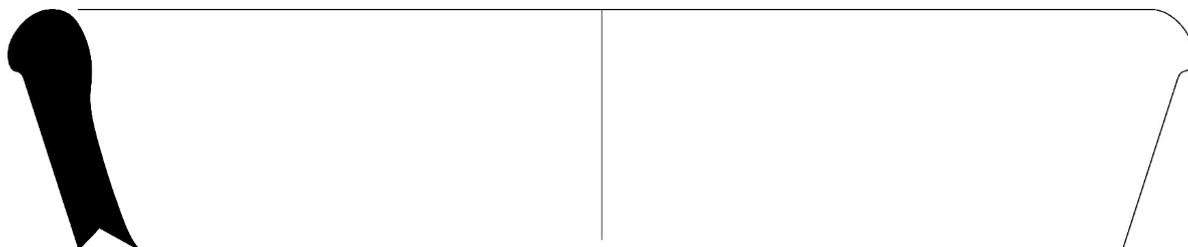
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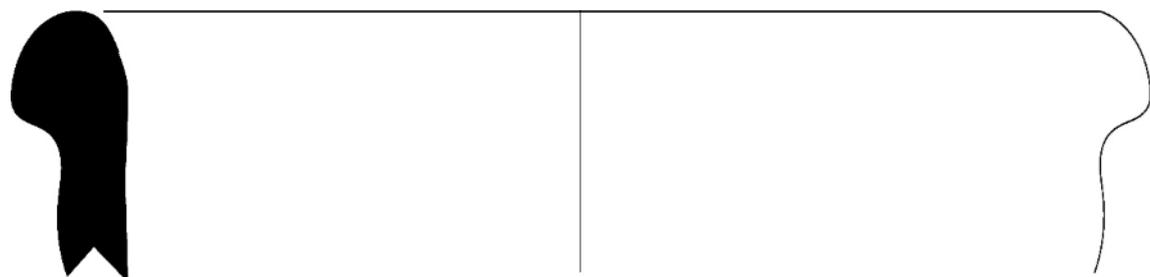
S3: 1465



S3: 1517

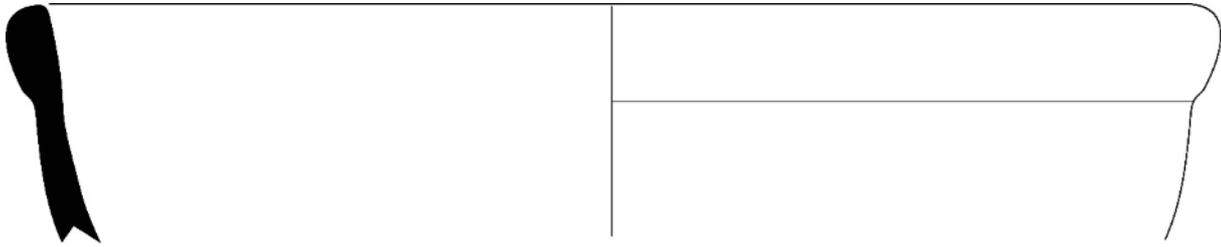


S3: 1458

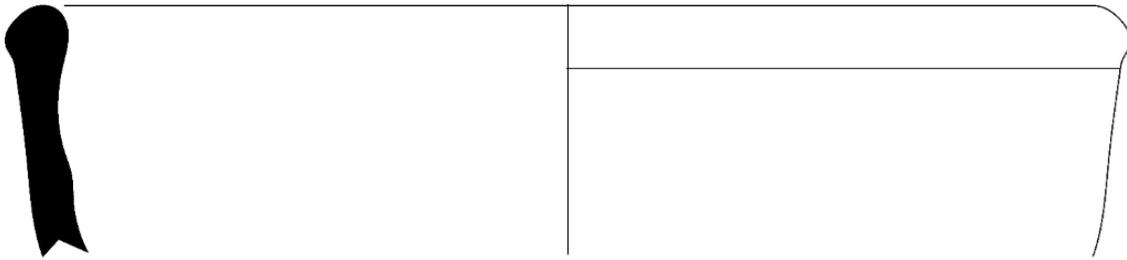


S3: 2306

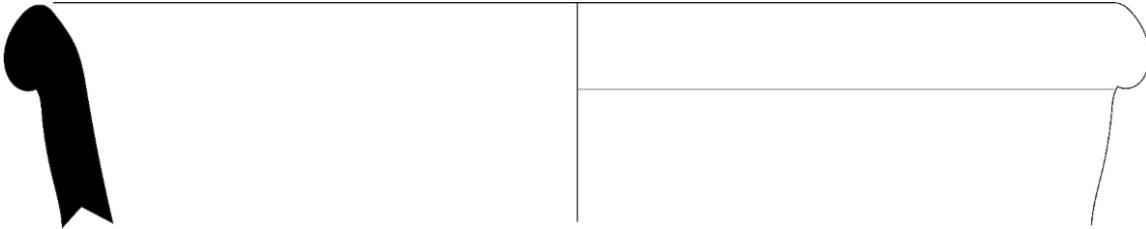




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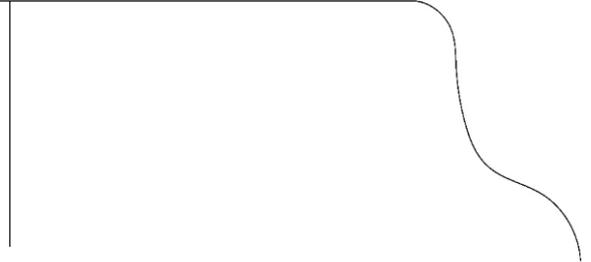


S3: 1432

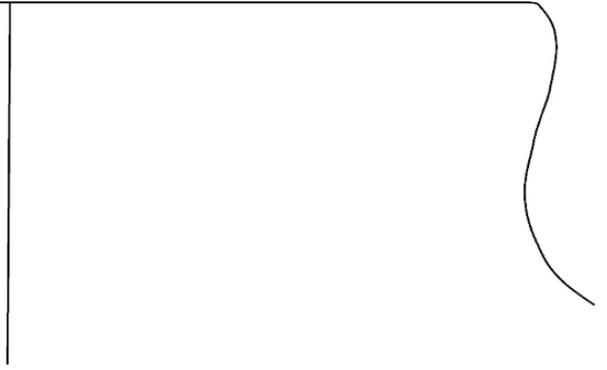
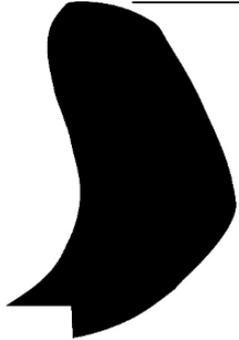


S3: 1443





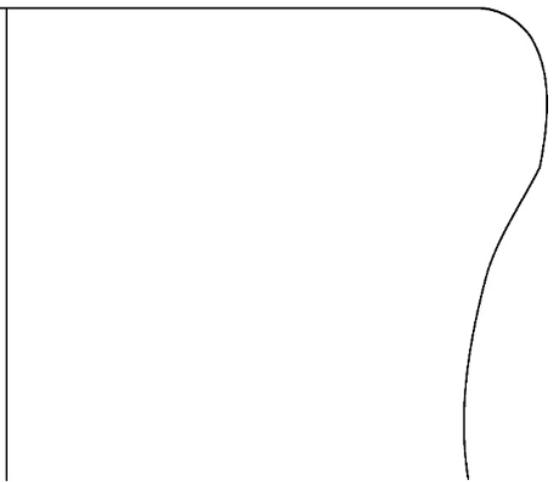
S2: 1310



S2: 2448

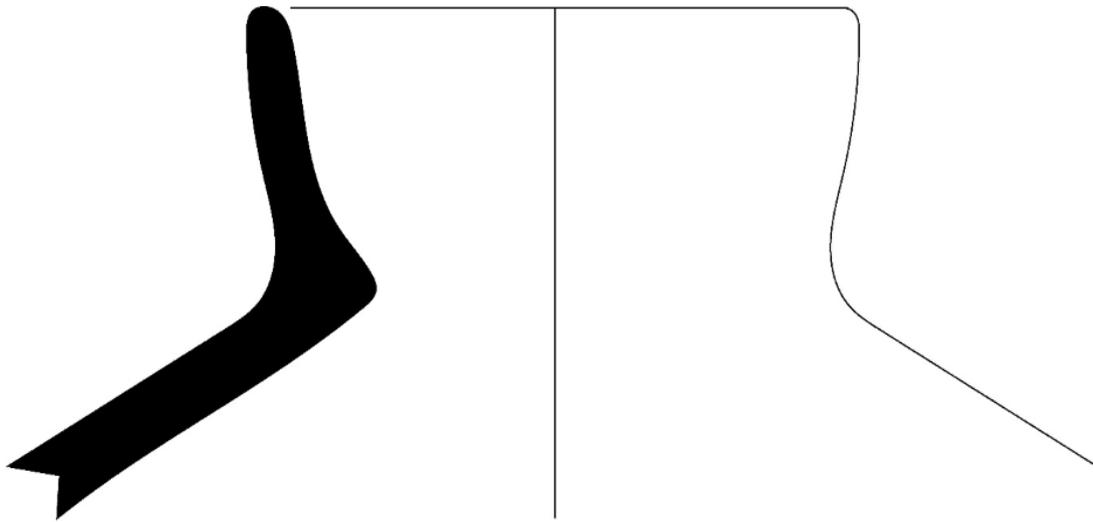


S2: 1039

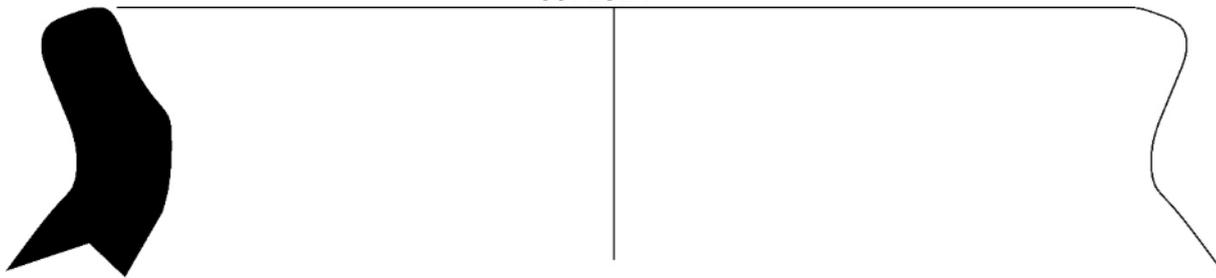


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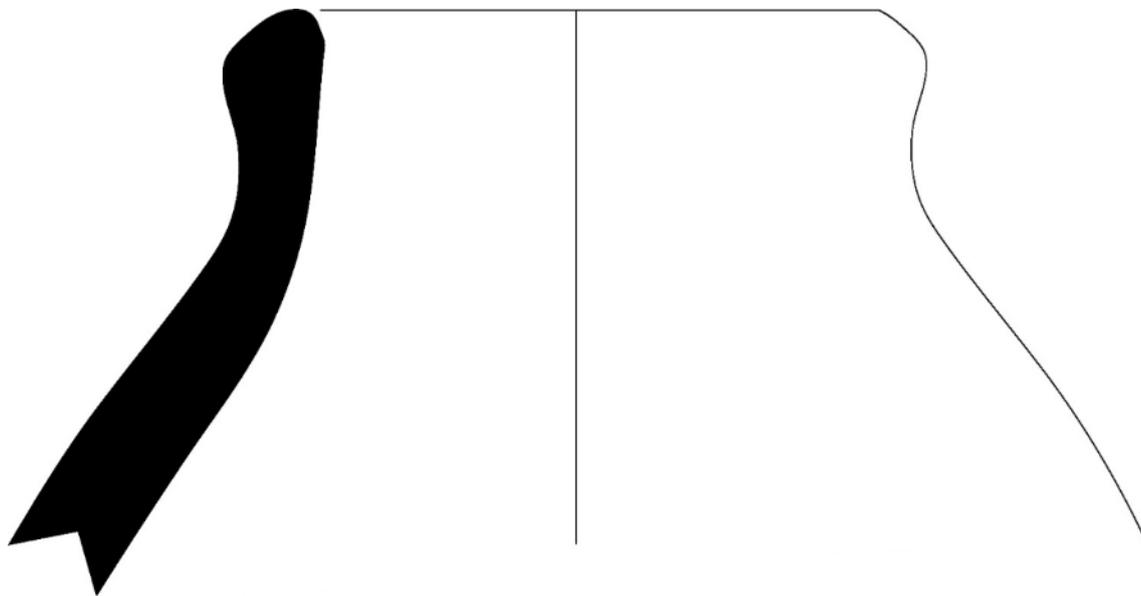




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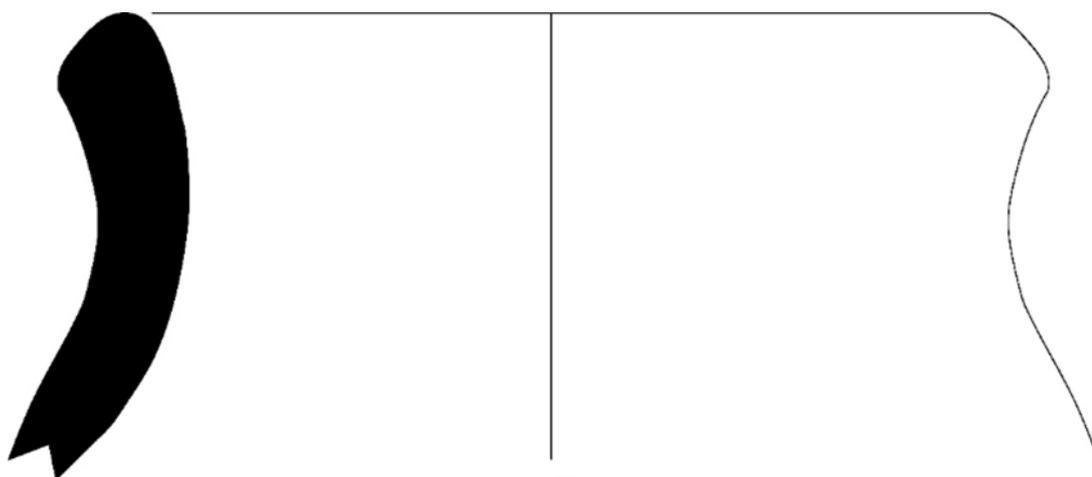


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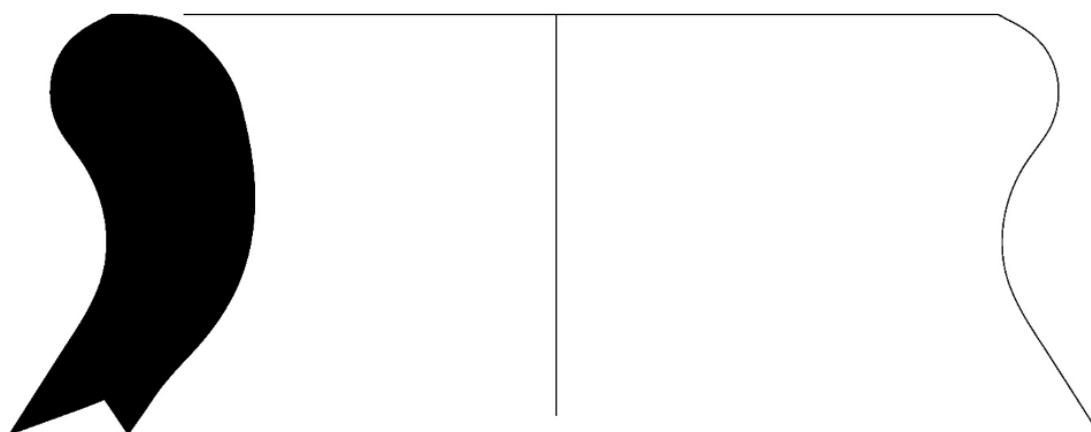


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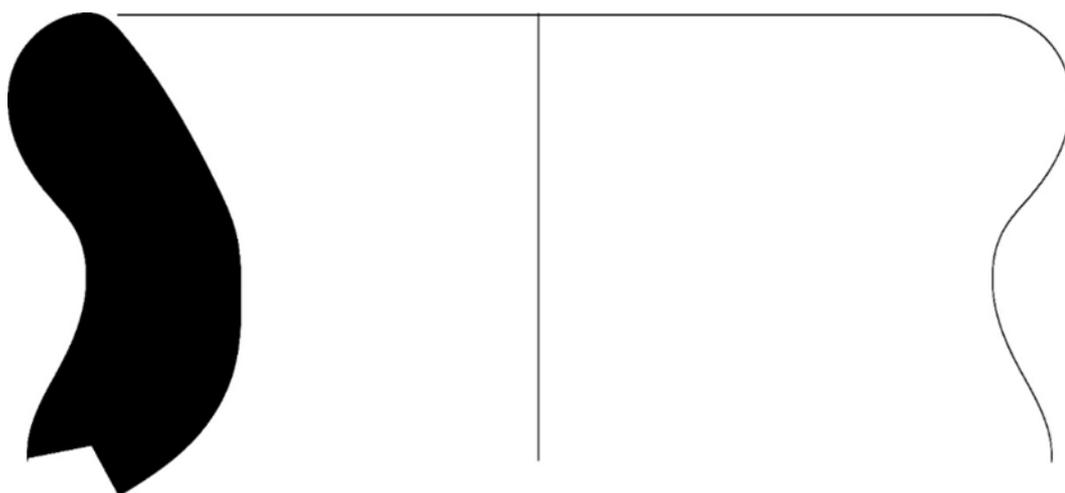




S3: 1392

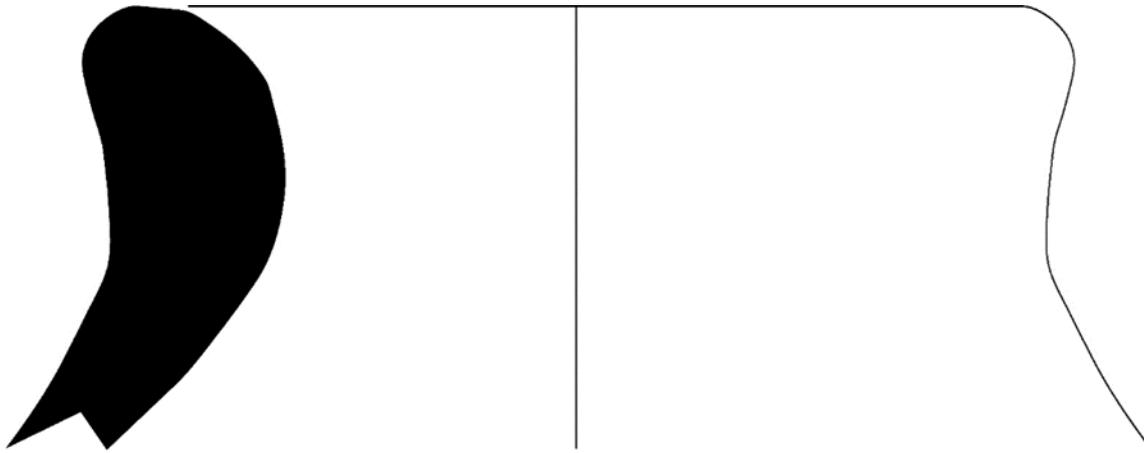


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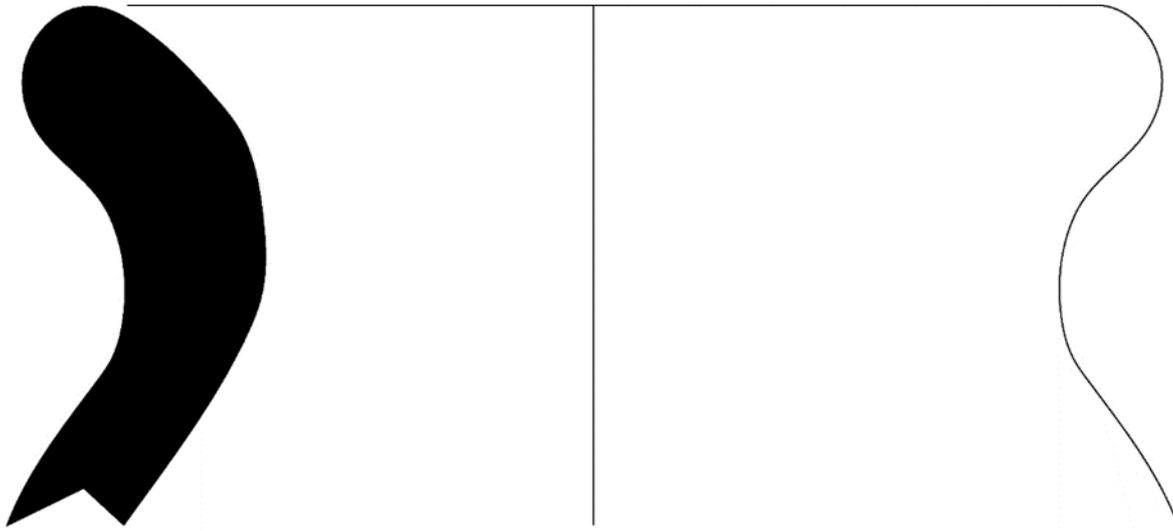


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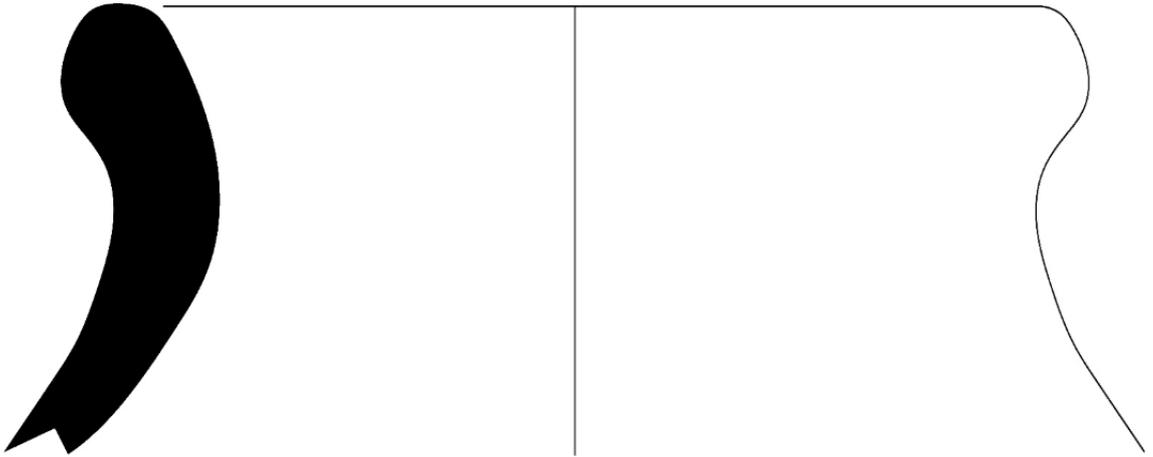


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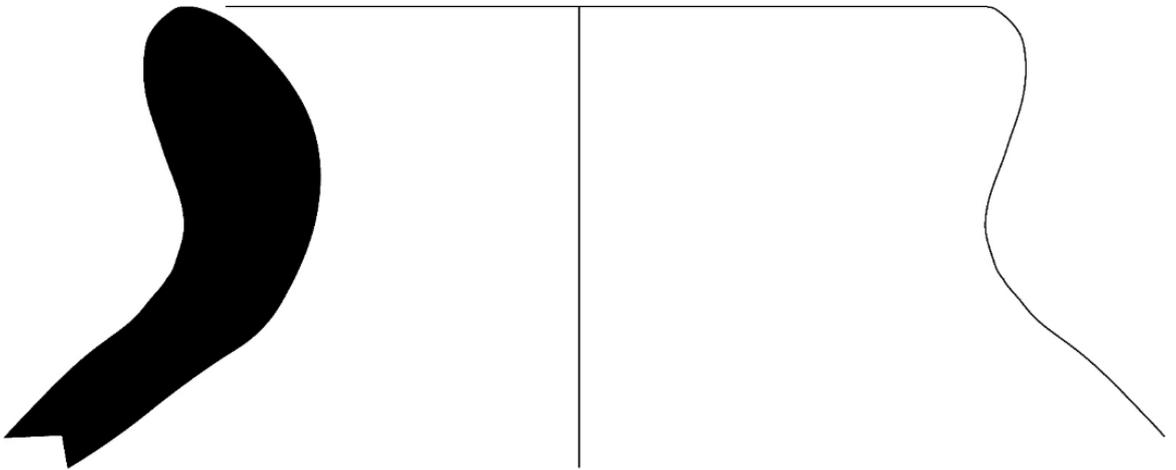


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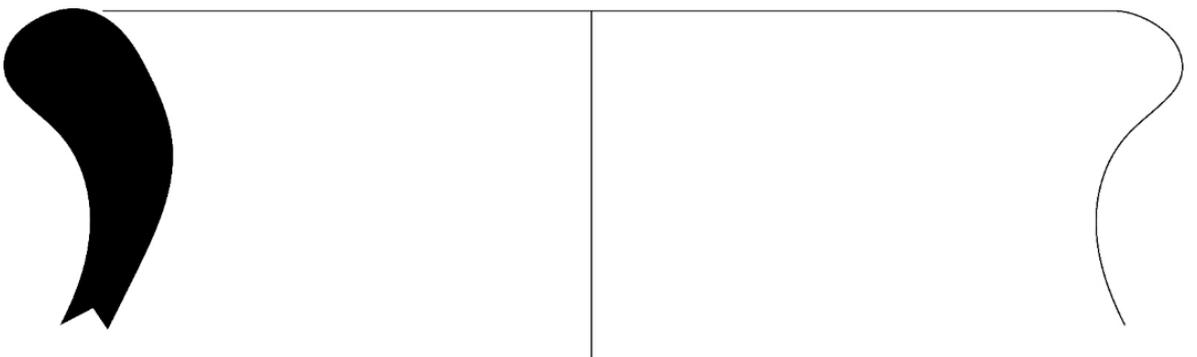




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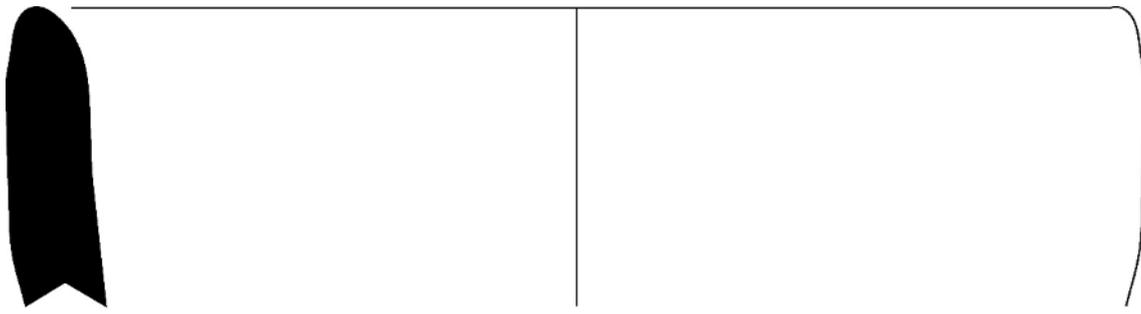


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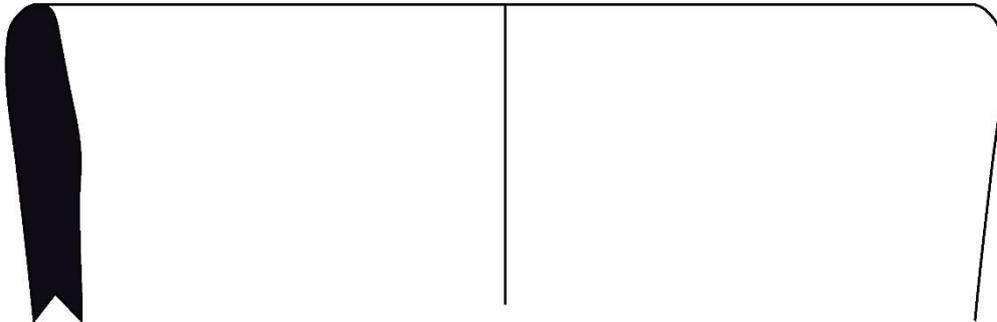


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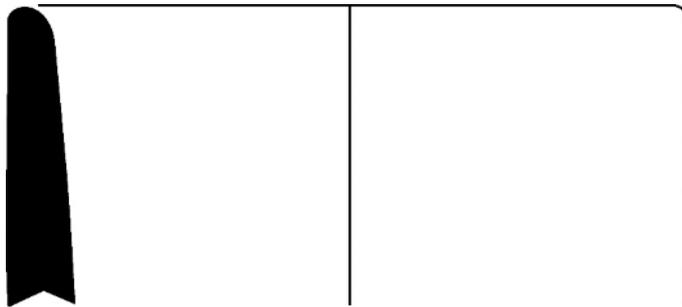




S2: 1402

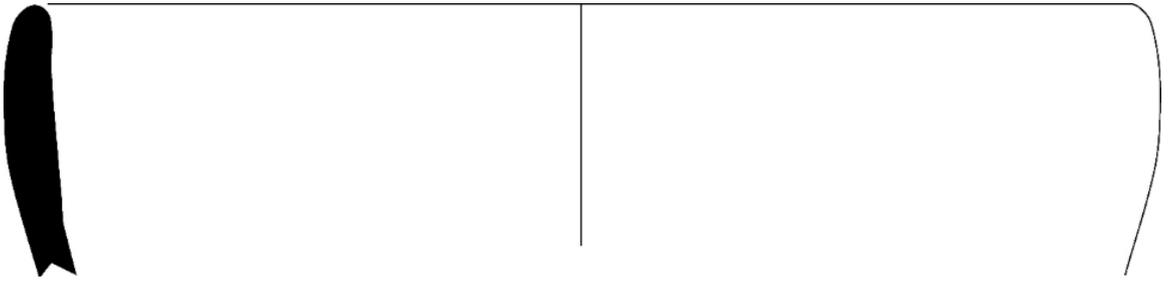


S2: 1132

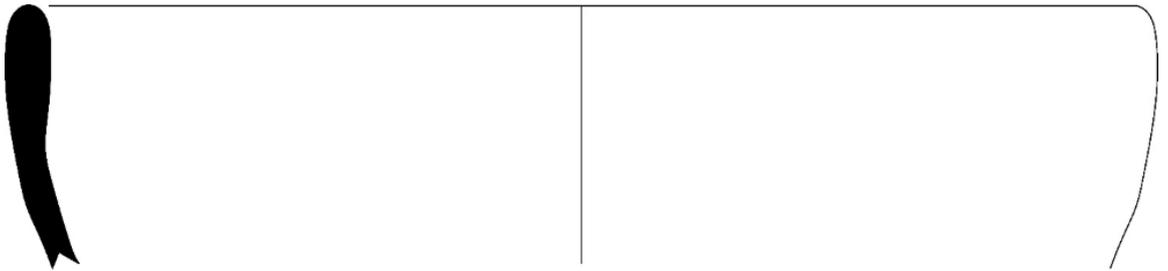


S2: 1160

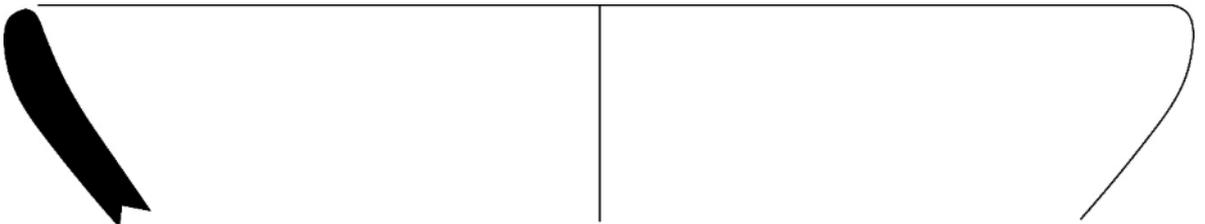




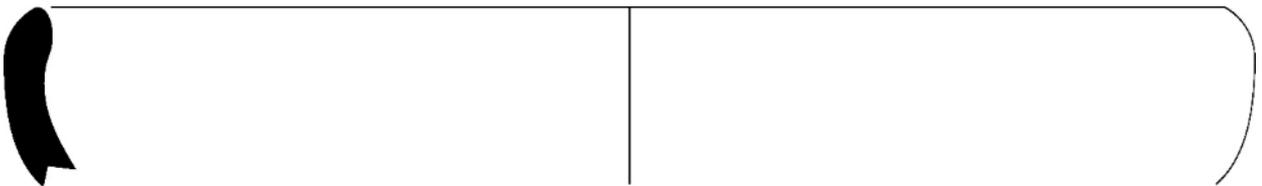
S3: 4661



S3: 1456



S3: 1530

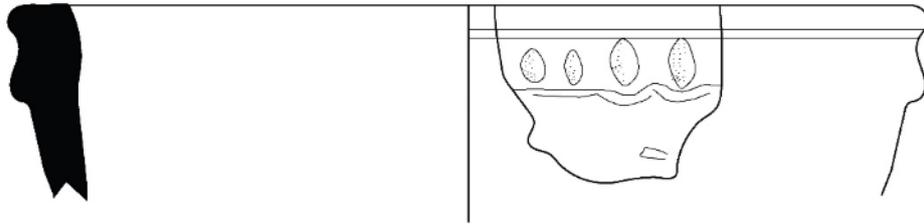


S3: 1490

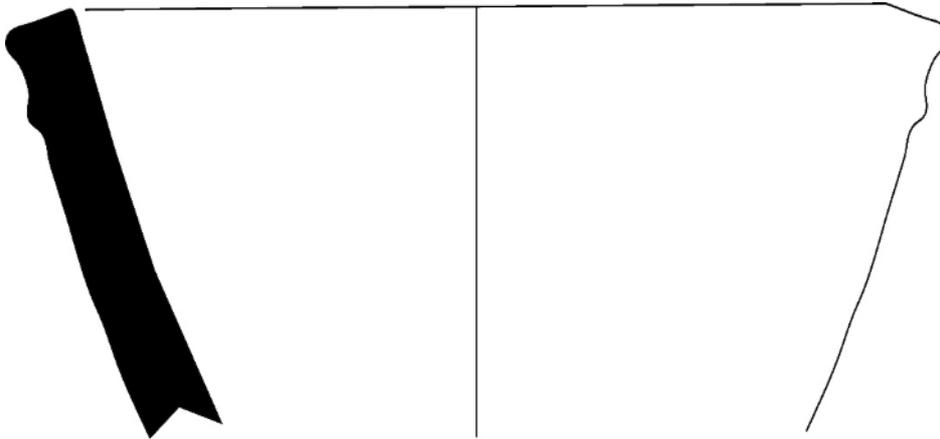


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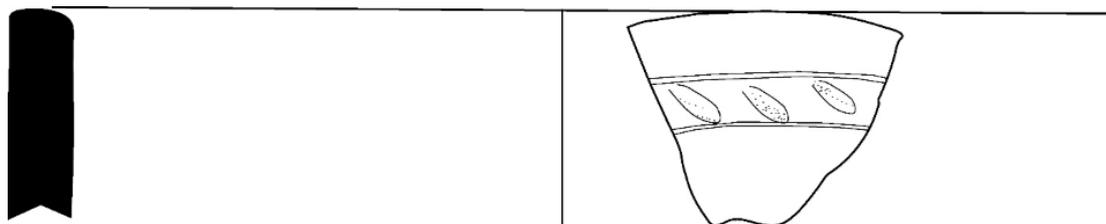


S2: 1092

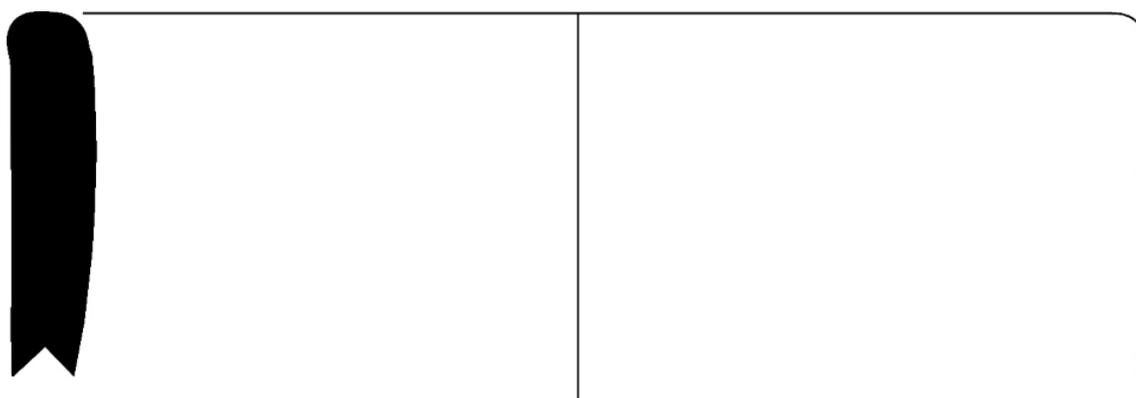


S2: 1111





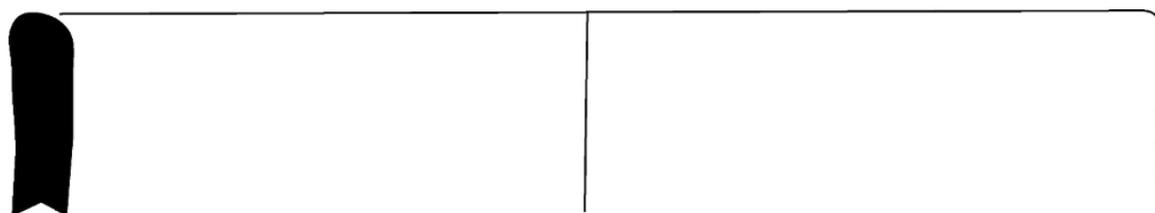
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S2: 1217

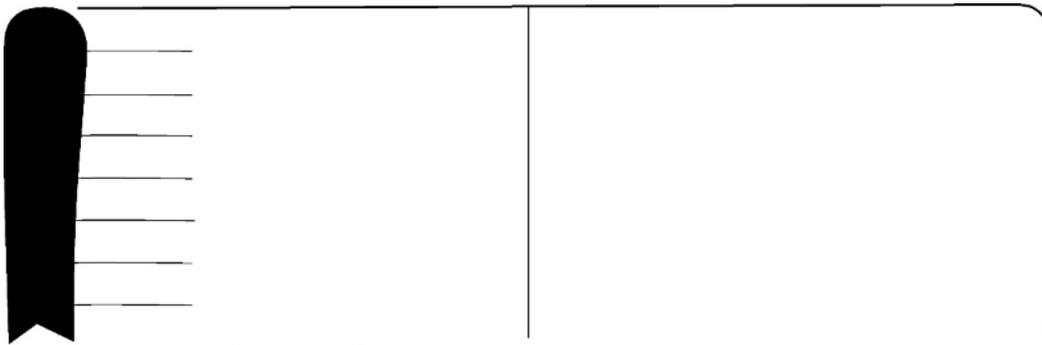


S2: 1101

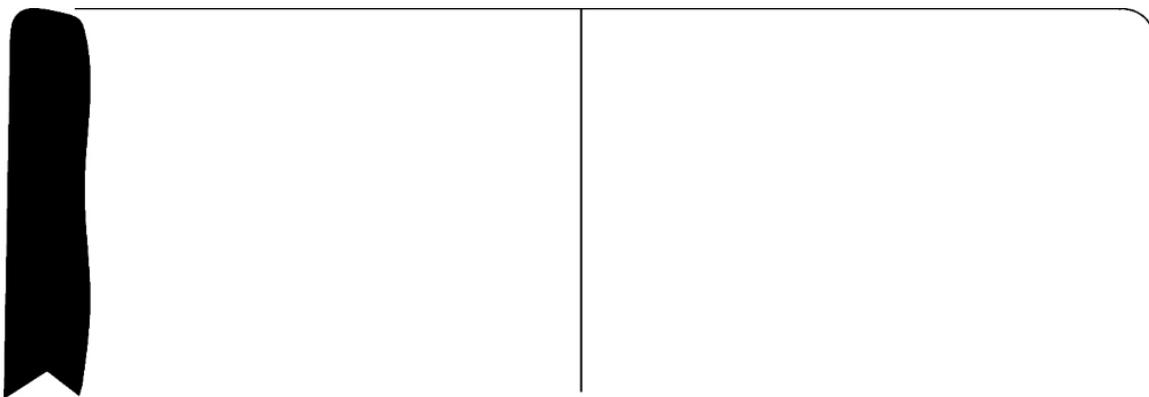


S2: 1103

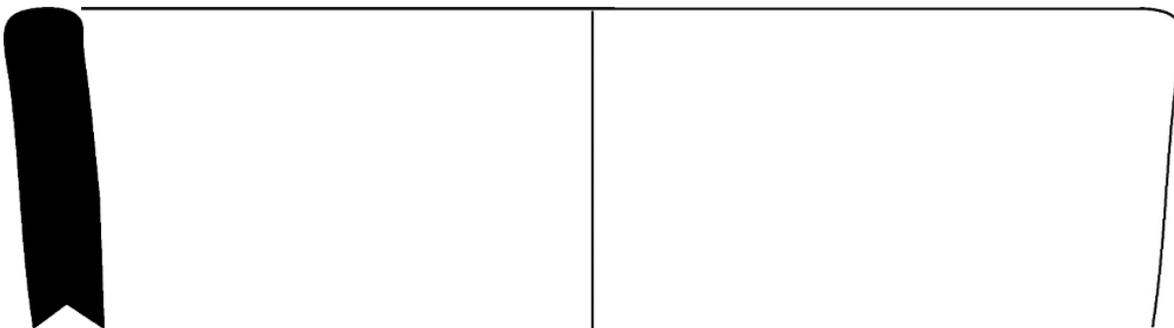




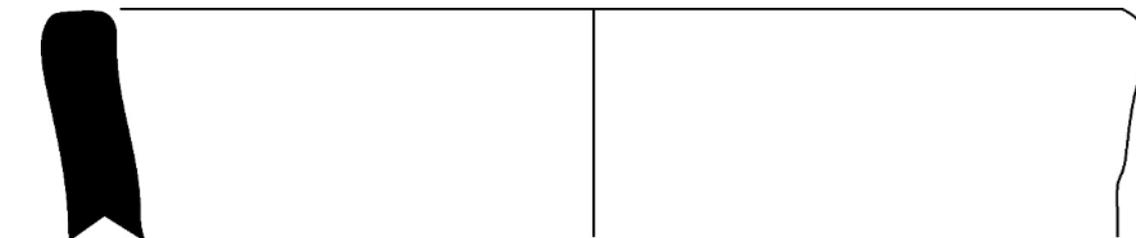
S2: 1098



S2: 1255

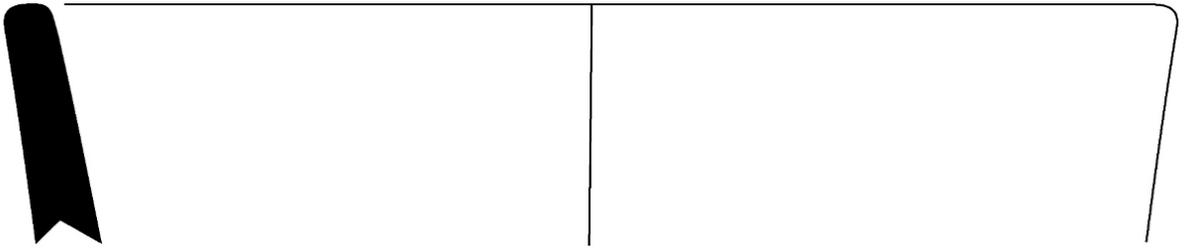


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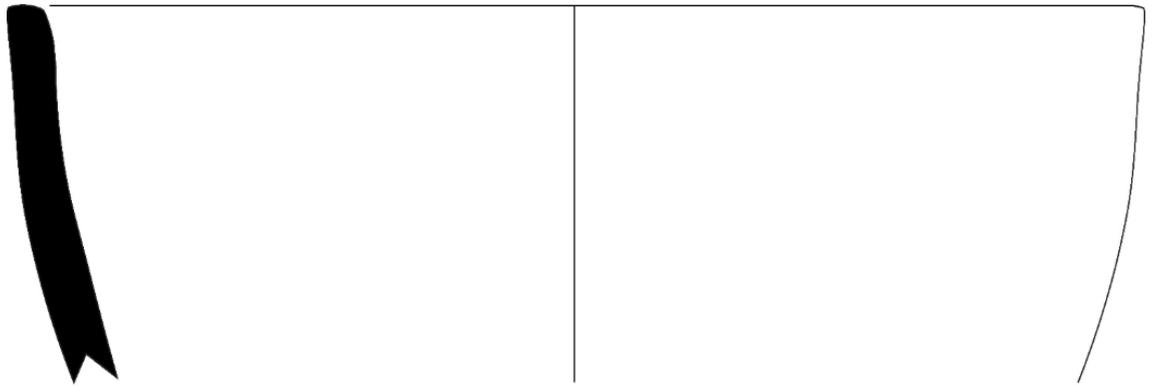


S2: 1025

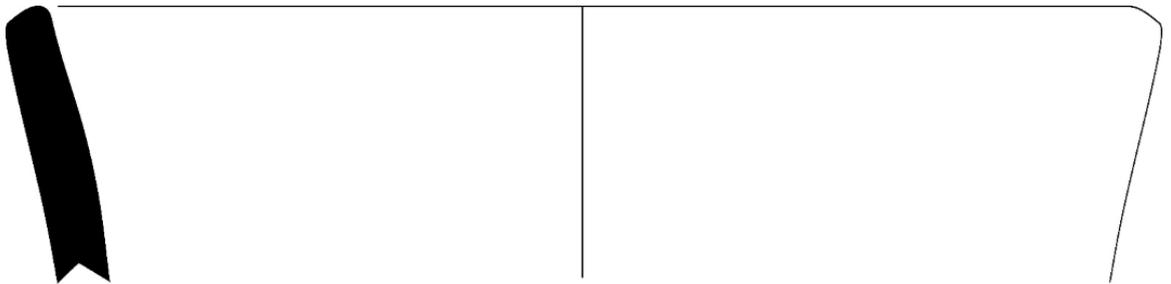




S2: 1394

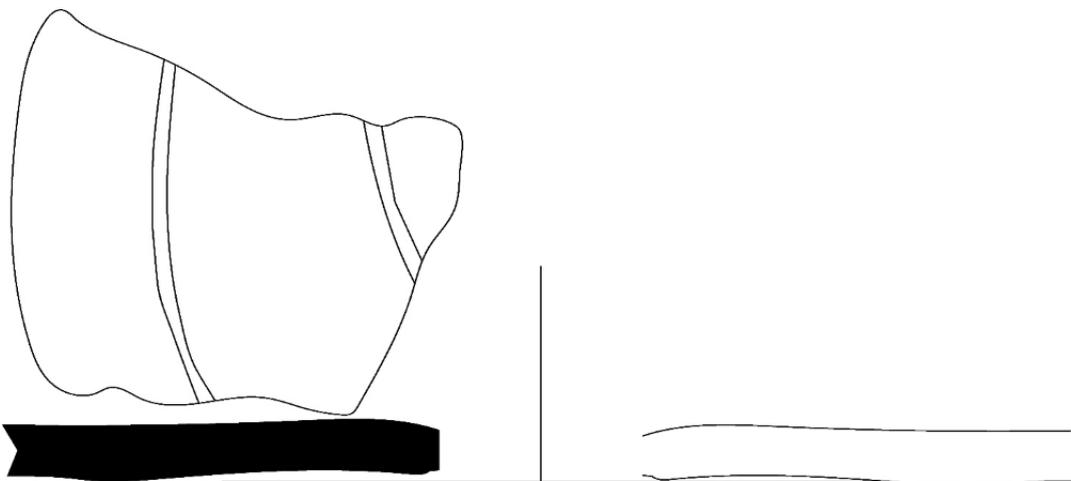


S3: 1106

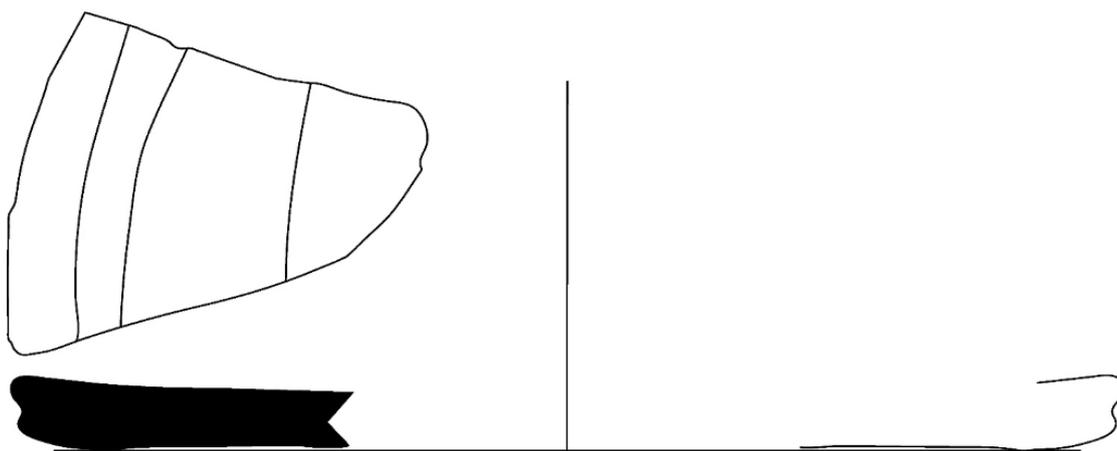


S3: 1535



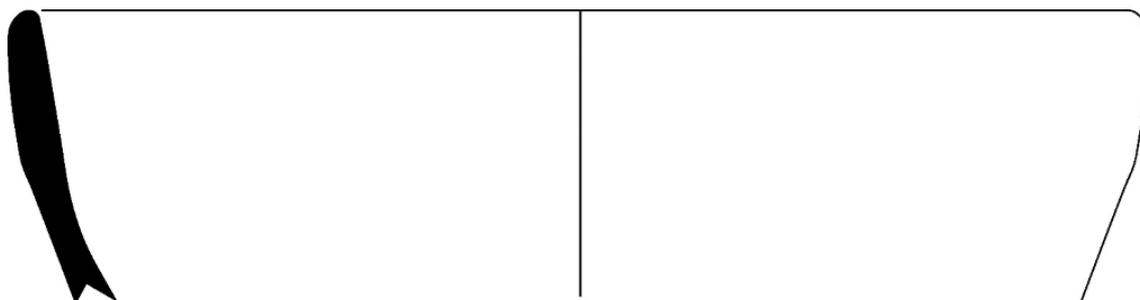


S2: 1232

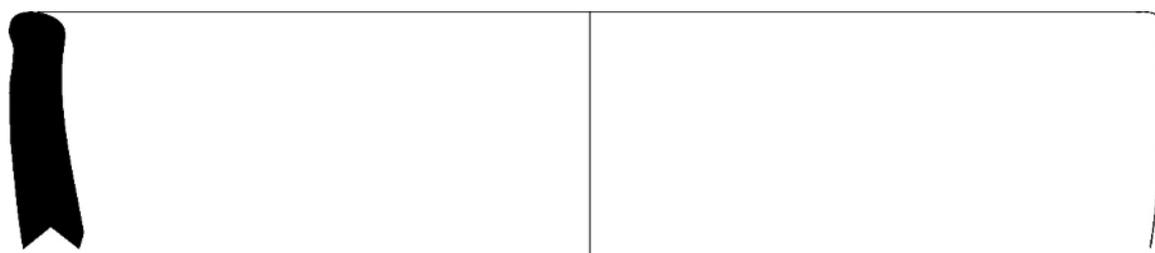


S2: 1142

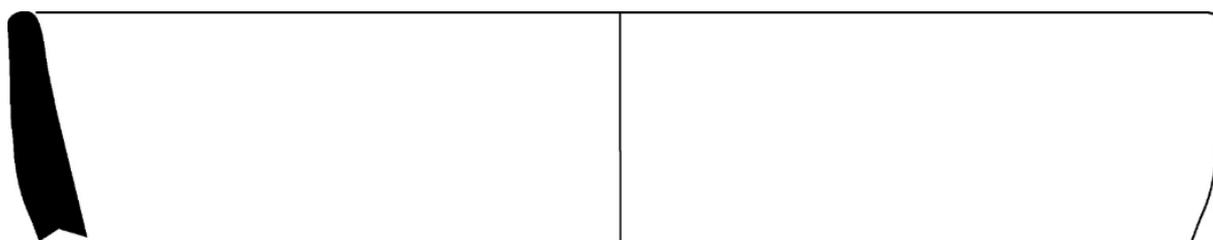




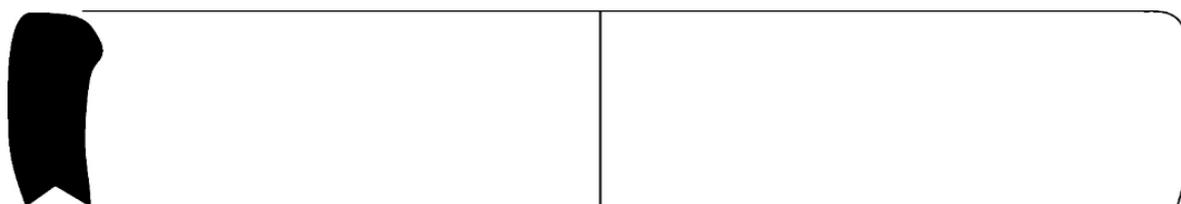
S2: 1356



S2: 1095

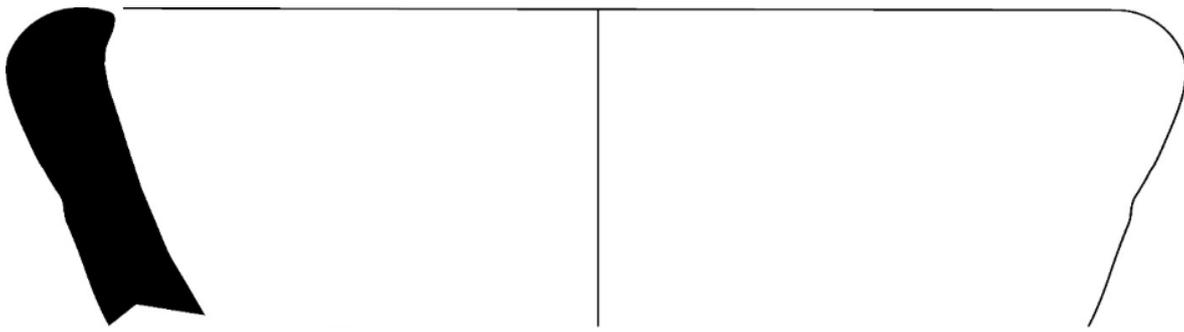


S2: 1137

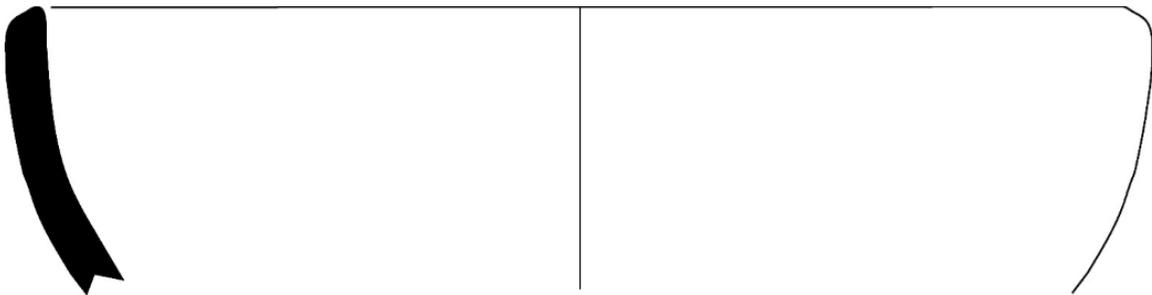


S2: 1031

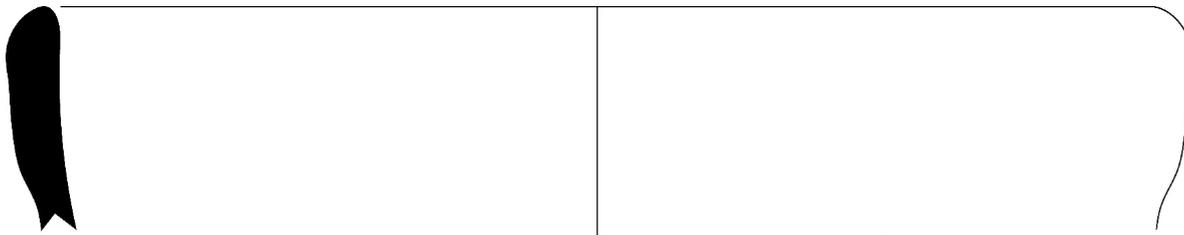




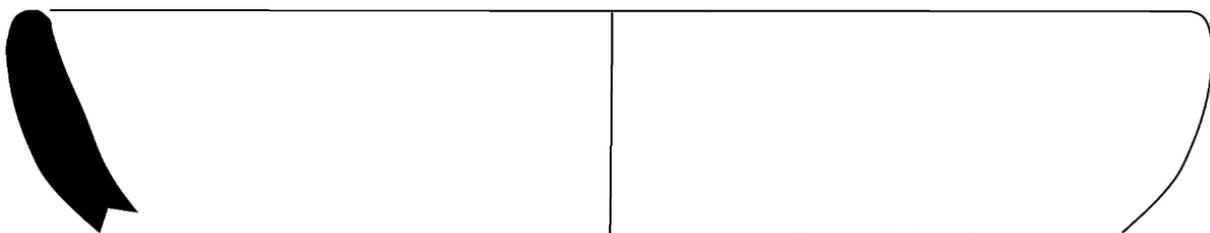
S2 3277



S2: 2185

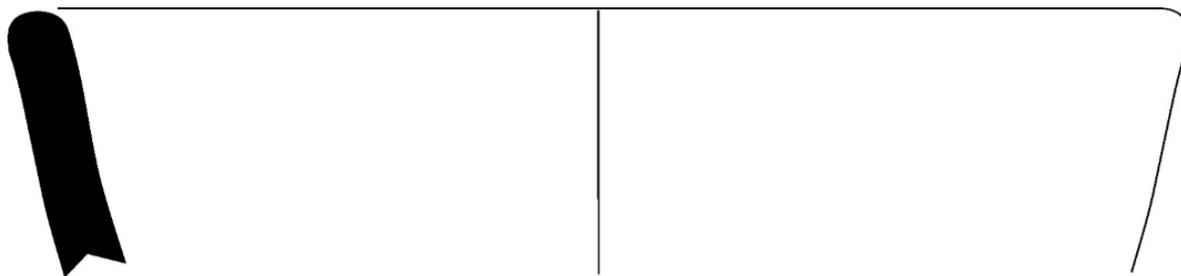


S2: 1329

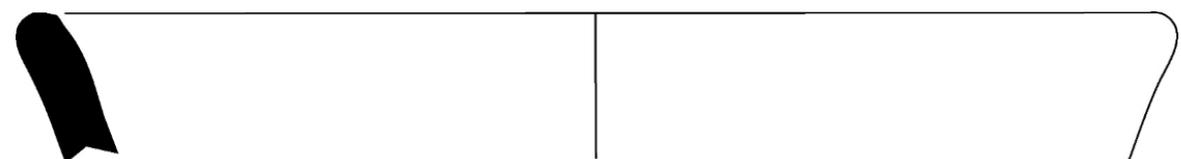


S2: 2735

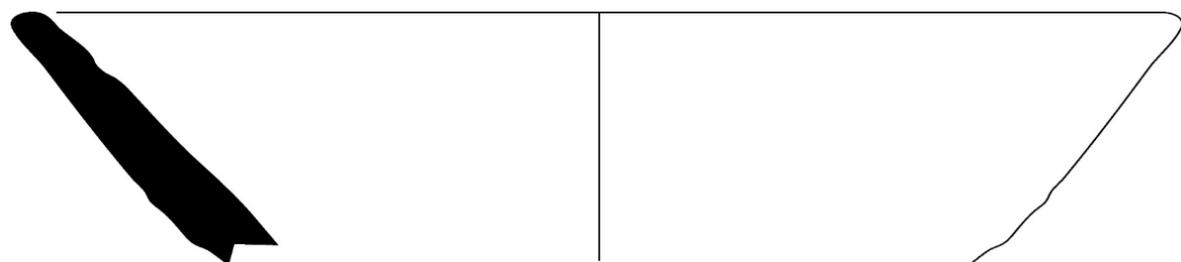




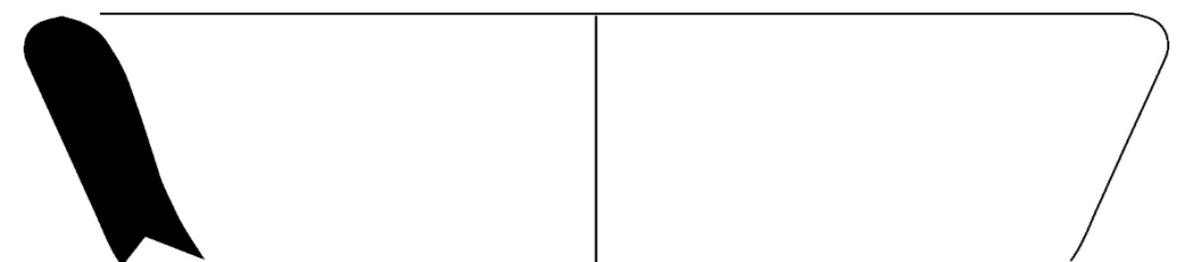
S2: 1483



S2: 1306

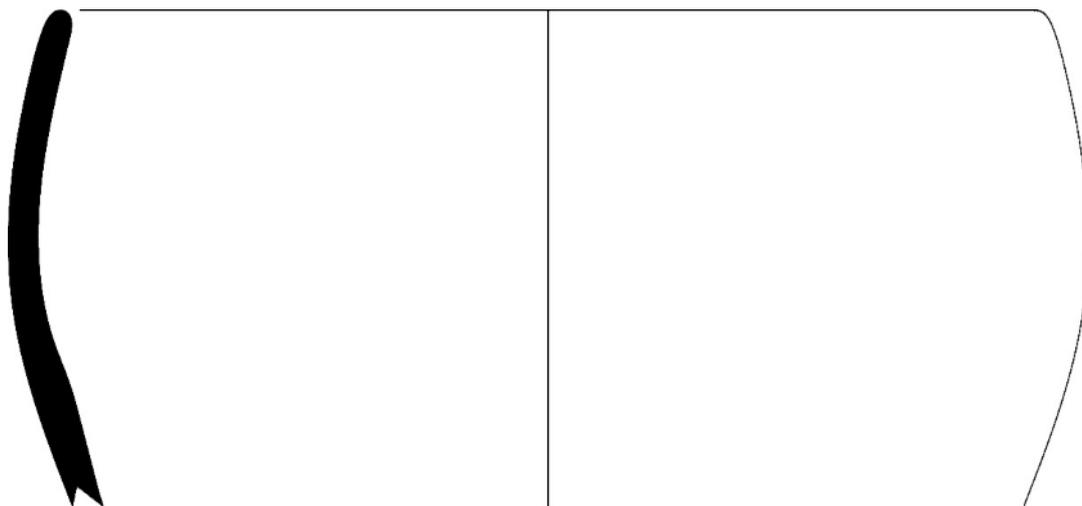


S2: 3125

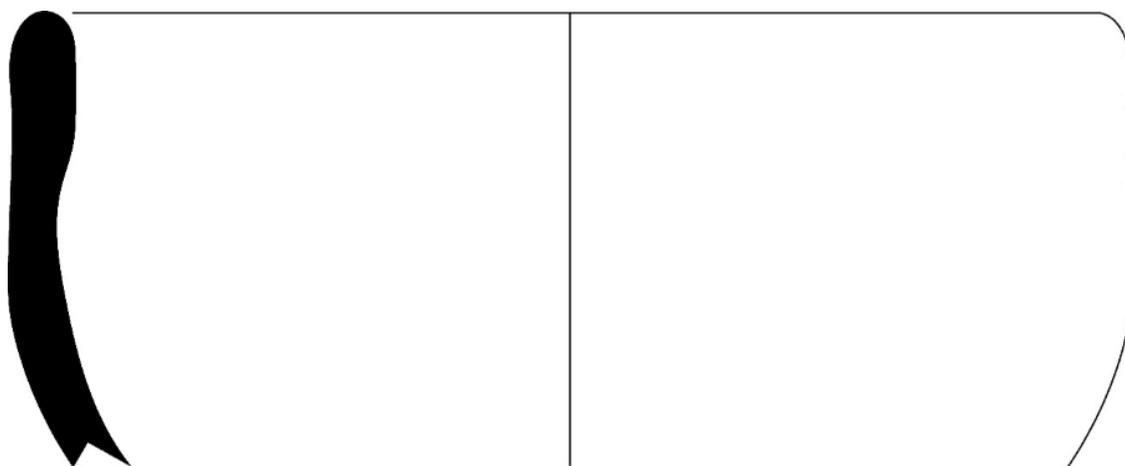


S2: 1482

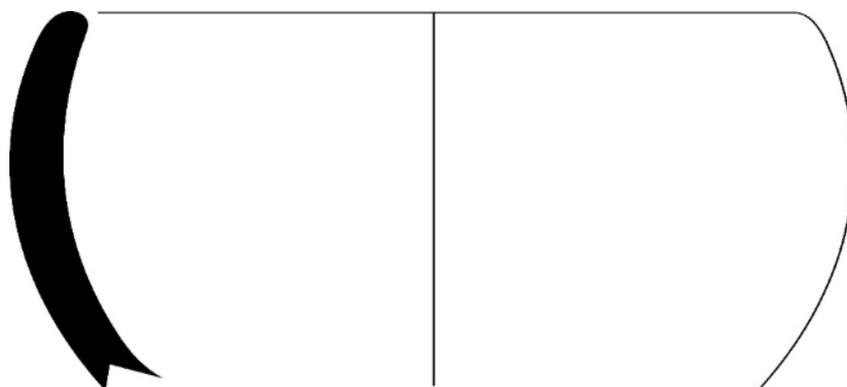




S3: 1508

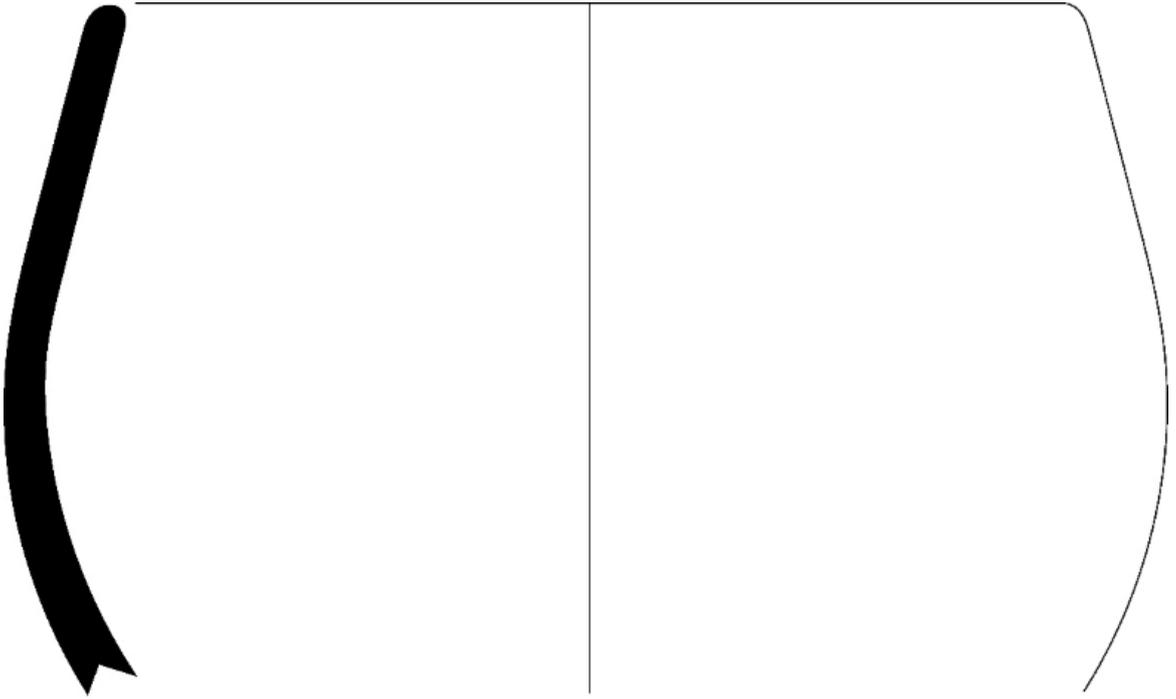


S3: 1429

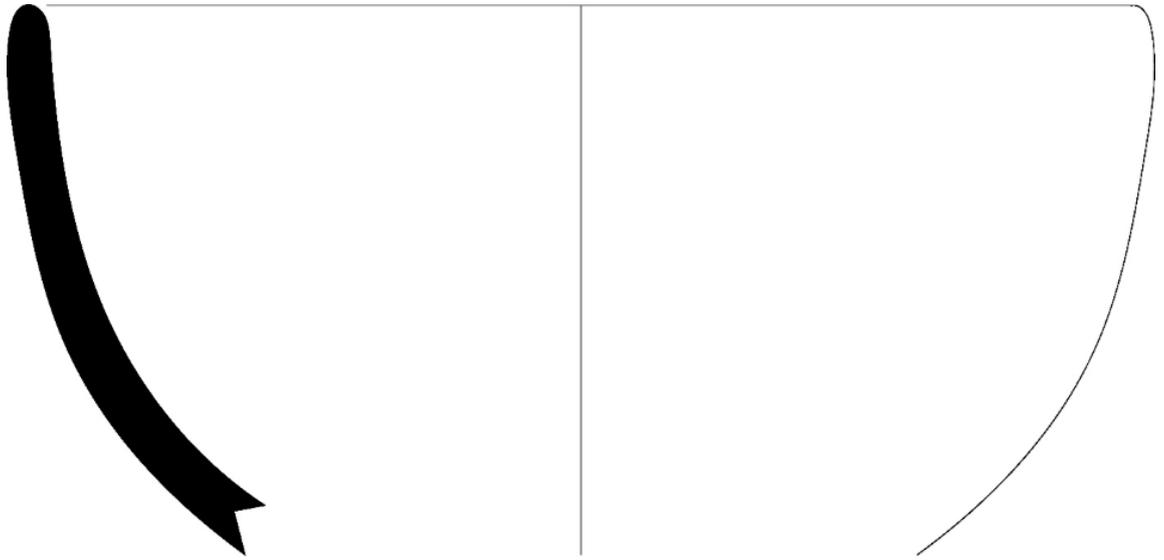


S3: 1365



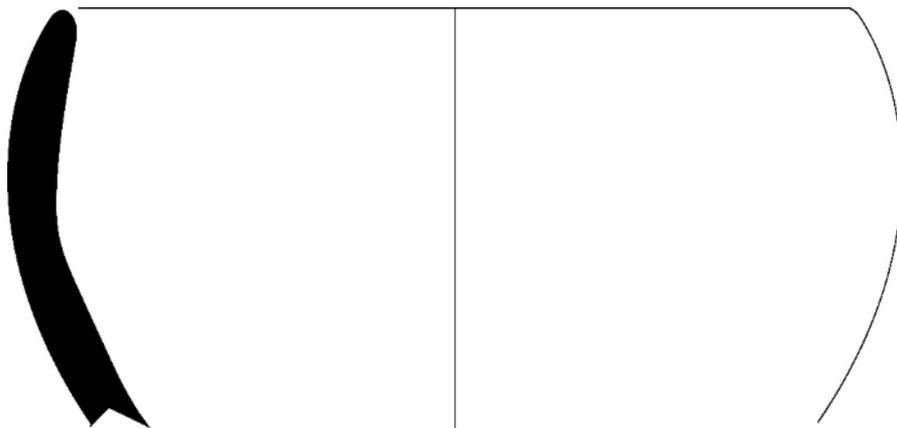


S3: 1521

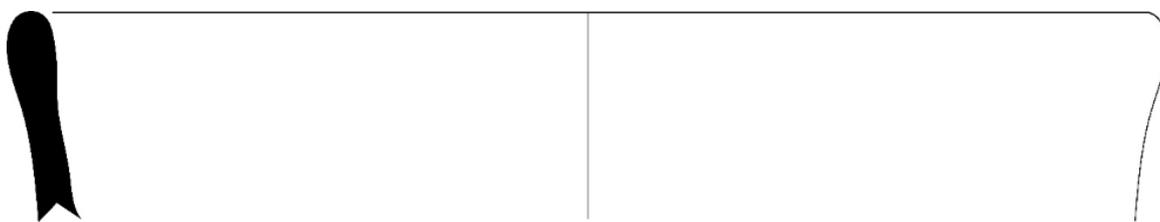


S3: 1510

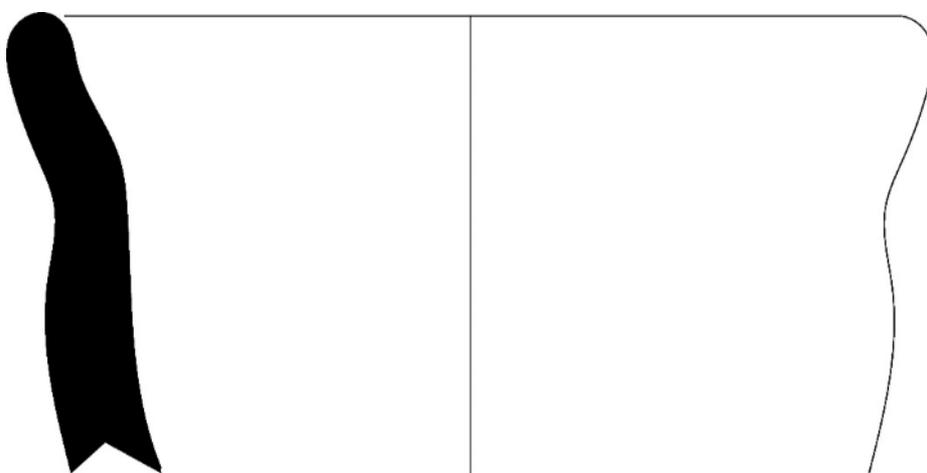




S3: 1414

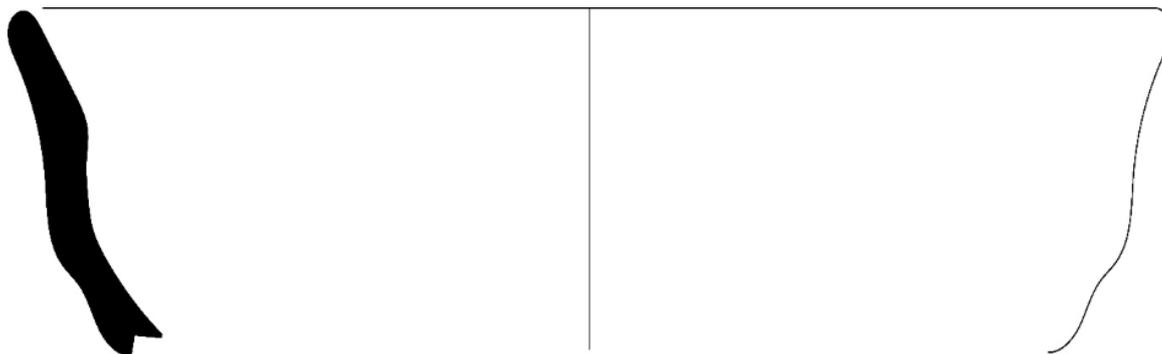


S3: 1454



S3: 1380

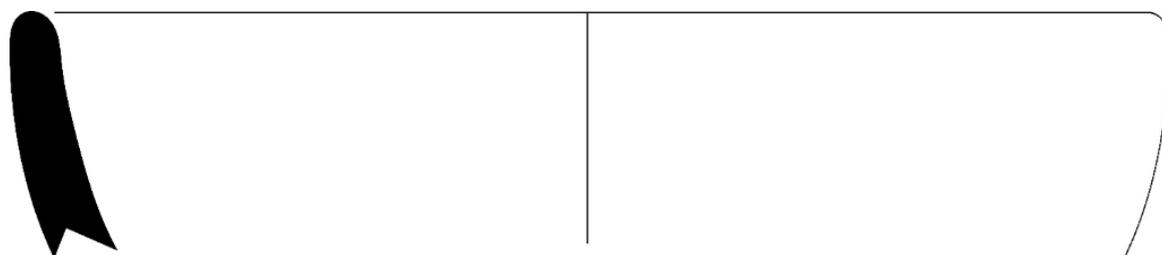




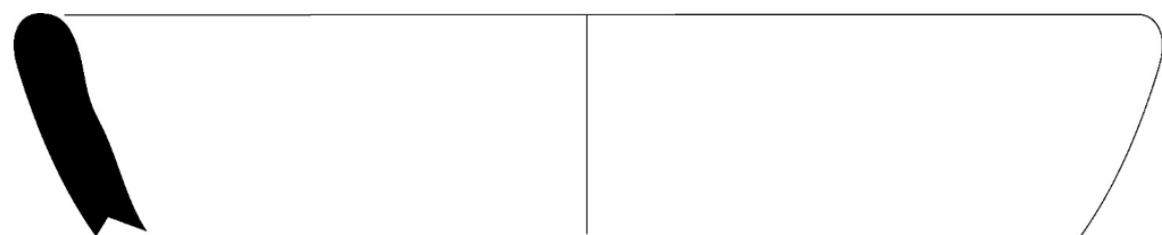
S3: 1513



S3: 4491



S3: 1488

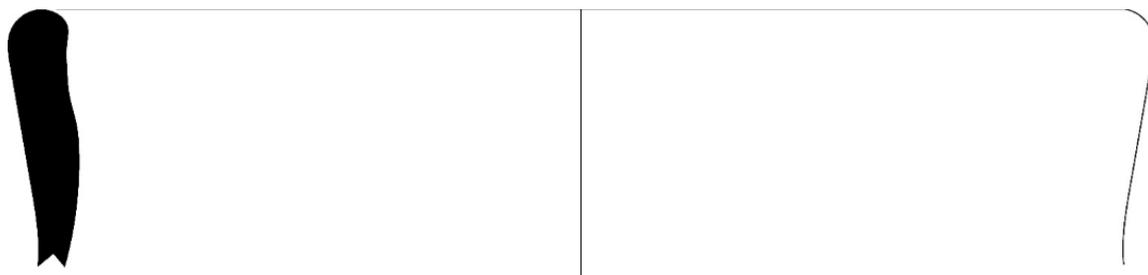


S3: 1484

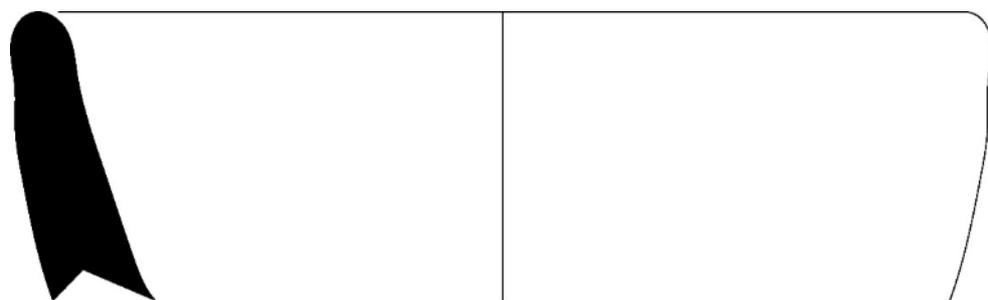




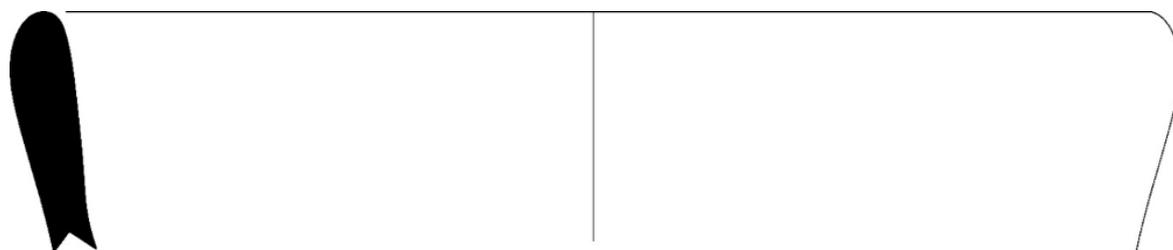
S3: 1381



S3: 1467

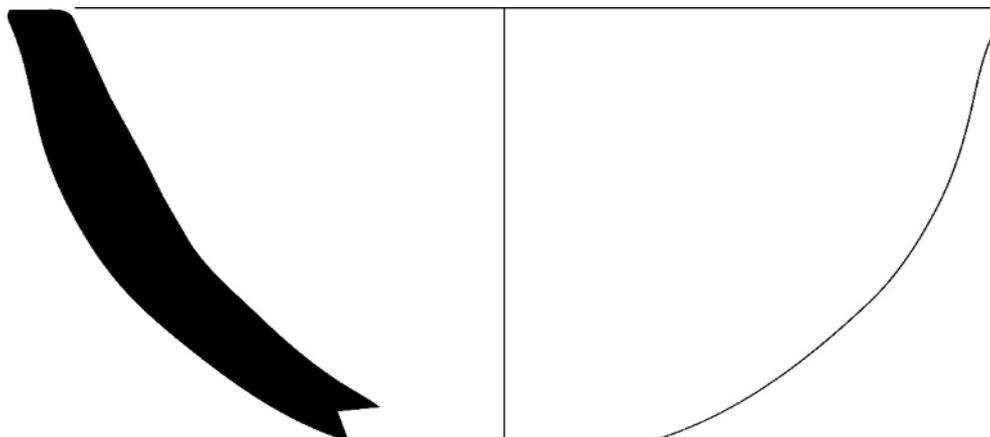


S3: 1507

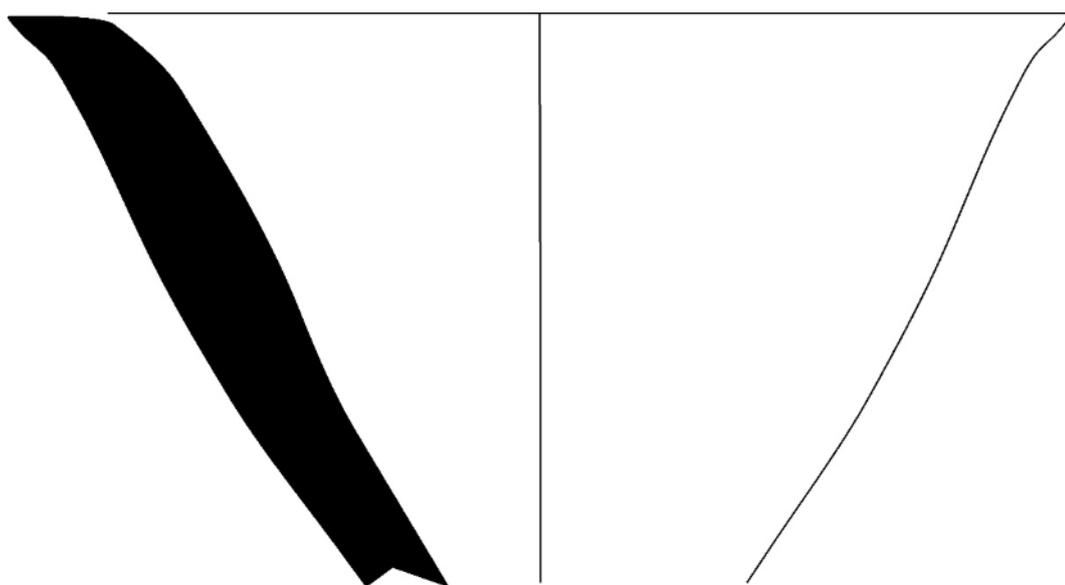


S3: 1494



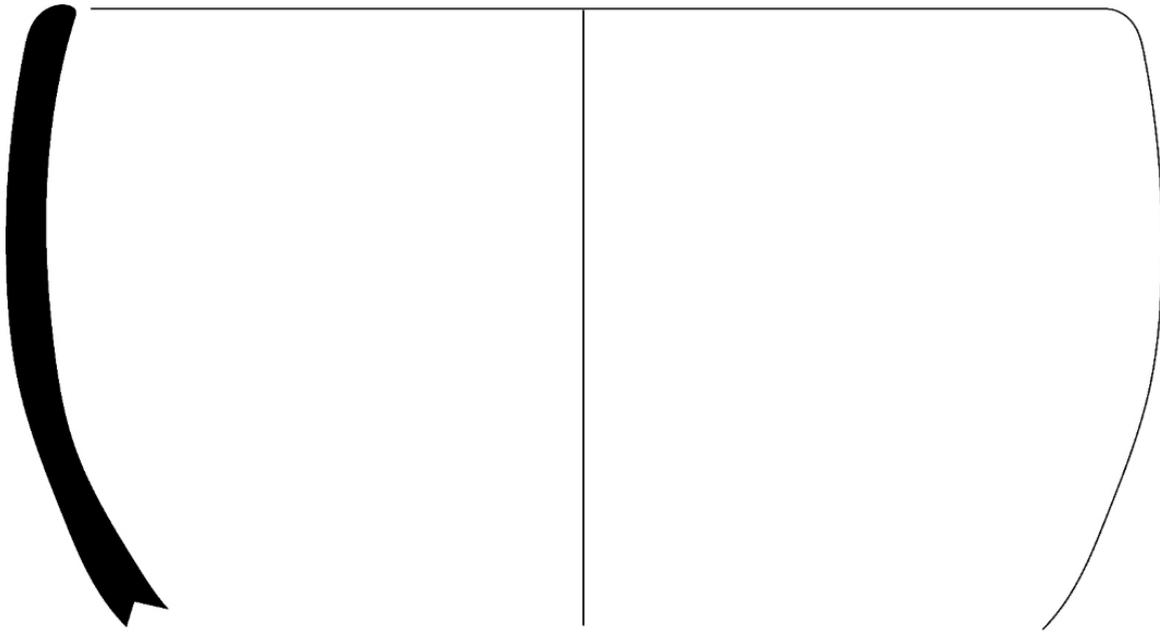


S2: 1051



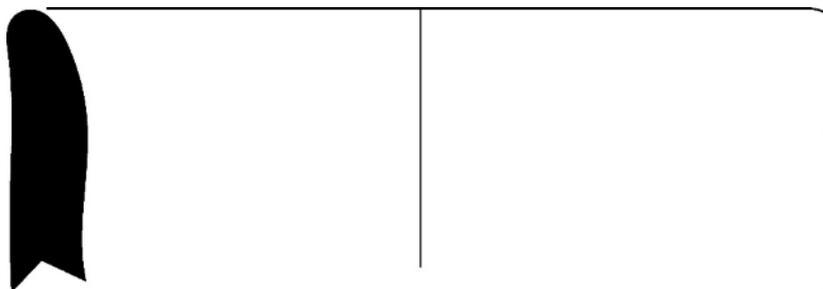
S2: 2191



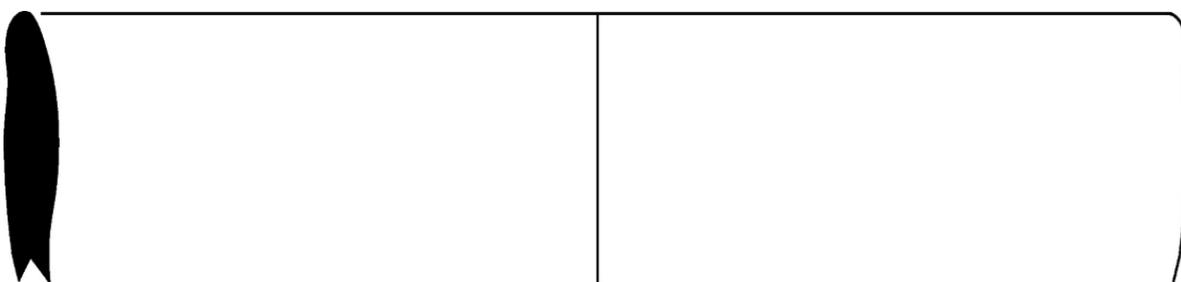


S2: 1298

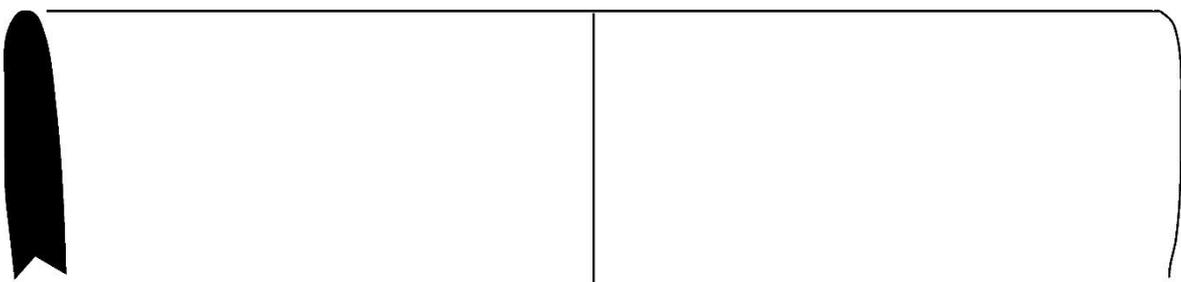




S2: 1228

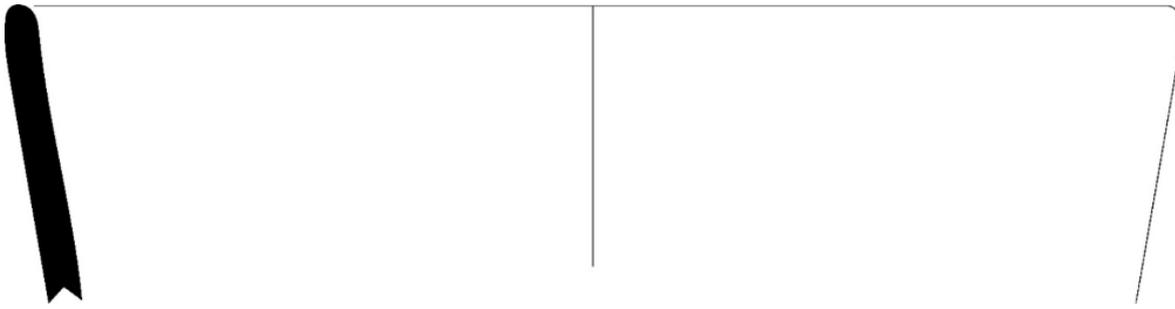


S2: 1334

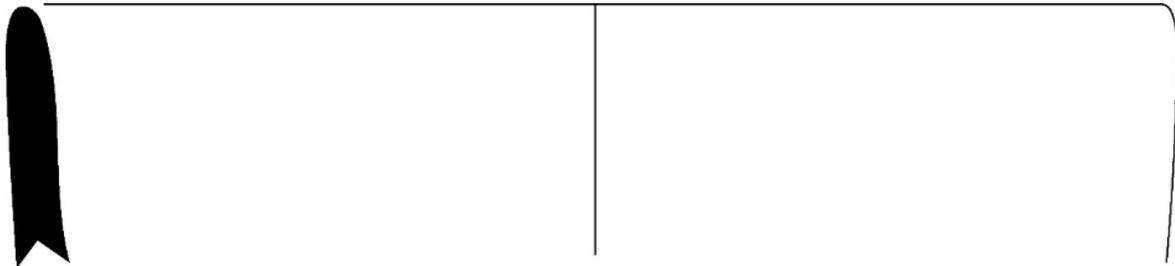


S2: 1028

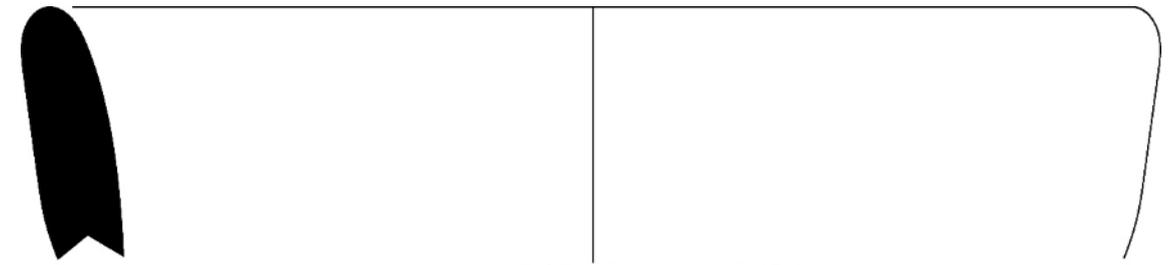




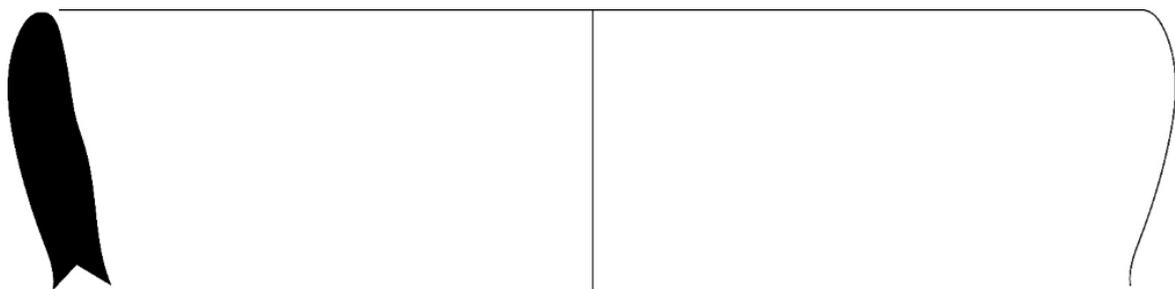
S3: 1487



S3: 1459

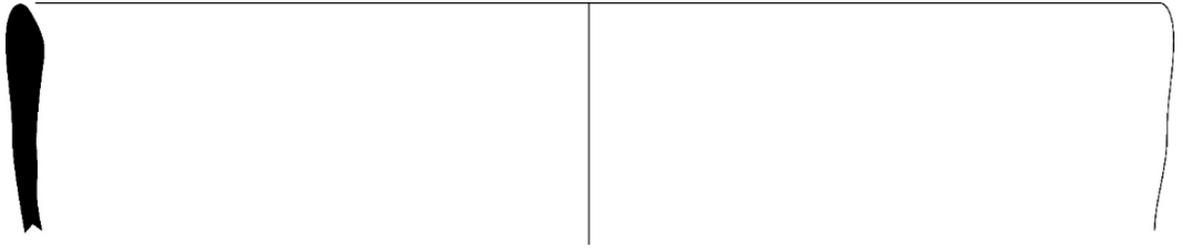


S3: 1424



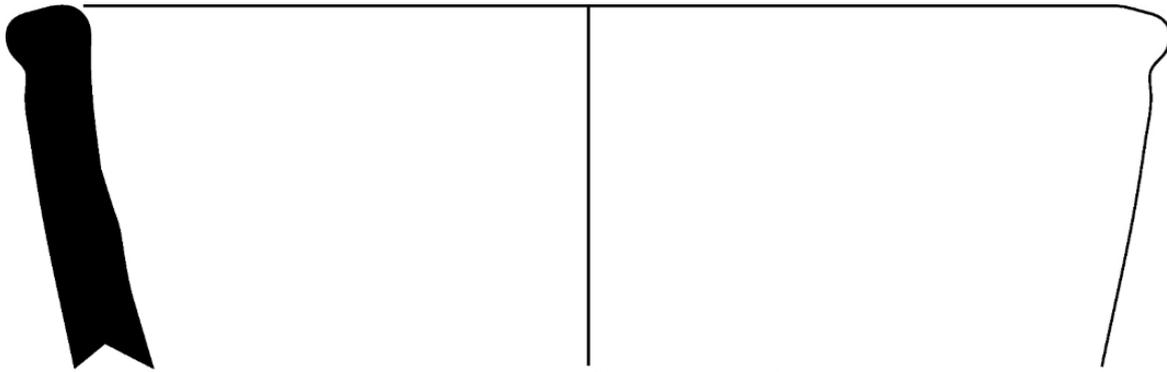
S3: 1425



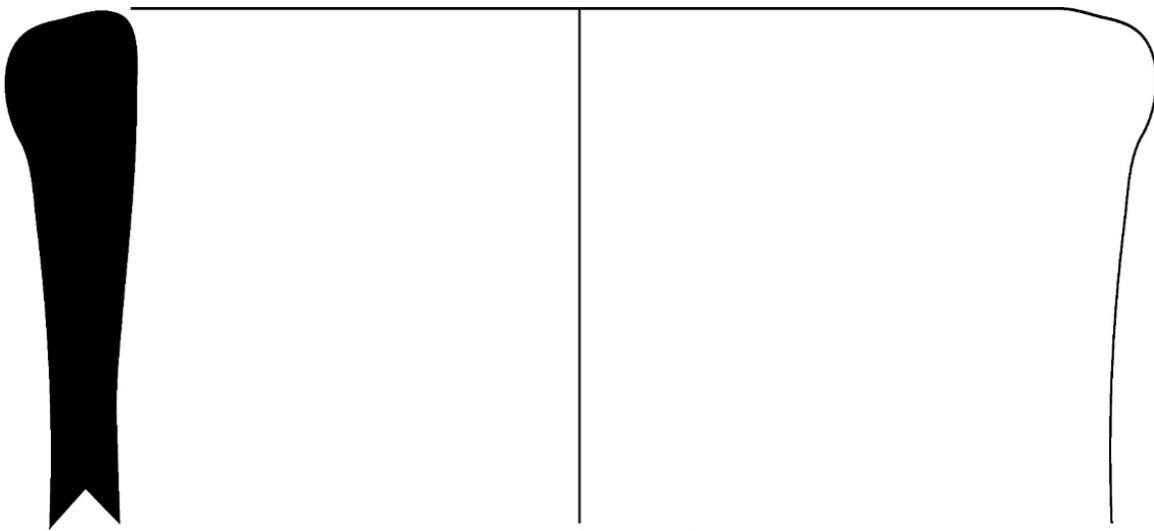


S3: 1500

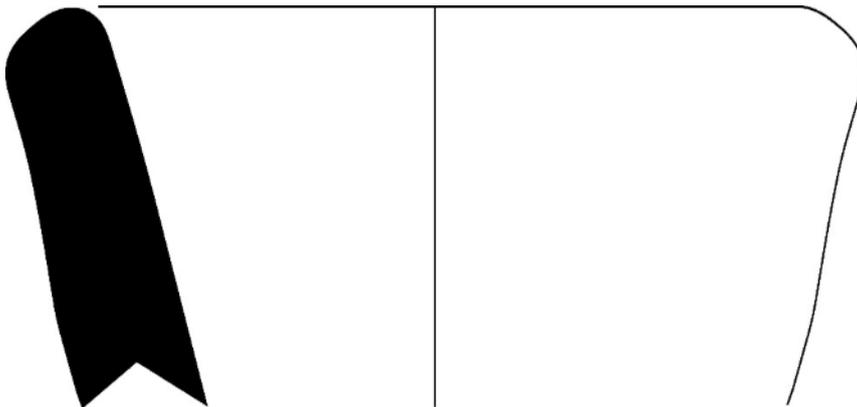




S2: 1355

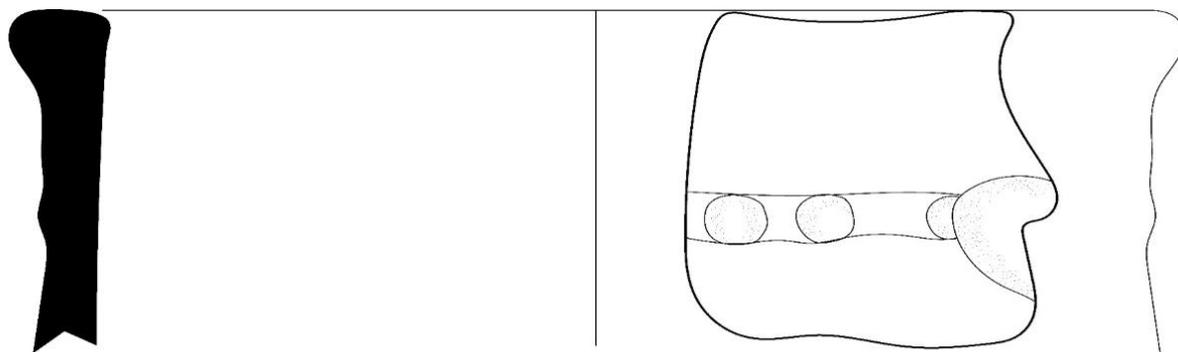


S2: 1342

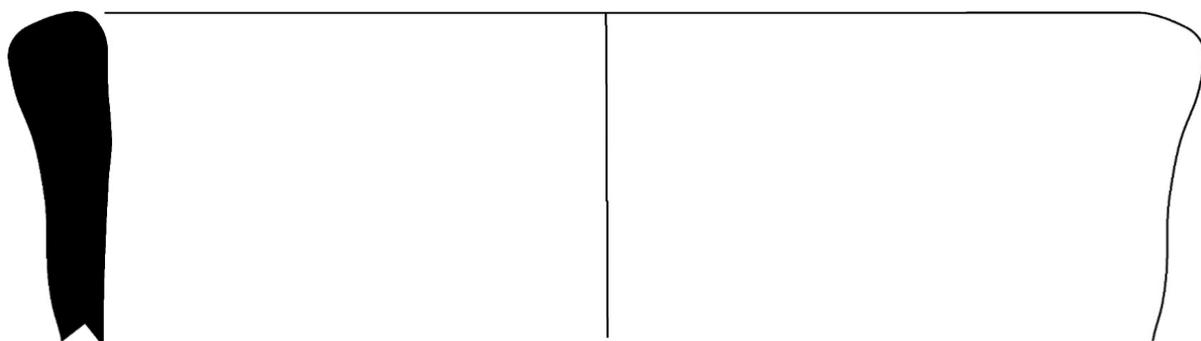


S2: 1149

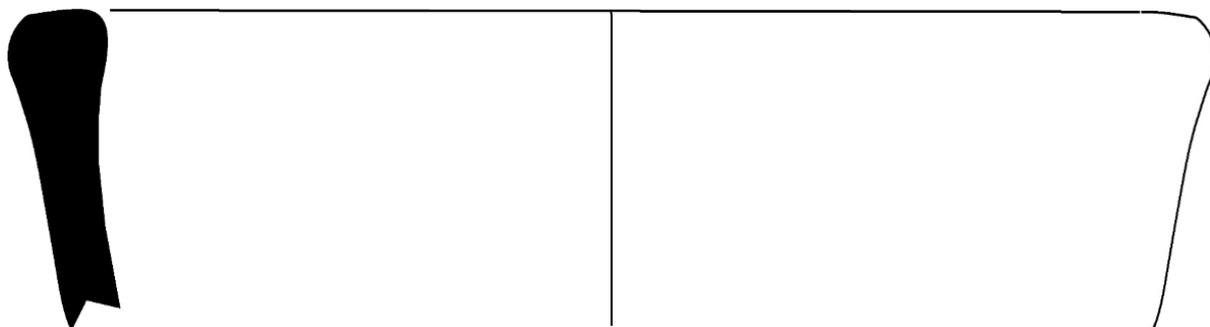




S2: 1304

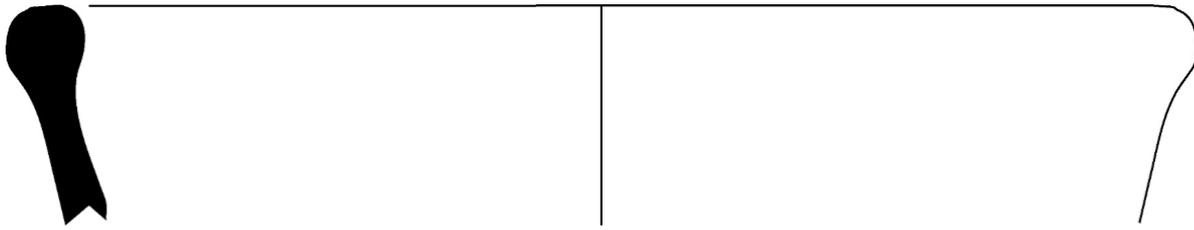


S2: 1639



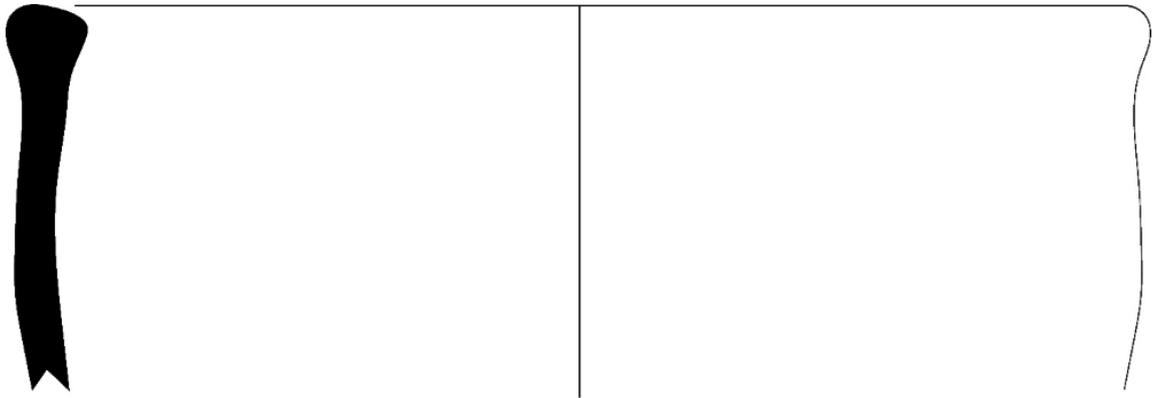
S2: 3278





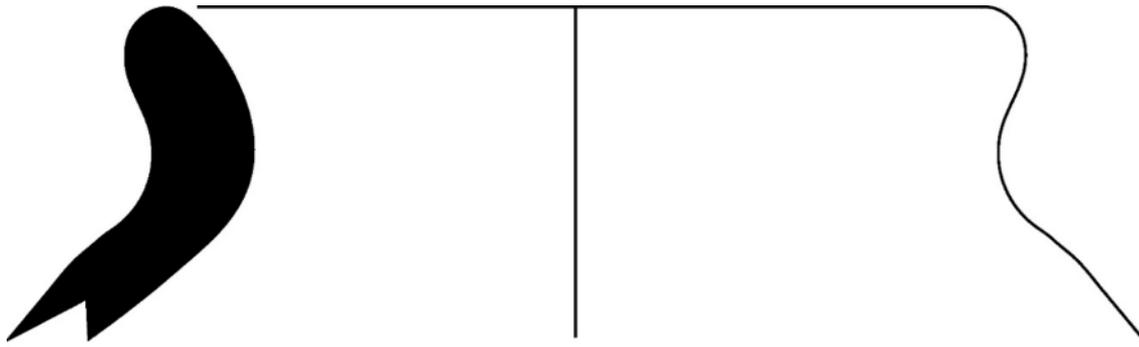
S2: 2699



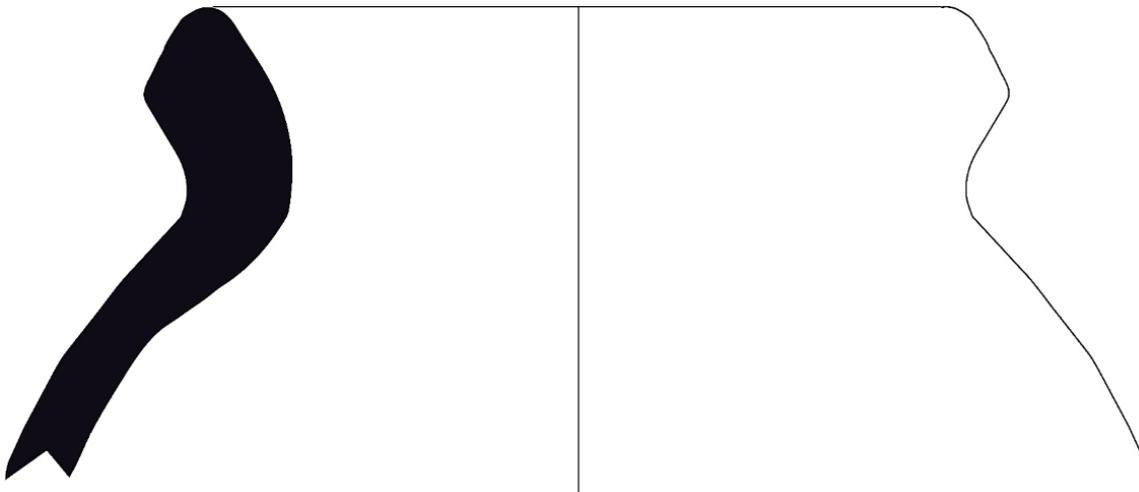


S3: 1457

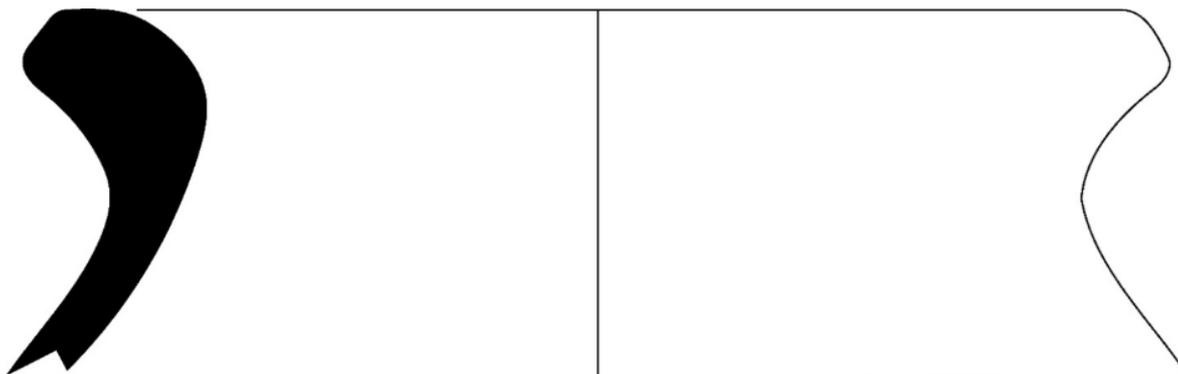




S2: 1349

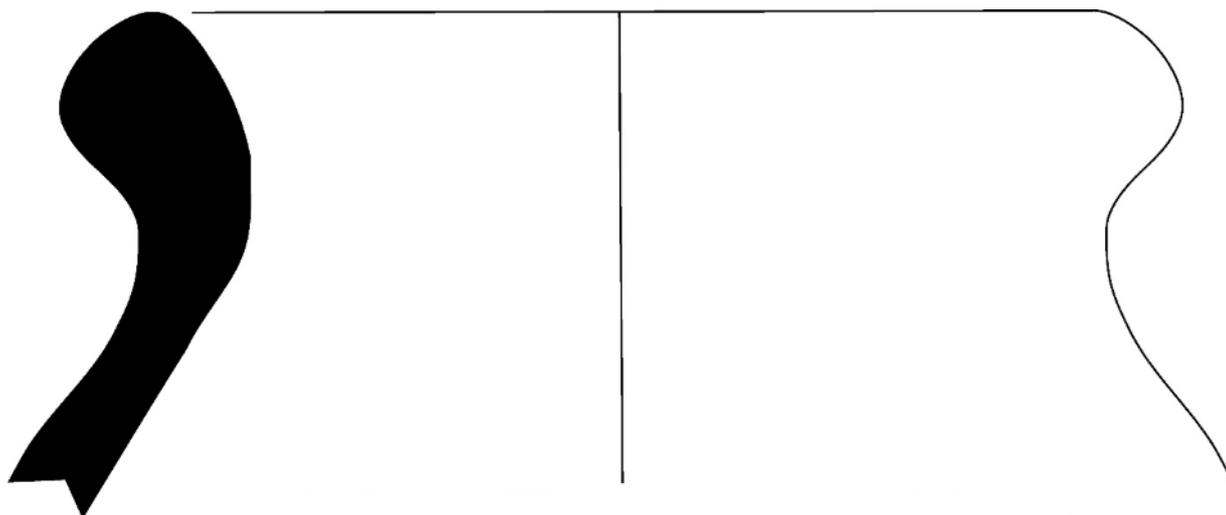


S2: 1006

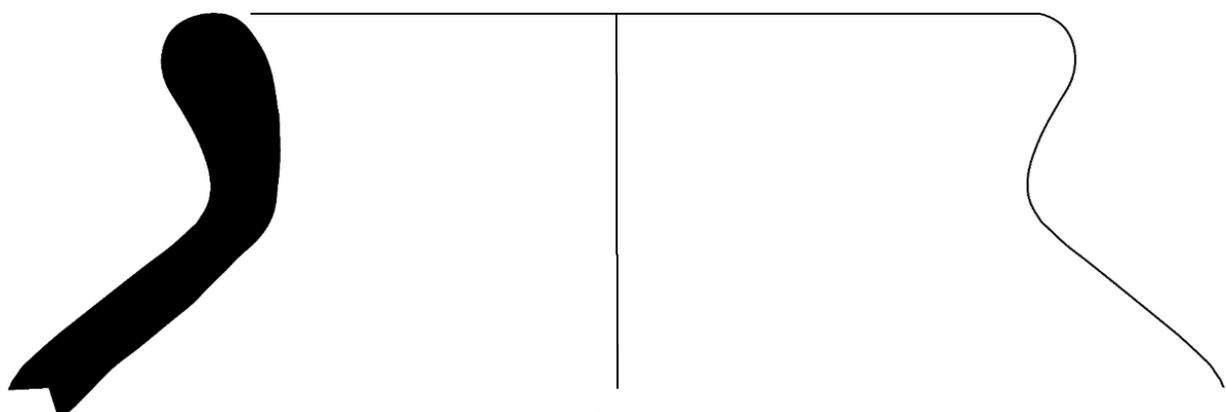


S2: 1038

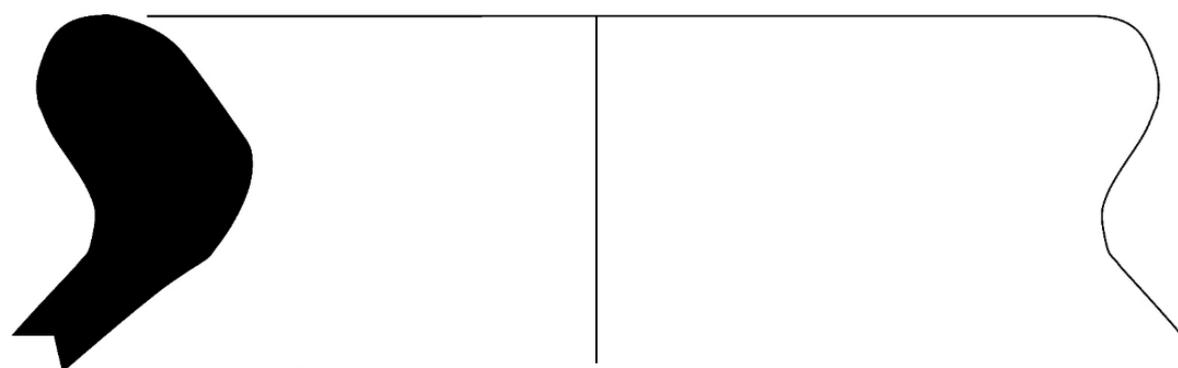




S2: 2437

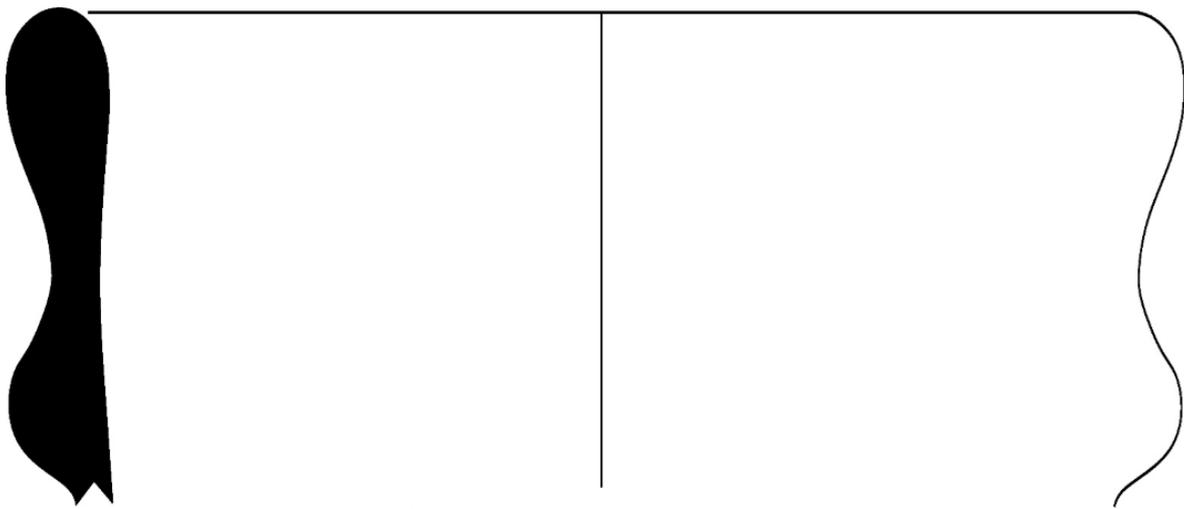


S2: 1971

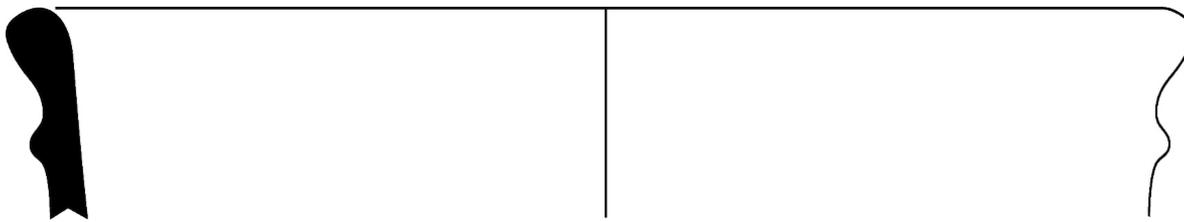


S2: 2449



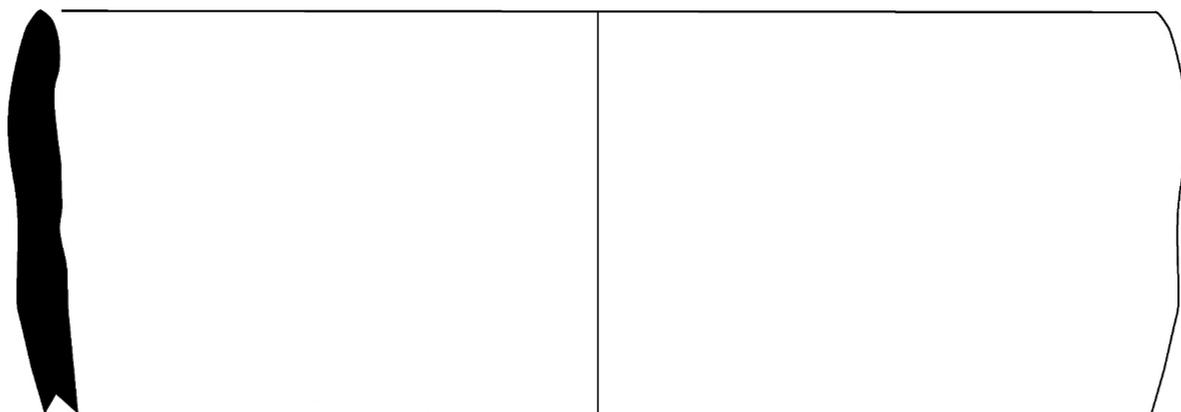


S2: 1363

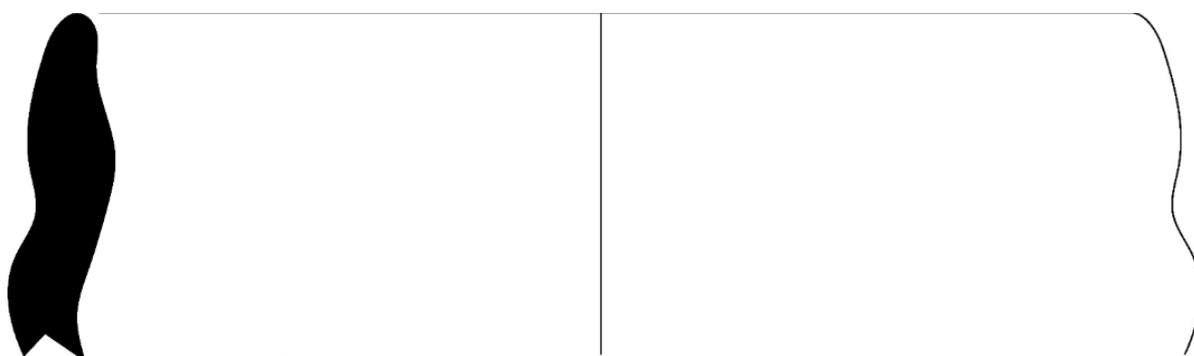


S2: 1177

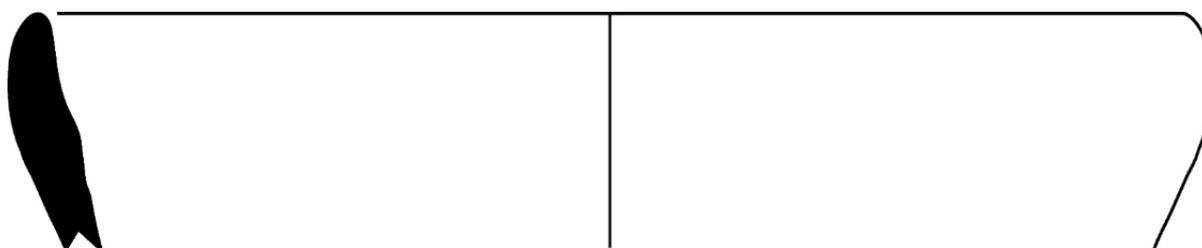




S2: 3124

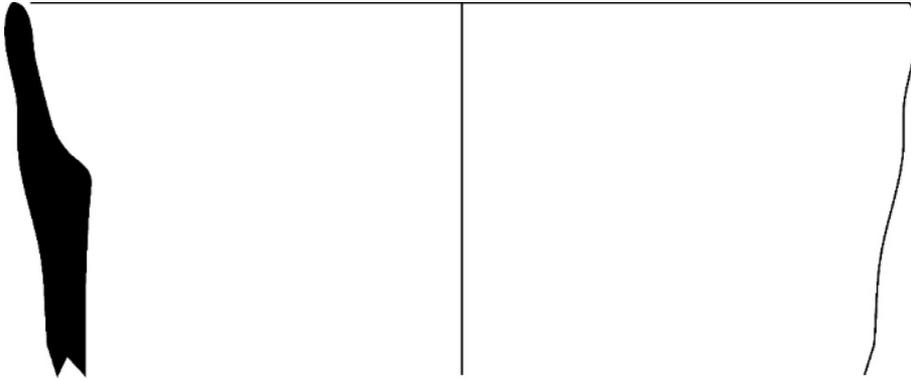


S2: 1325

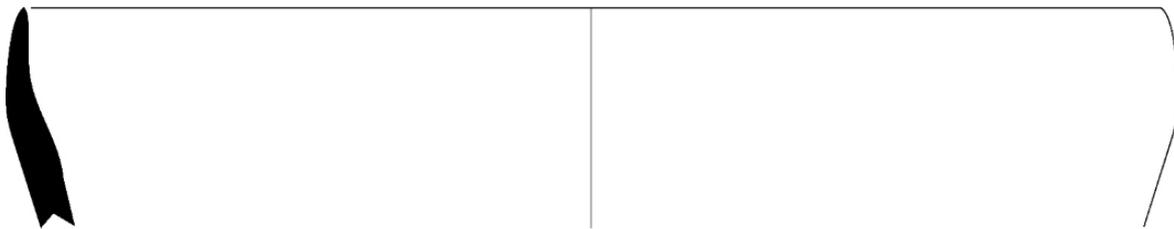


S2: 1337

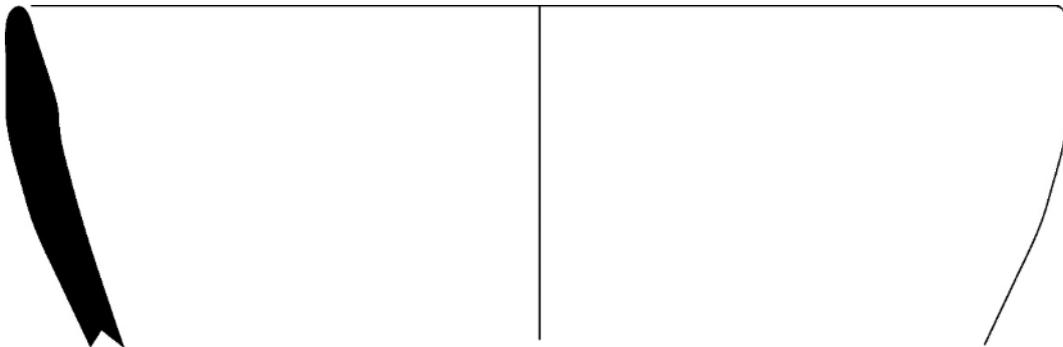




S3: 1527

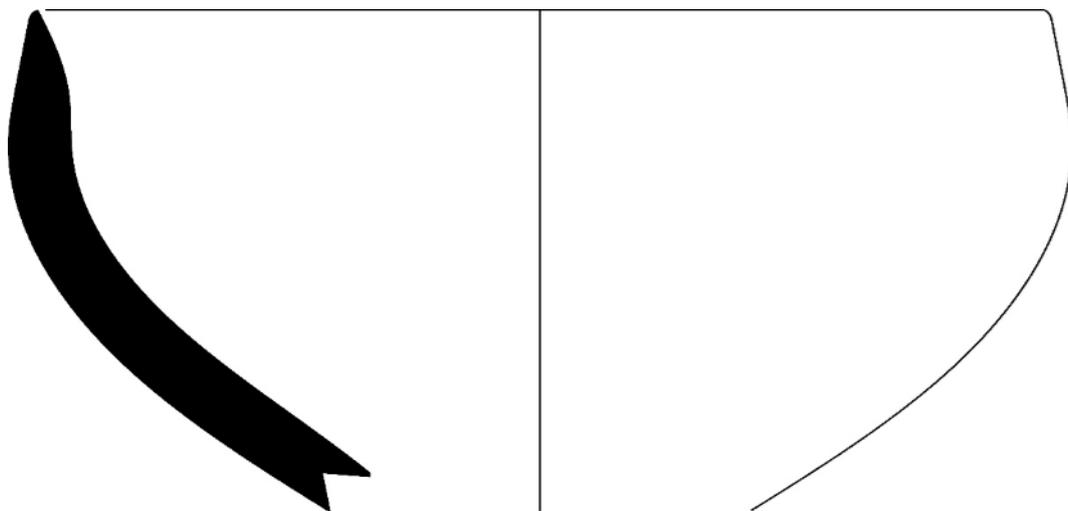


S3: 1435

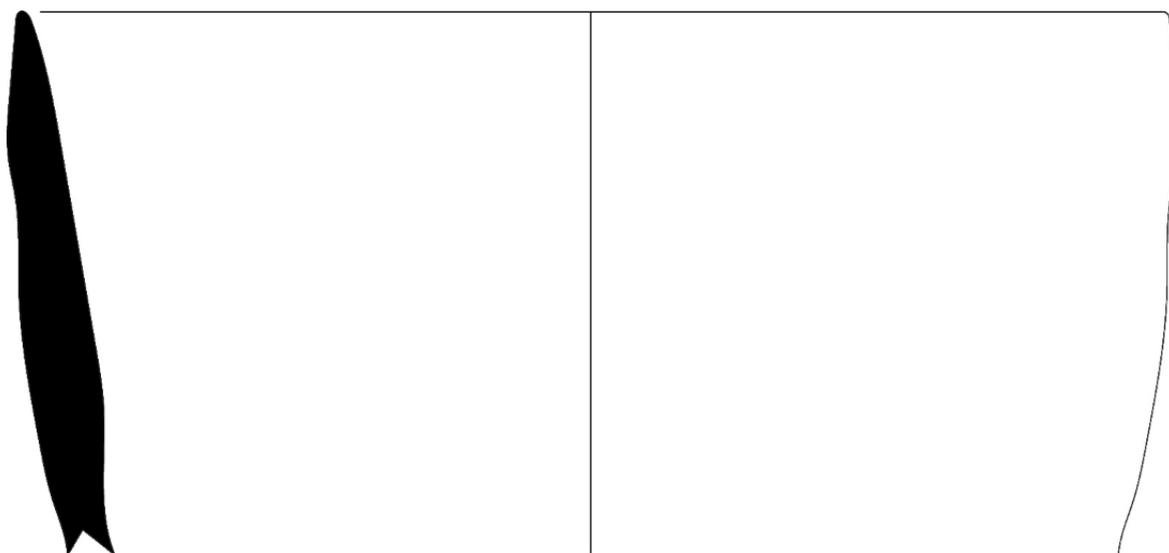


S3: 1389



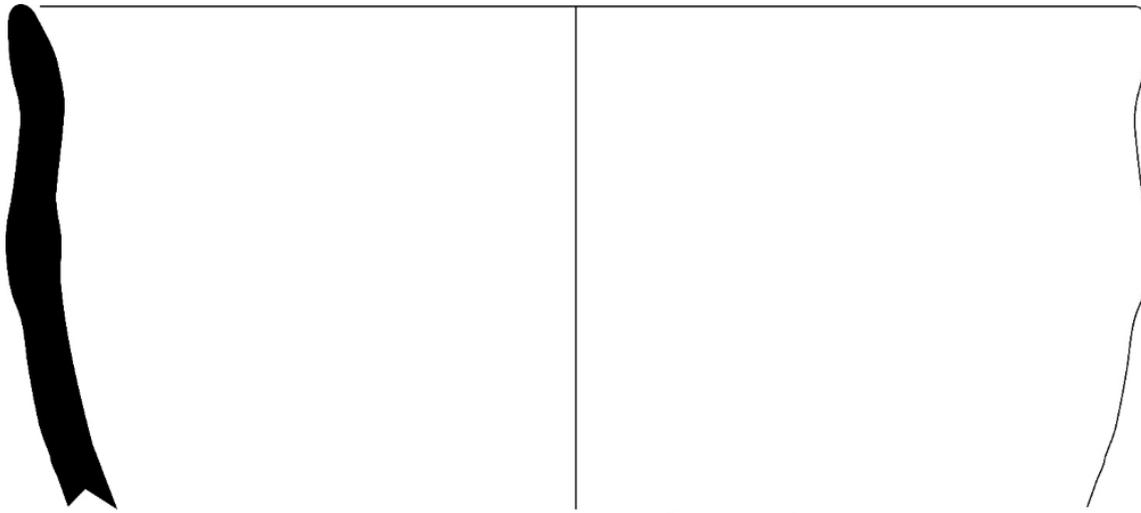


S3: 1379

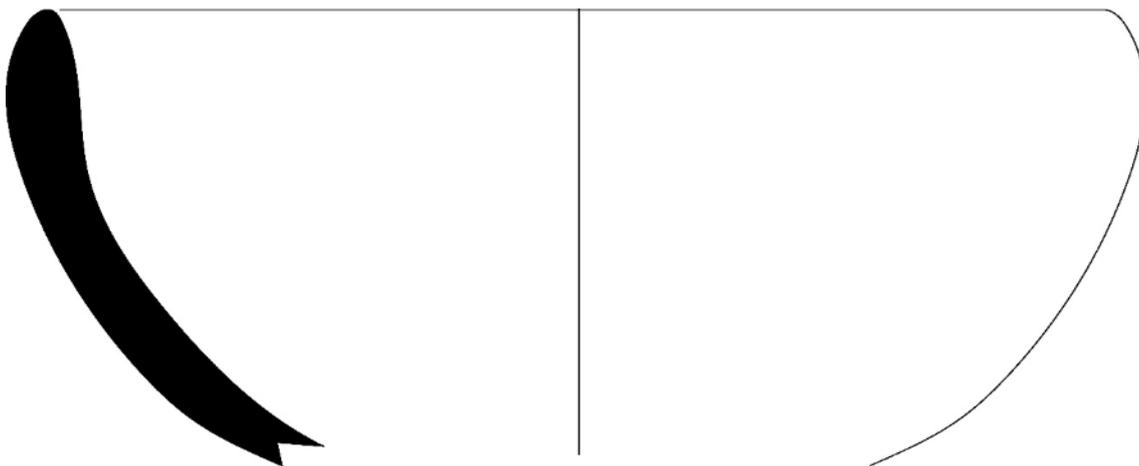


S3: 1450



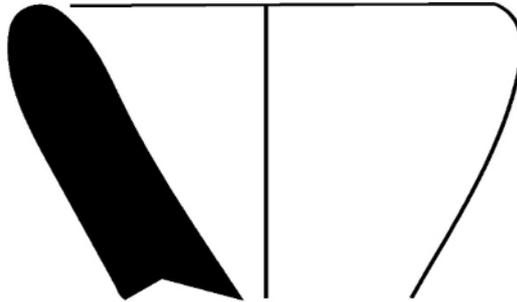


S3: 4399

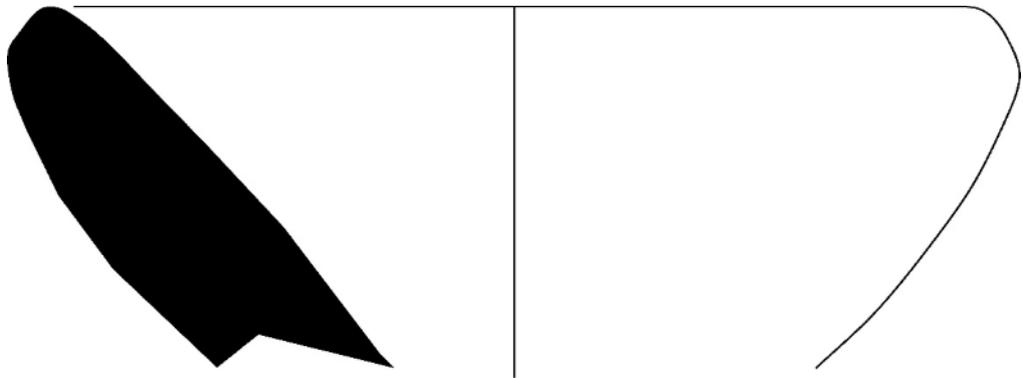


S3: 2616



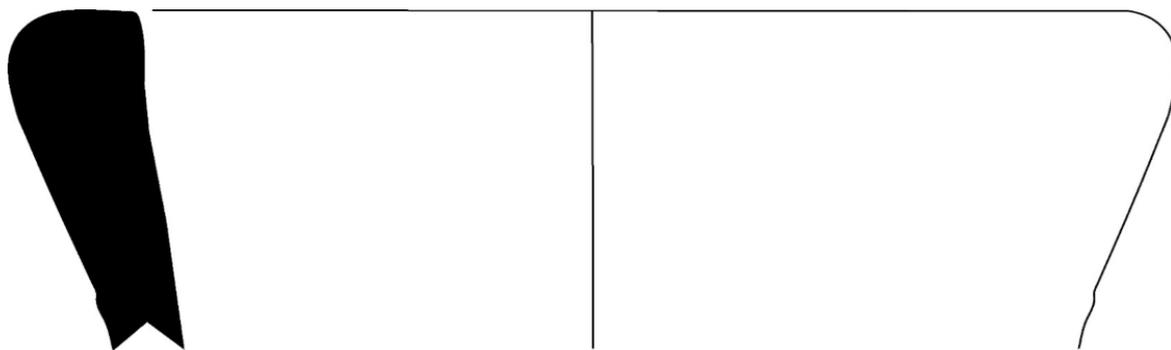


S2: 1027

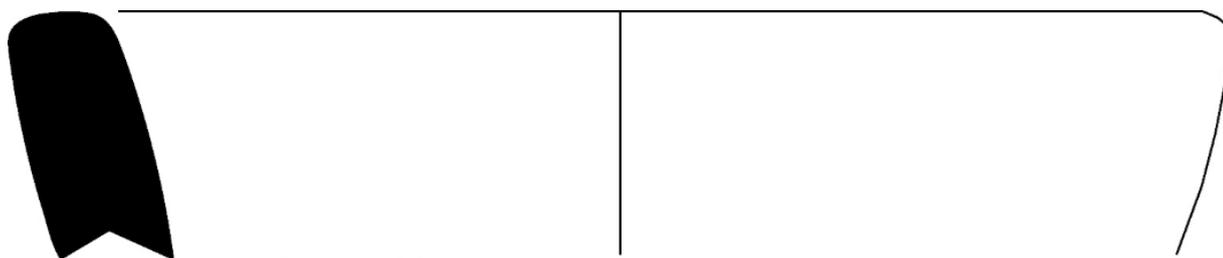


S2: 1024

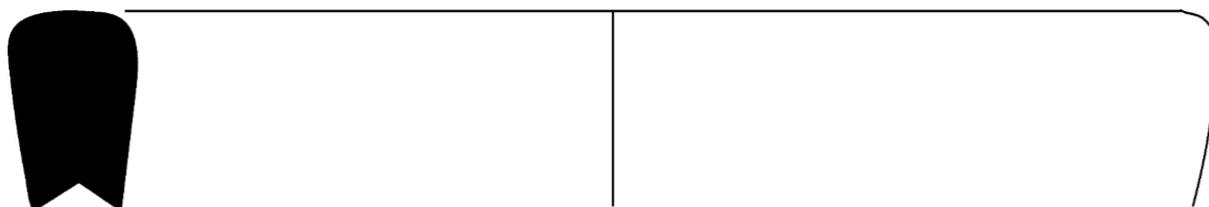




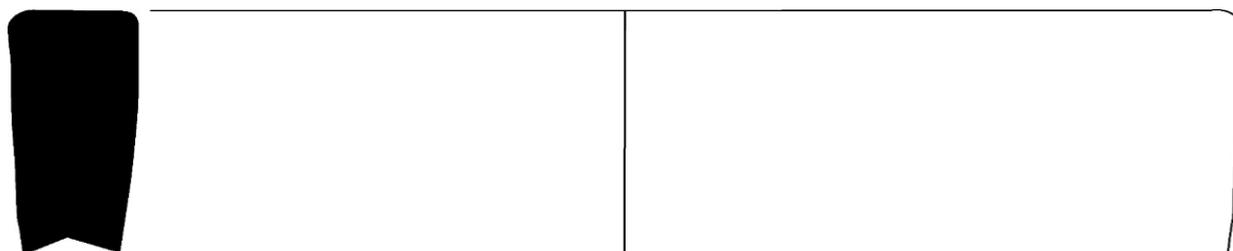
S2: 2187



S2: 1034

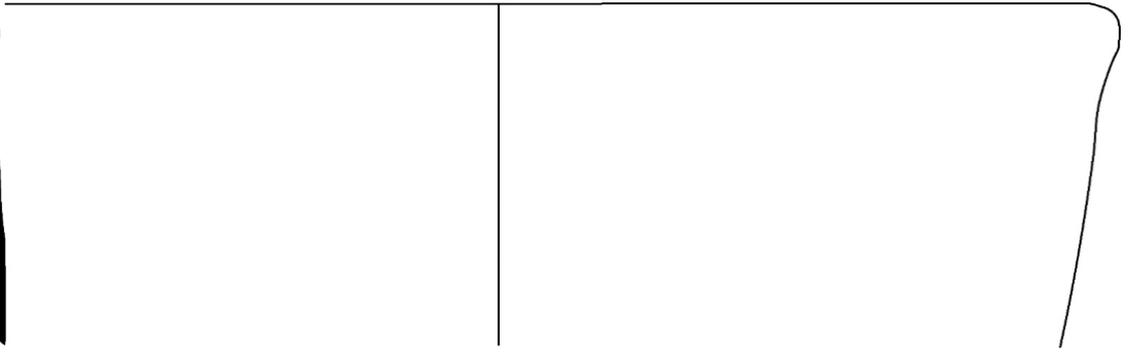


S2: 1033

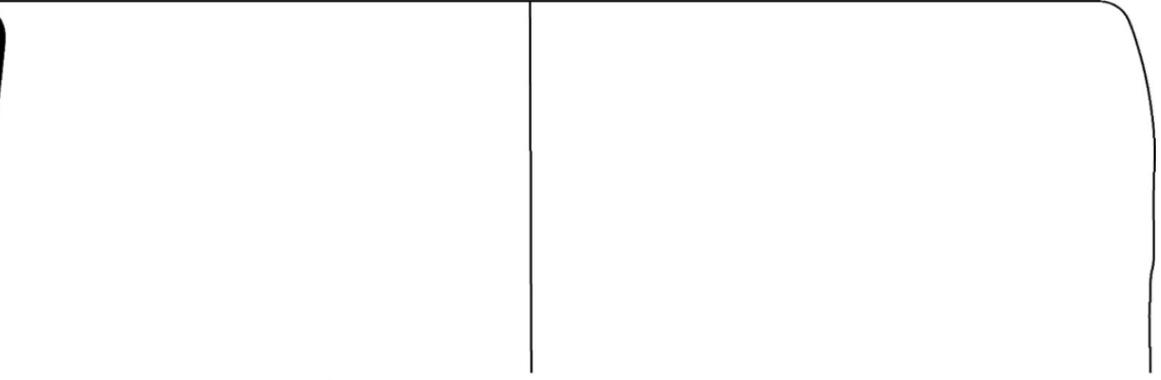


S2: 3192

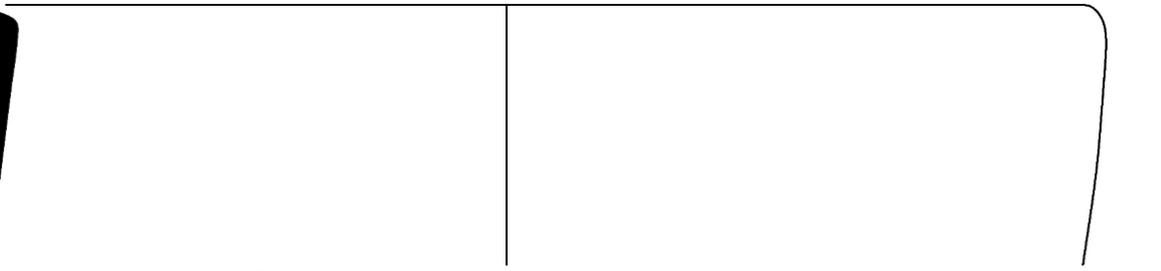




S2: 2451

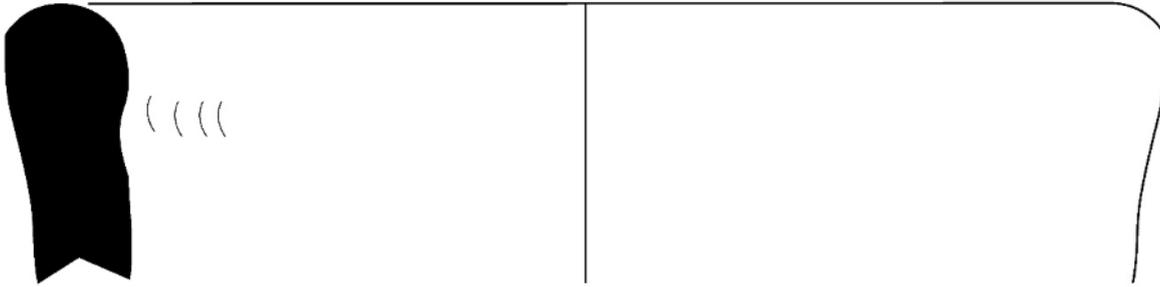


S2: 2450

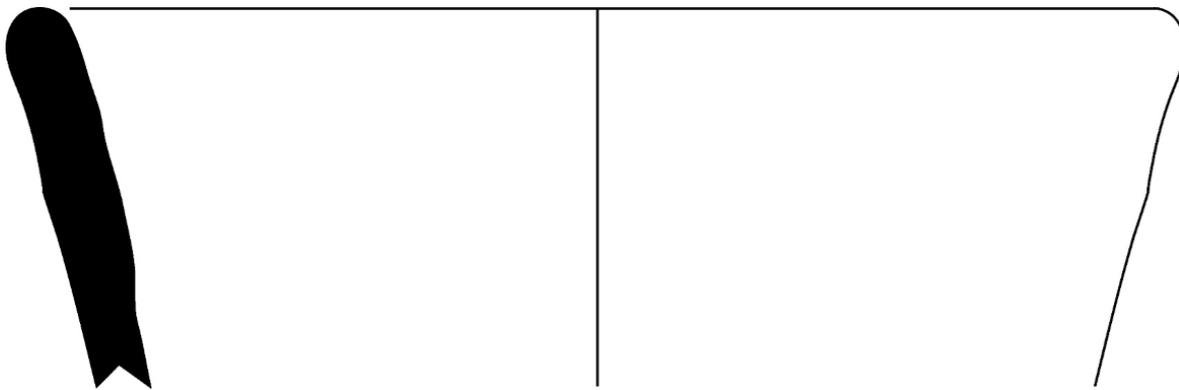


S2: 1640

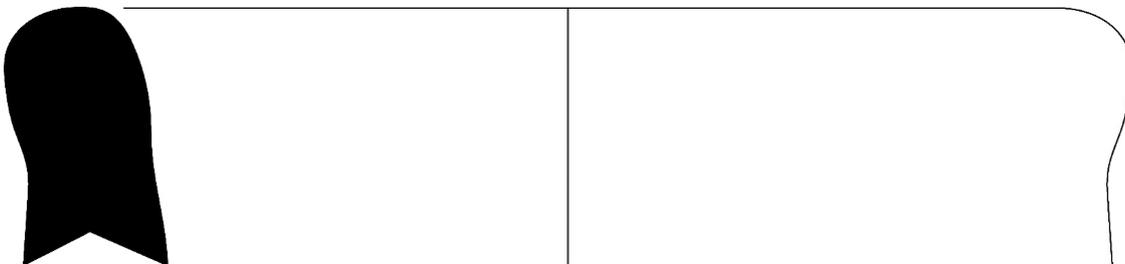




S2: 1007

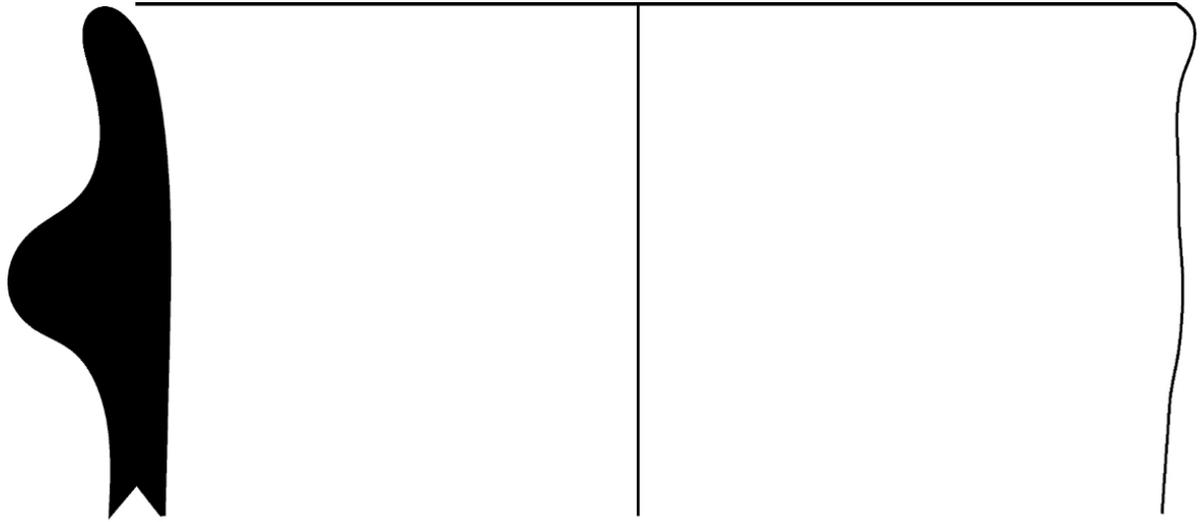


S2: 1353



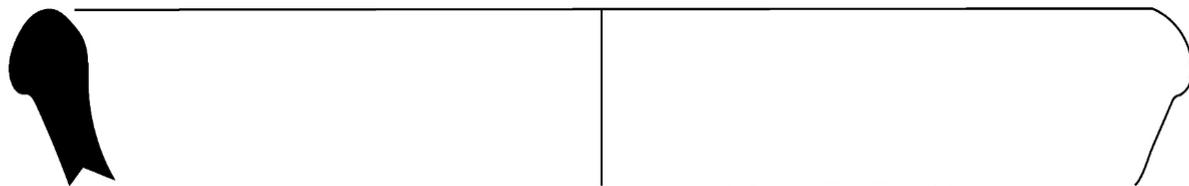
S2: 1324





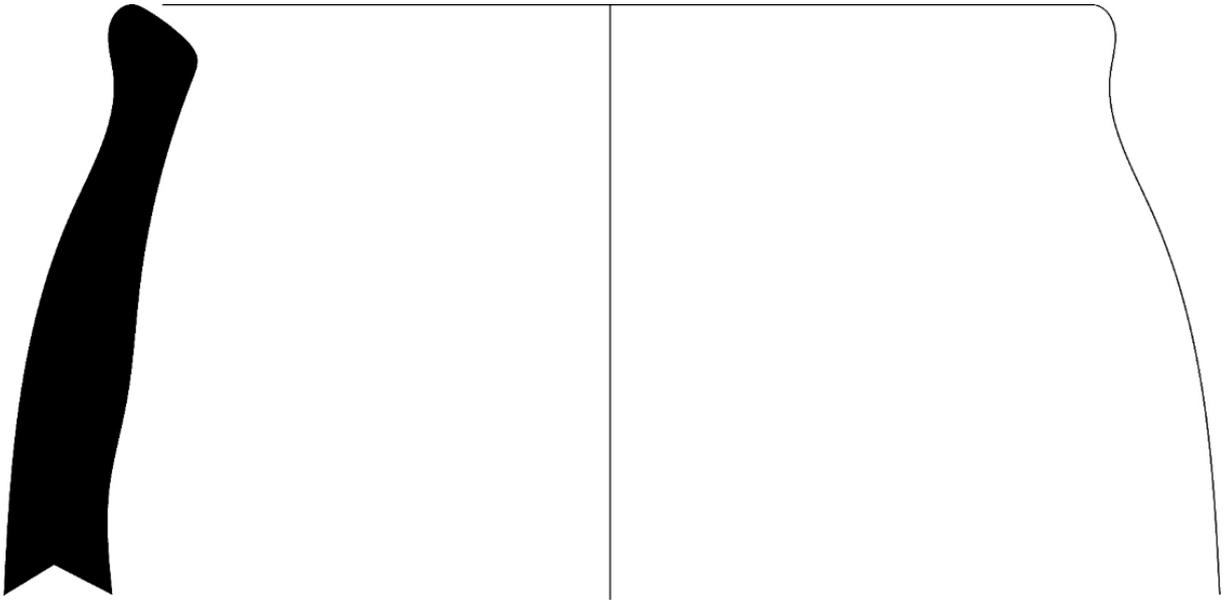
S2: 1341





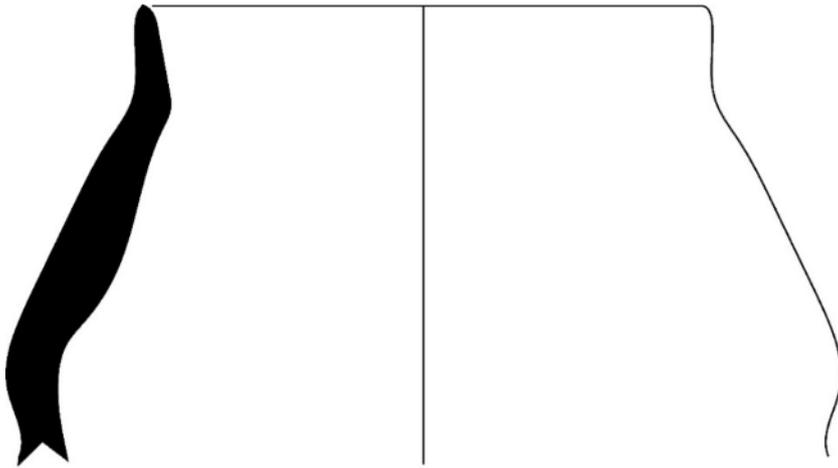
S2: 1026



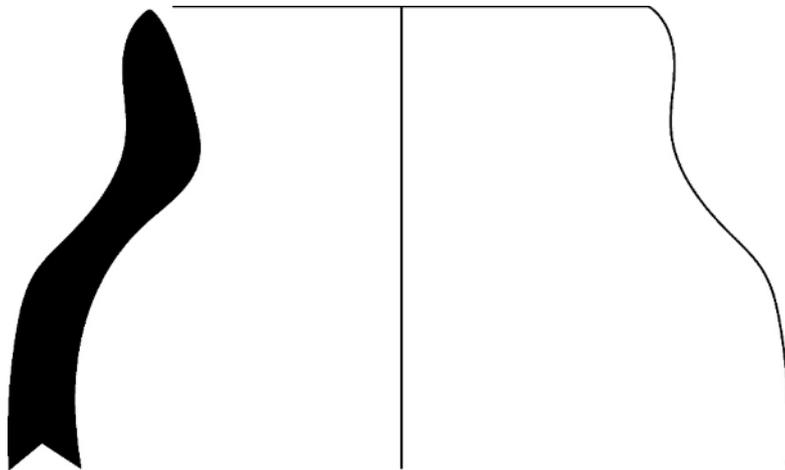


S2: 1322

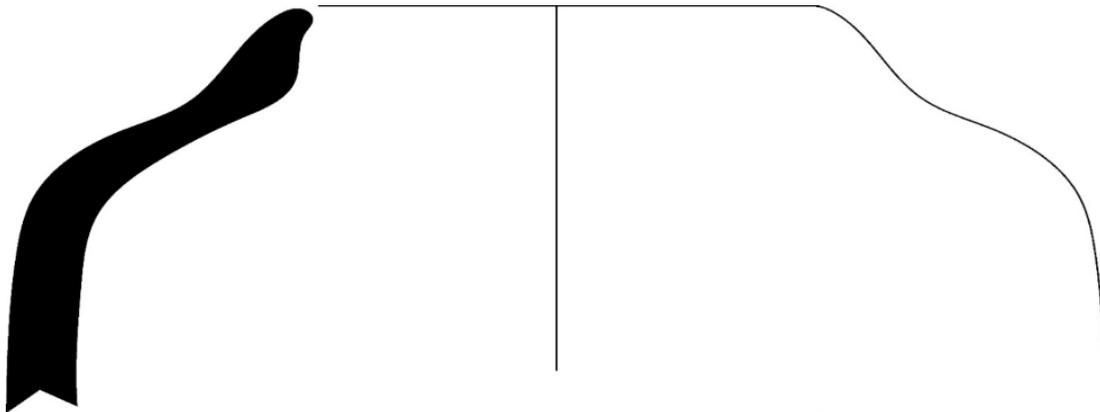




S3: 1492

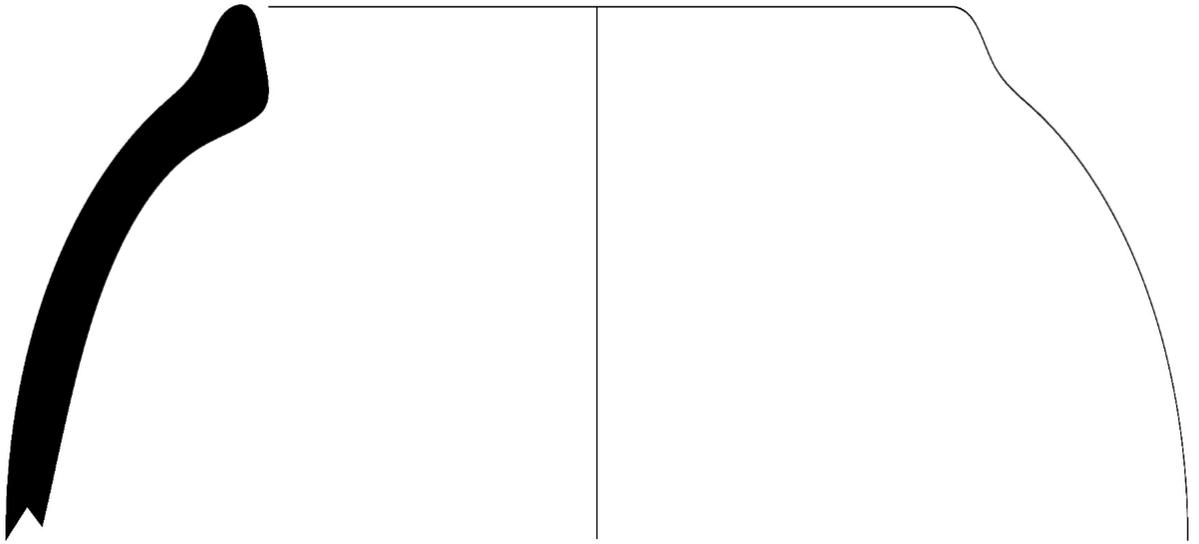


S3: 1436

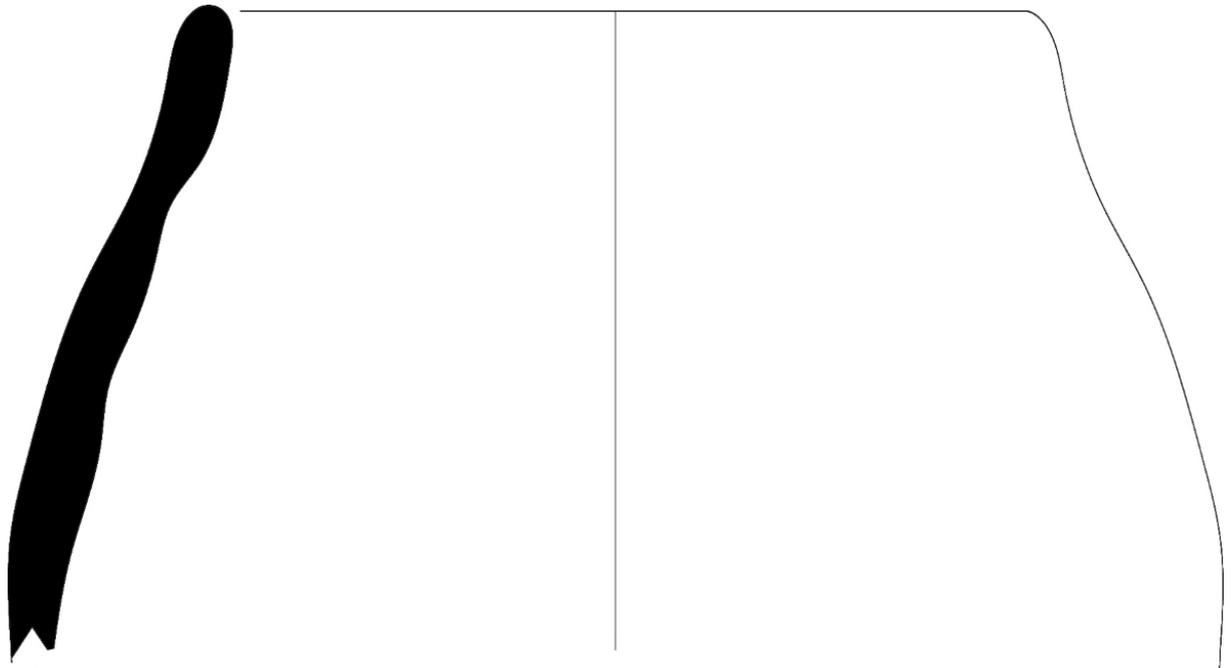


S3: 1528





S3: 1505



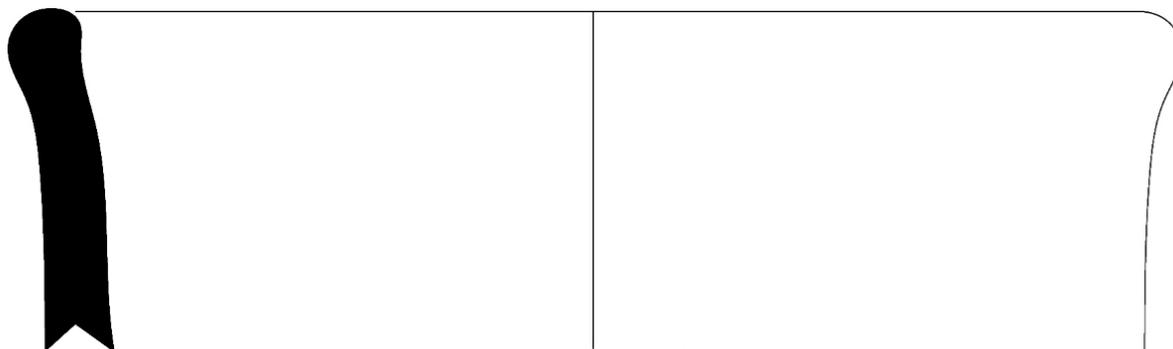
S3: 1442



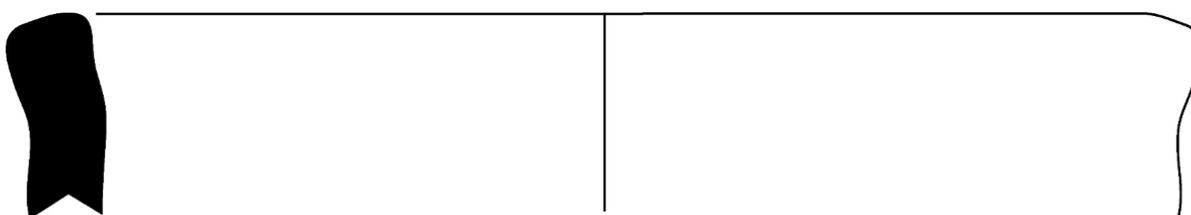
Rim - Wheel-made

Plate 56

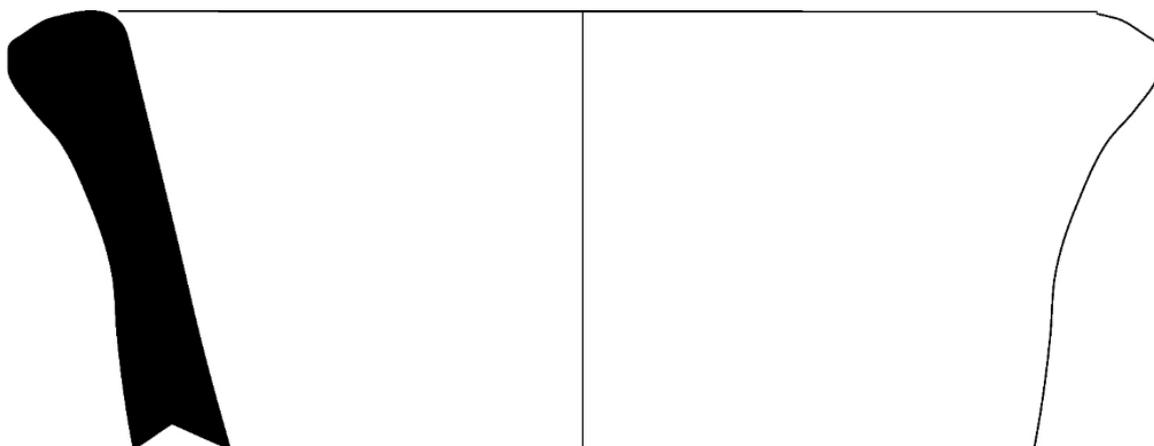
Type WM-A: Rim - Wheel-made



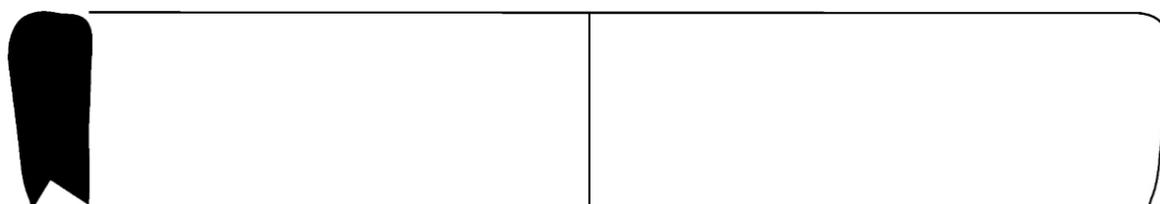
S2: 1326



S2: 2153

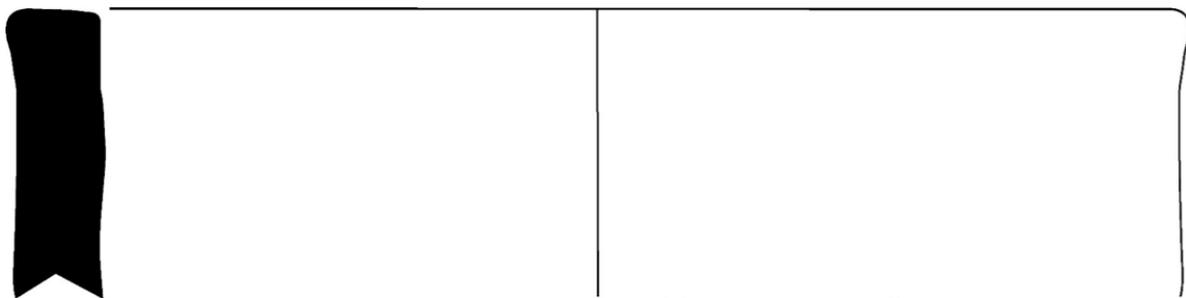


S2: 2186

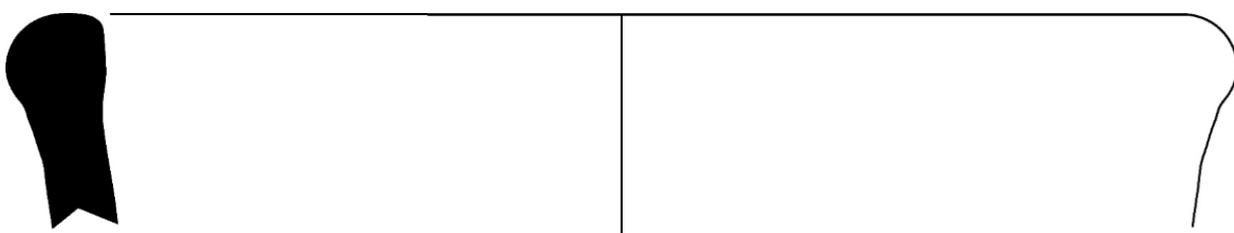


S2: 3127

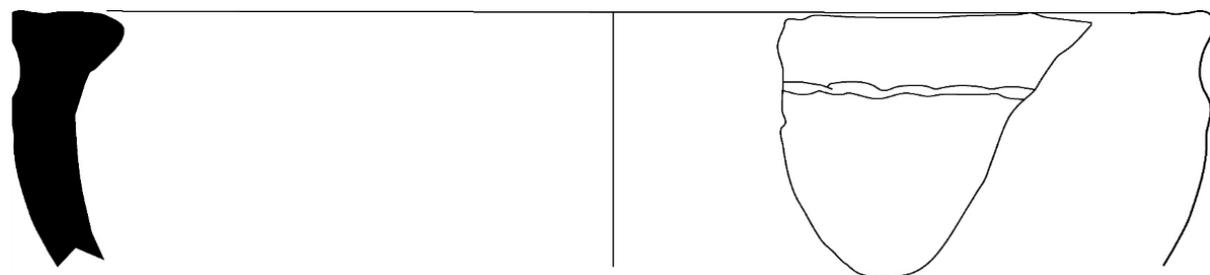




S2: 3128

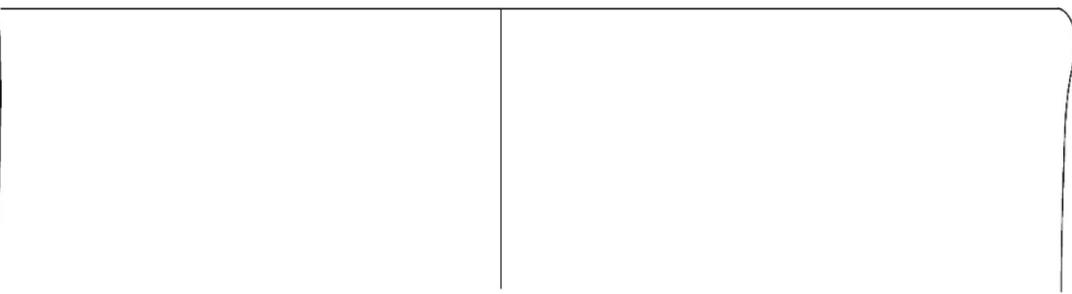


S2: 3286

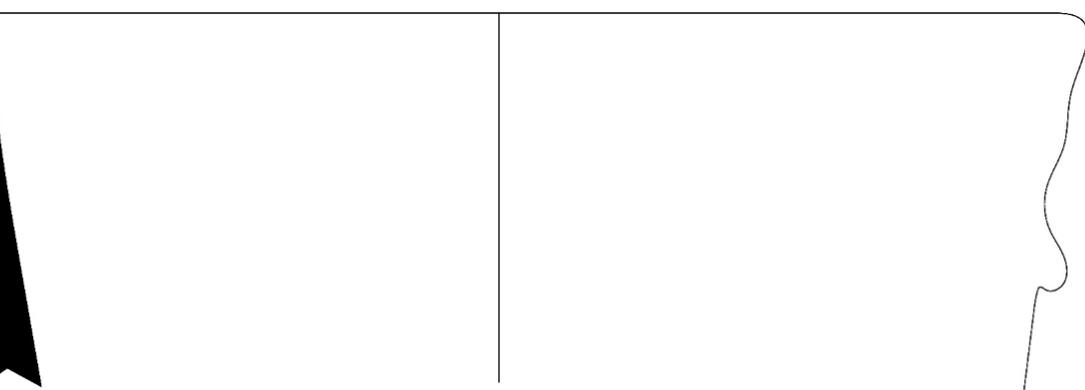


S2: 3565

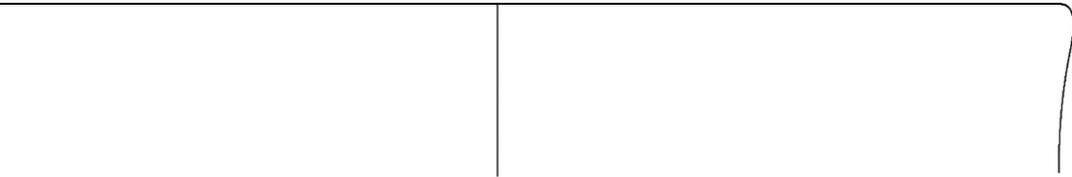




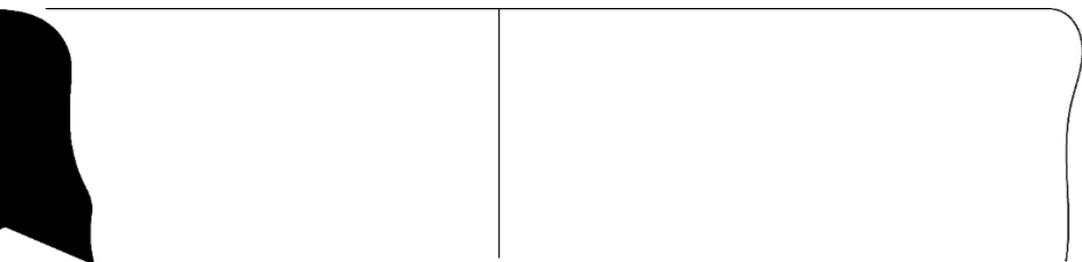
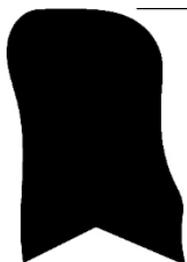
S3: 1471



S3: 1428

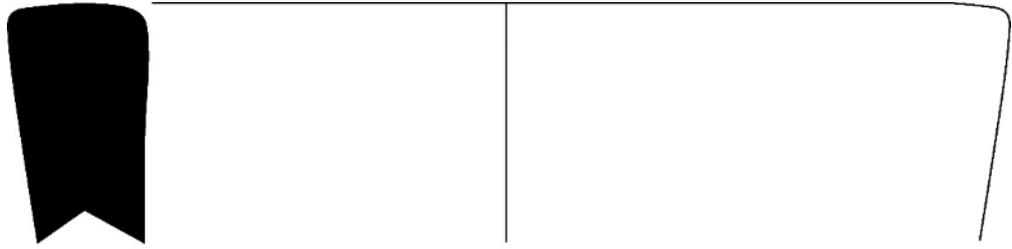


S3: 4267

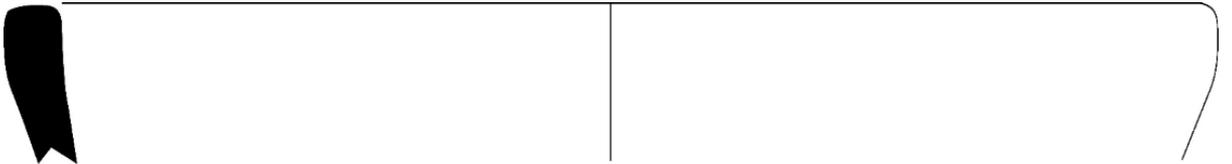


S3: 1512

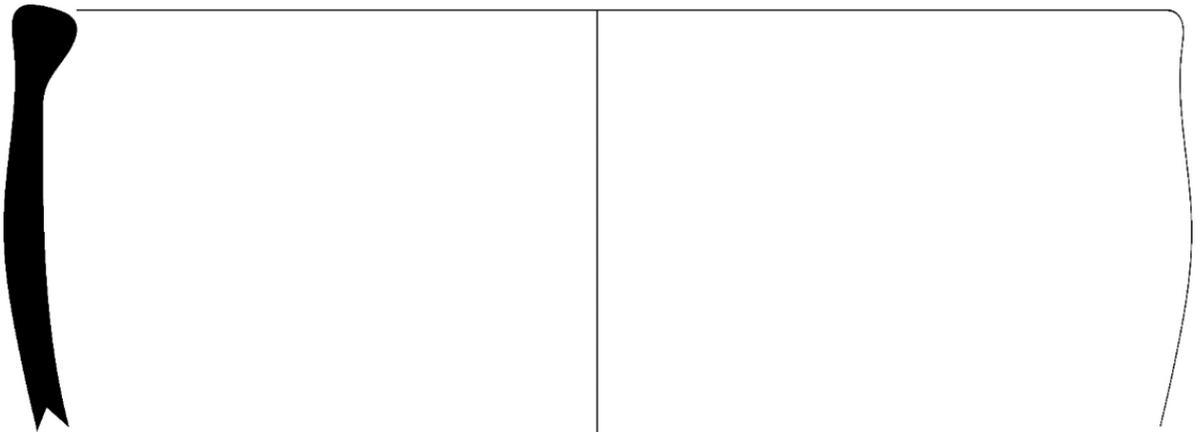




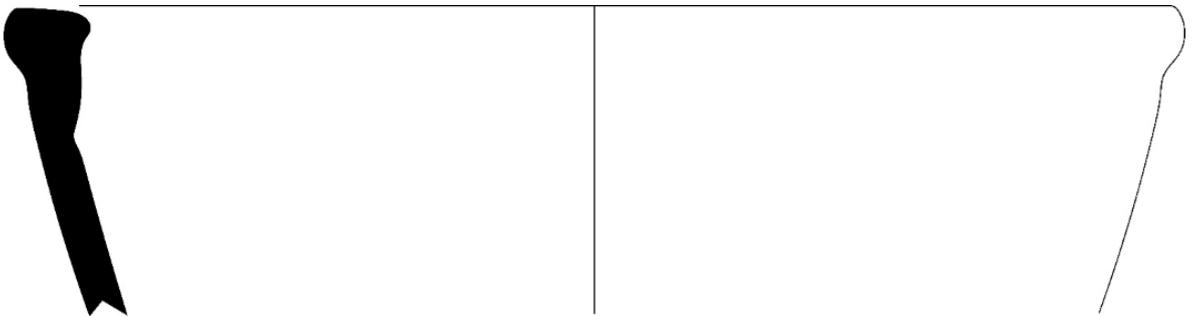
S3: 1390



S3: 1531

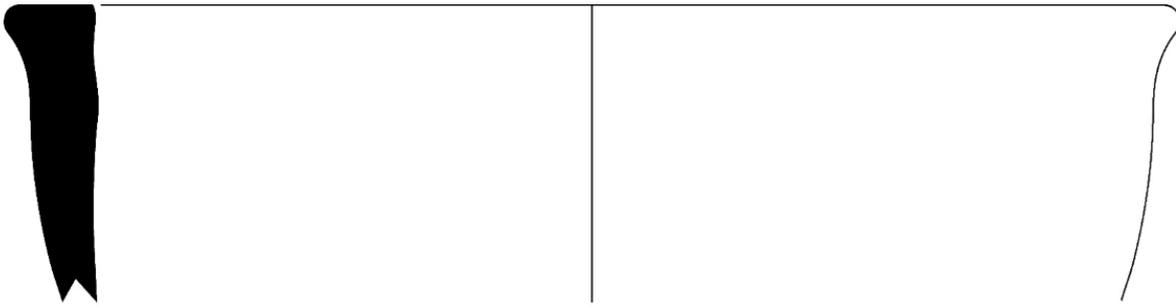


S3: 1529

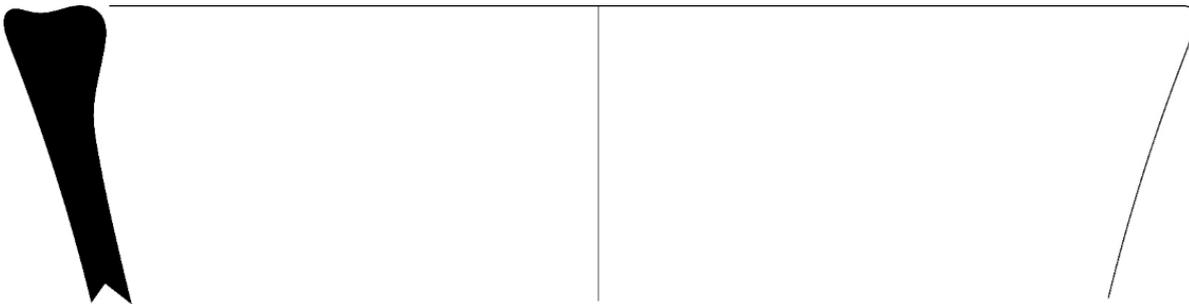


S3: 1422

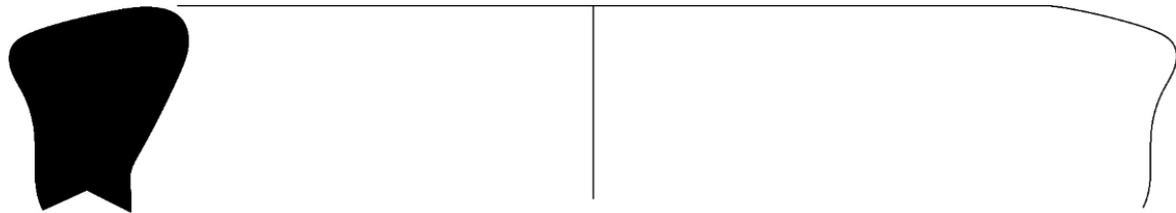




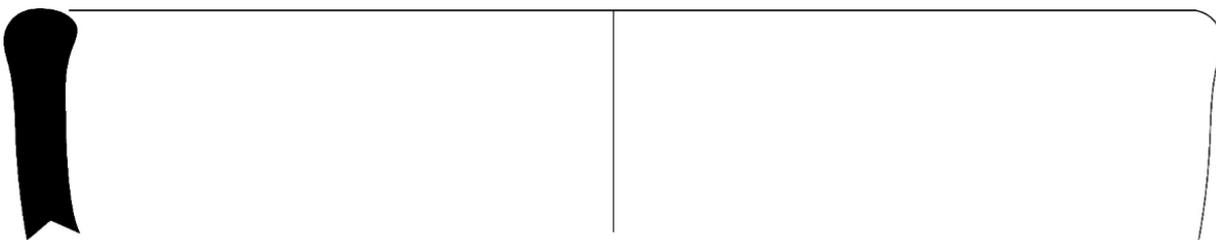
S3: 4268



S3: 1418

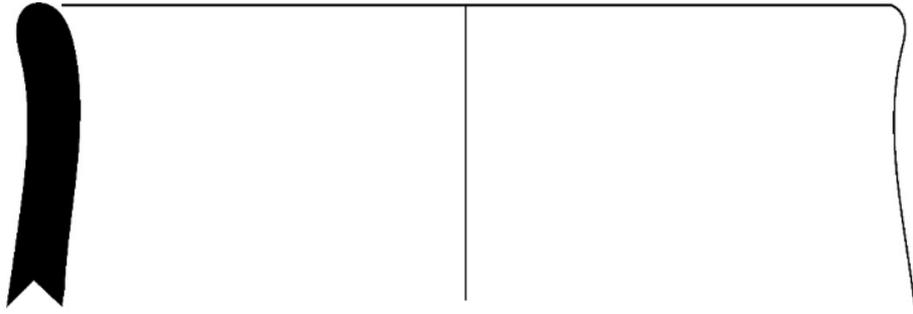


S3: 2271

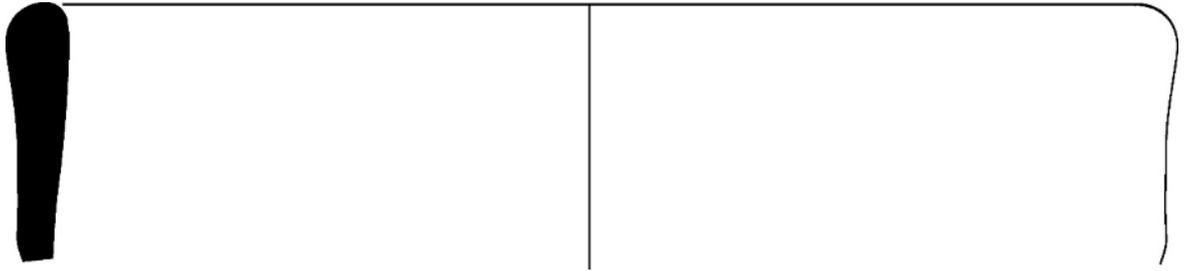


S3: 1477

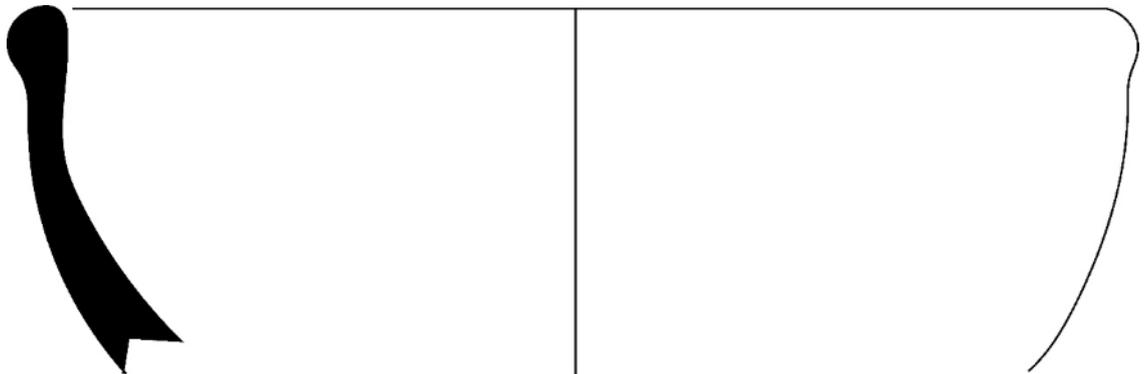




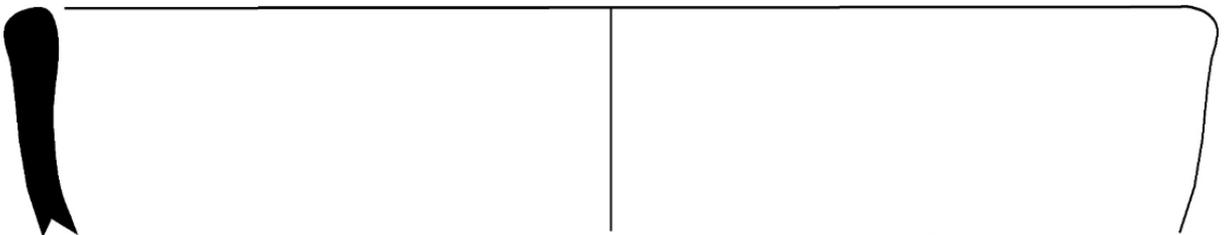
S2: 1226



S2: 1139

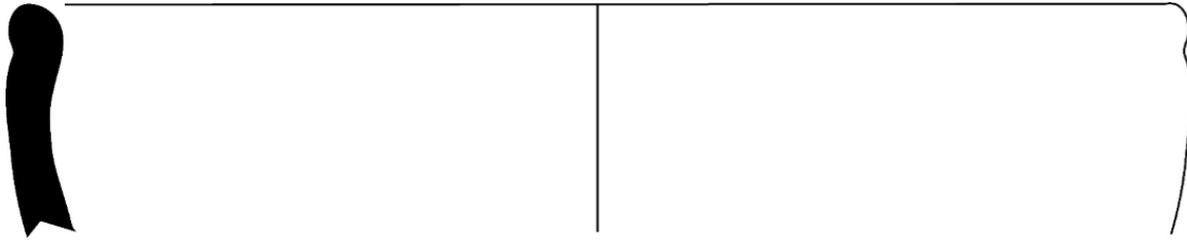


S2: 1259

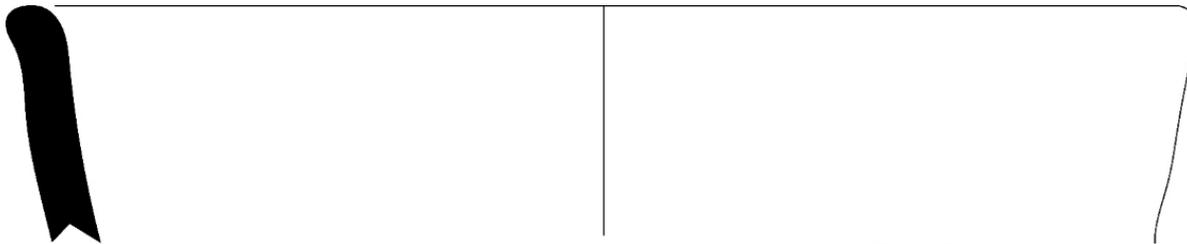


S2: 1486

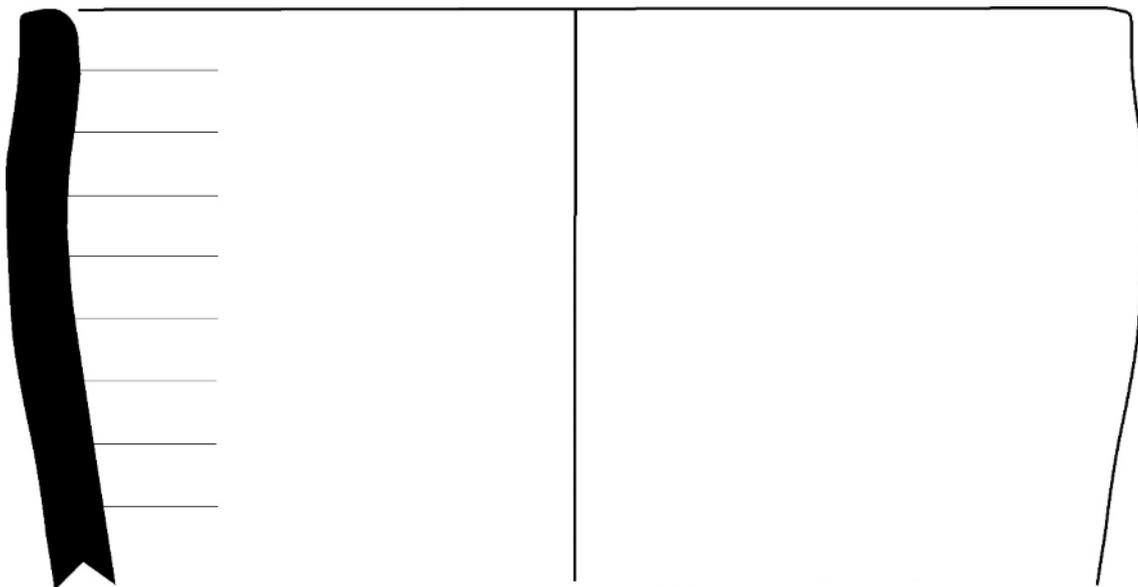




S2: 1512

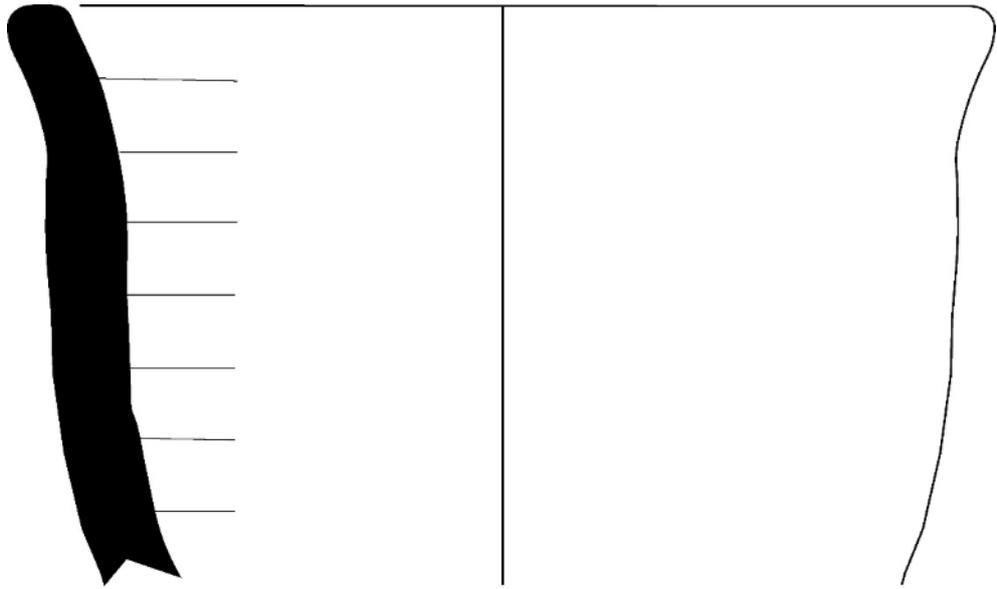


S2: 1281

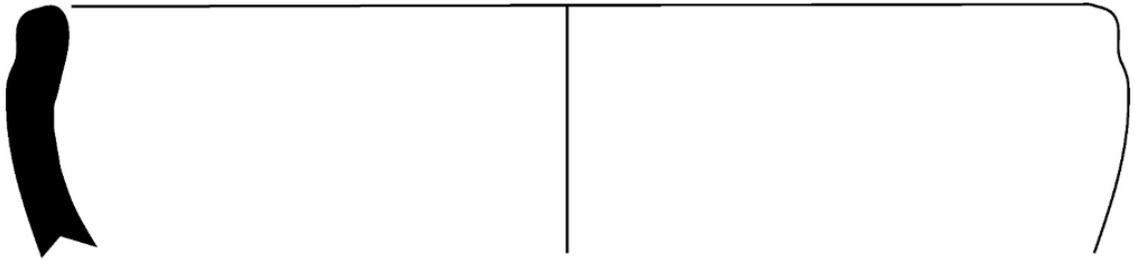


S2: 1120





S2: 1127

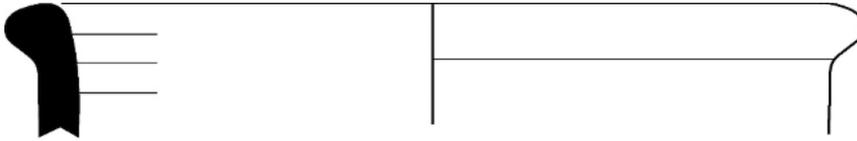


S2: 1123

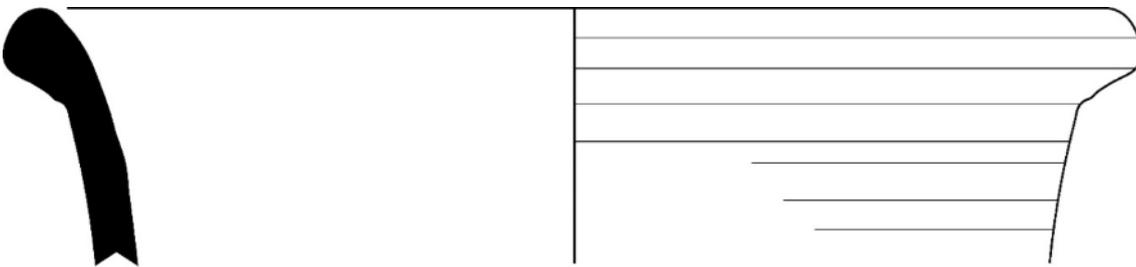




S2: 1206



S2: 1178



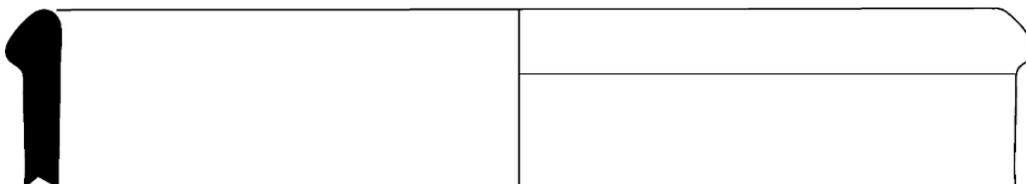
S2: 1212



S2: 1181

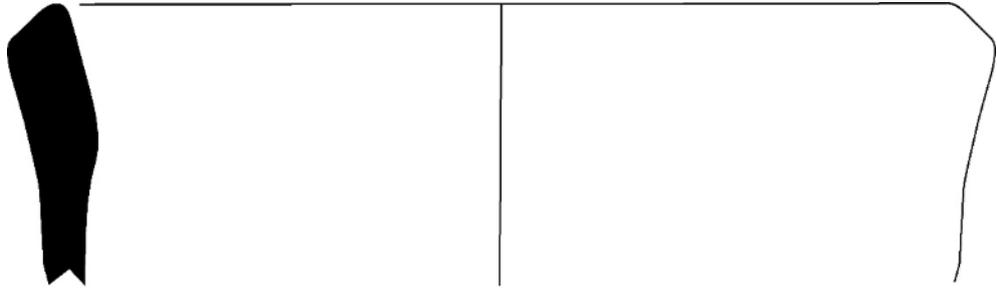


S2: 1105

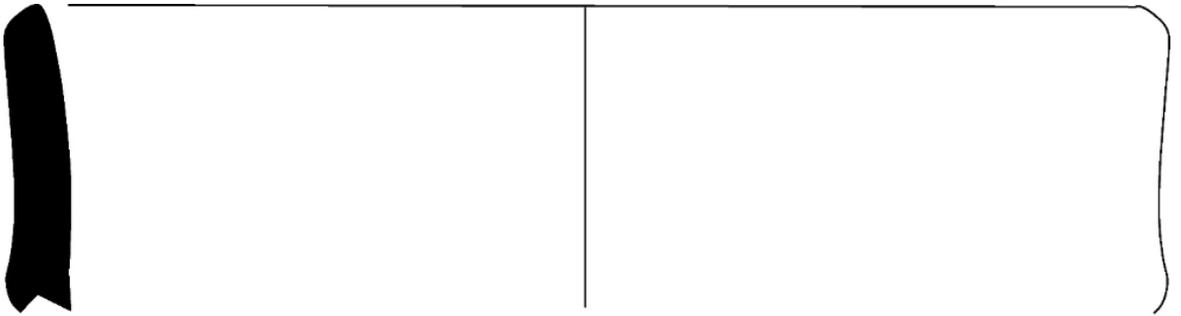


S2: 1112



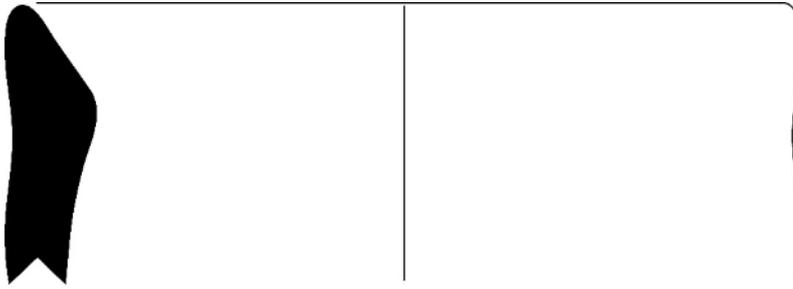


S2: 3195

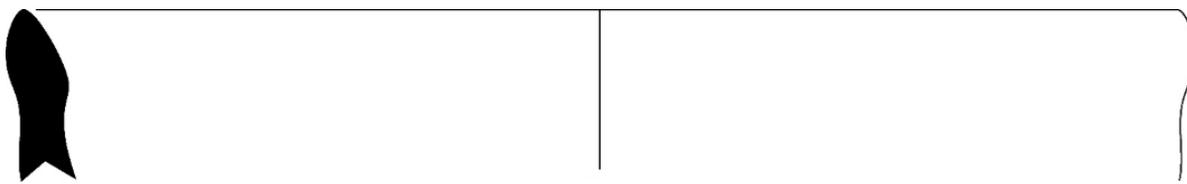


S2: 3191

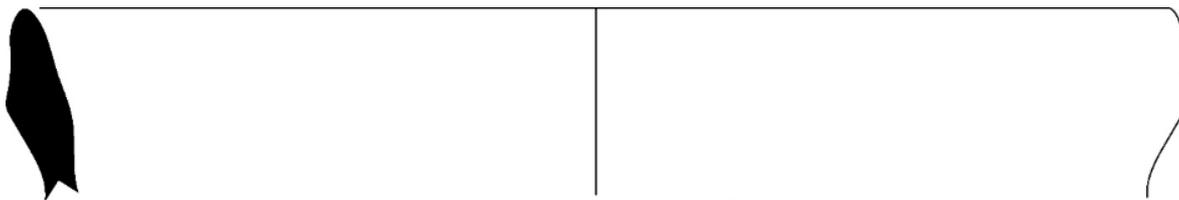




S3: 1046



S3: 1485

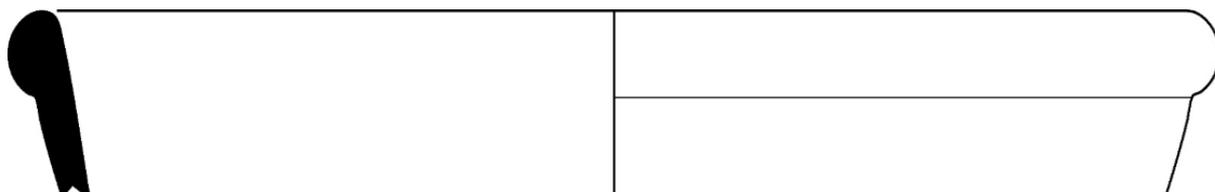


S3: 1405

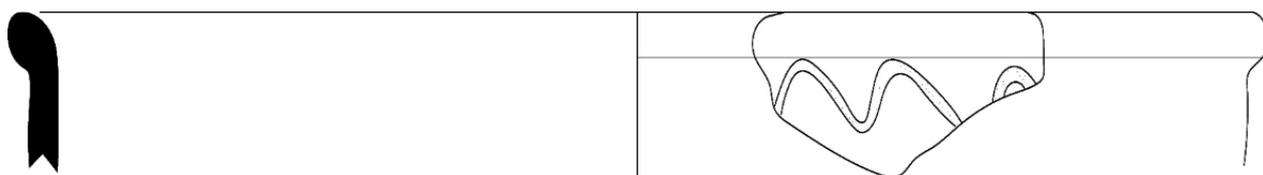




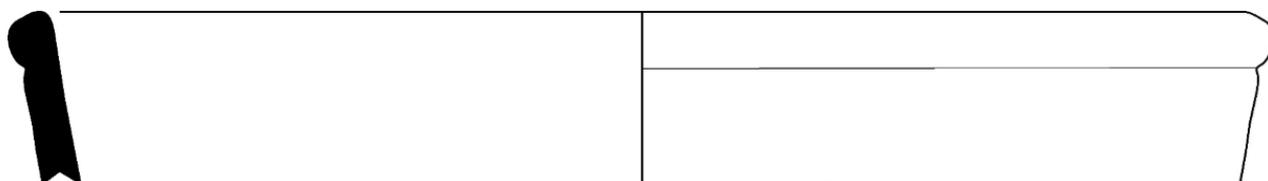
S2: 1246



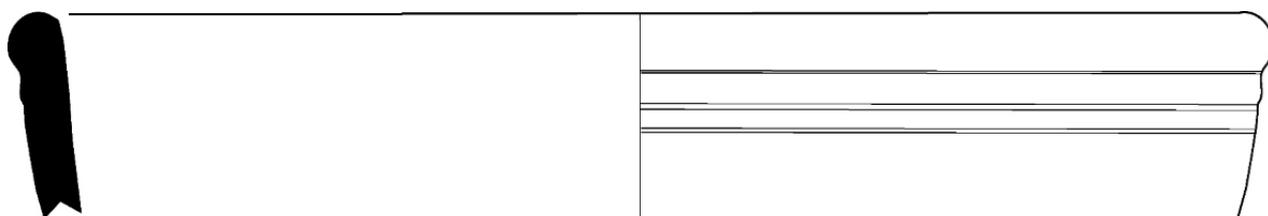
S2: 1148



S2: 1277

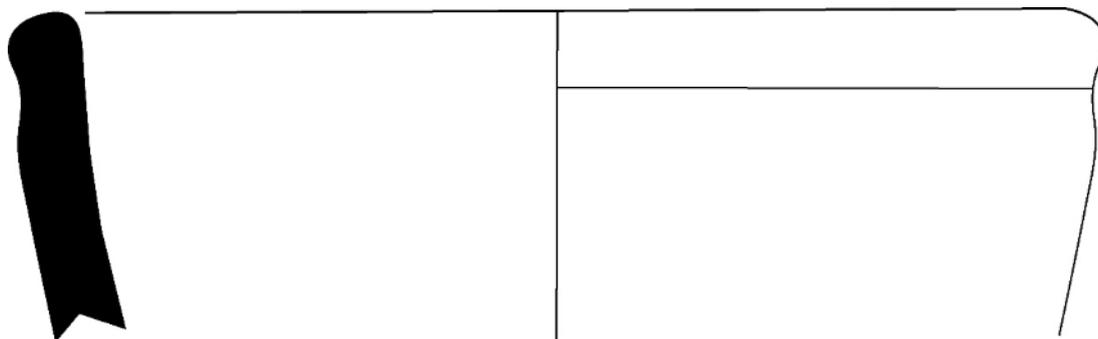


S2: 1423



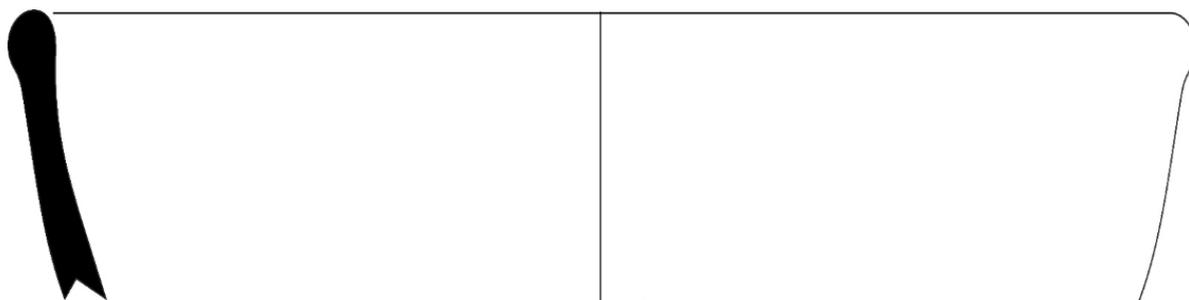
S2: 1513



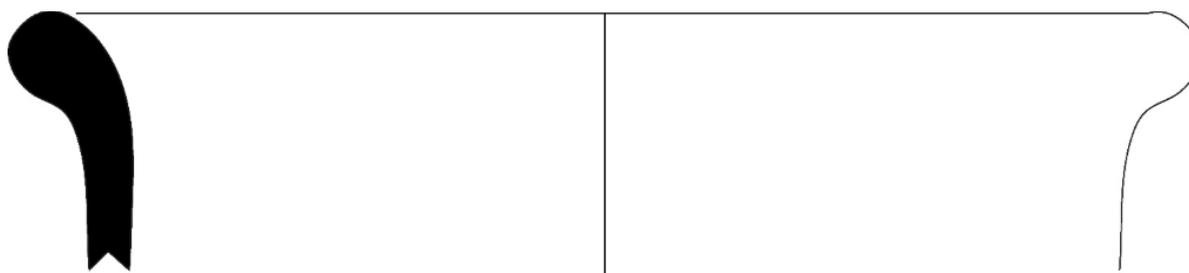


S2: 2154

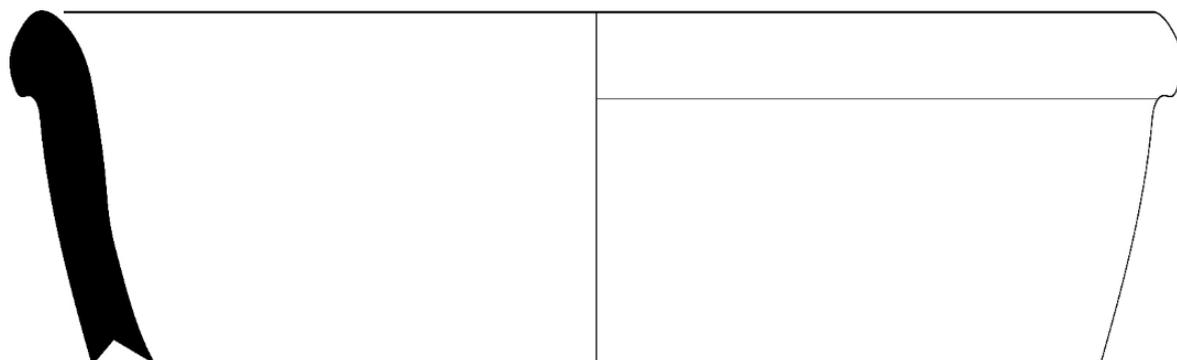




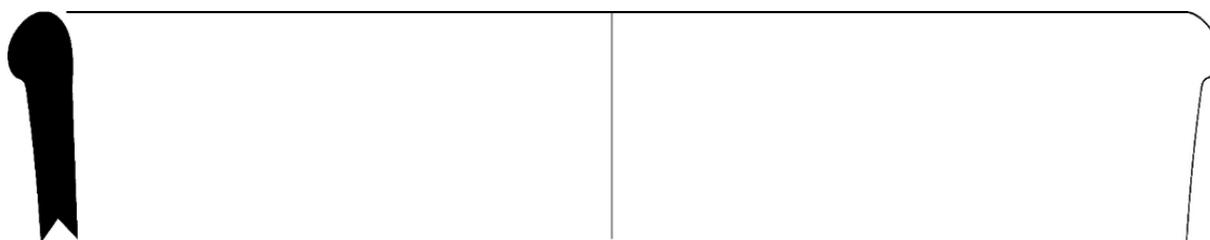
S3: 1427



S3: 2304

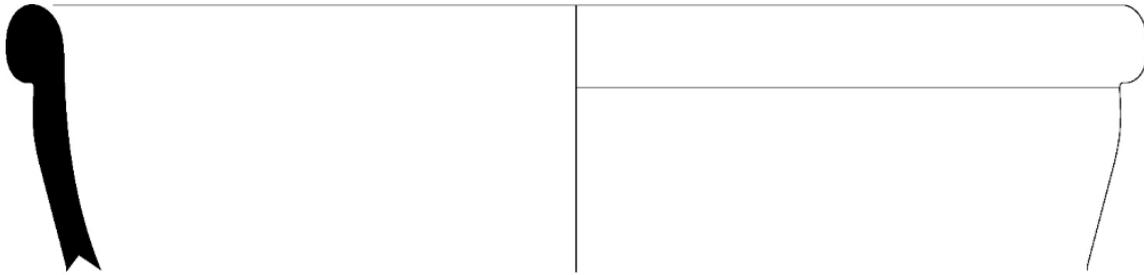


S3: 1464

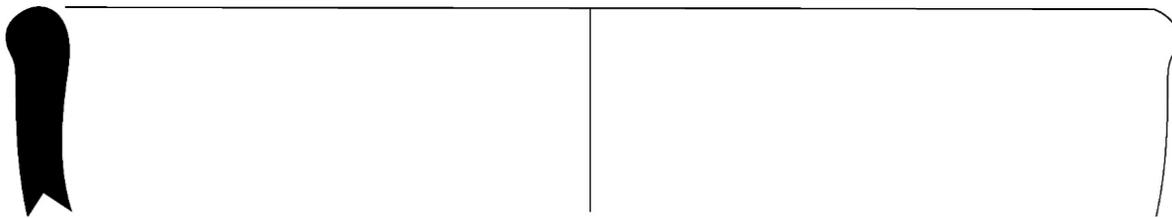


S3: 1417



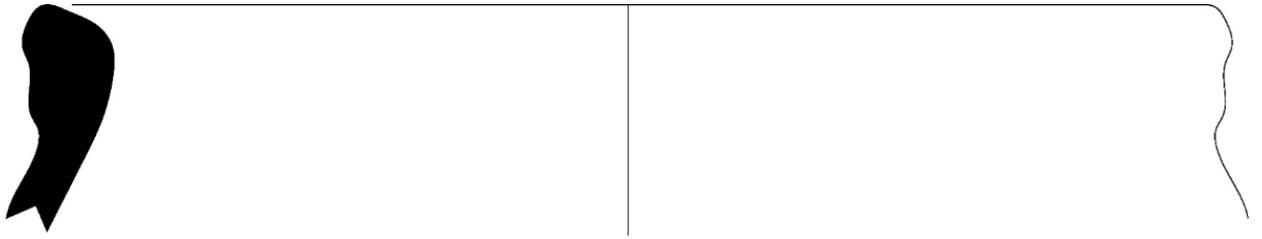


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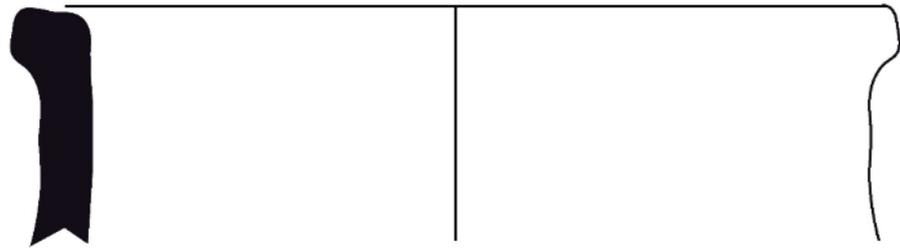


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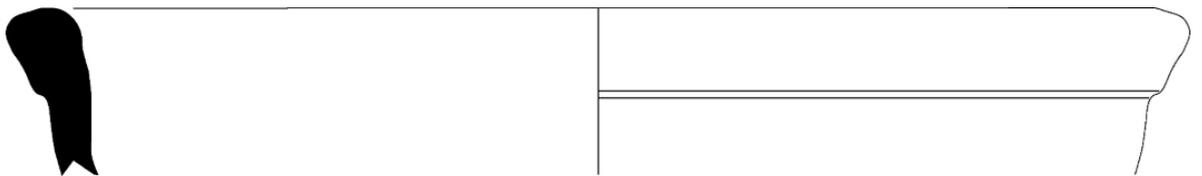




S2: 1290

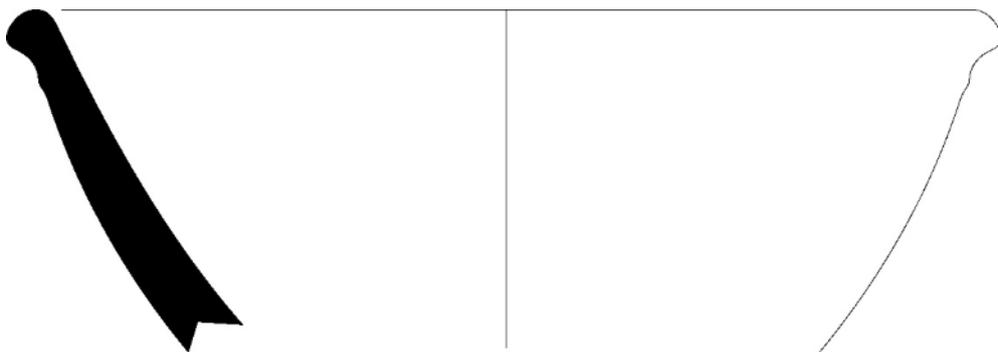


S2: 1003

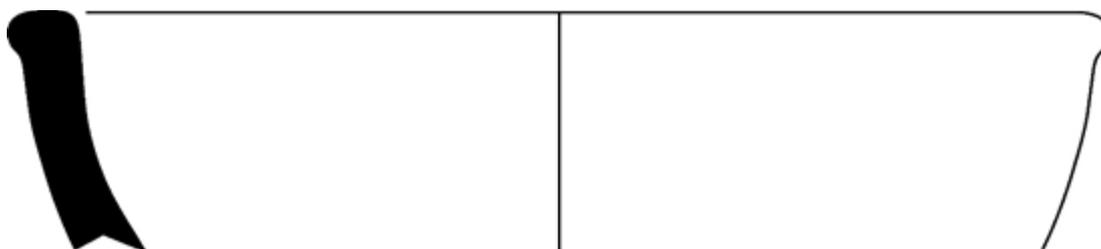


S2: 1514

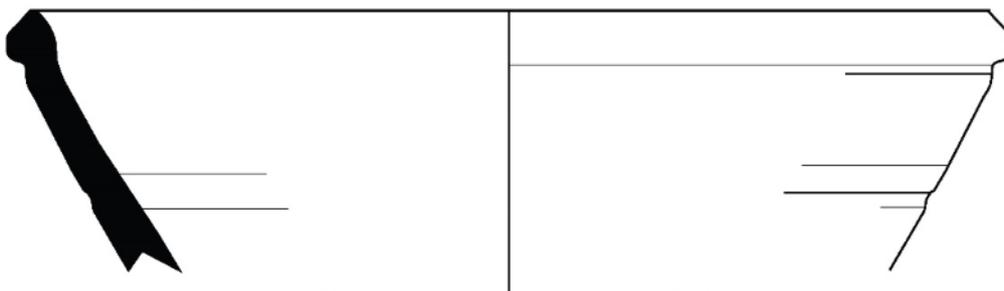




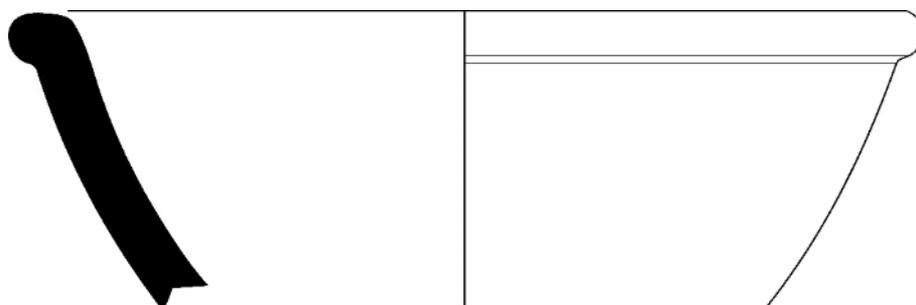
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S2: 1205

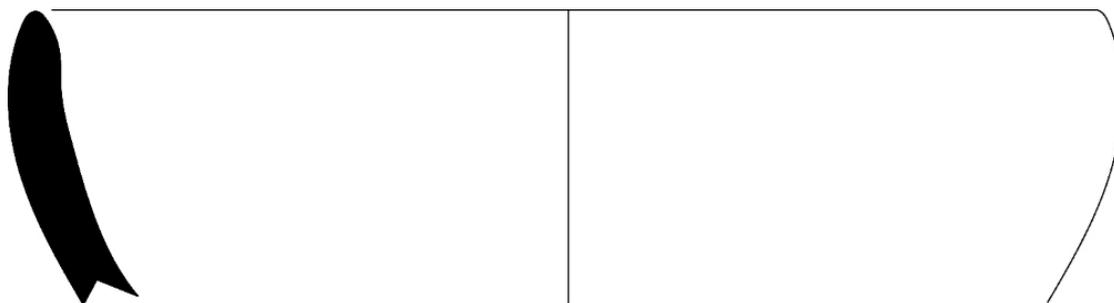


S2: 1004

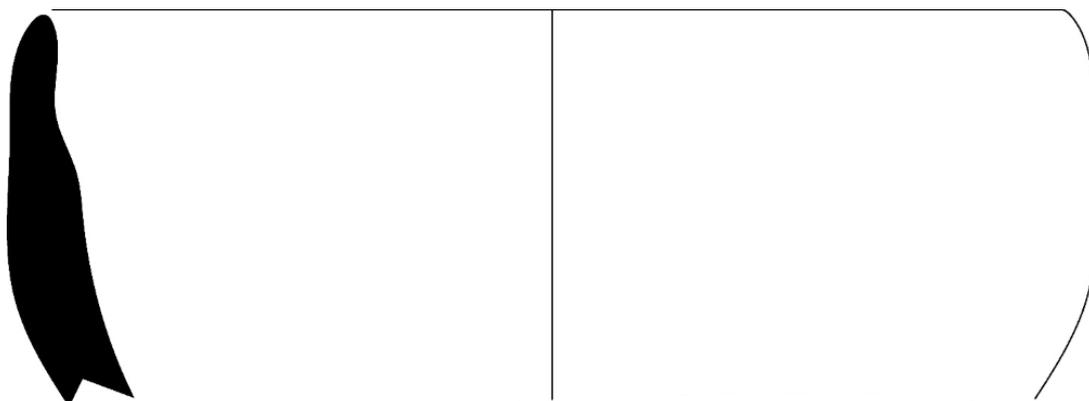


S2: 1035

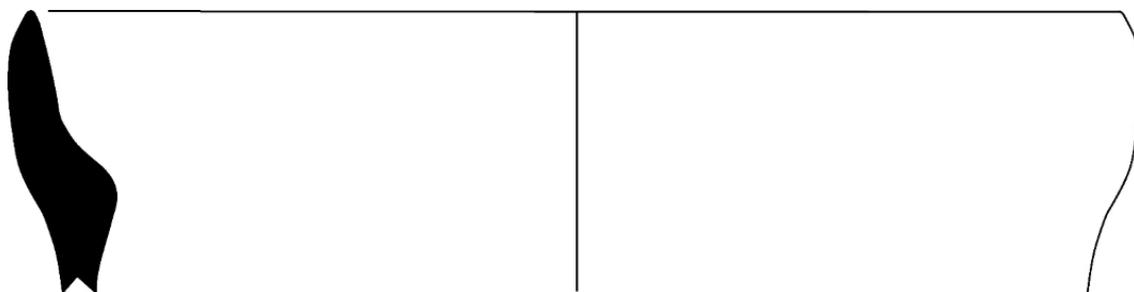




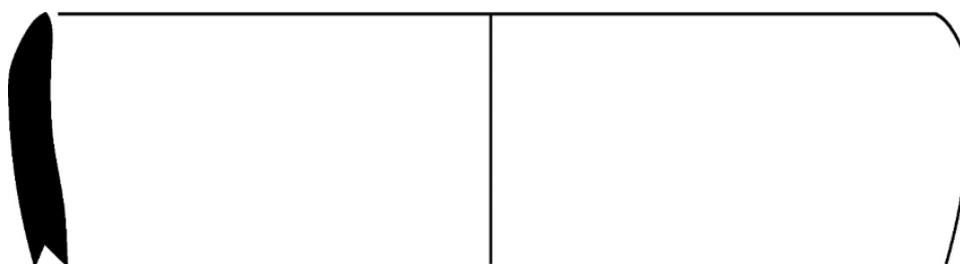
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S2: 1305

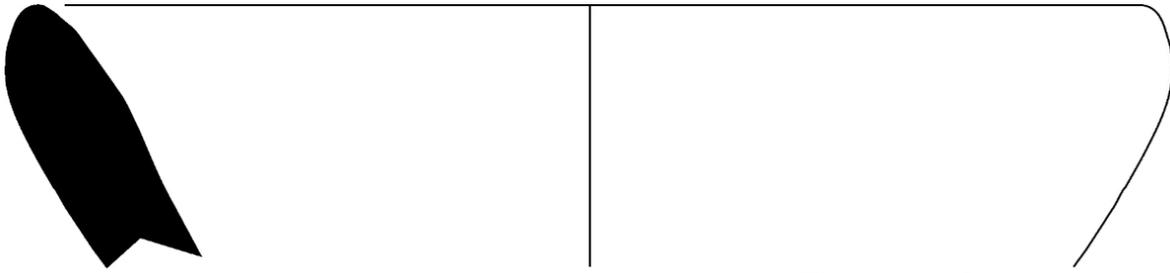


S2: 2190

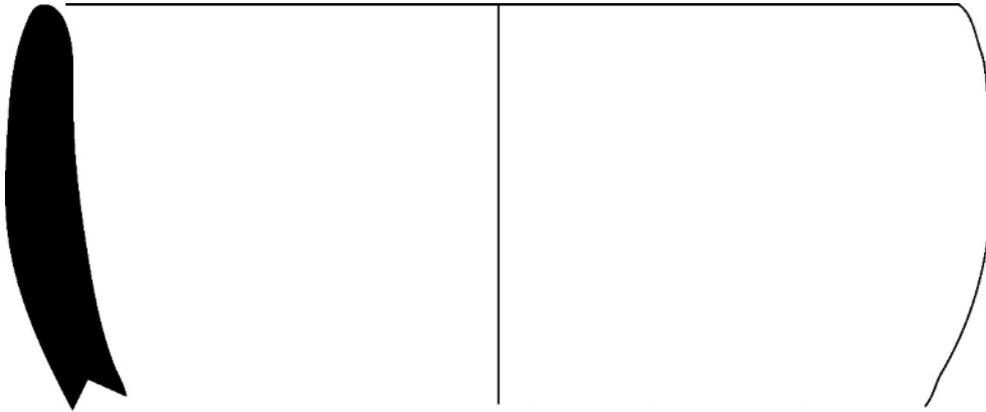


S2: 1346



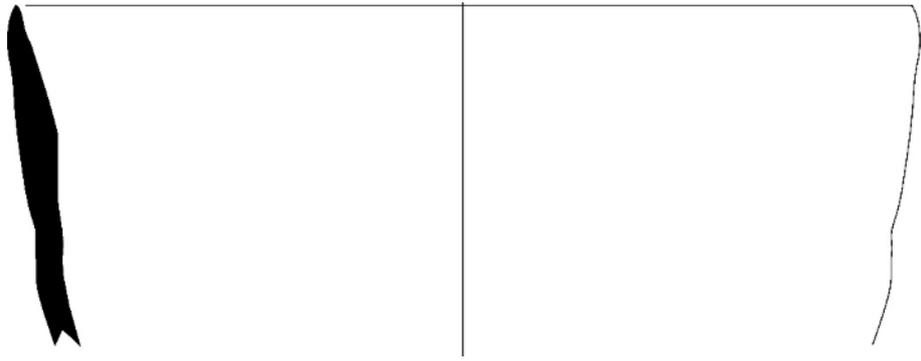


S2: 3193

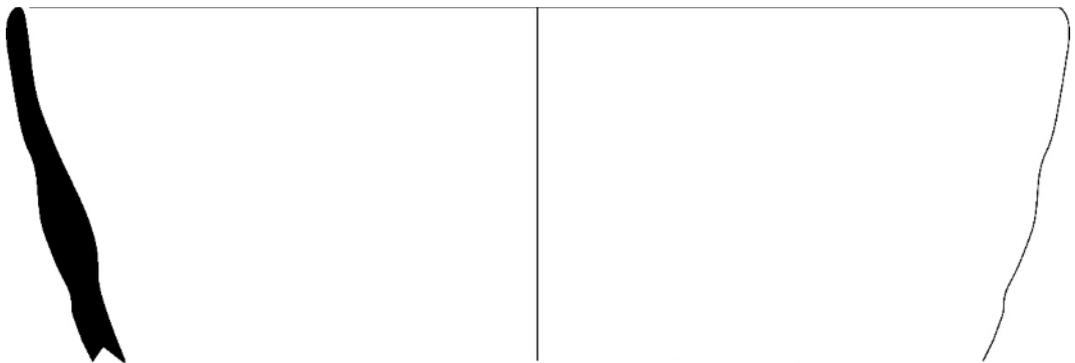


S2: 1036

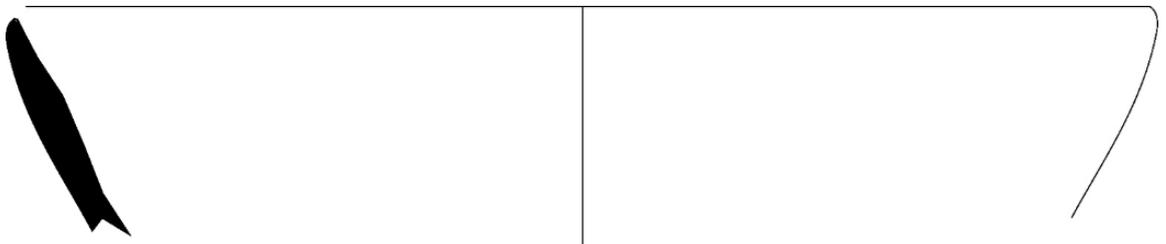




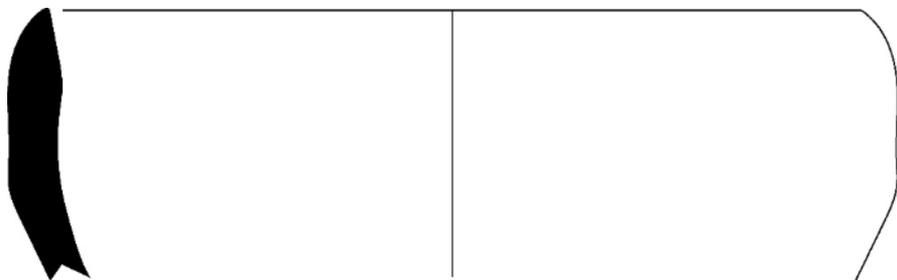
S3: 1042



S3: 1041

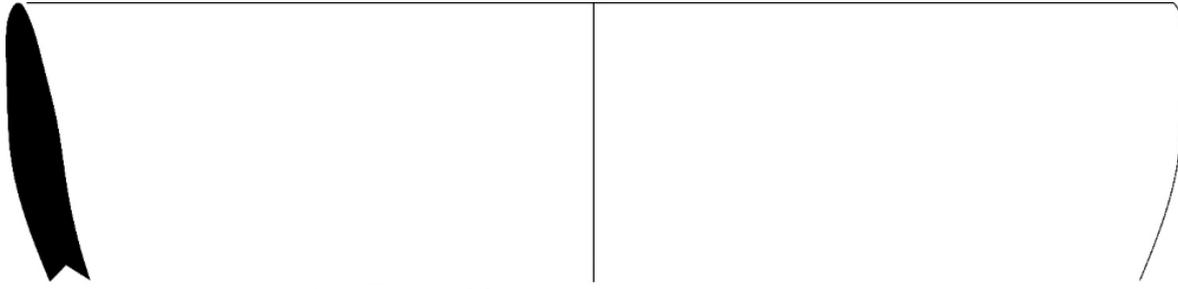


S3: 1406

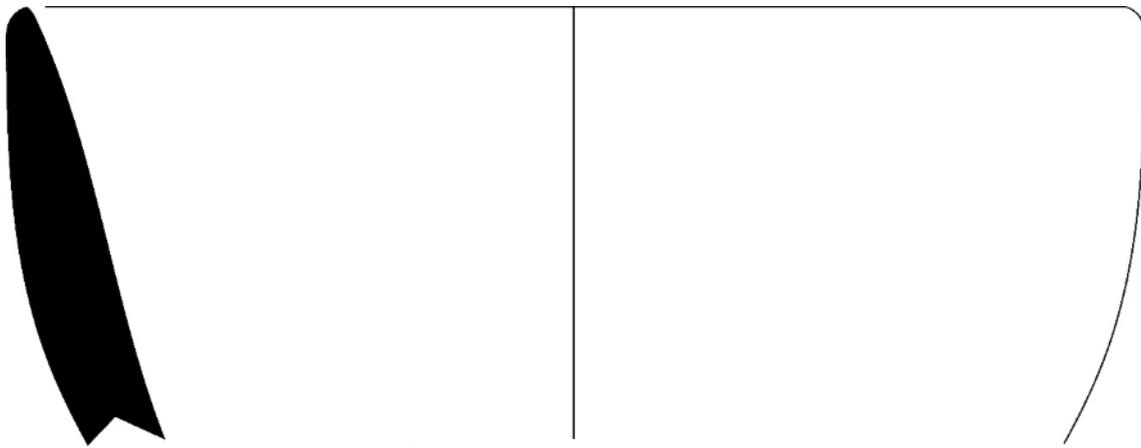


S3: 1455

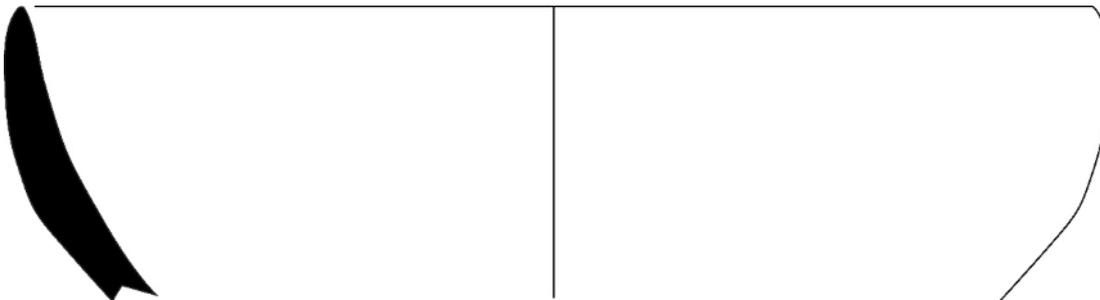




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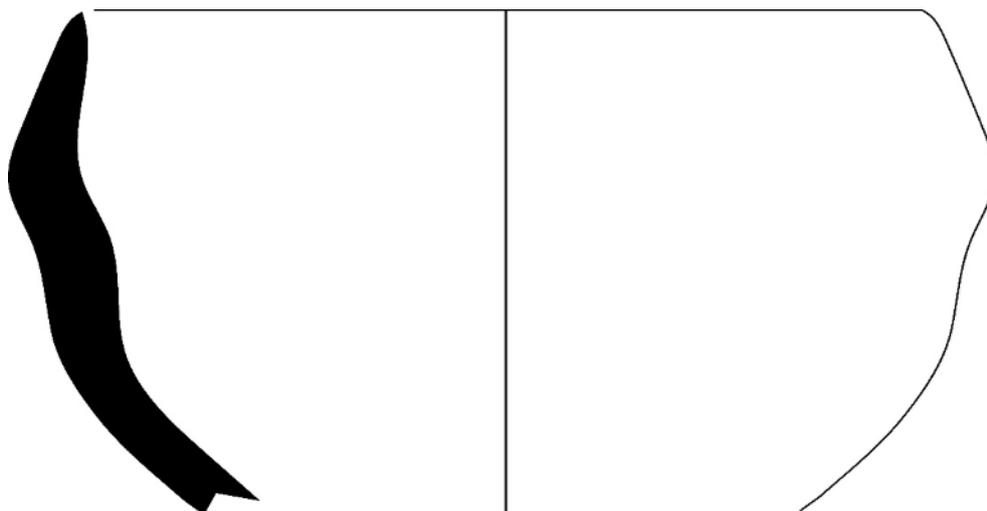


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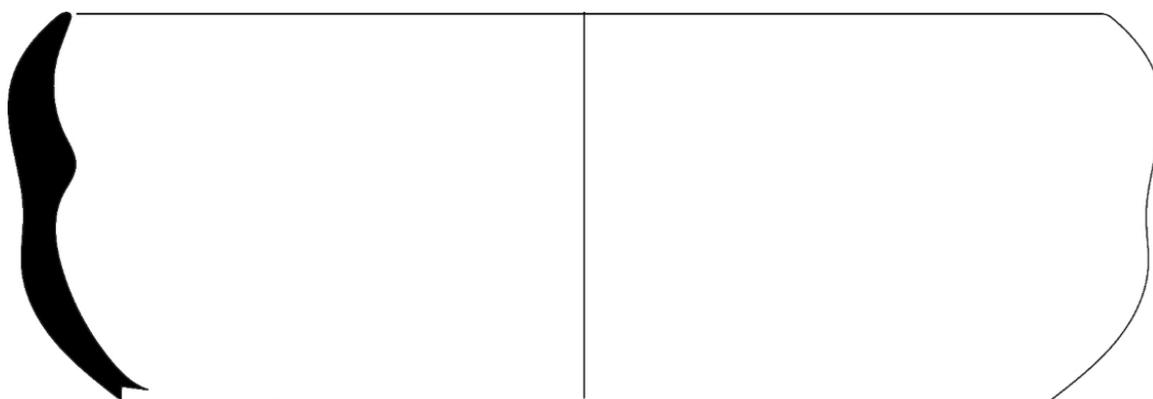


S3: 1448



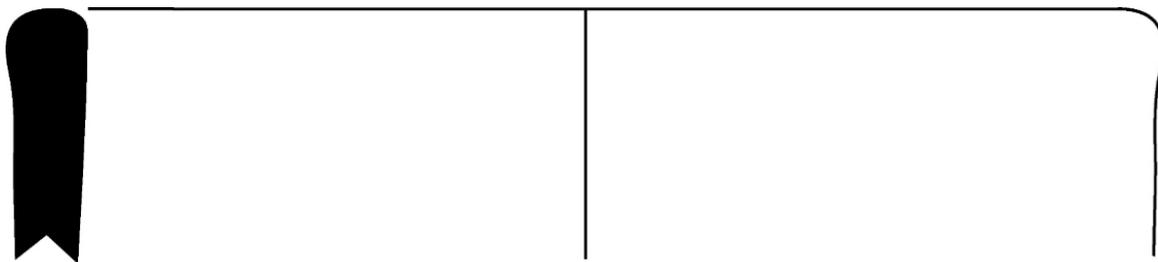


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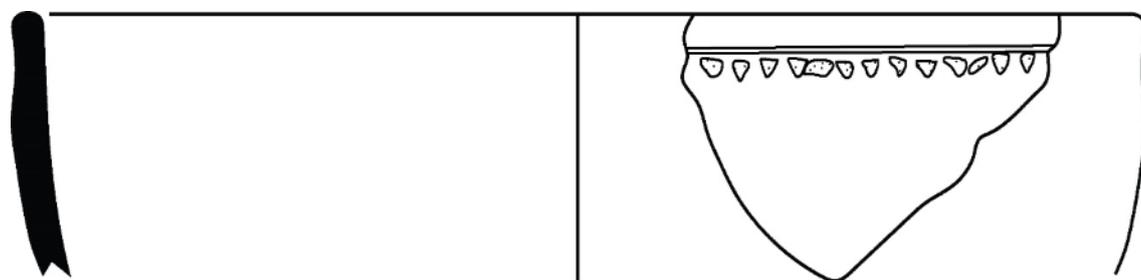


S3: 3245

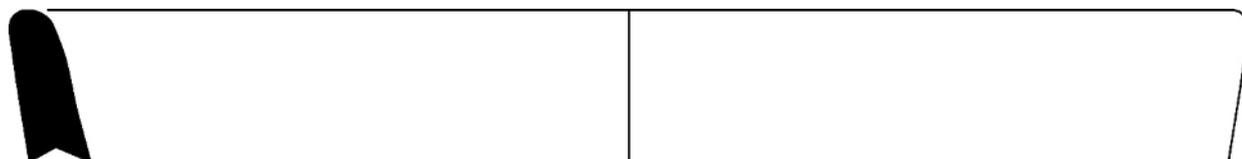




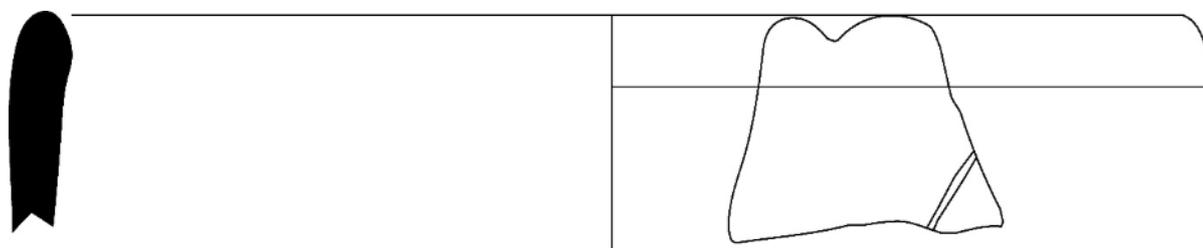
S2: 1340



S2: 1345

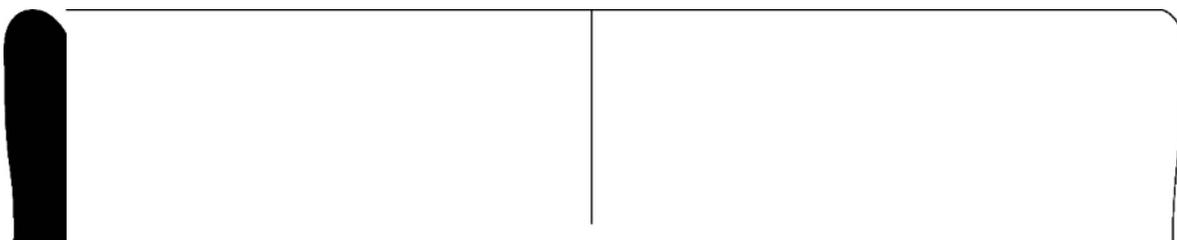


S2: 1145



S2: 1237

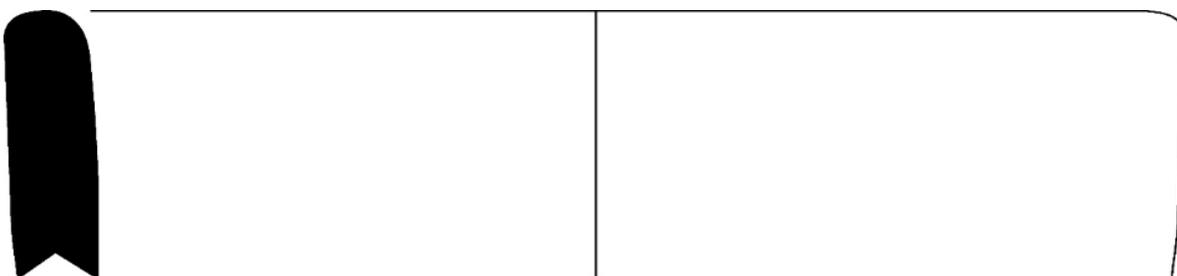




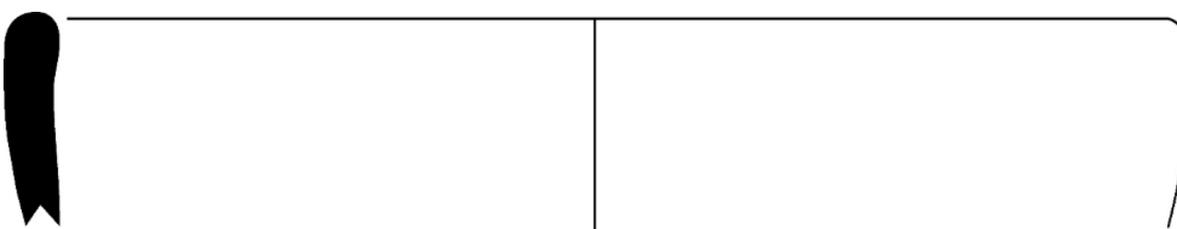
S2: 1229



S2: 1210

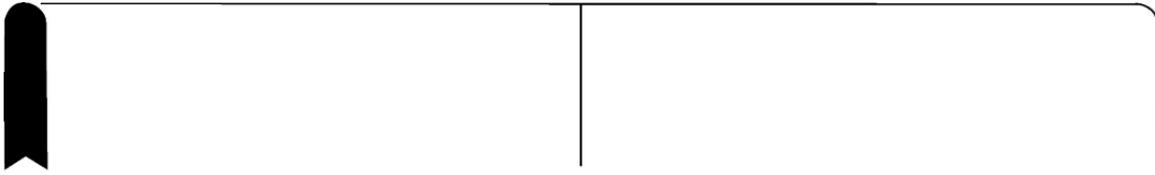


S2: 1548

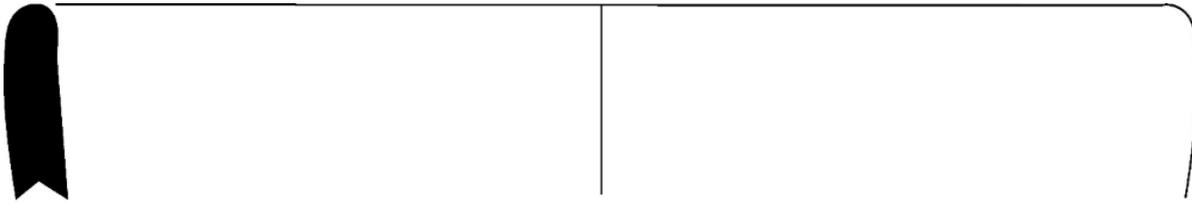


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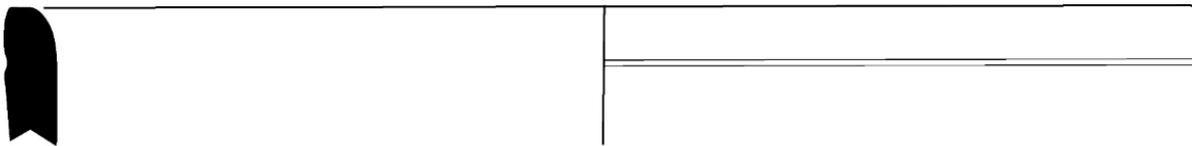




S2: 1116

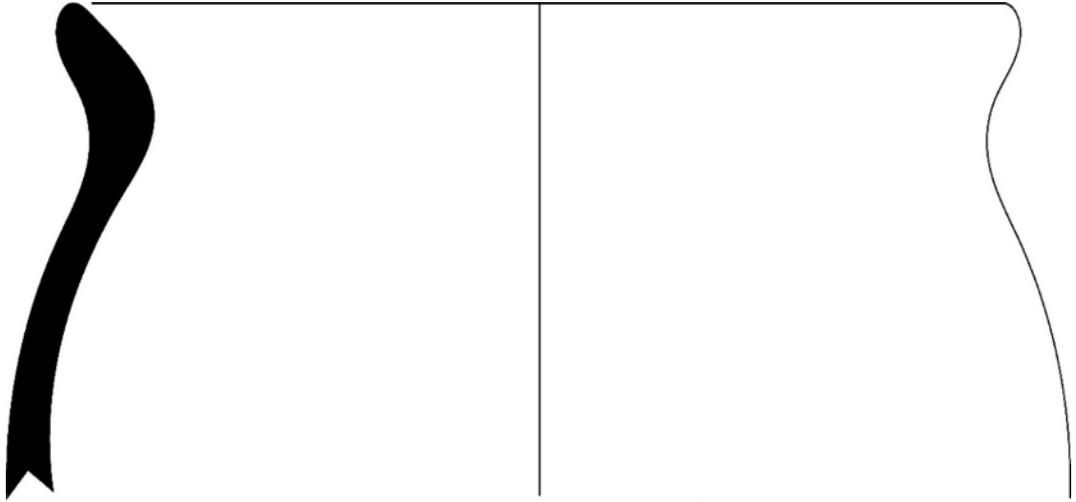


S2: 1851

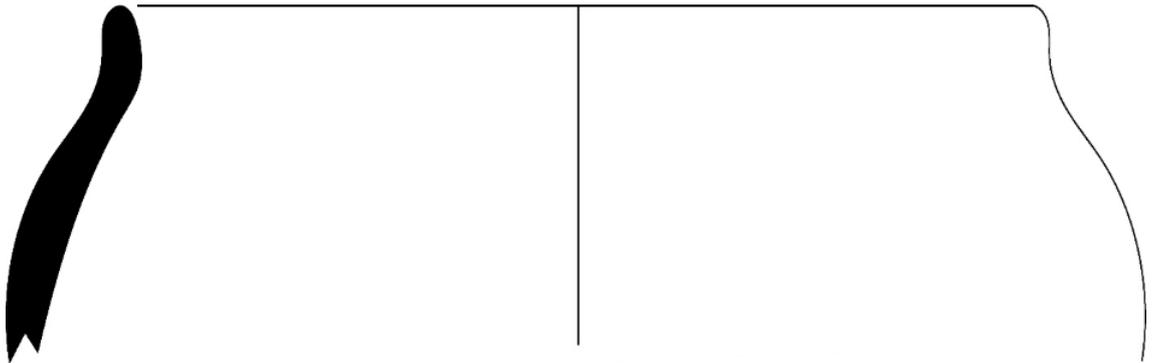


S2: 1850

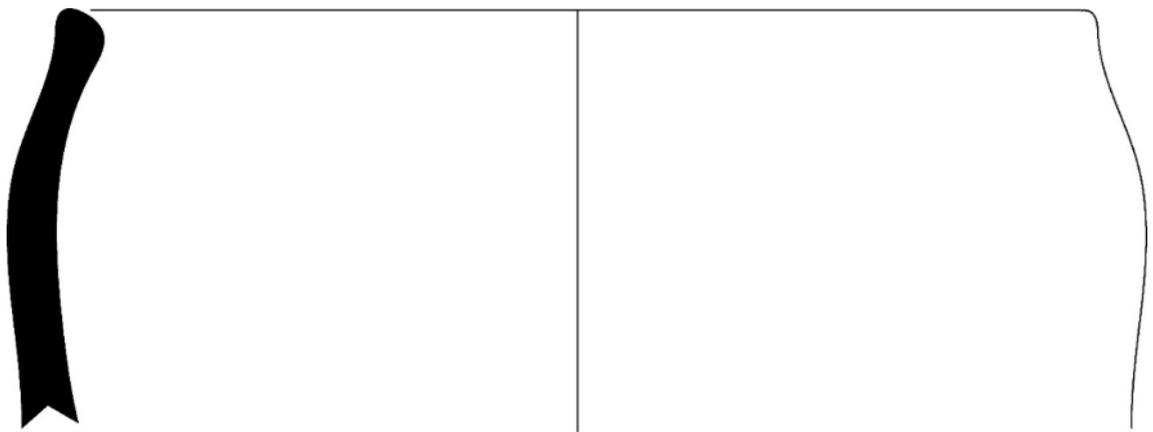




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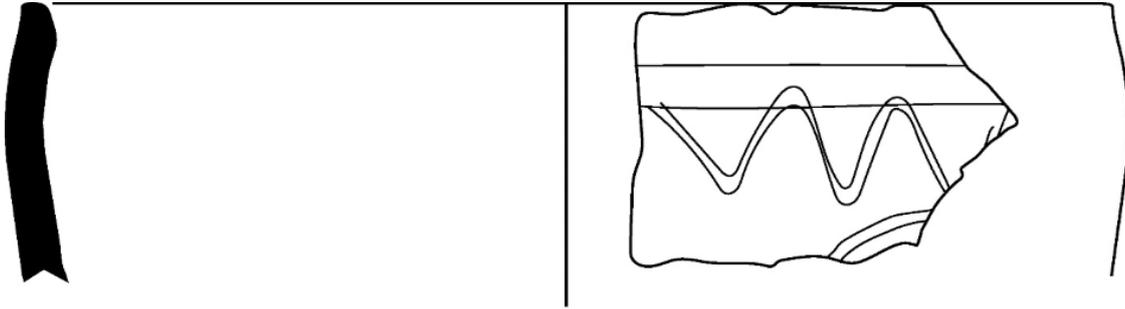


S2: 1313

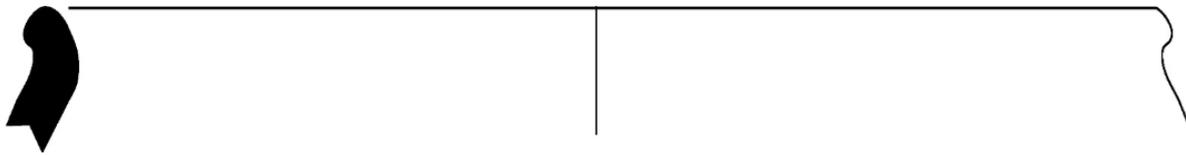


S2: 1295

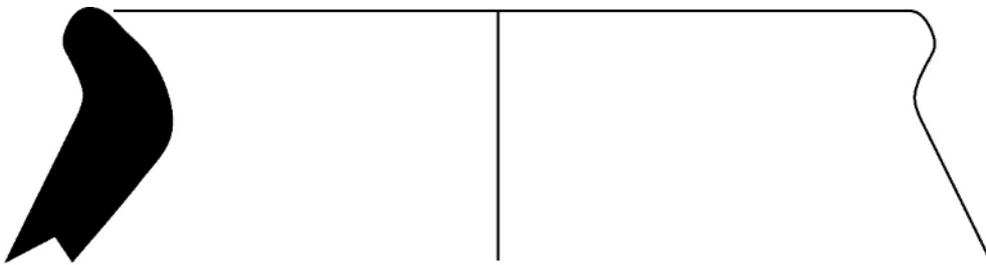




S2: 1170

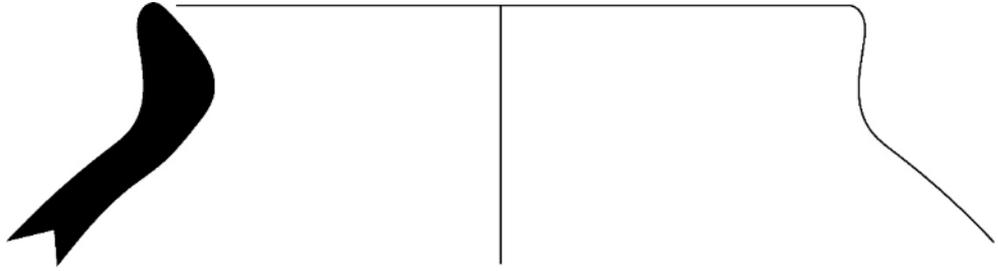


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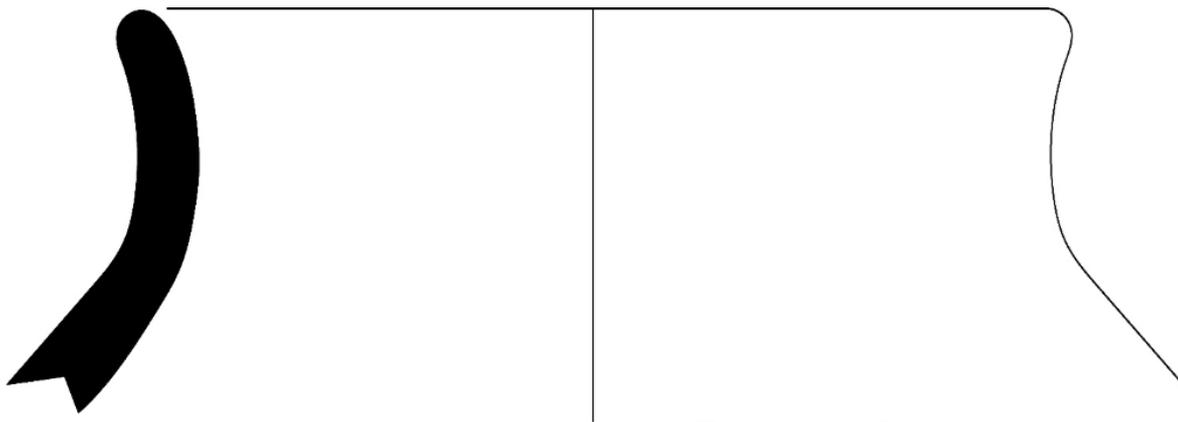
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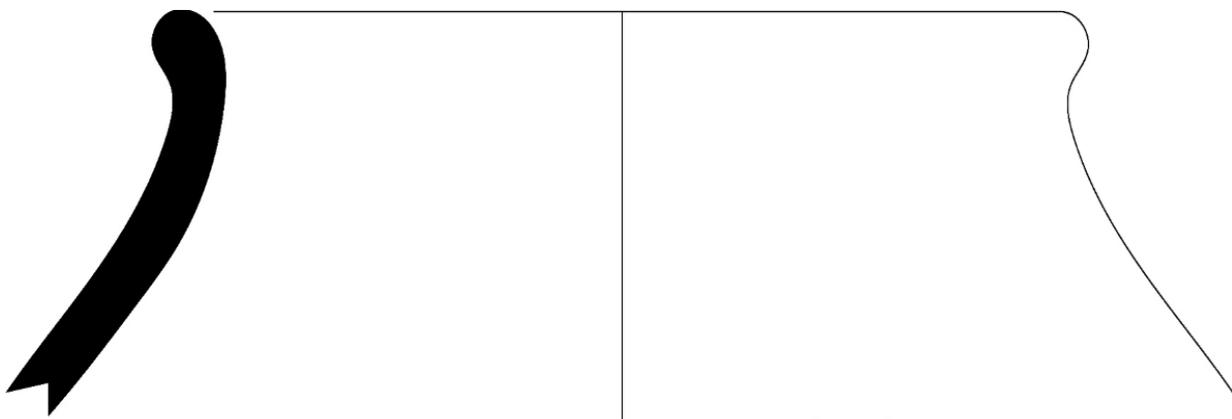


S3: 1469

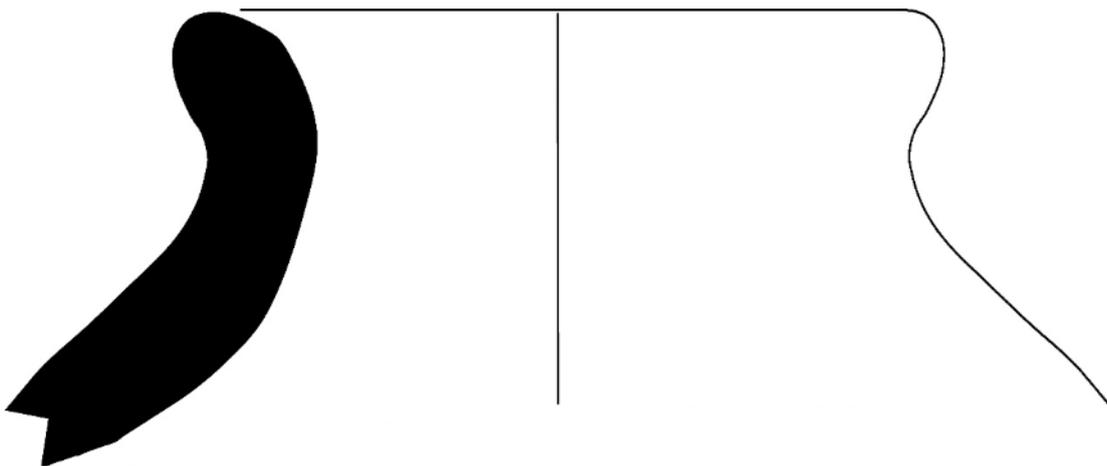




S2: 1331

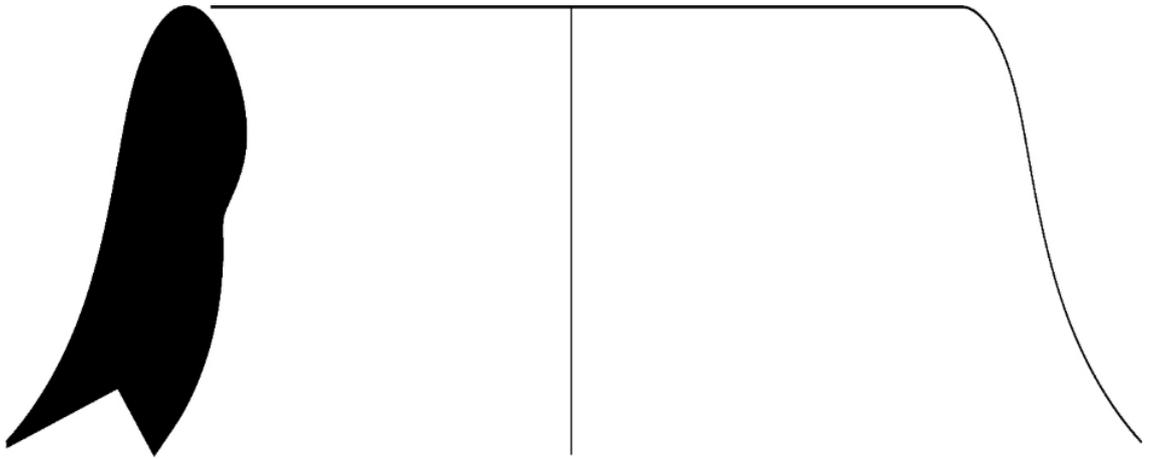


S2: 1327



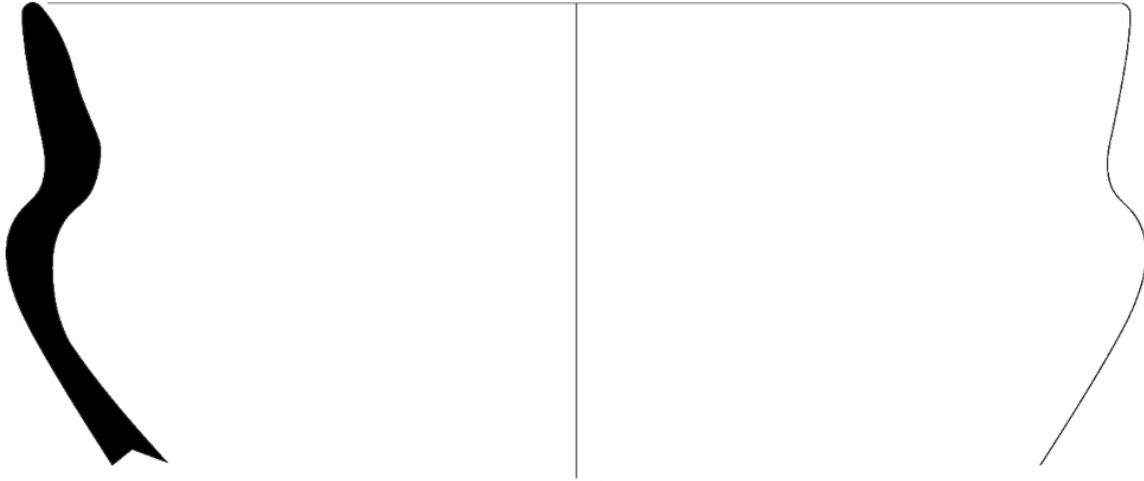
S2: 2741



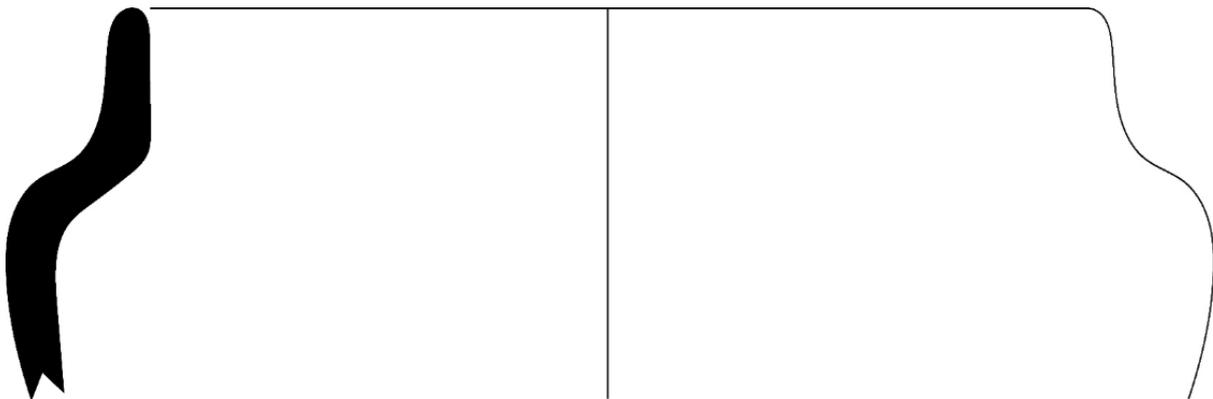


S2: 1314



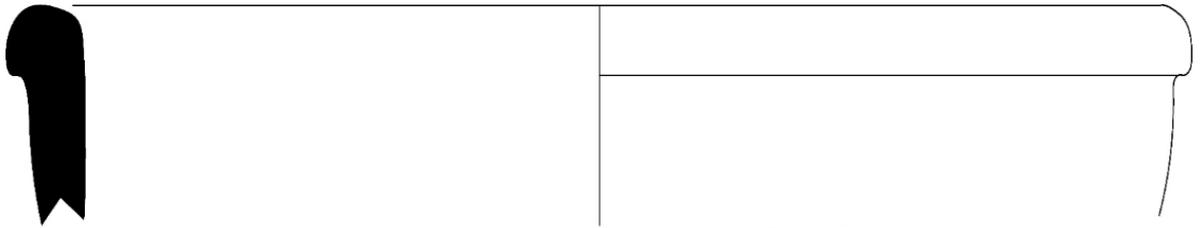


S3: 1015

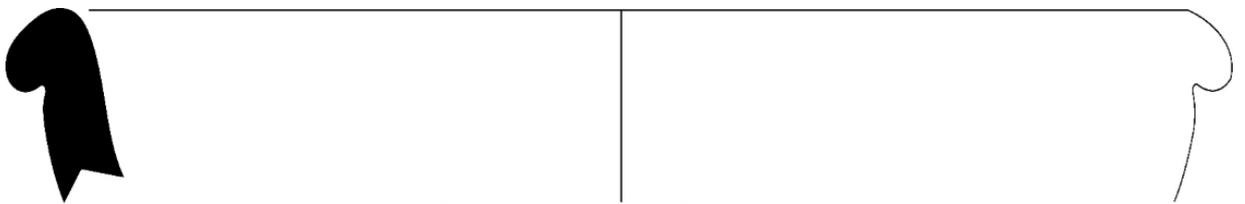


S3: 1399

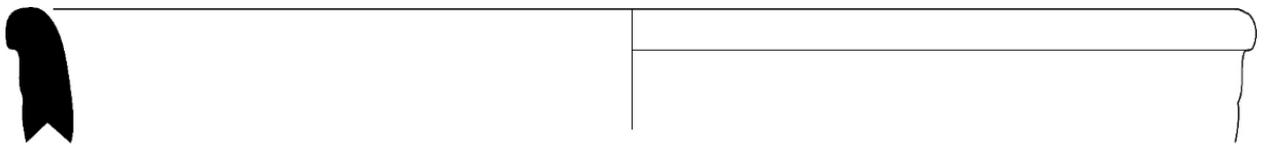




S2: 1266

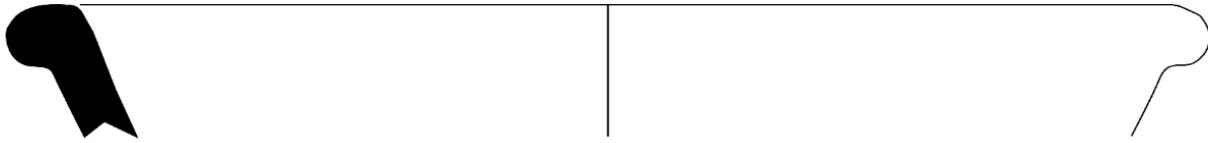


S2: 1235

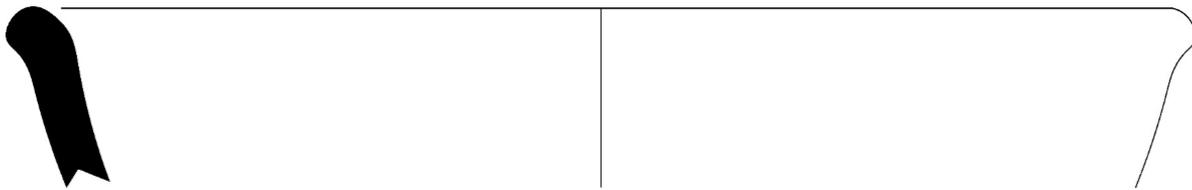


S2: 1236

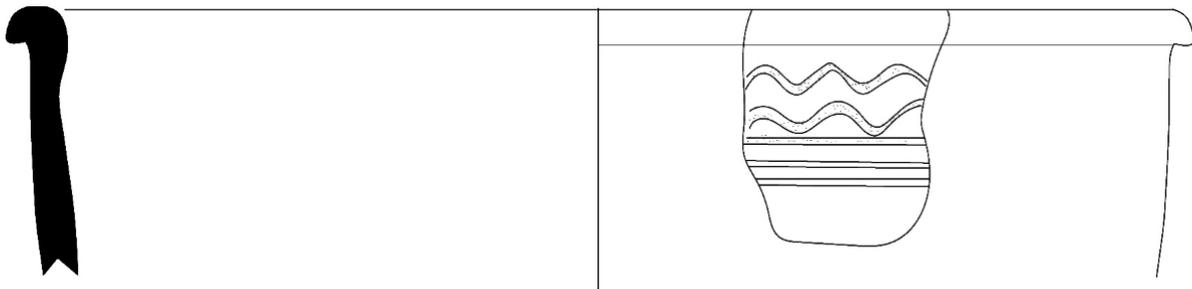




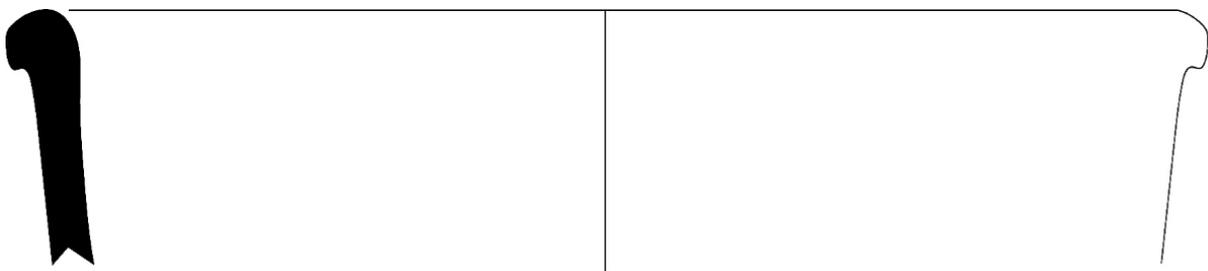
S3: 3244



S3: 1516

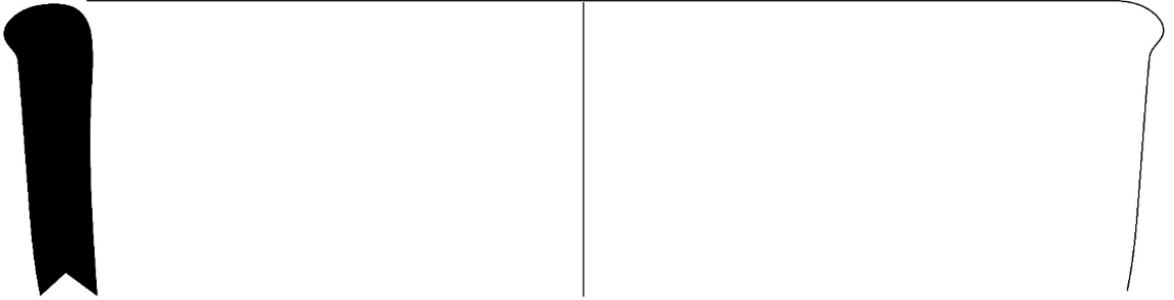


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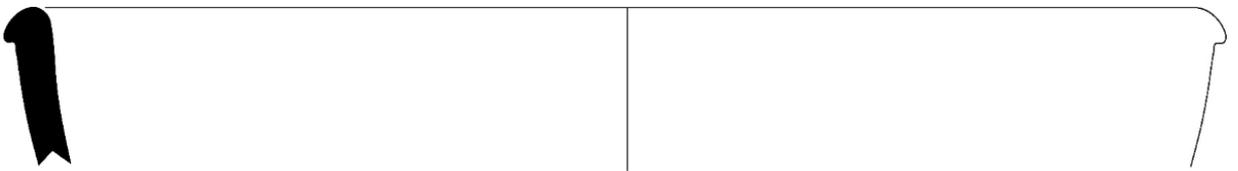


S3: 1472



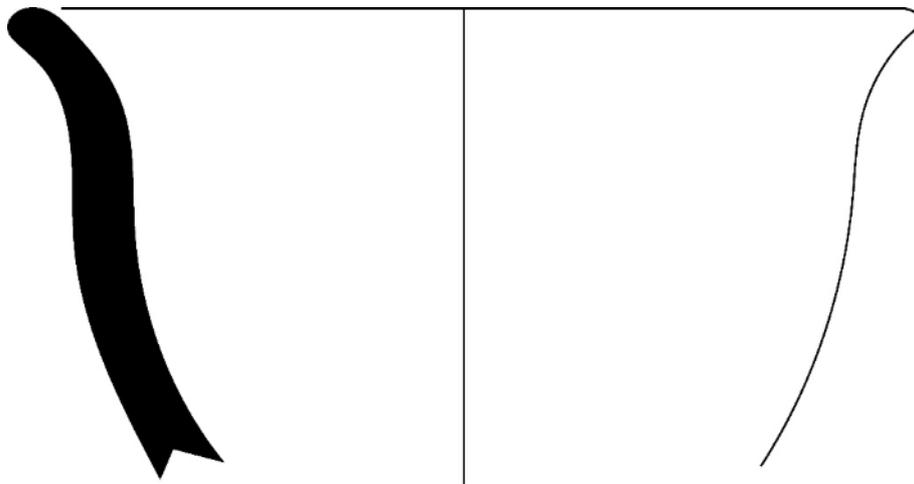


S3: 1385

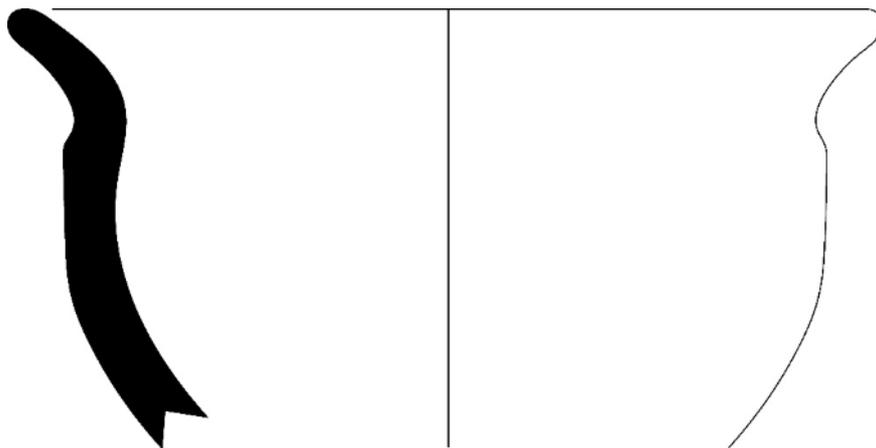


S3: 1393



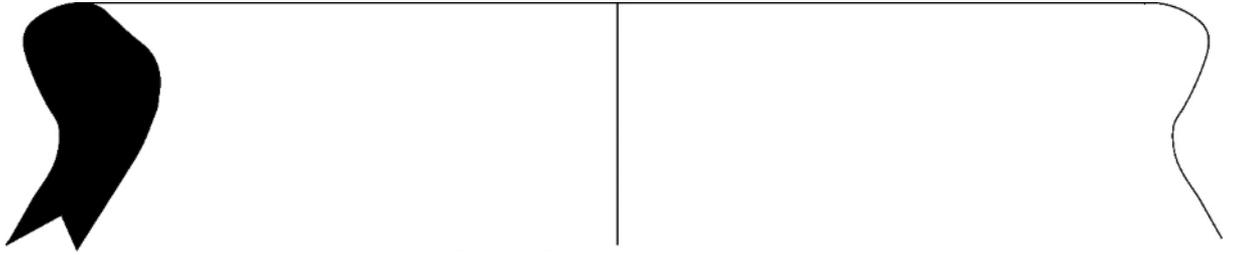


S2: 1269

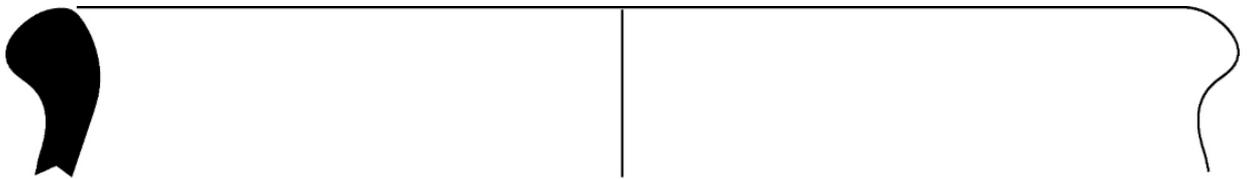


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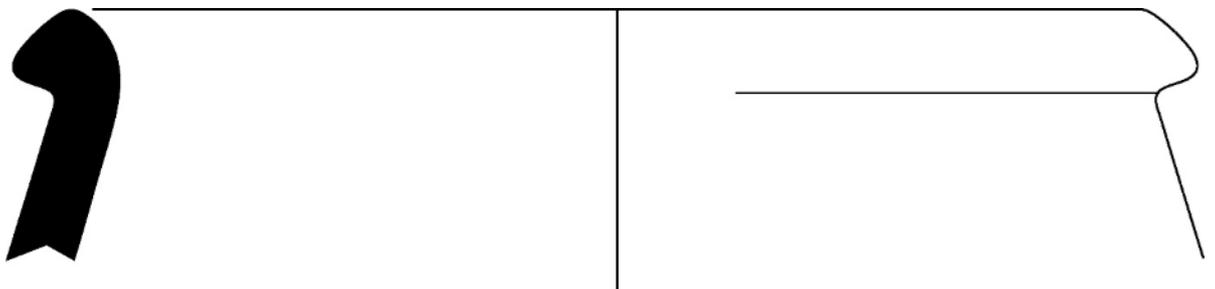




S2: 1114

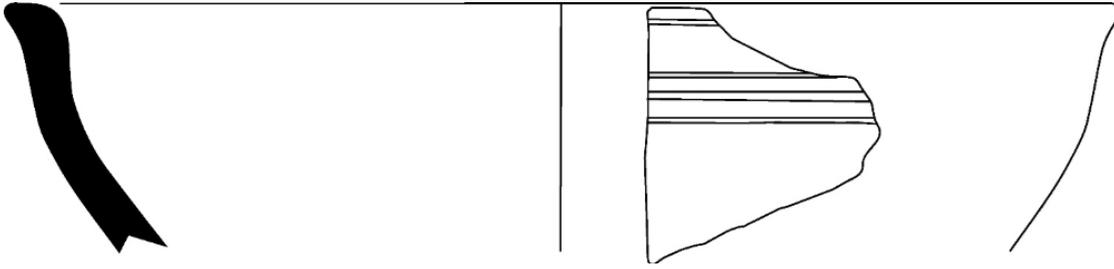


S2: 1158

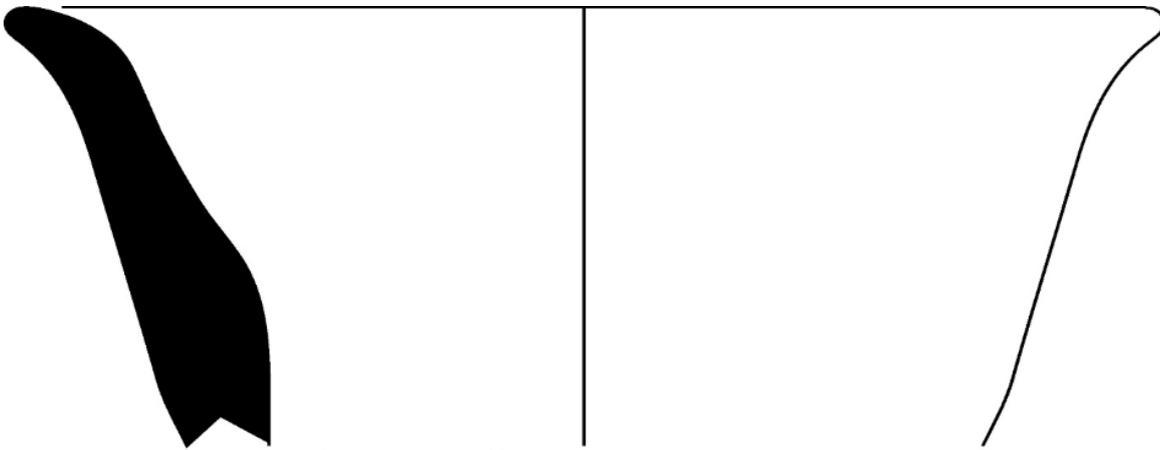


S2: 1200

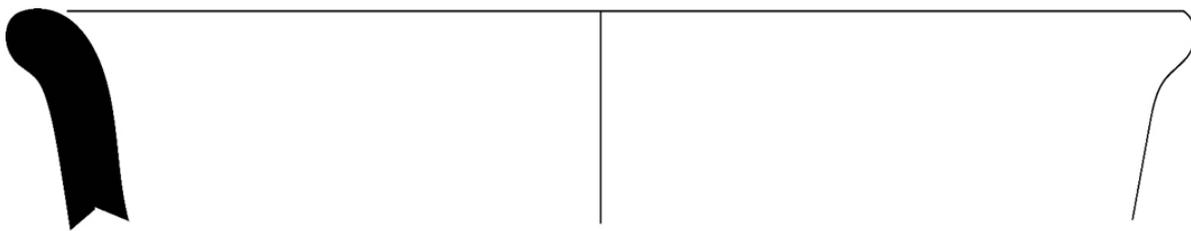




S2: 1097

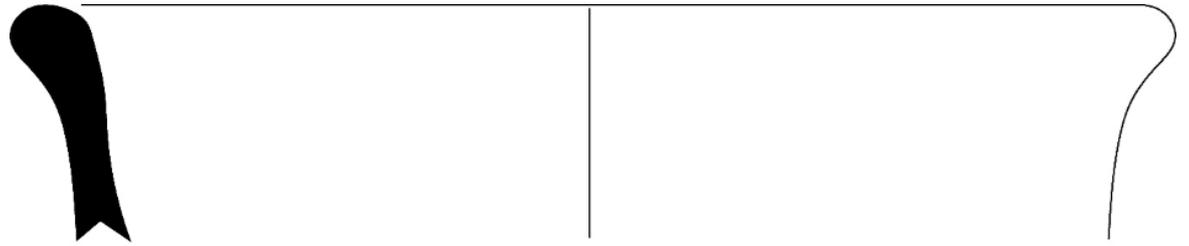


S2: 1350

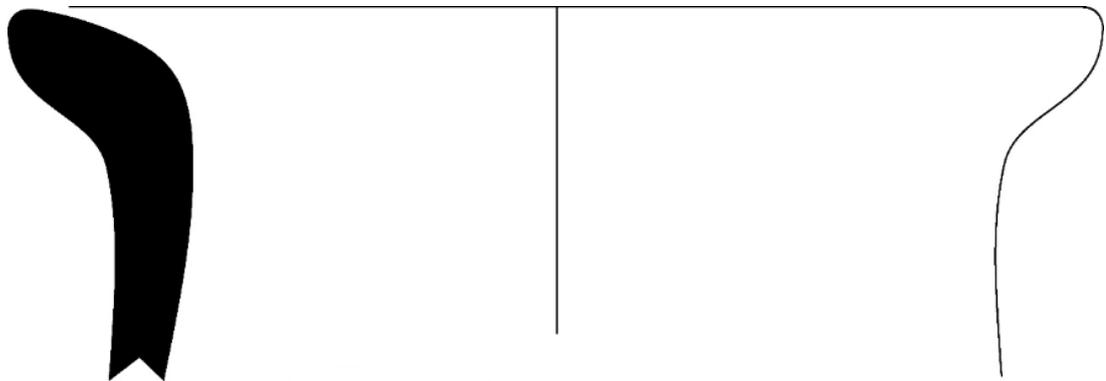


S2: 1256



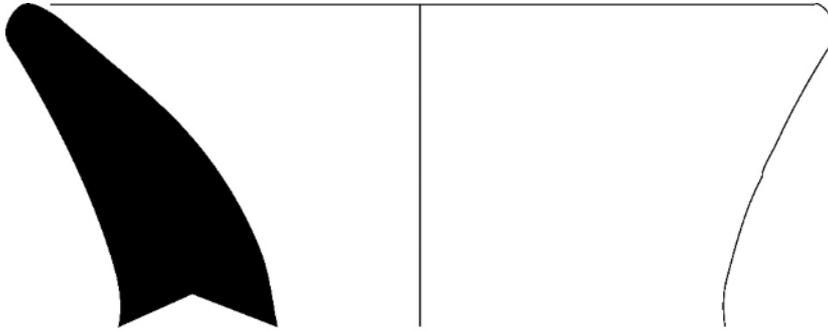


S3: 1420

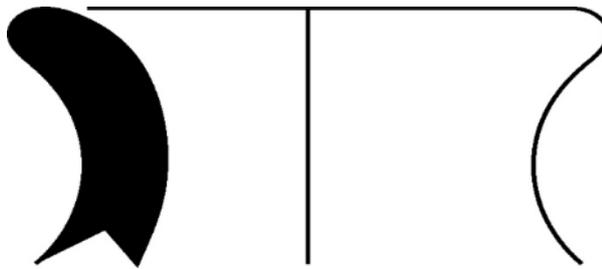


S3: 1398



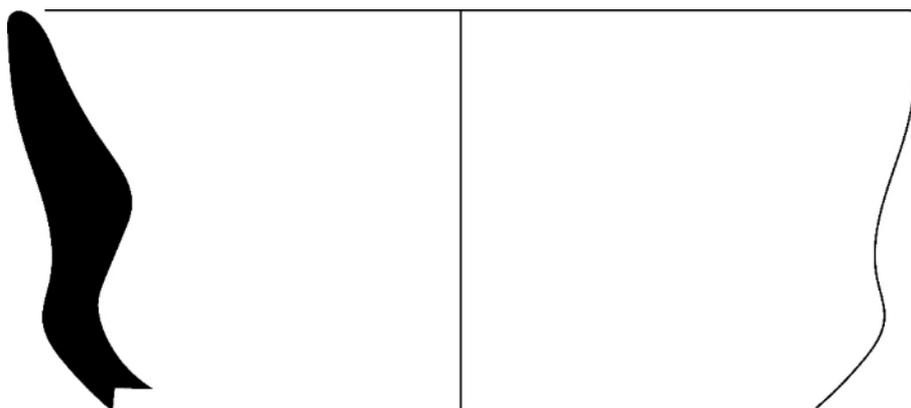


S2: 1142

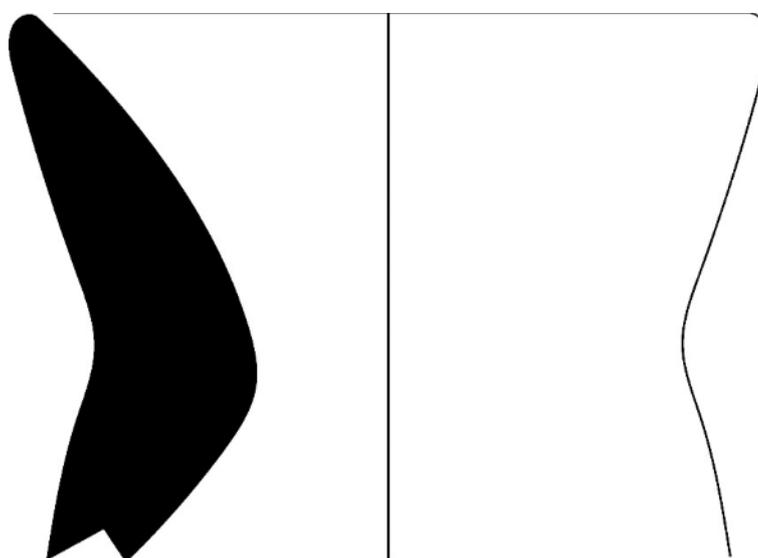


S2: 1336

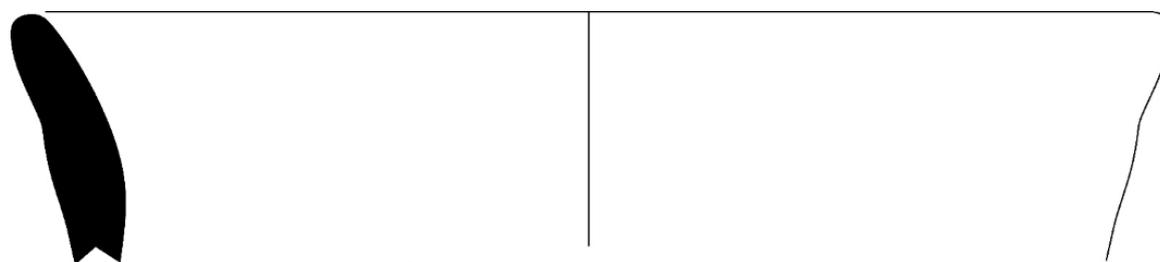




S3: 1522

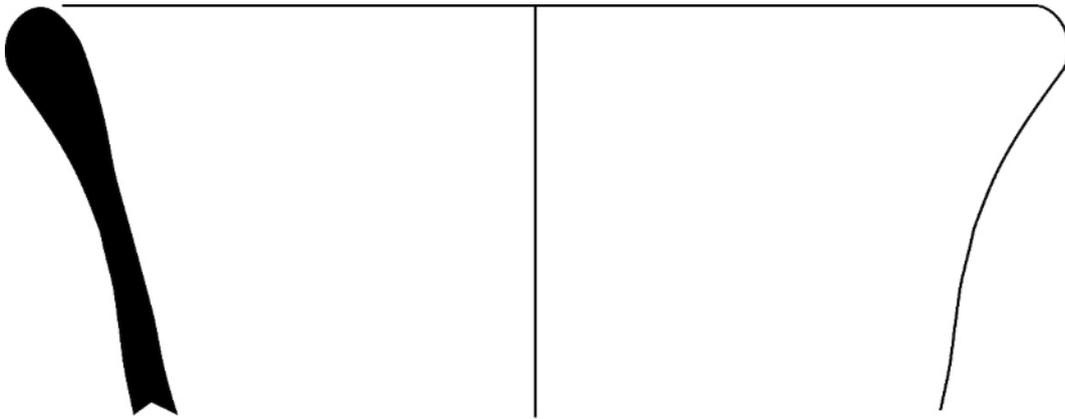


S3: 1364

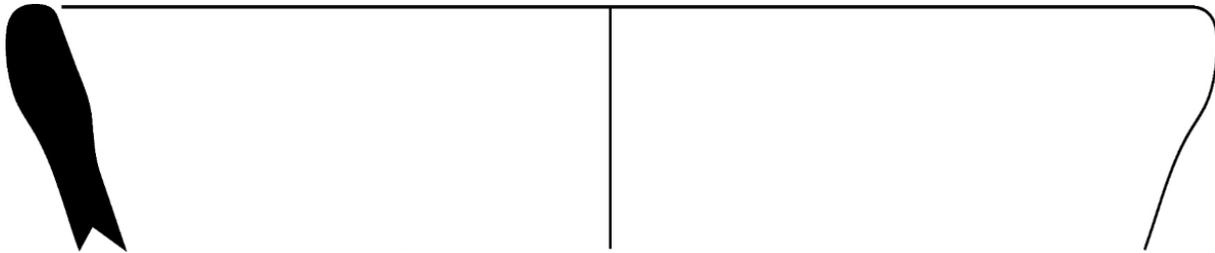


S3: 1394

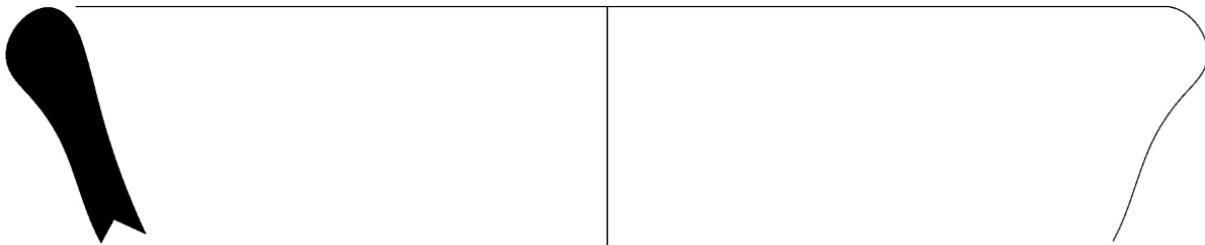




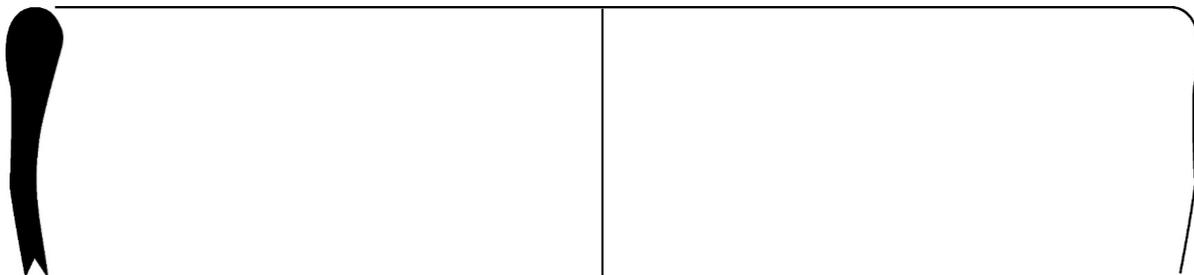
S2: 1183



S2: 1352

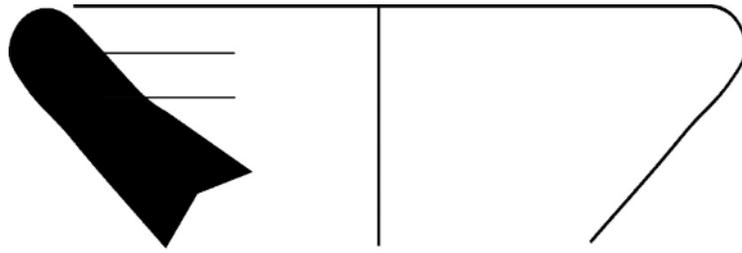


S2: 1332

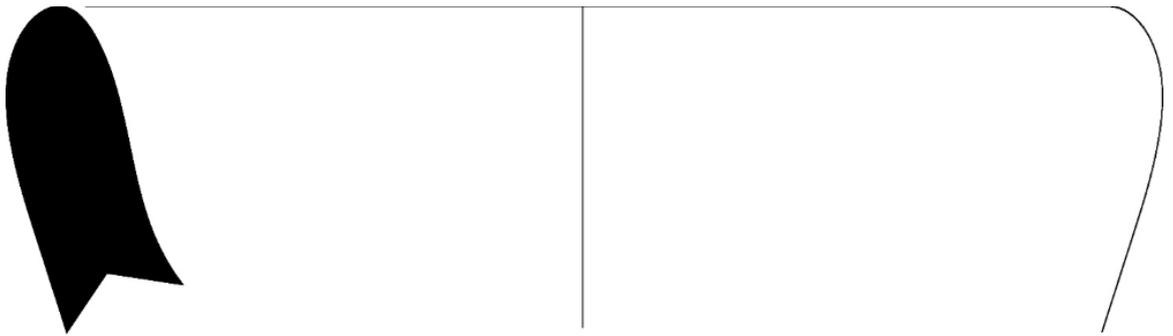


S2: 1351

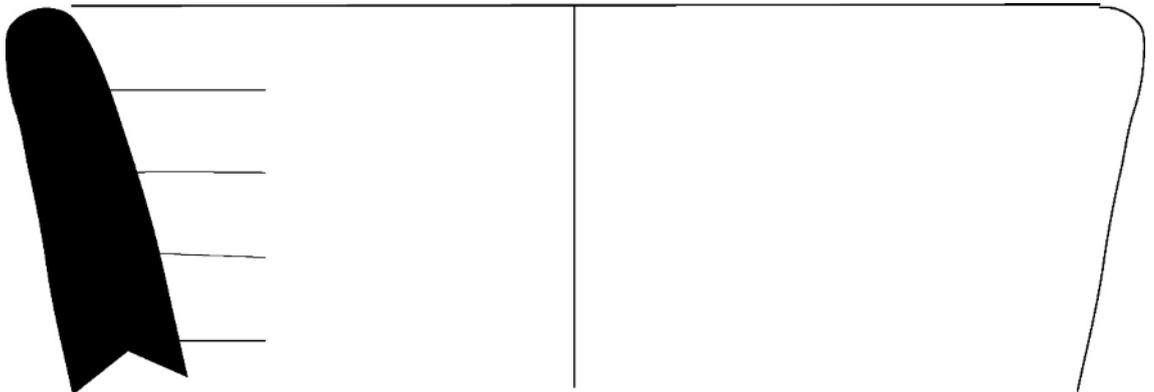




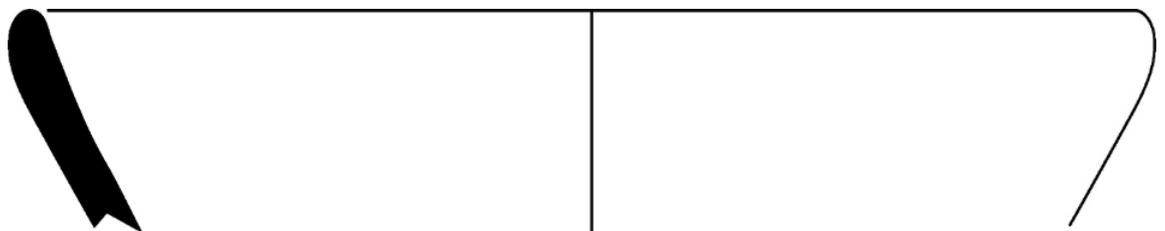
S2: 1192



S2: 1321

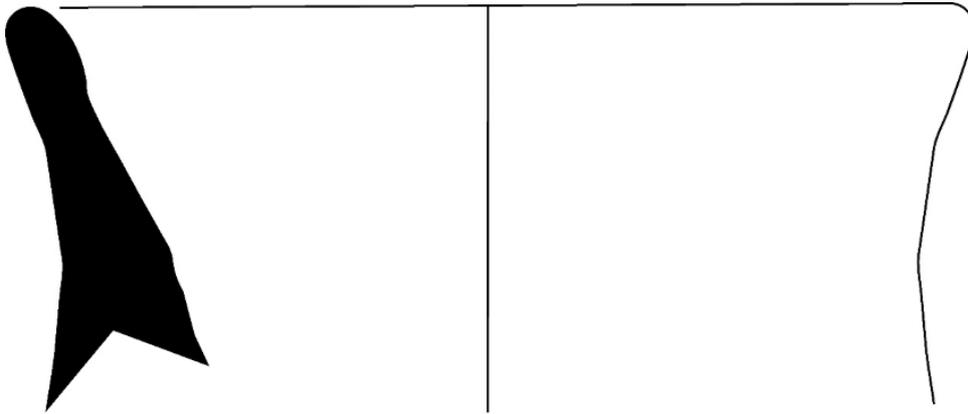


S2: 2184

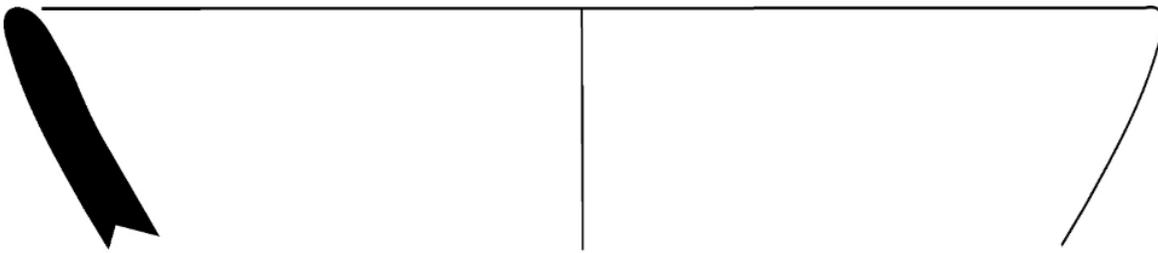


S2: 1487



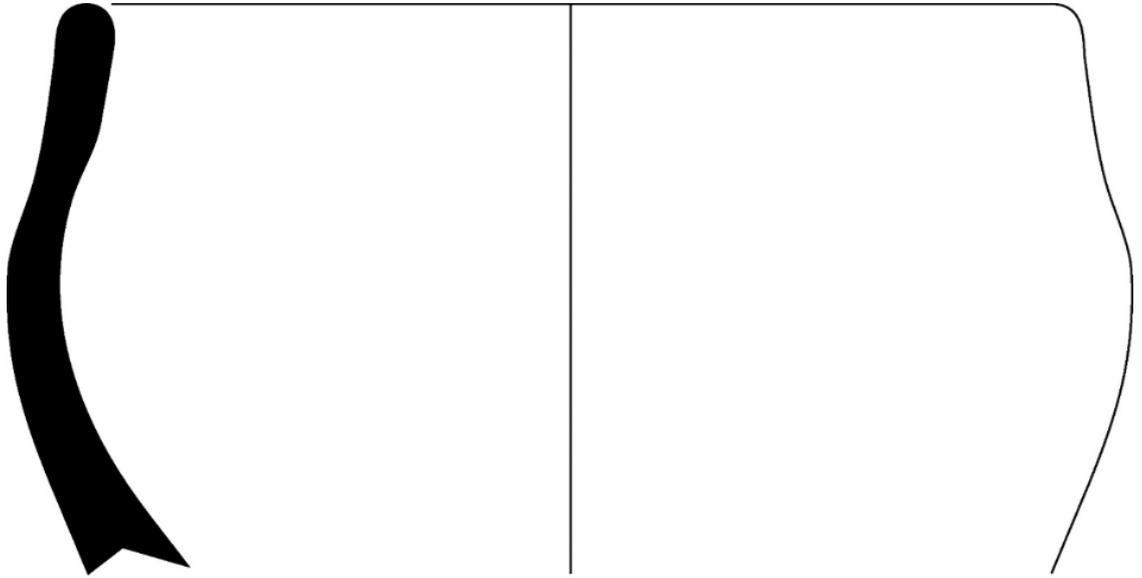


S2: 1389



S2: 1481

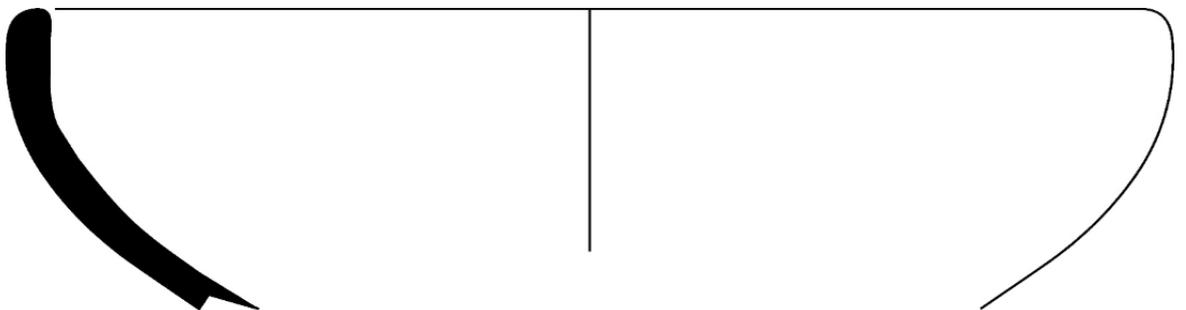




S2: 1362

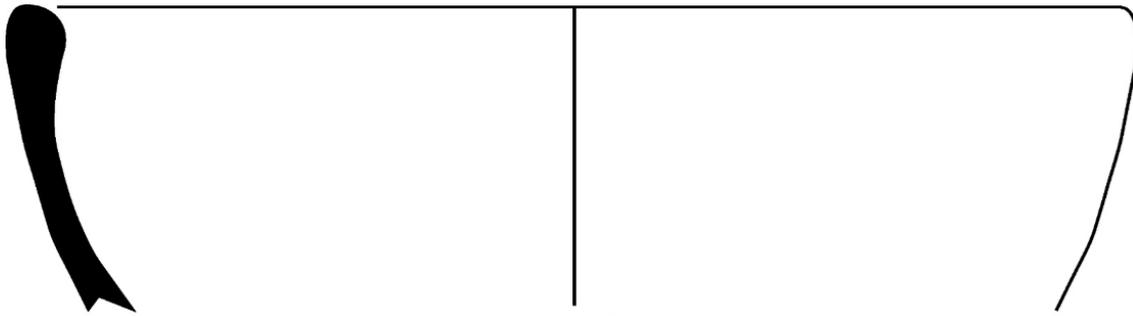


S2: 1358

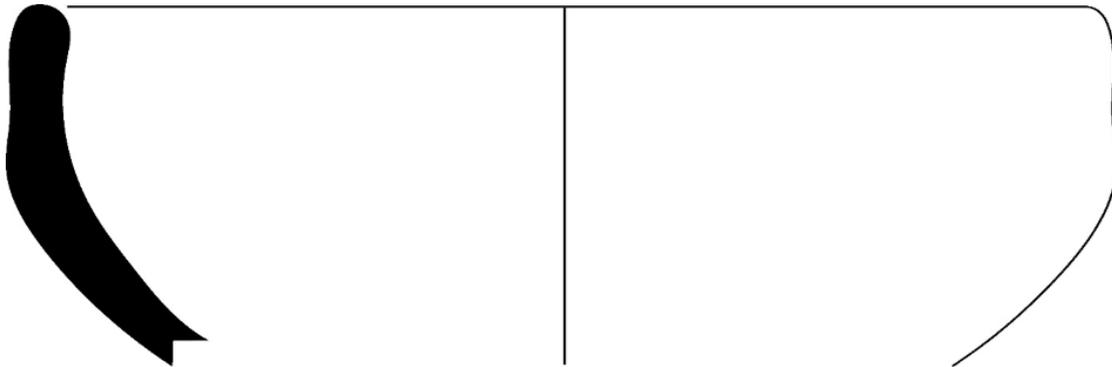


S2: 1347

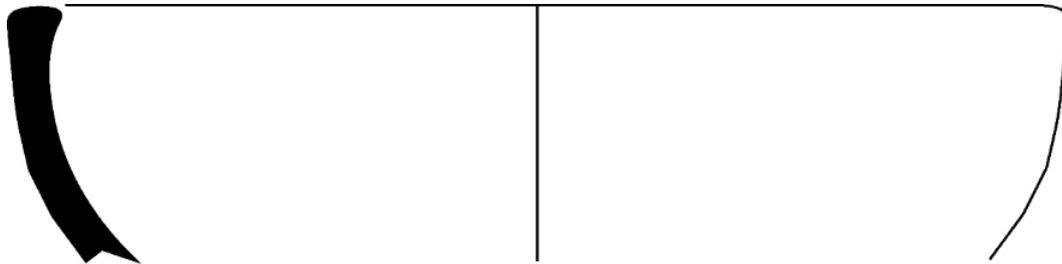




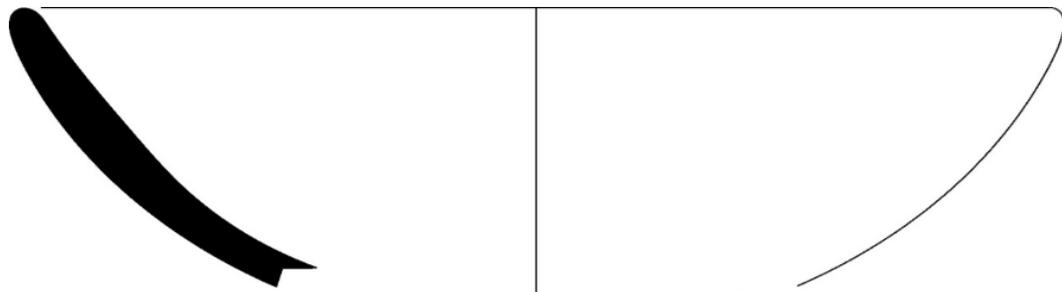
S2: 1348



S2: 1240

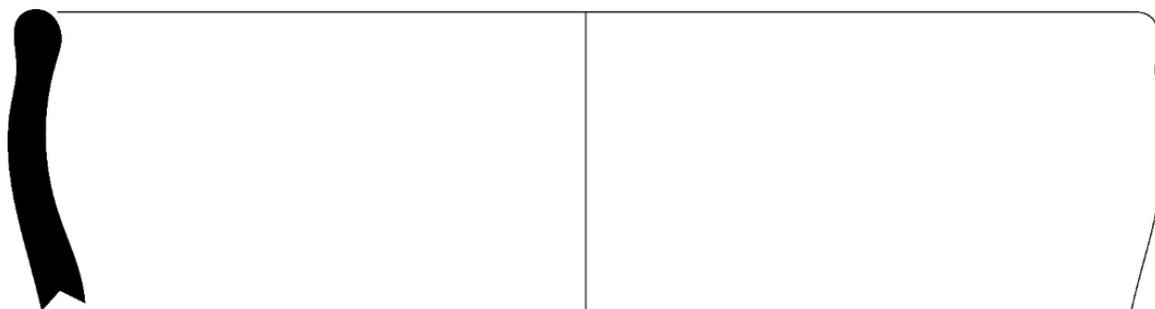


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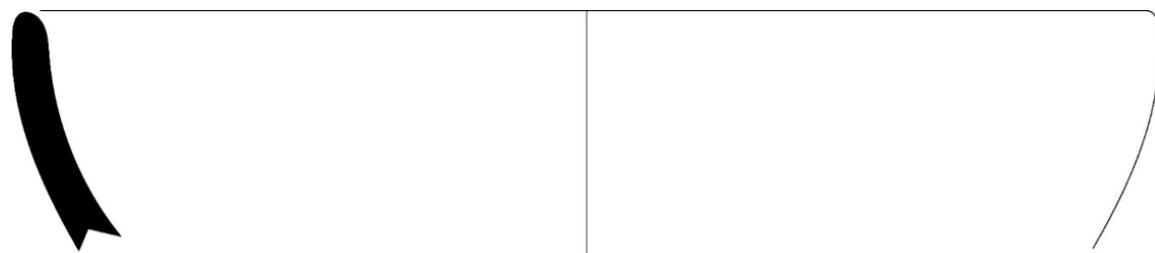


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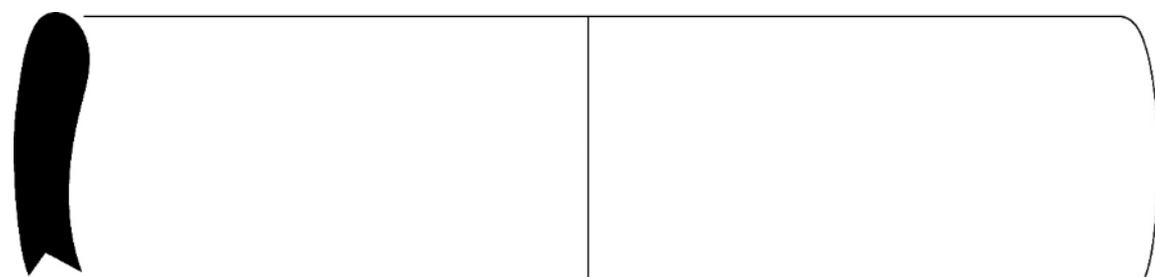




S2: 1301



S2: 1317

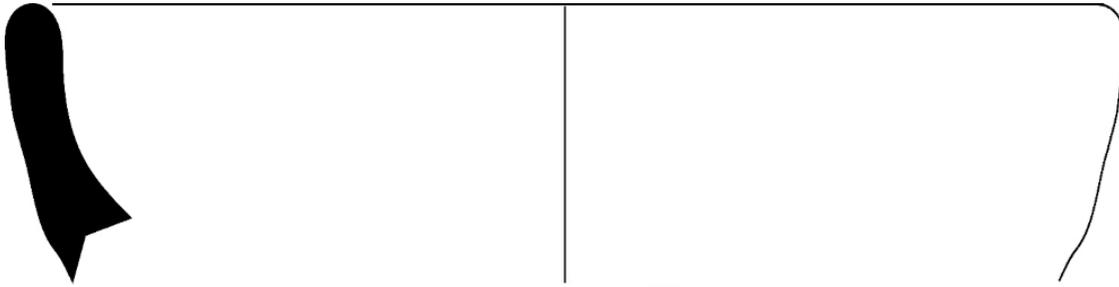


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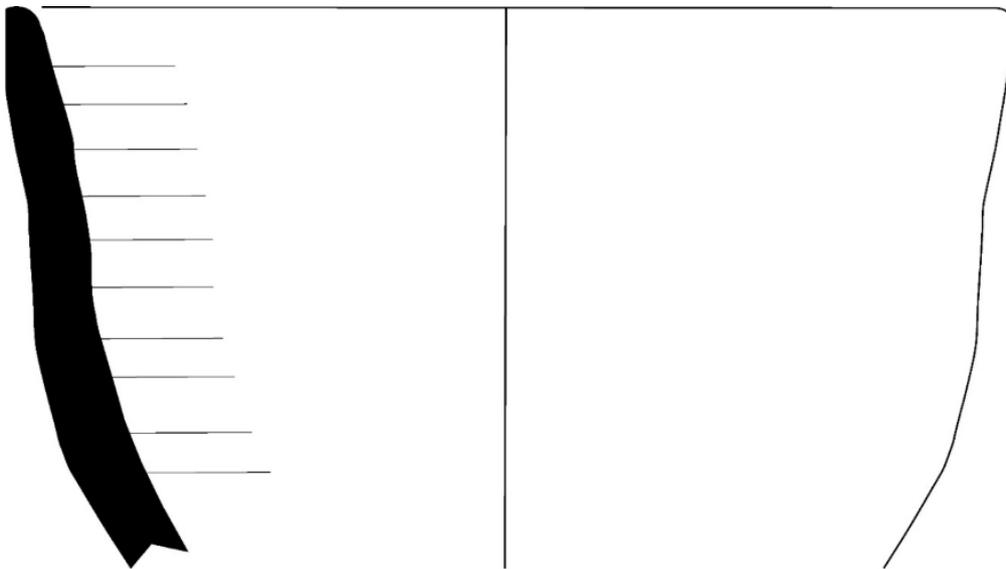


S2: 1307

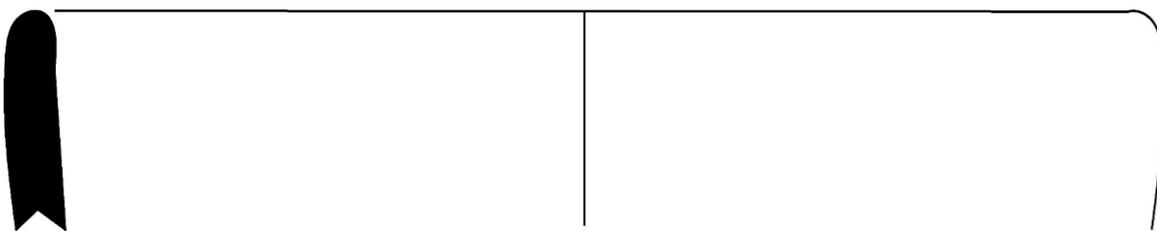




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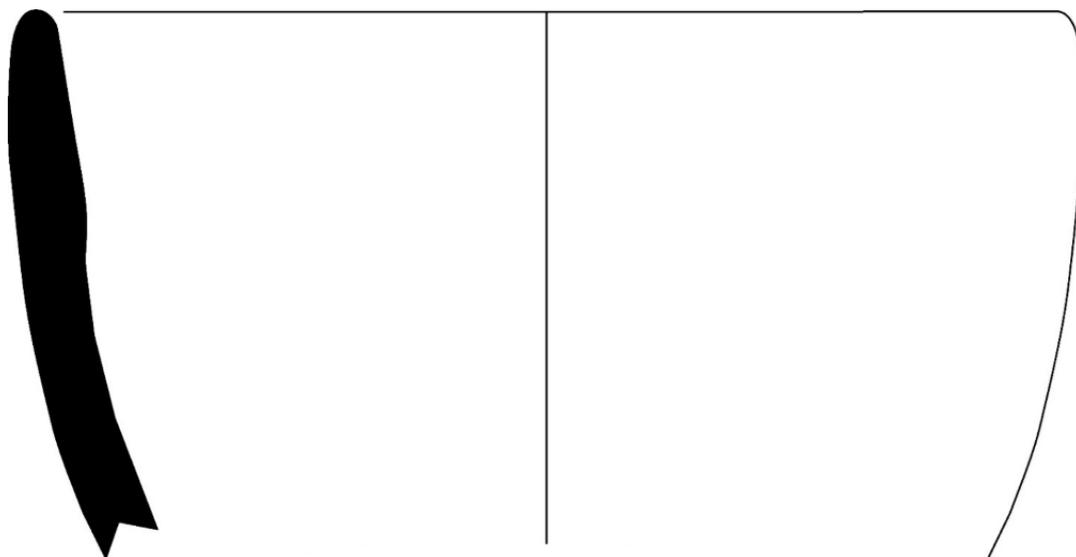


S2: 2150

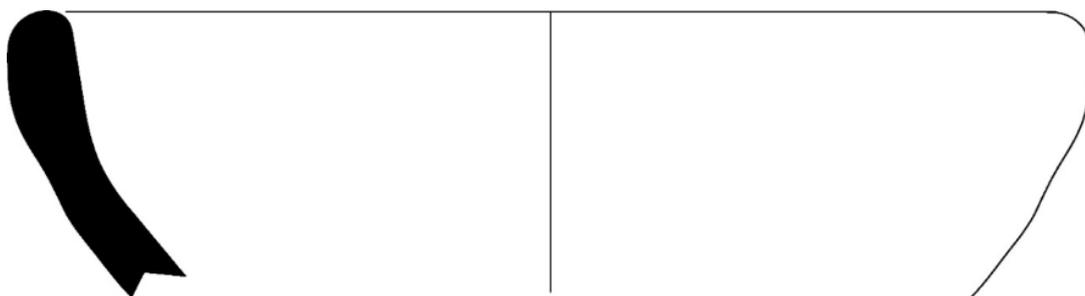


S2: 1851



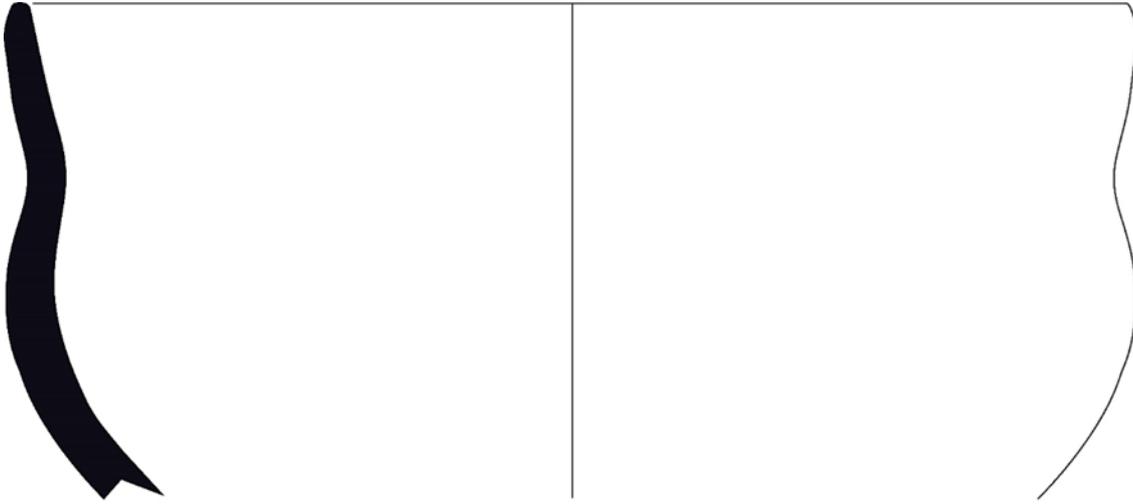


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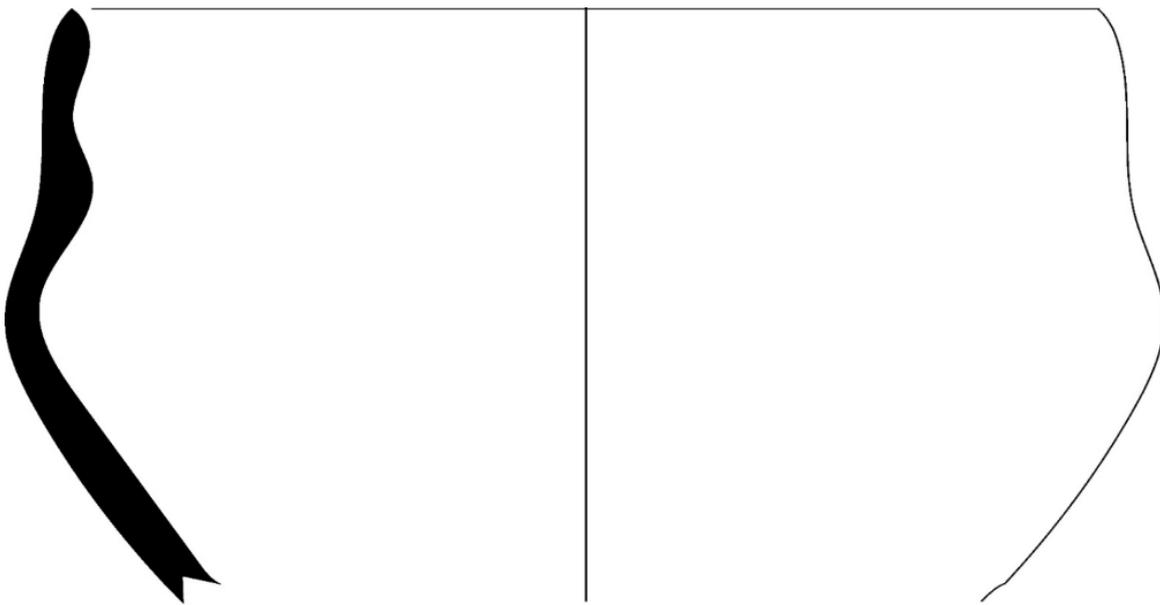


S2: 2736



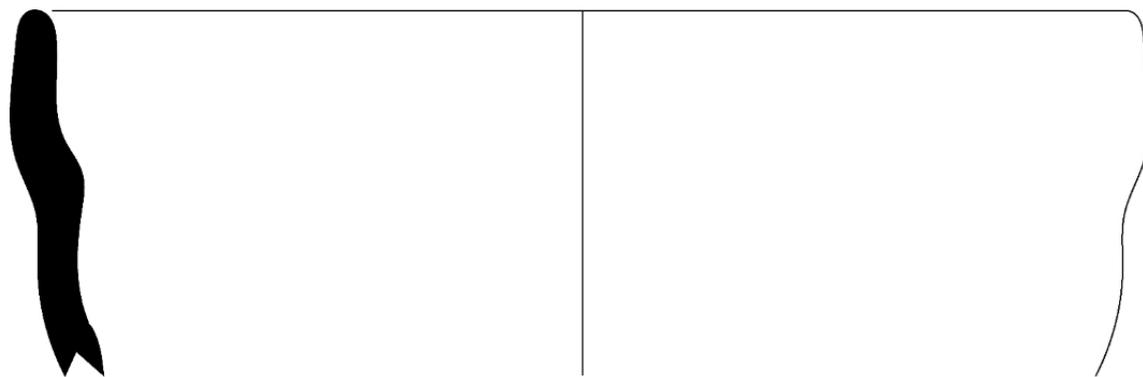


S3: 1011

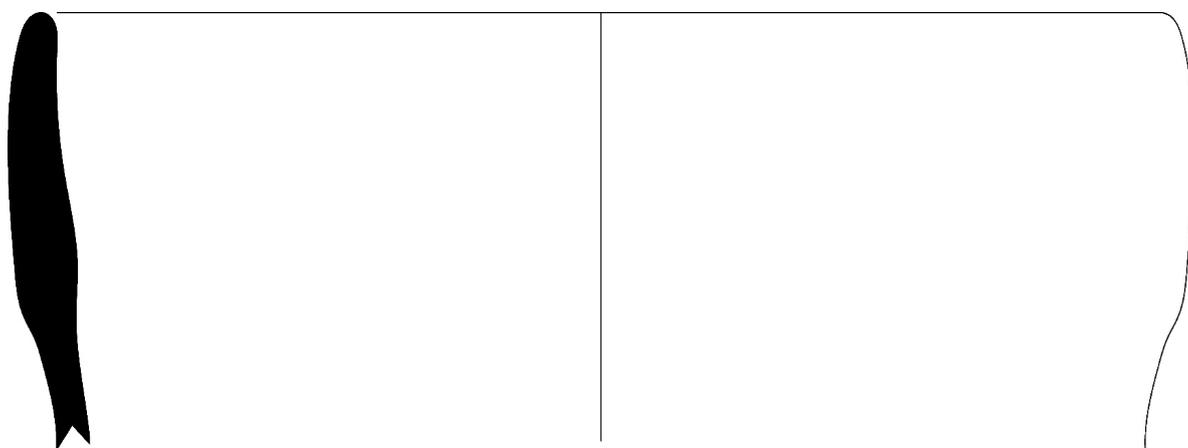


S3: 1368

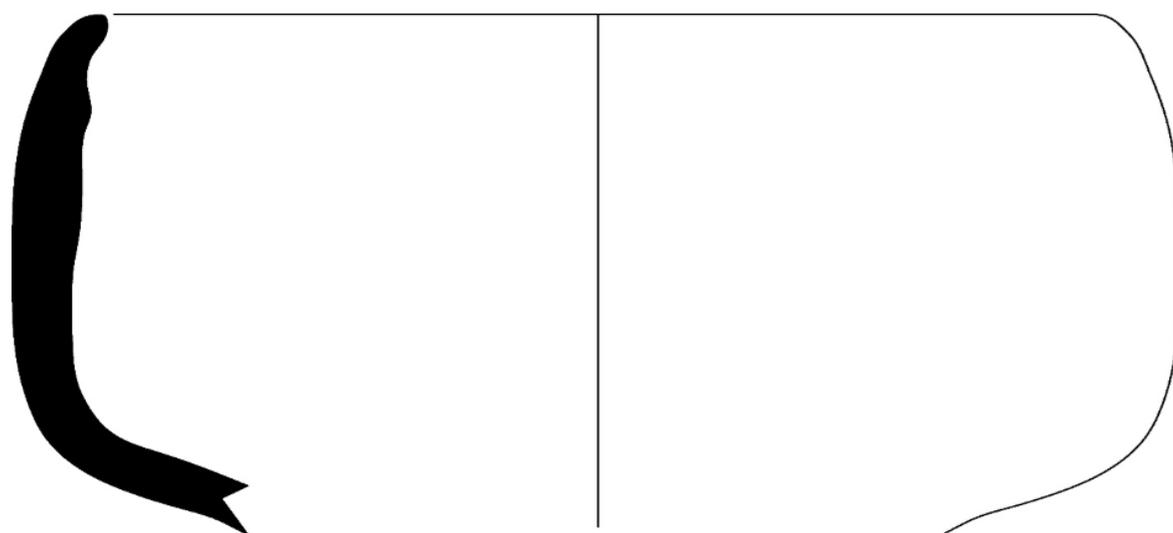




S3: 1402

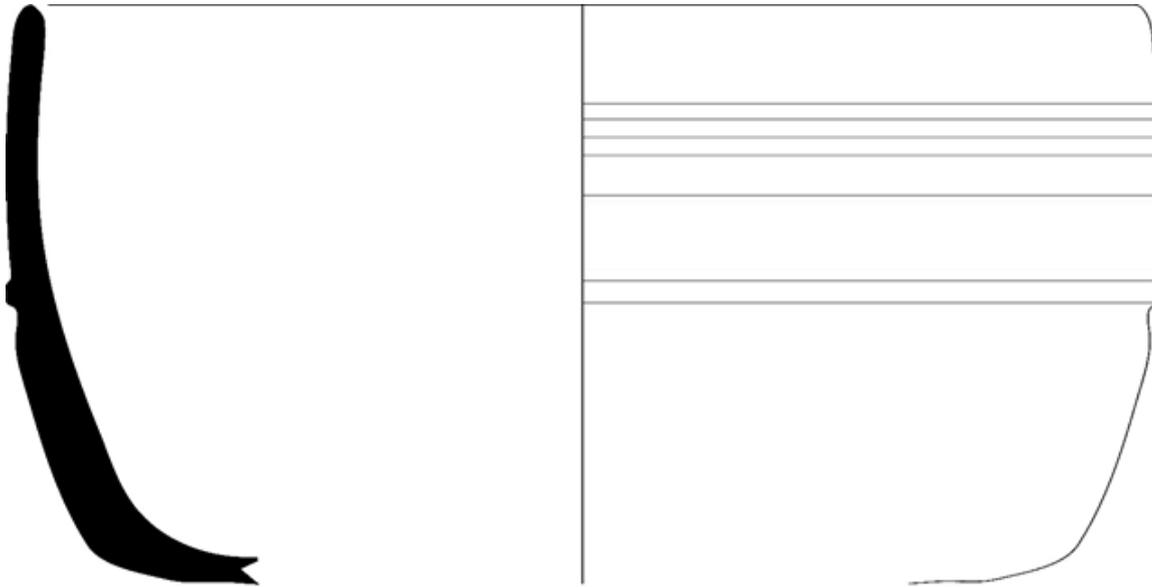


S3: 1523

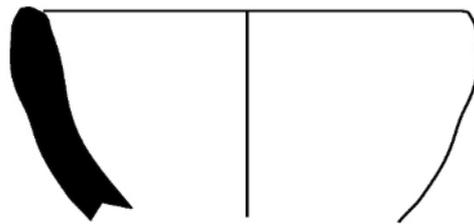


S3: 1397

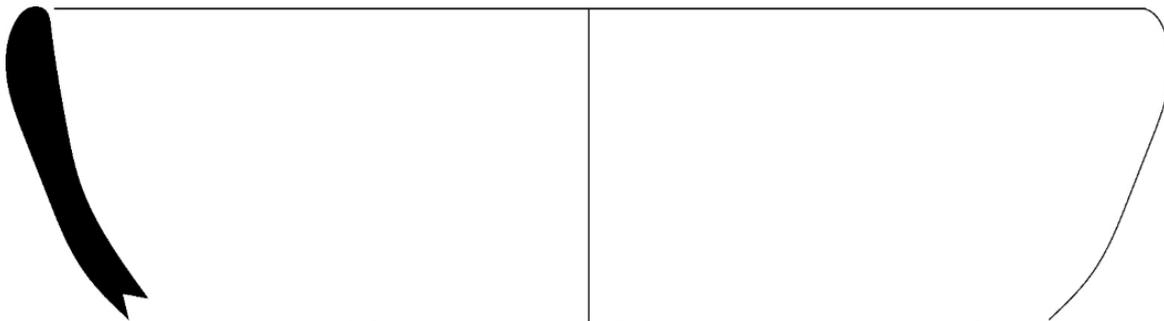




S3: 1536

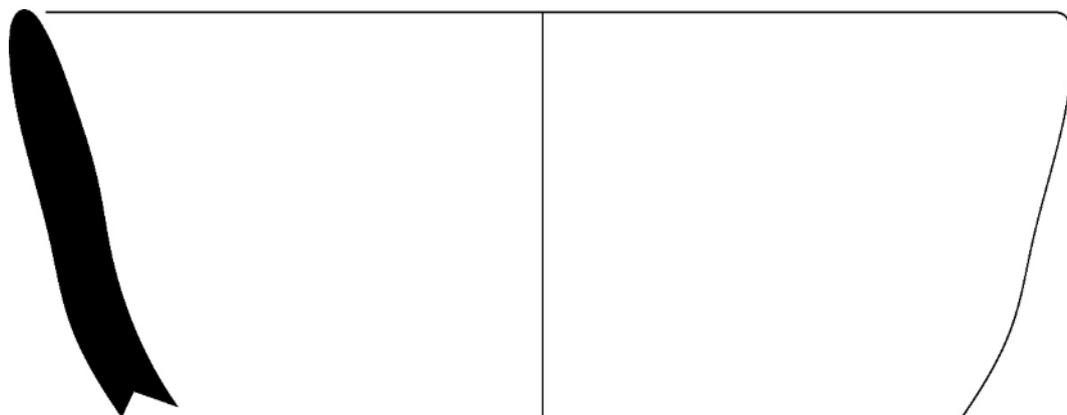


S3: 1002

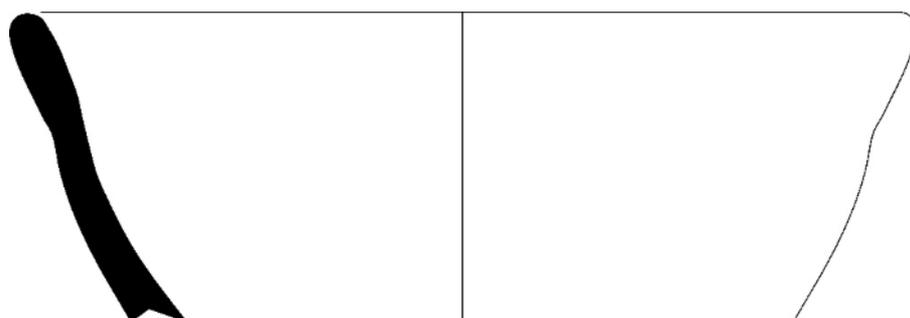


S3: 1509

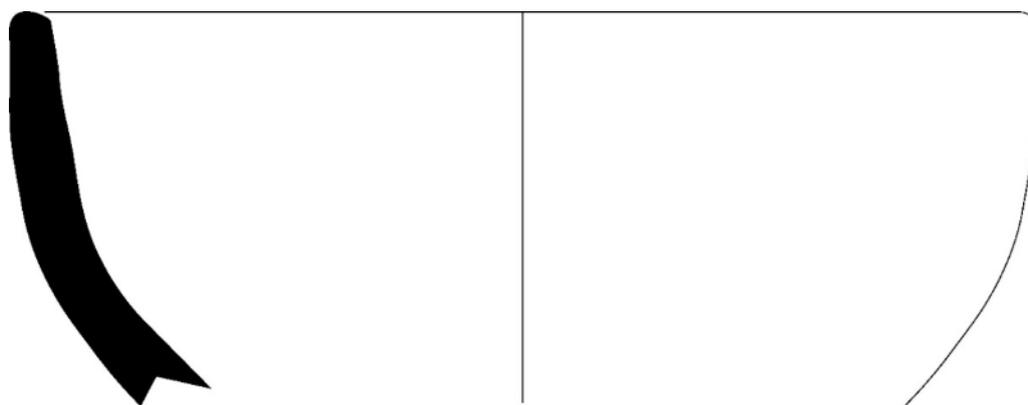




S3: 1502



S3: 1016

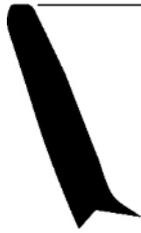


S3: 4492

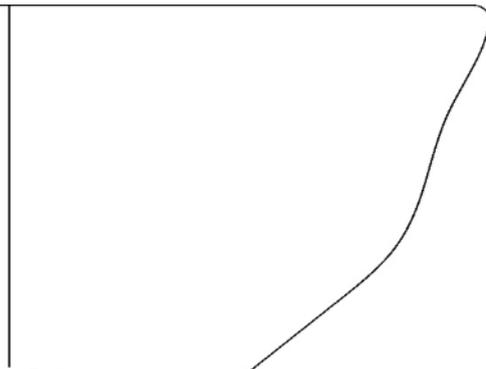
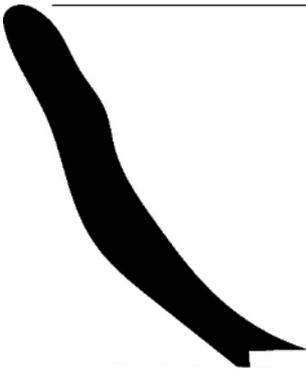




S3: 4639



S3: 1526

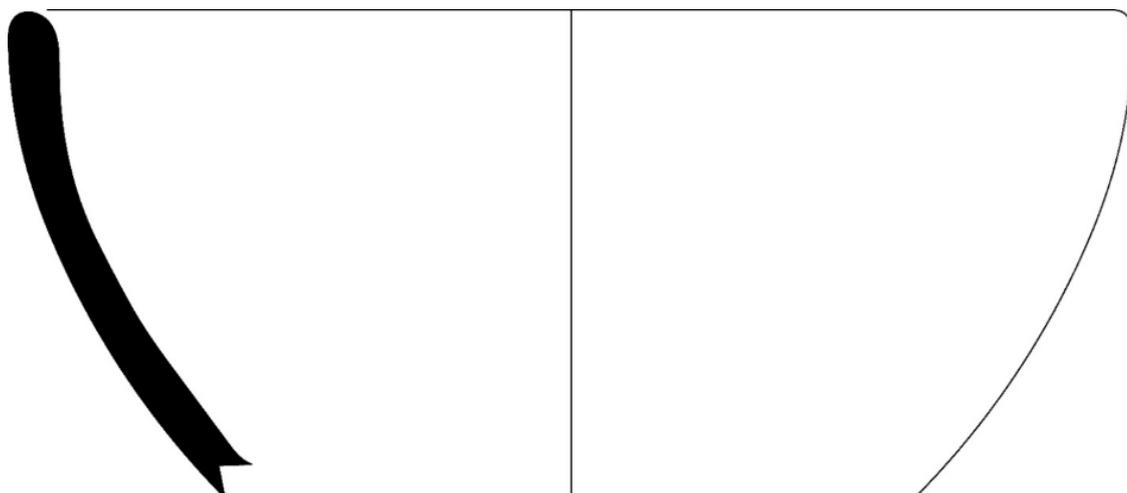


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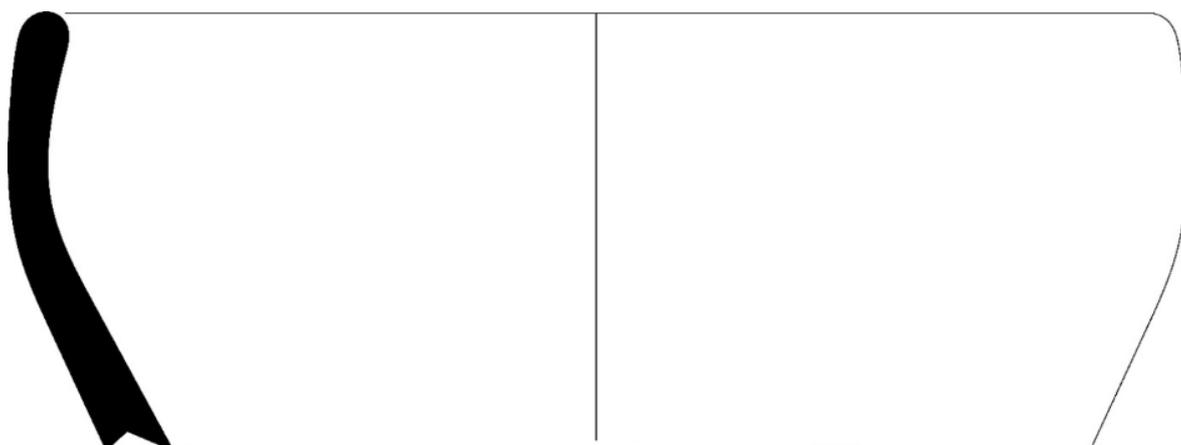


S3: 1511



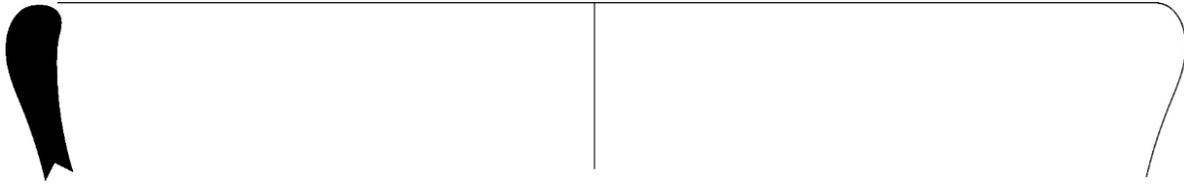


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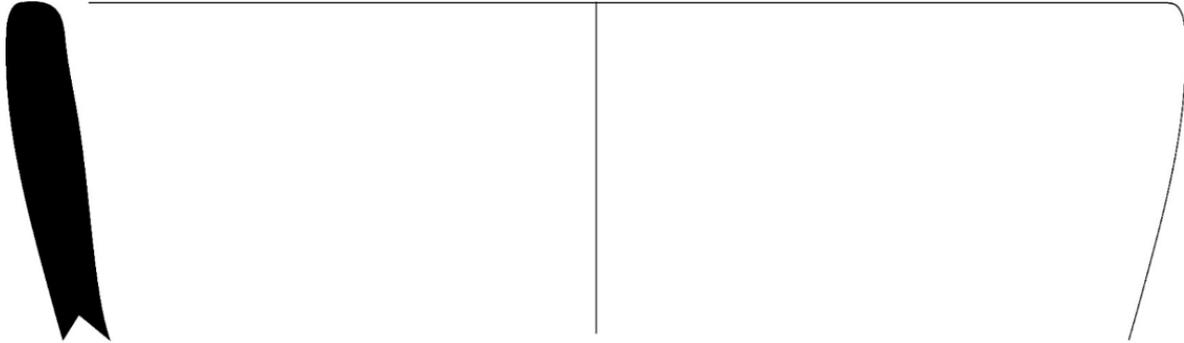


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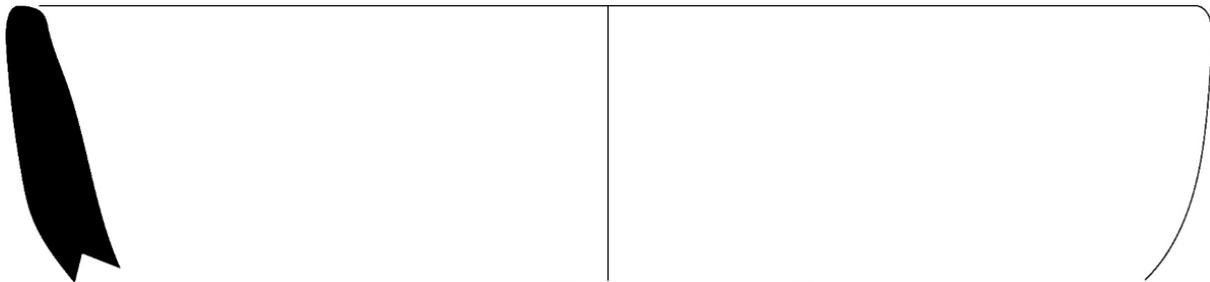




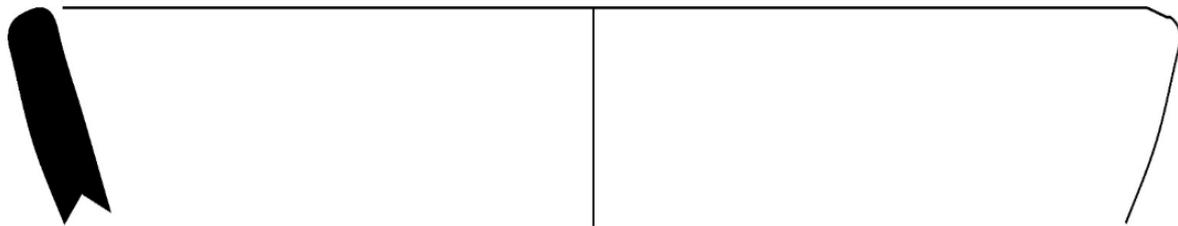
S2: 1318



S2: 1328

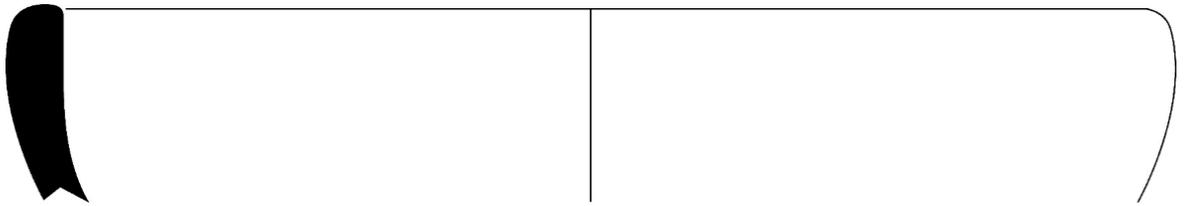


S2: 1309

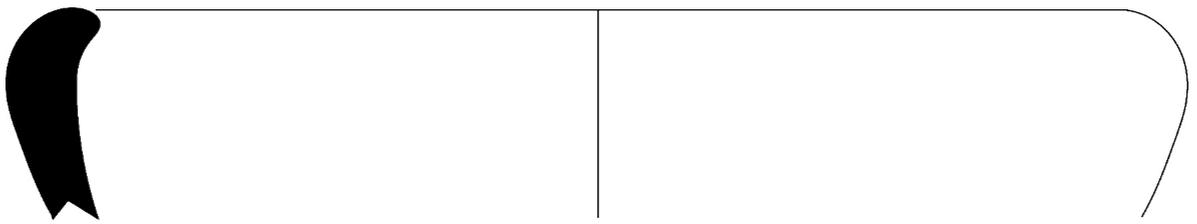


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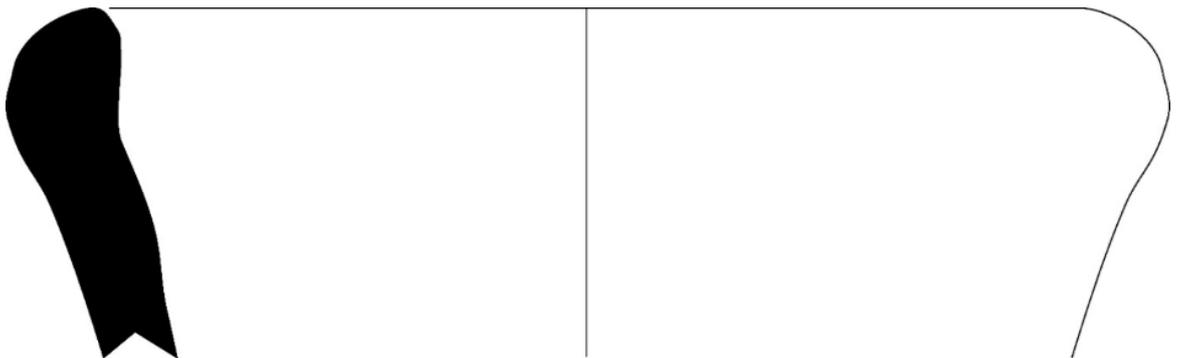




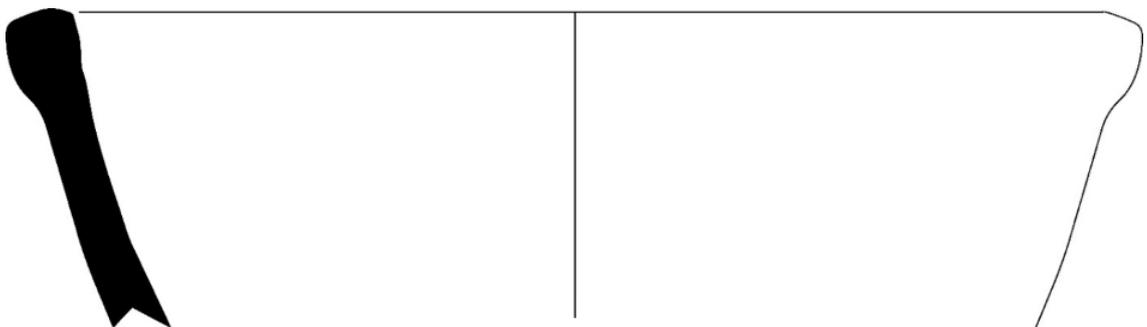
S3: 2305



S3: 2315

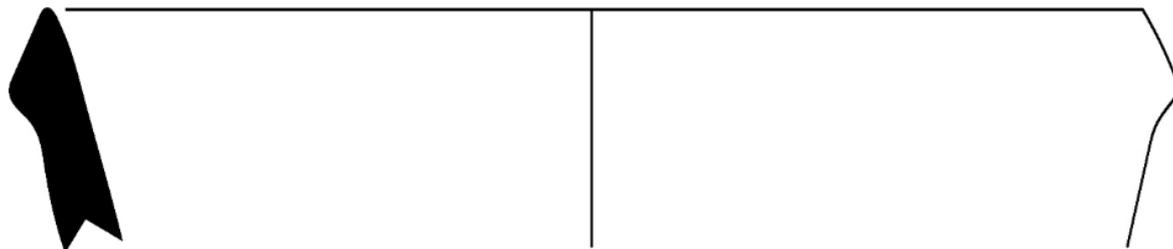


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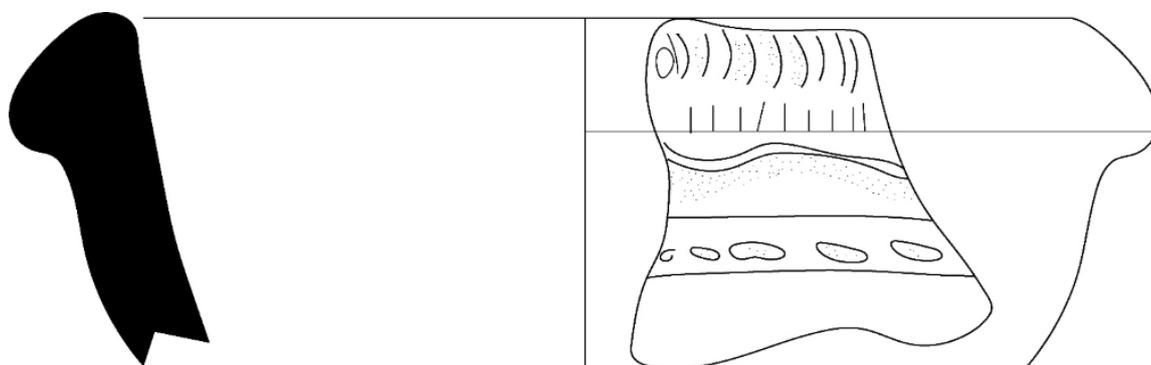


S3: 1028



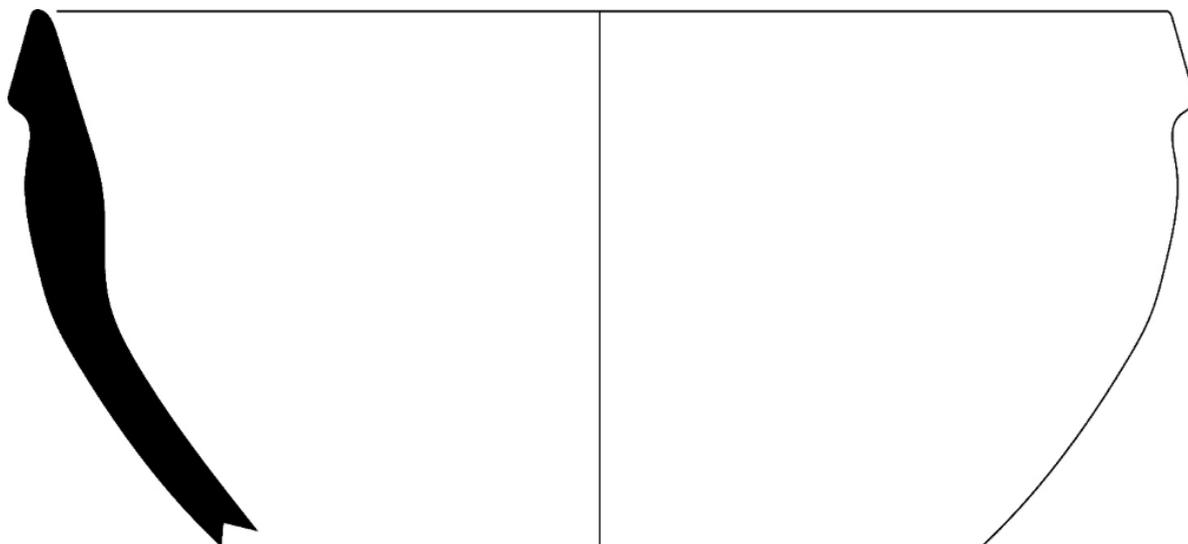


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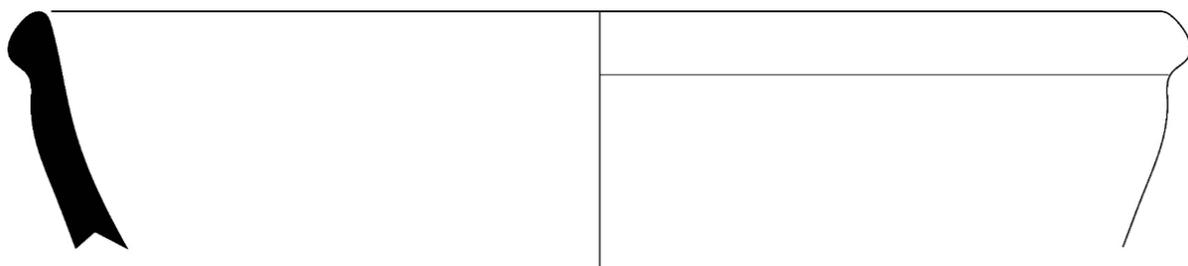


S2: 1227

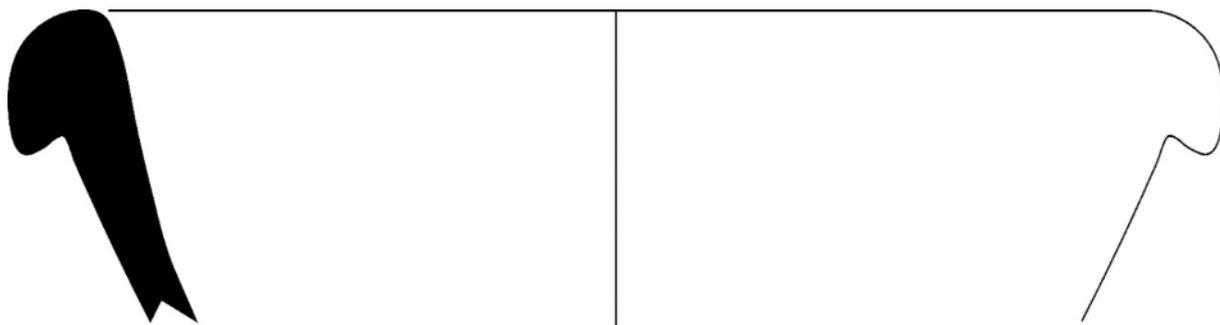




S3: 1377

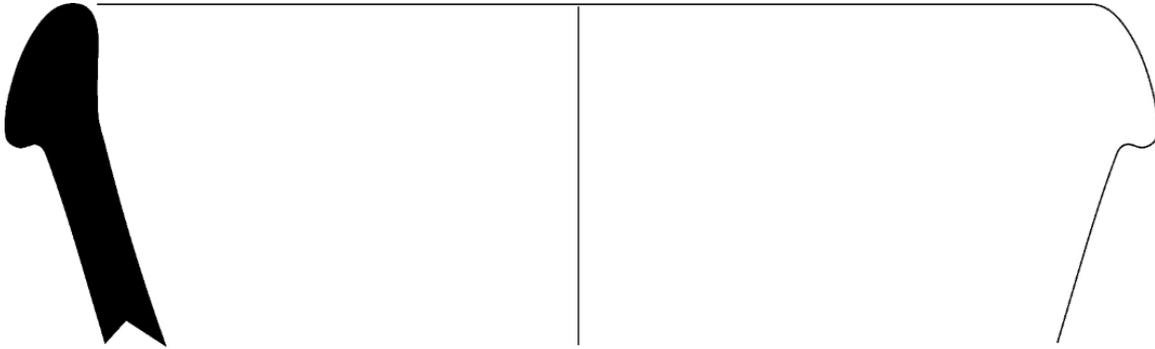


S3: 1269



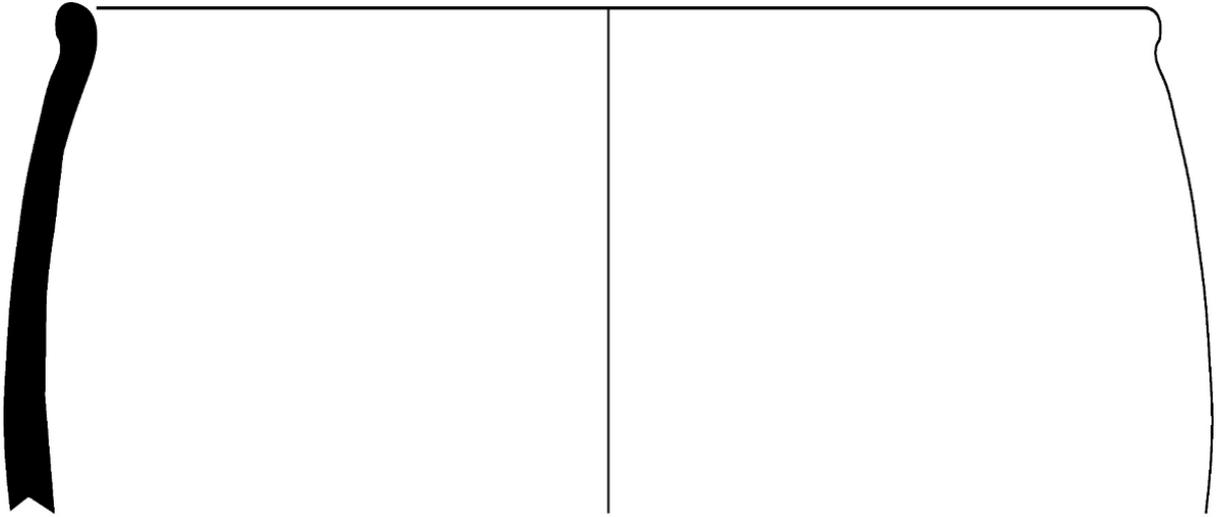
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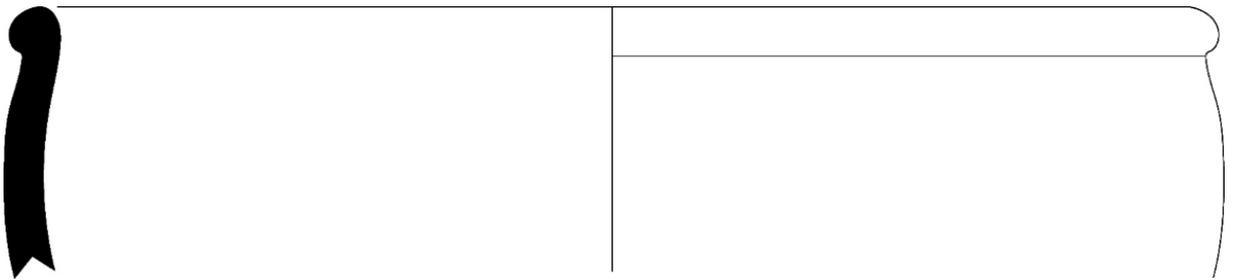


S3: 1371



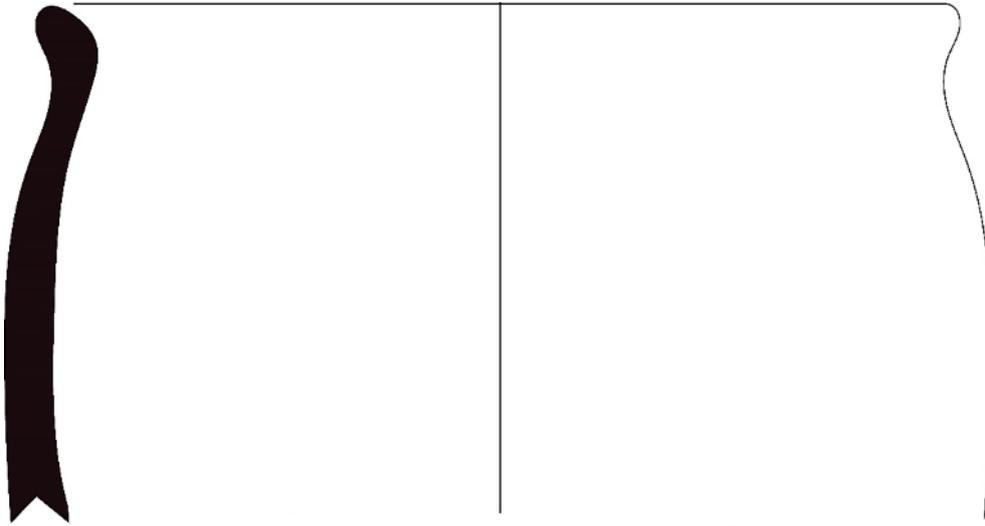


S2: 1165



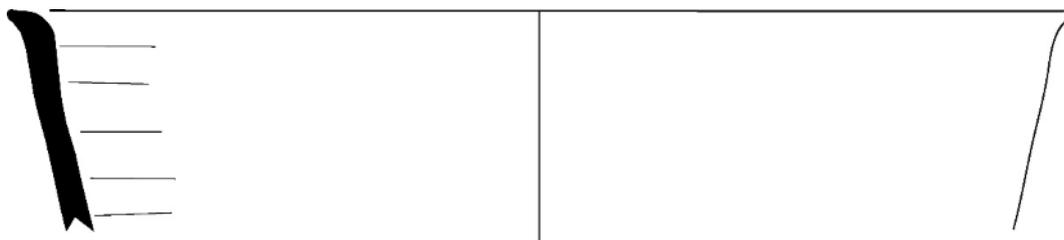
S2: 1283



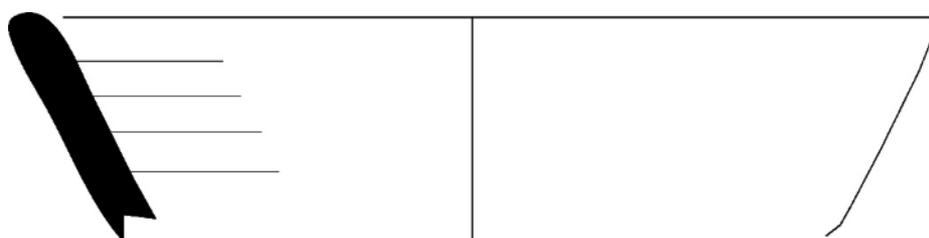


S3: 3243

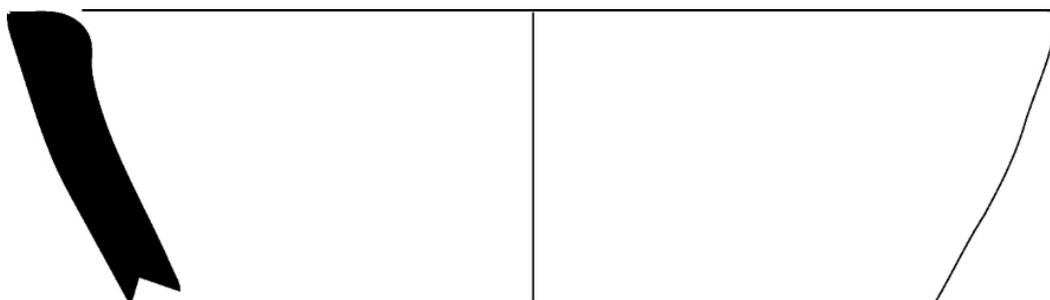




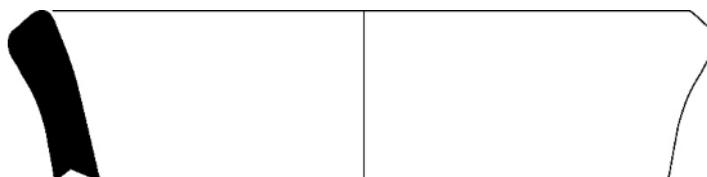
S2: 1114



S2: 1127

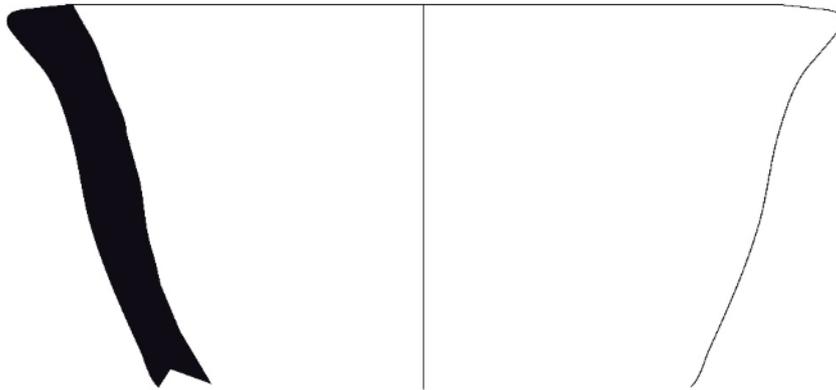


S2: 1067



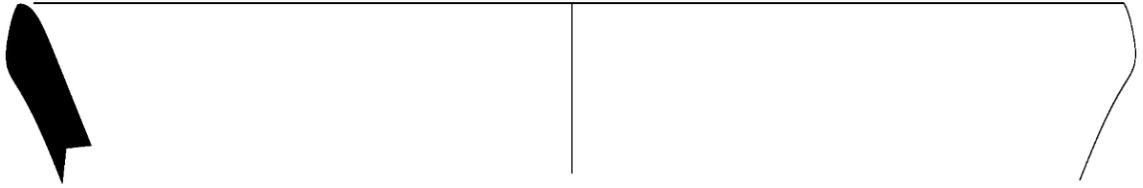
S2: 1146





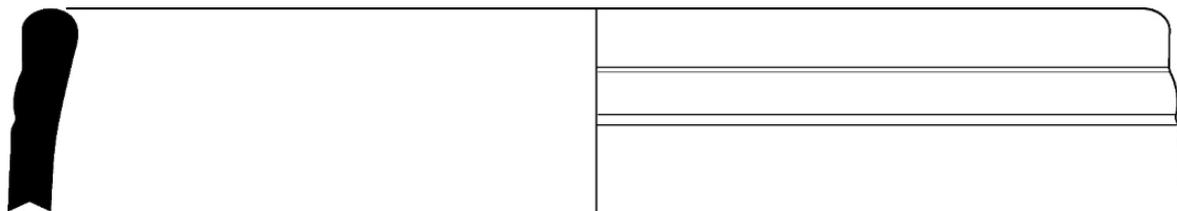
S2: 1001



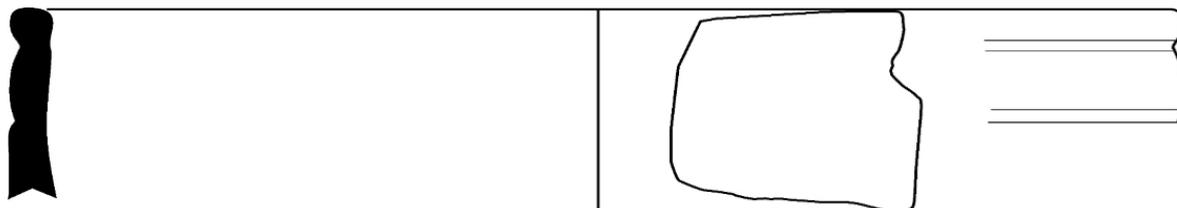


S3: 1491

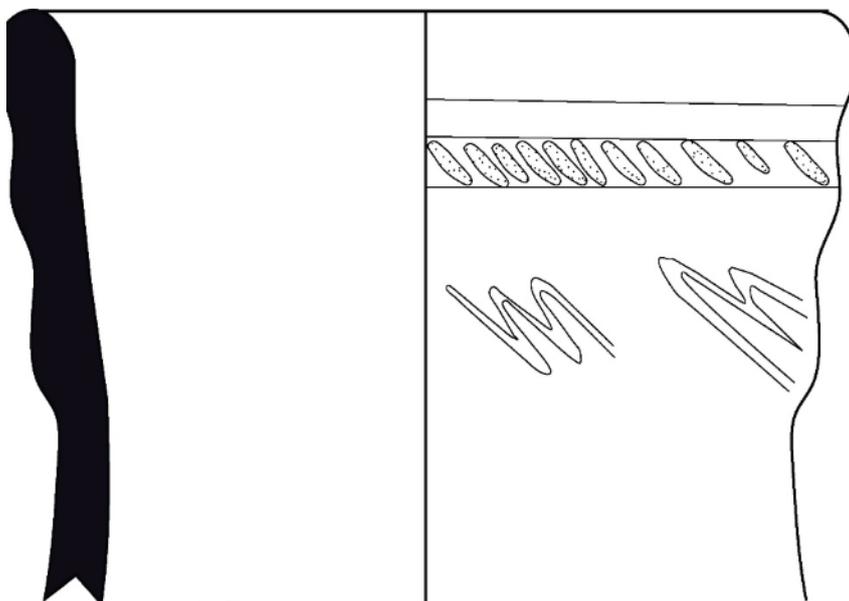




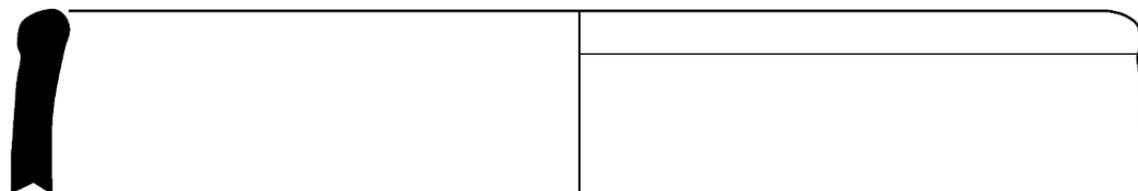
S2: 1162



S2: 1161

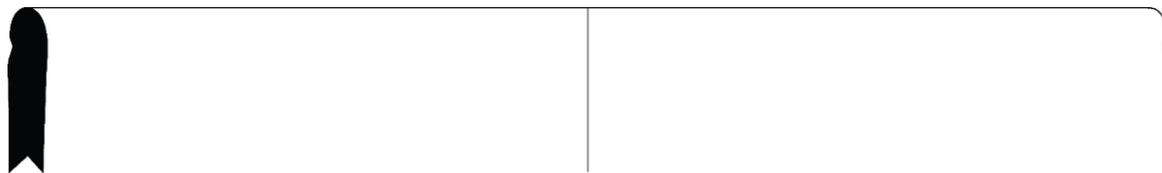


S2: 1131

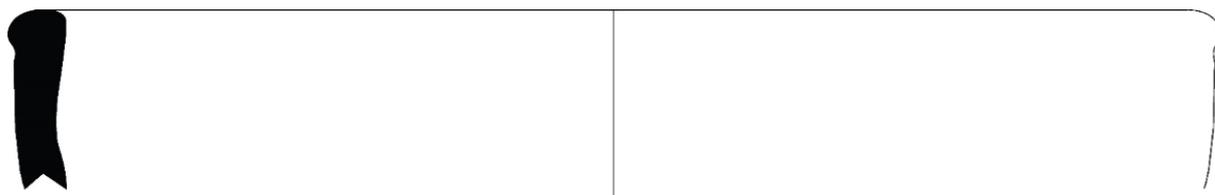


S2: 1163

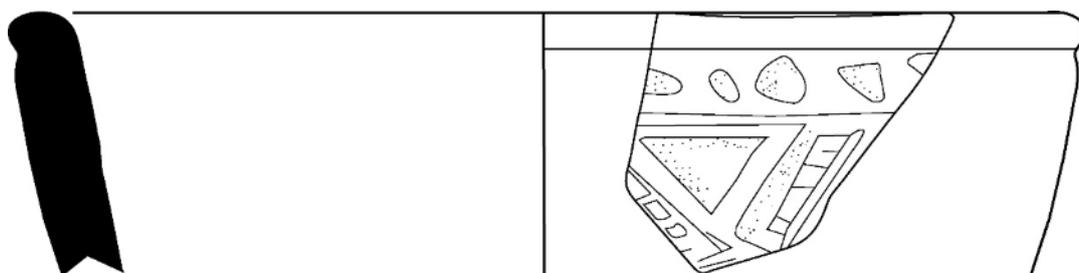




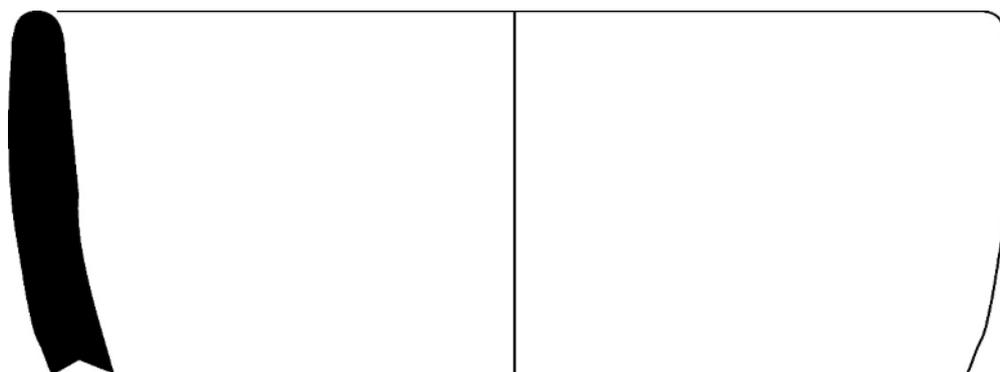
S2: 1117



S2: 1118

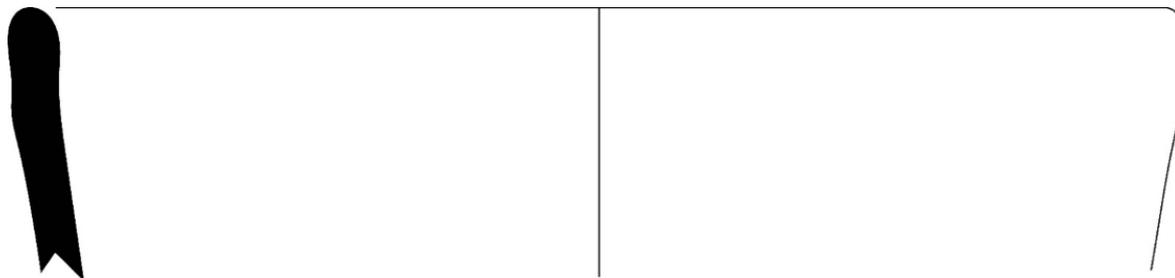


S2: 1144

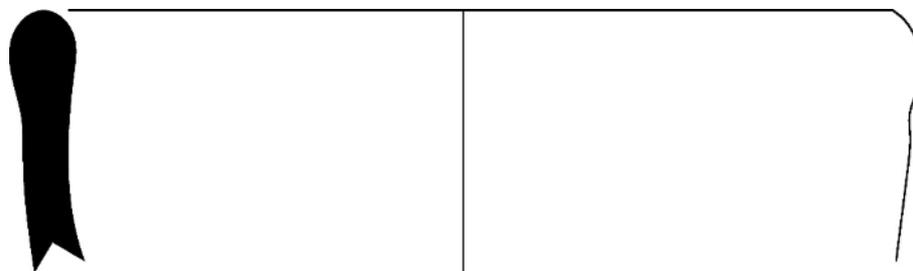


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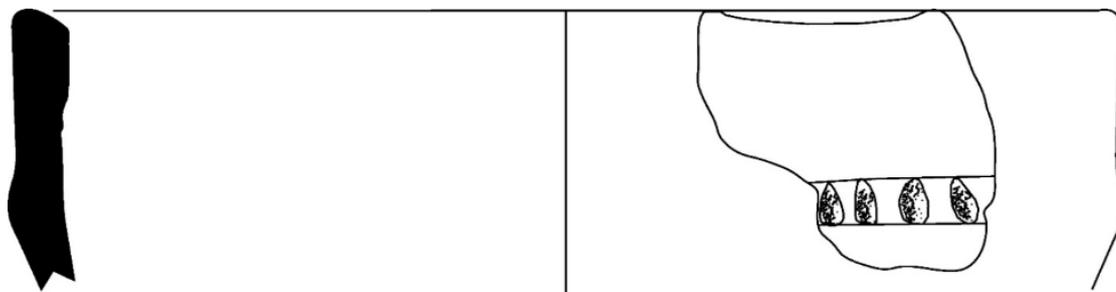




S2: 1231

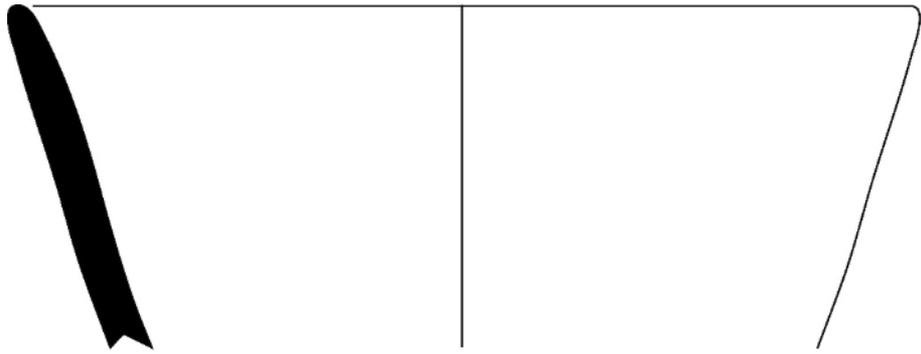


S2: 1262

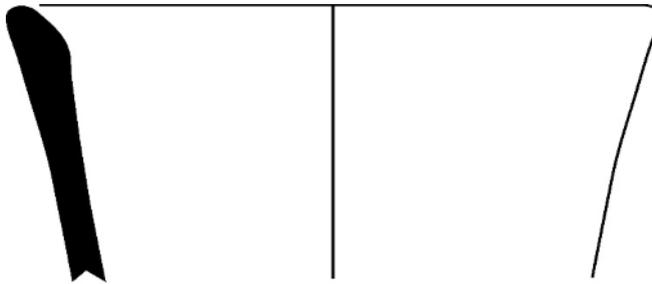


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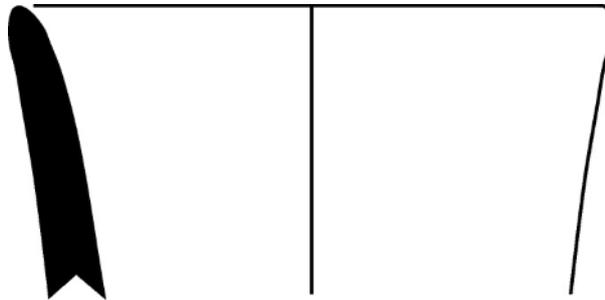




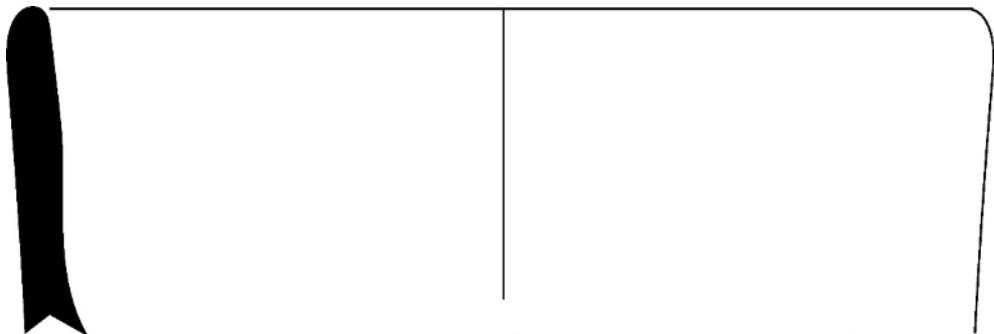
S2: 1195



S2: 1202

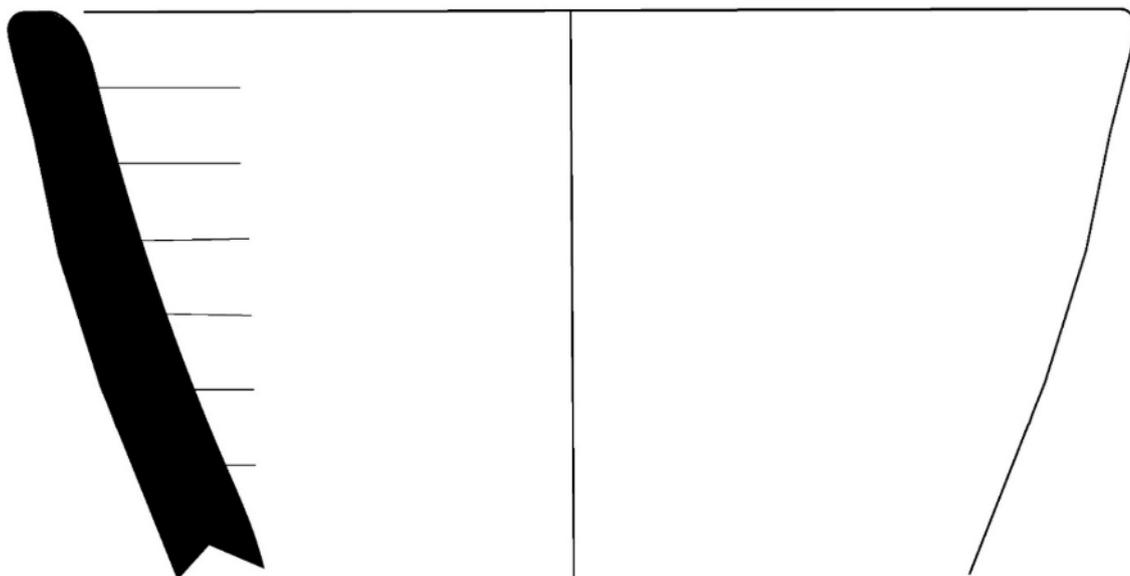


S2: 1215

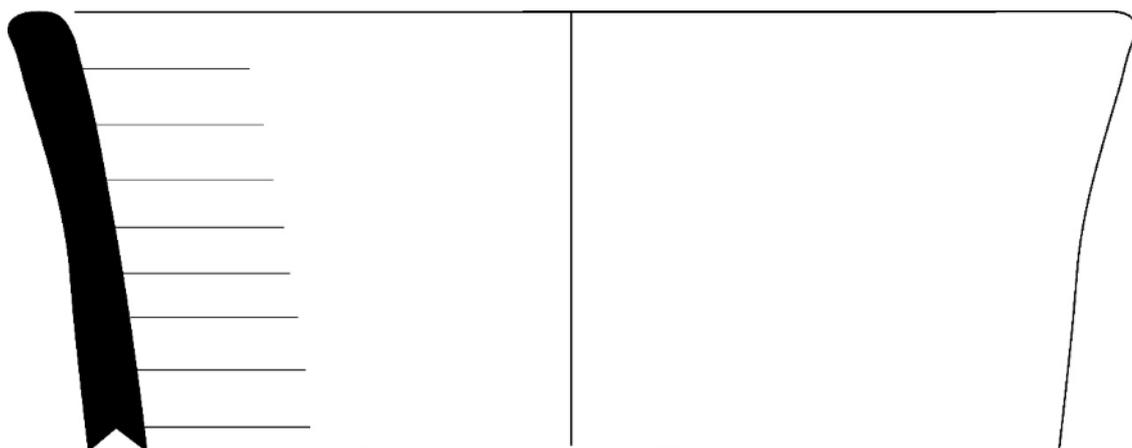


S2: 1333

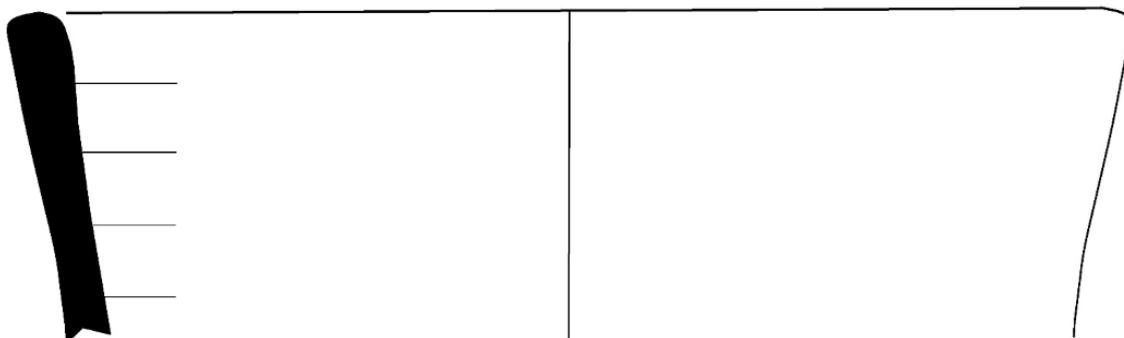




S2: 1183

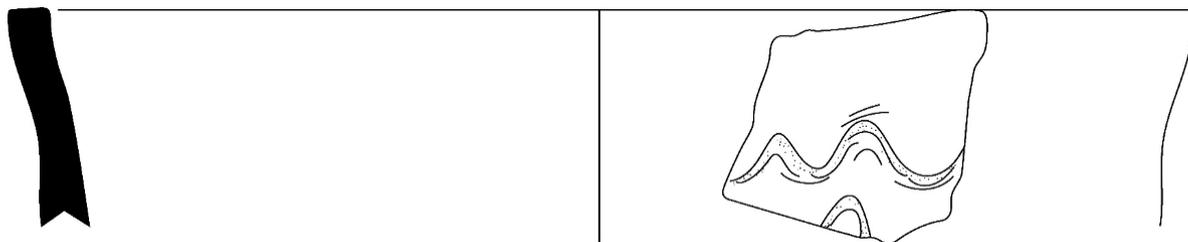


S2: 1238

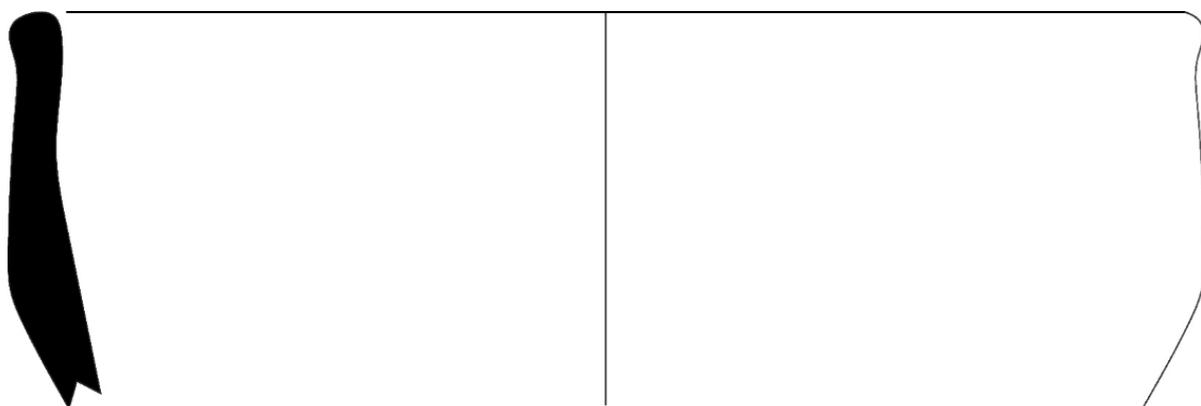


S2: 1182

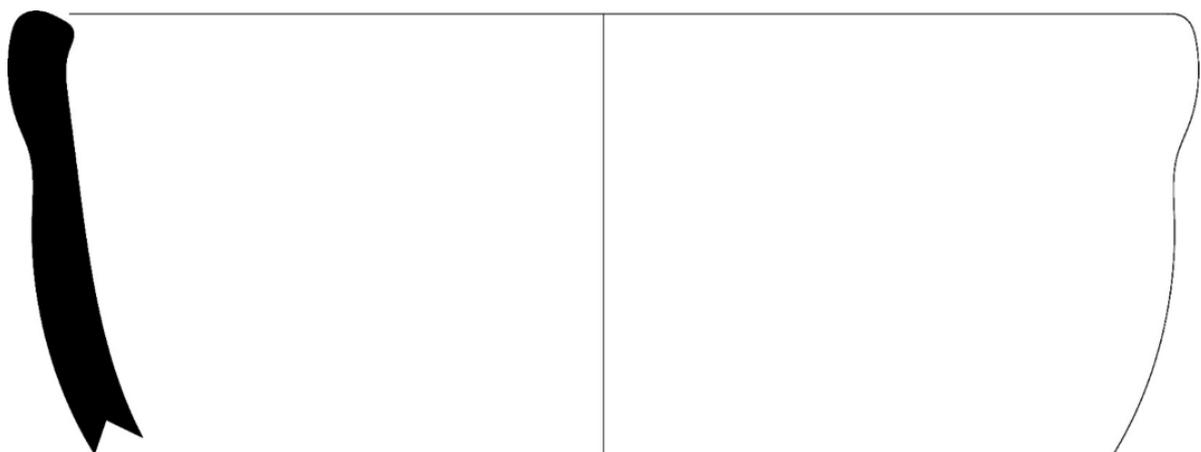




S3: 3807

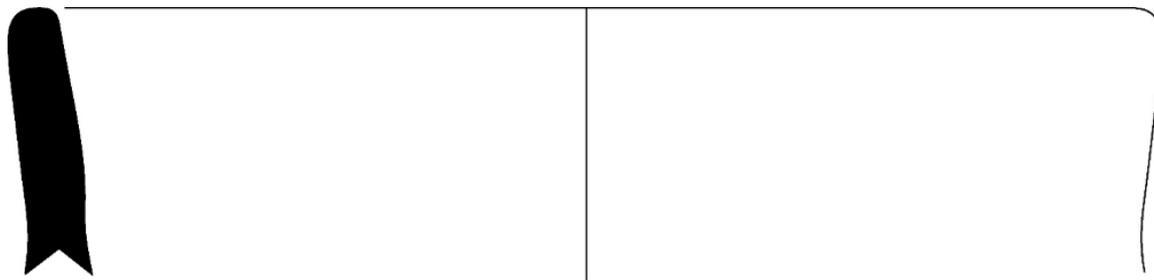


S3: 1483

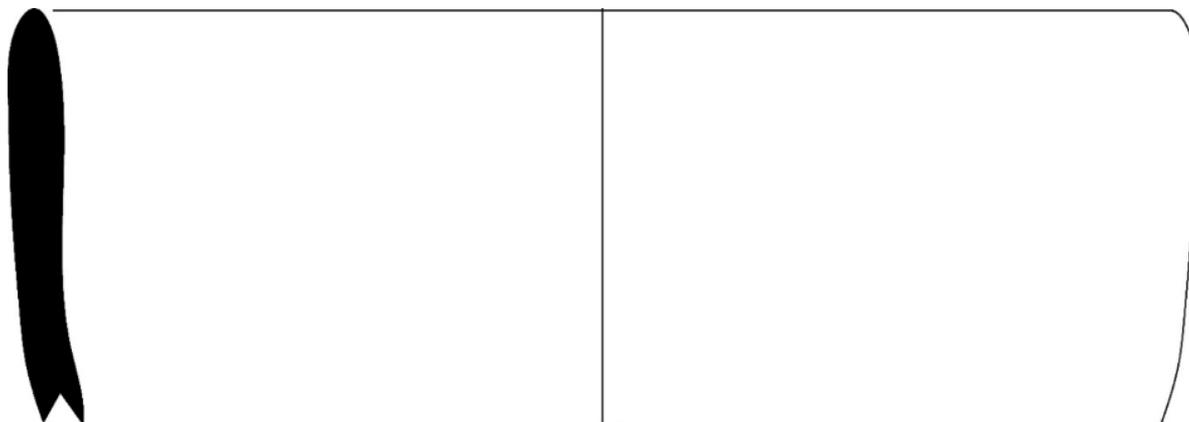


S3: 1506

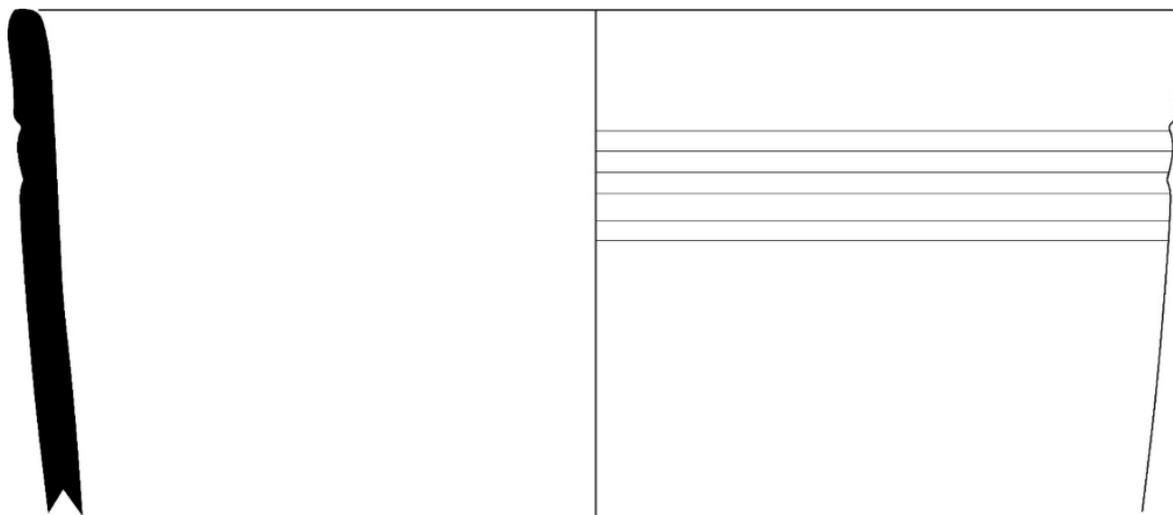




S3: 1374

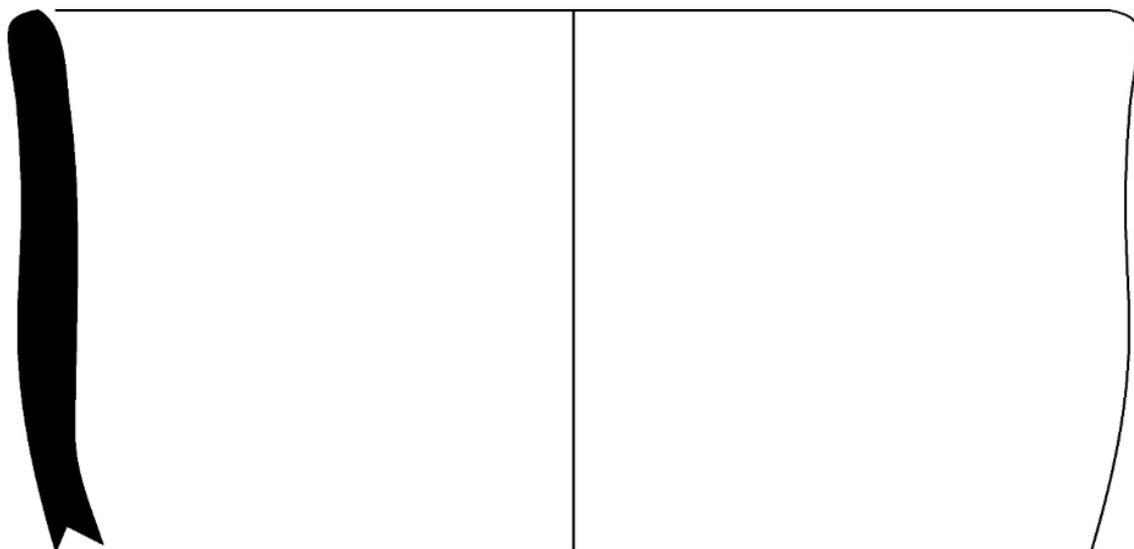


S3: 1403

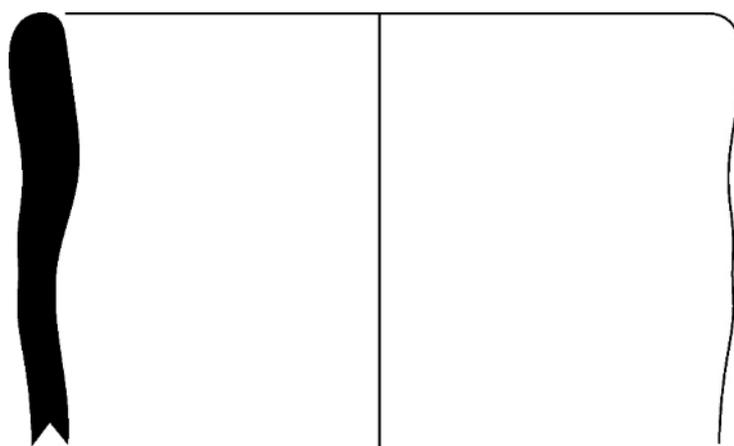


S3: 1107

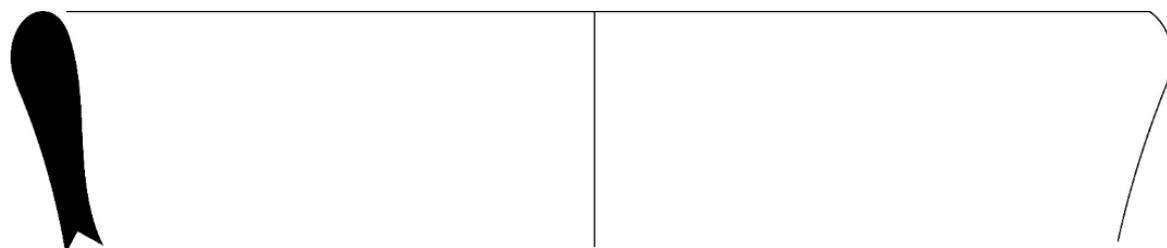




S3: 1103

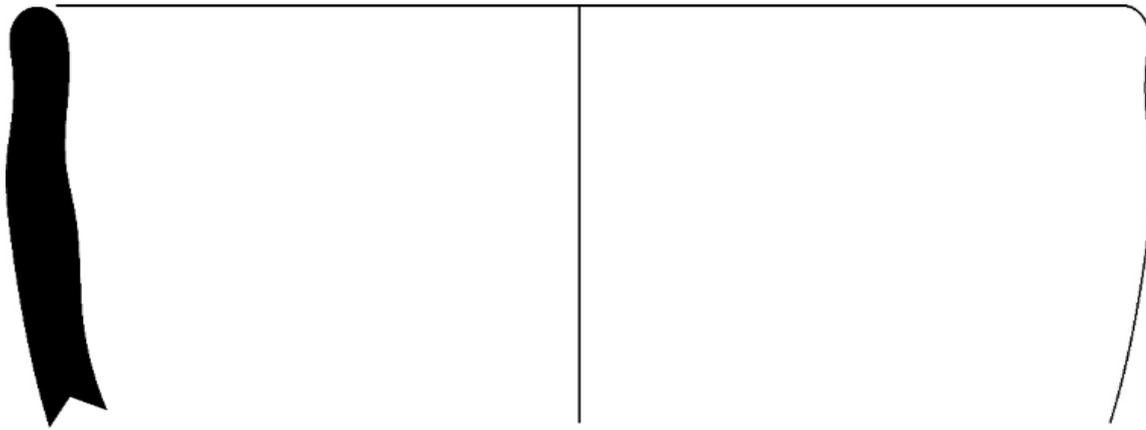


S3: 1375

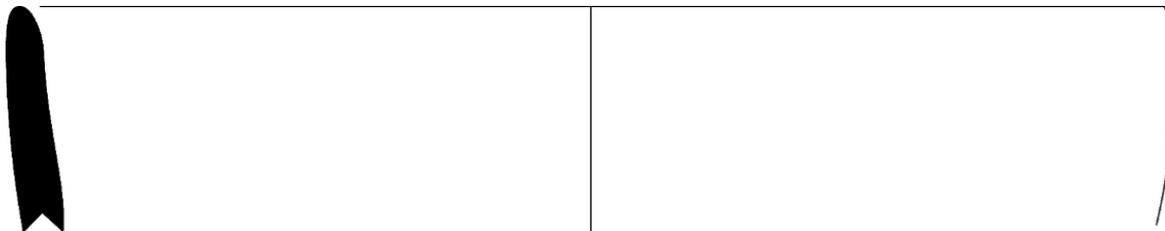


S3: 1496

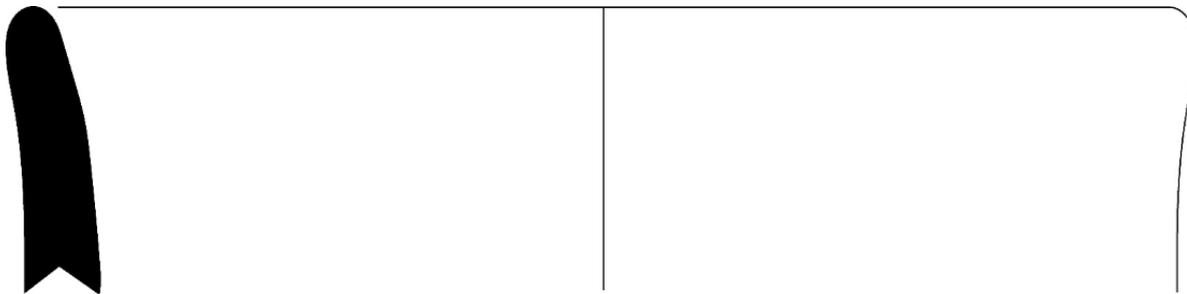




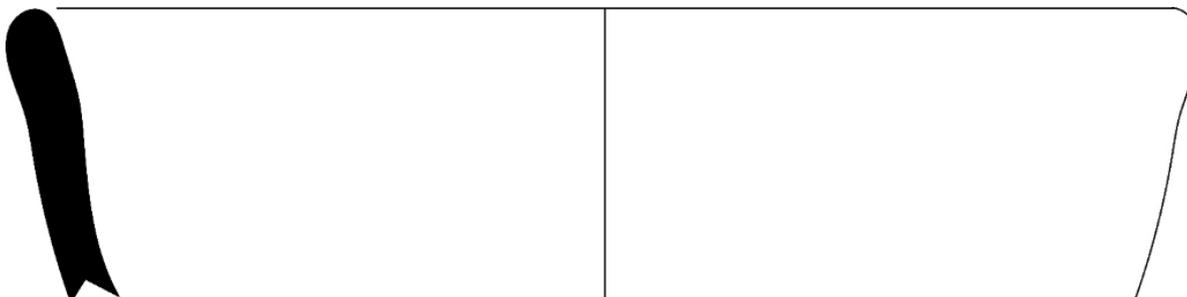
S3: 1404



S3: 1497

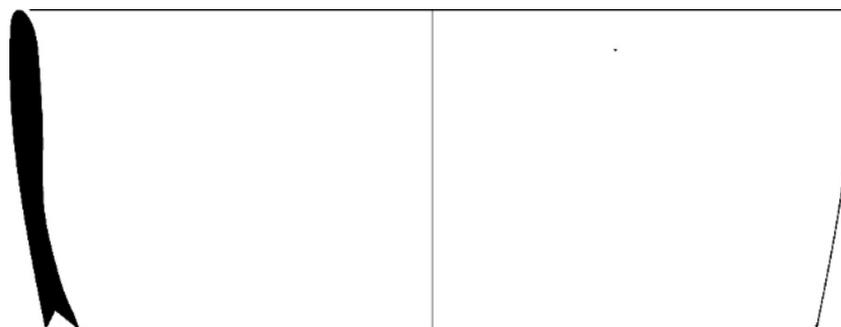


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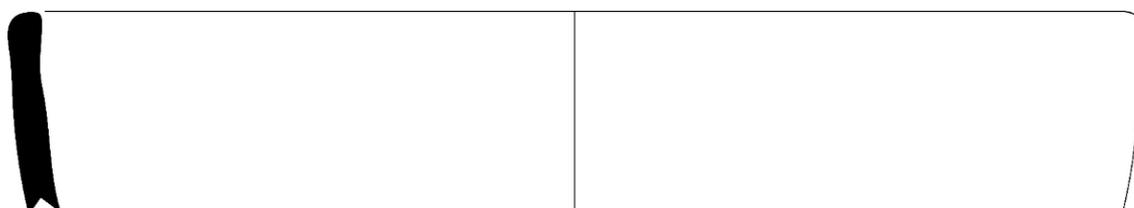


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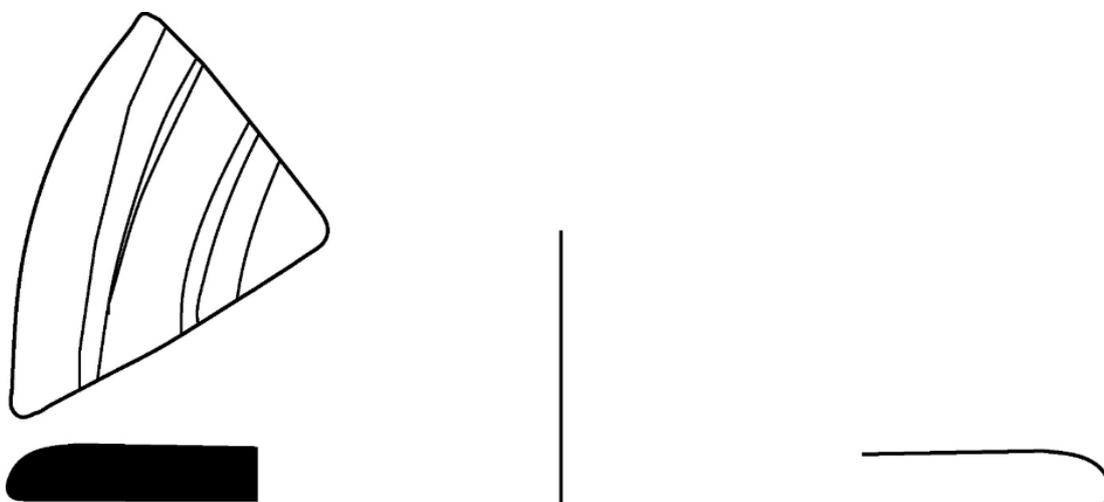




S3: 1466



S3: 1463



S2: 1159



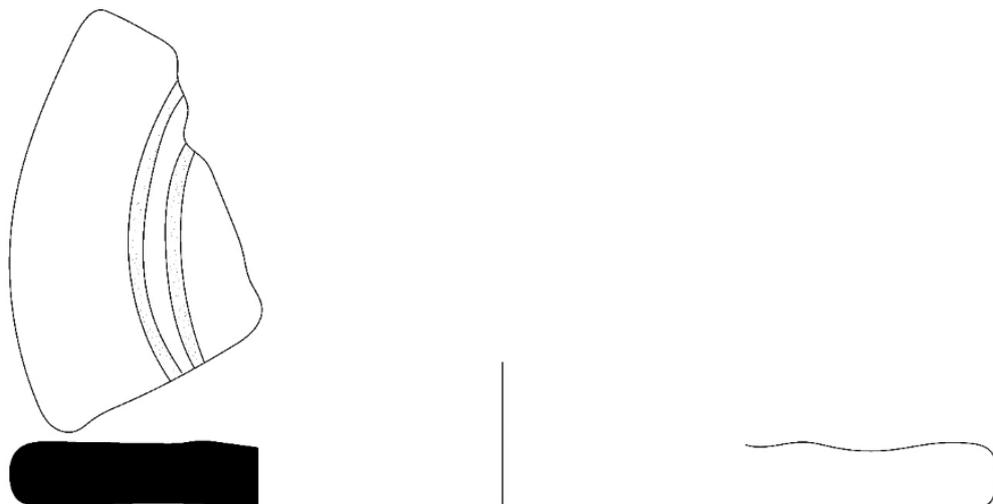


S2: 1642

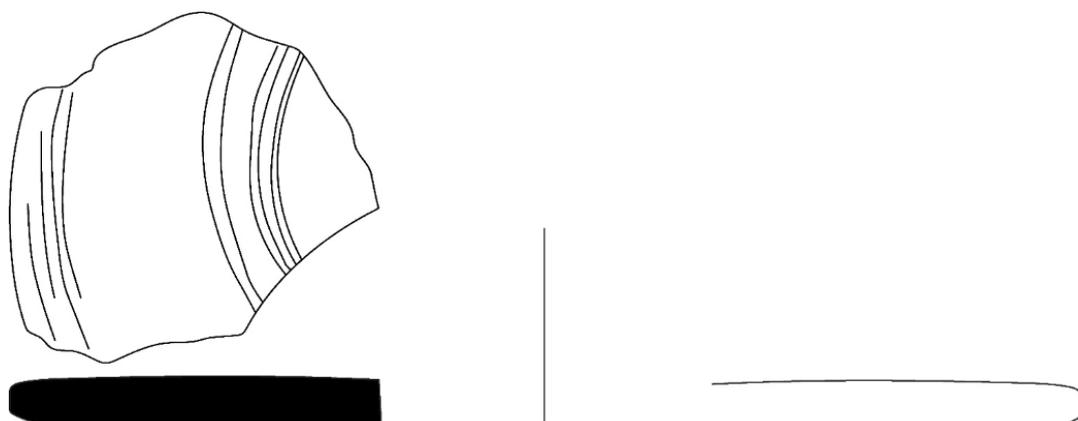


S2: 1100

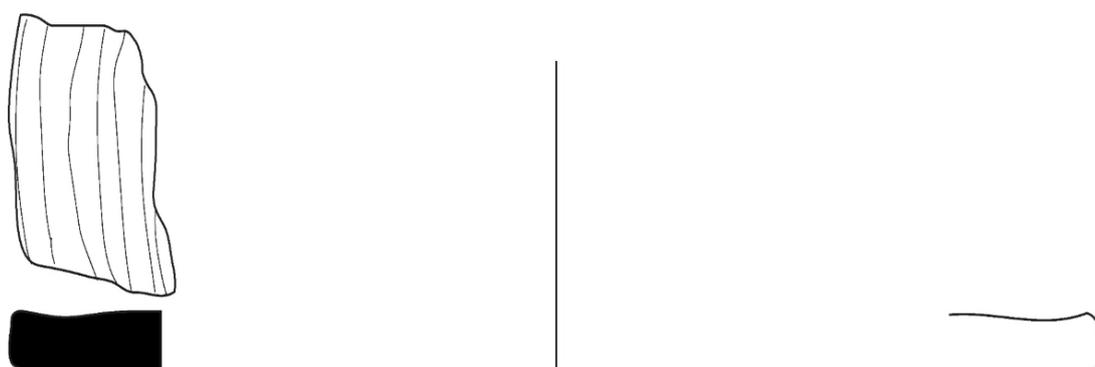




S2: 1278

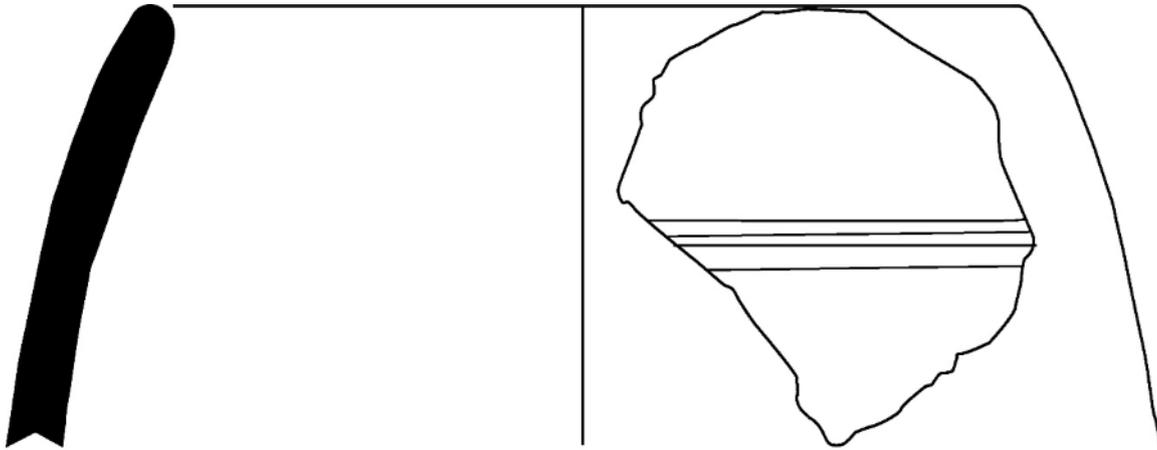


S2: 1254

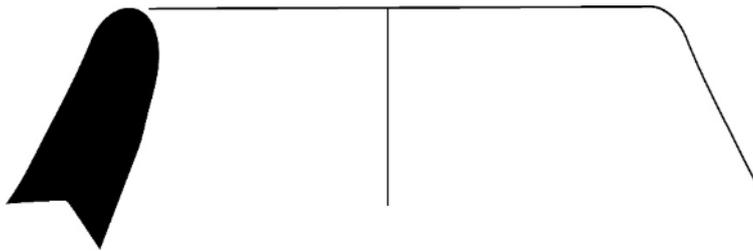


S2: 1251



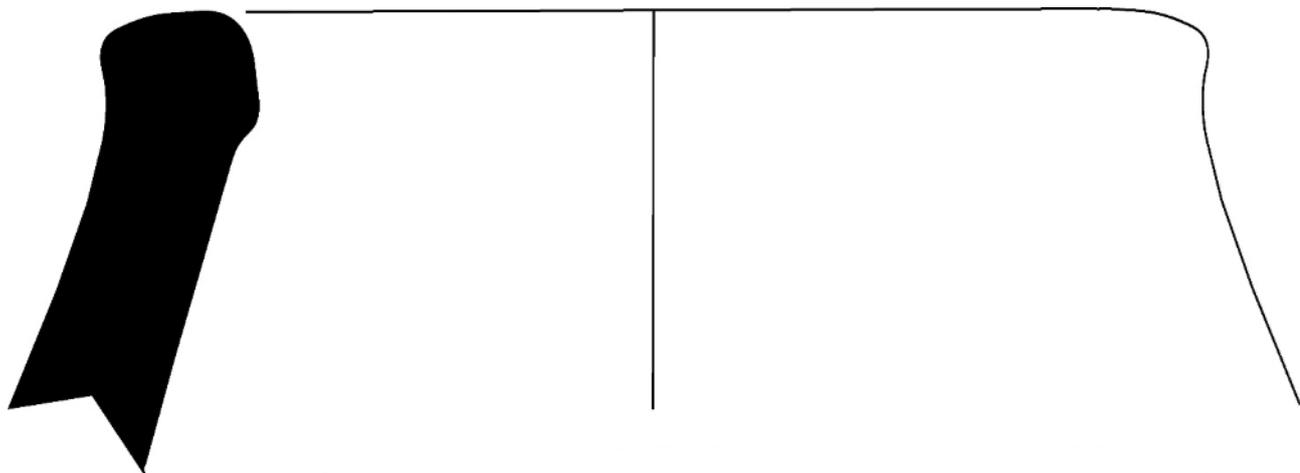


S2: 1184



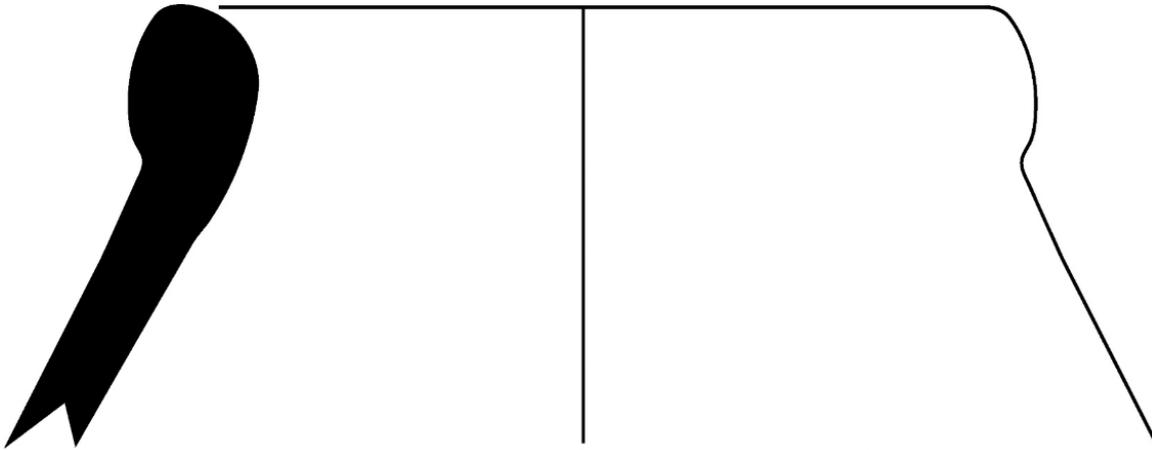
S2: 1910





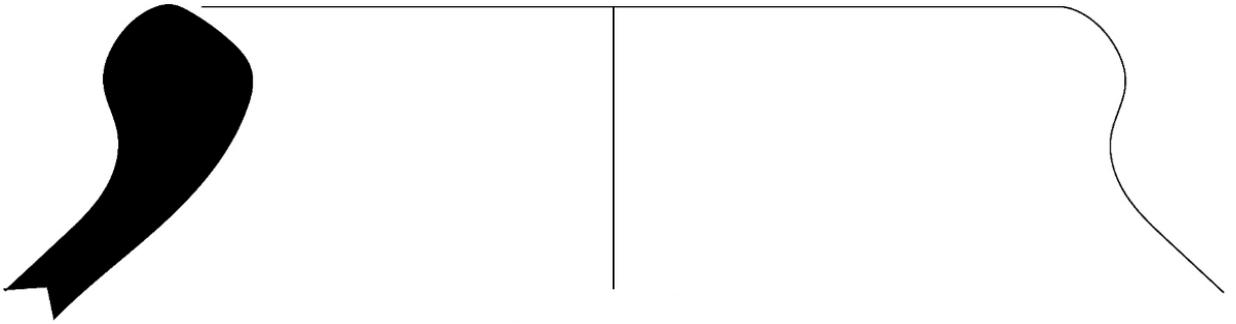
S2: 1838





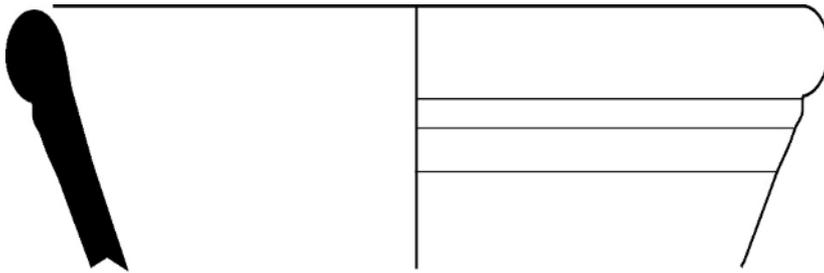
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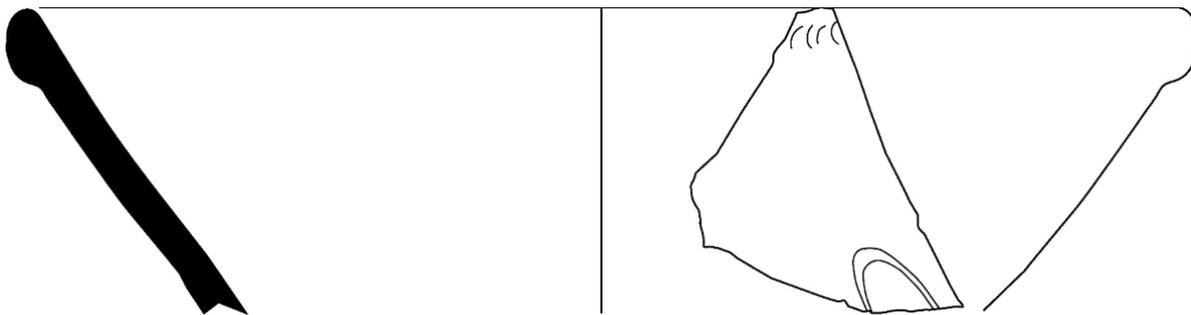


S3: 1533

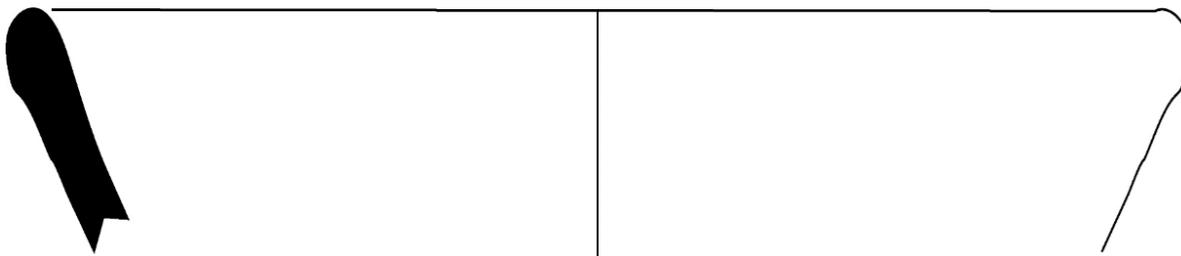




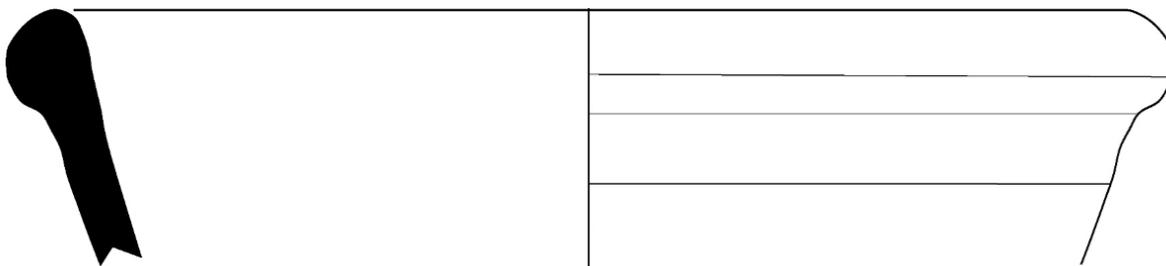
S2: 1211



S2: 1194

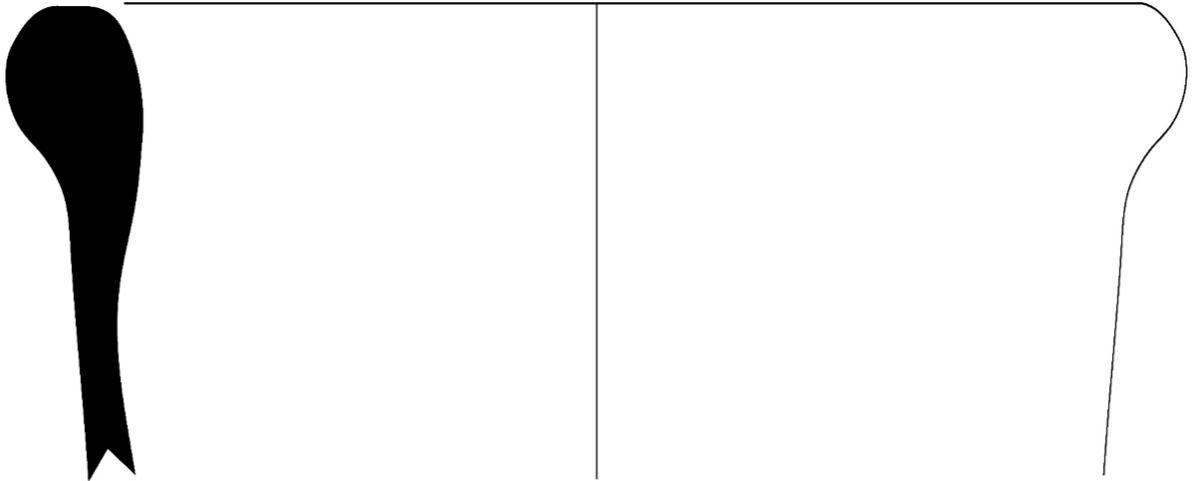


S2: 1634

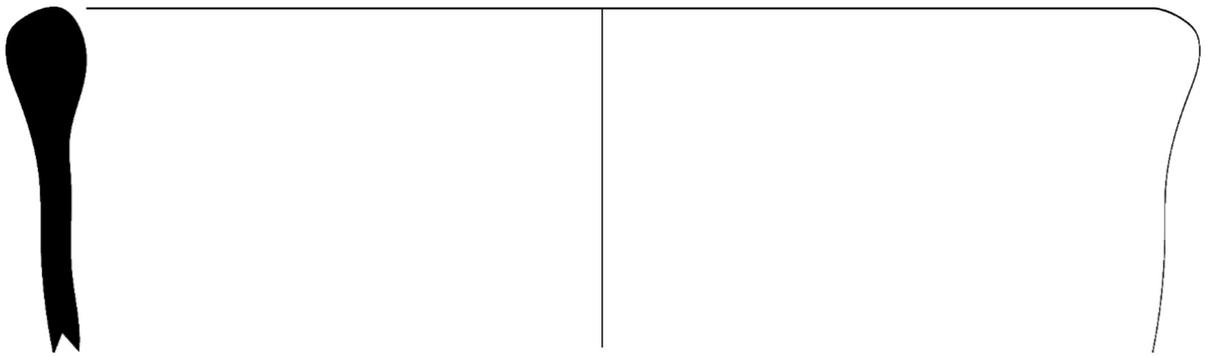


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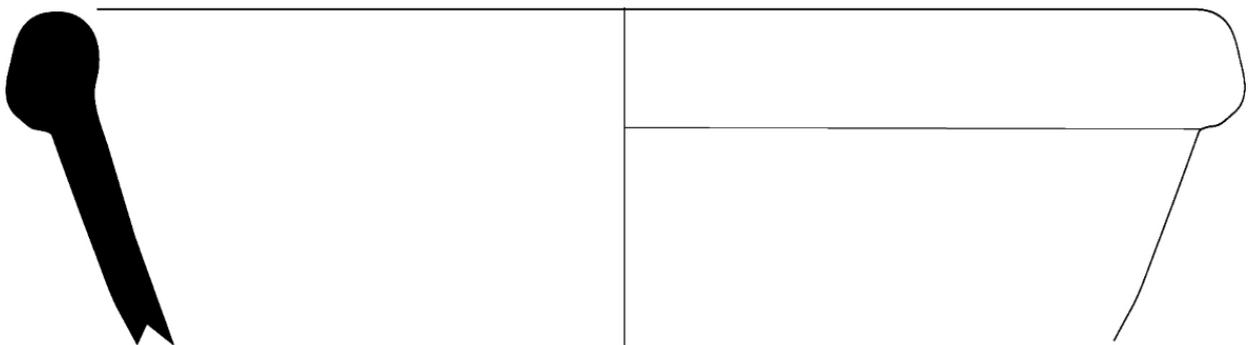




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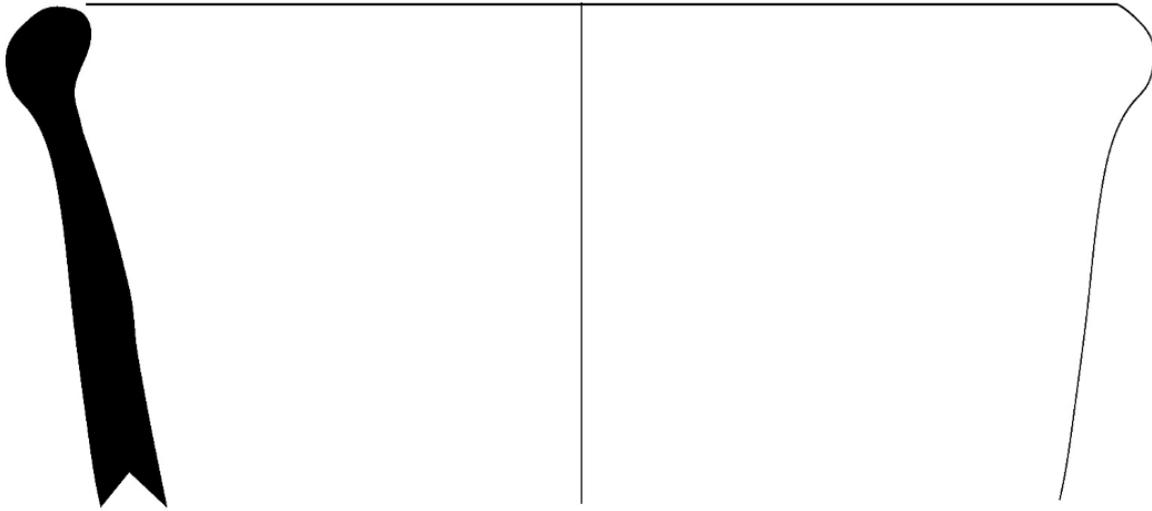


S3: 1441



S3: 4400





S3: 4500



Base – Hand-made

Plate 139

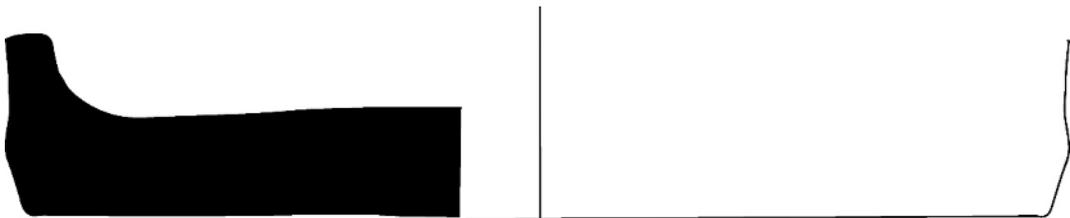
Type HMB-A: Base – Hand-made



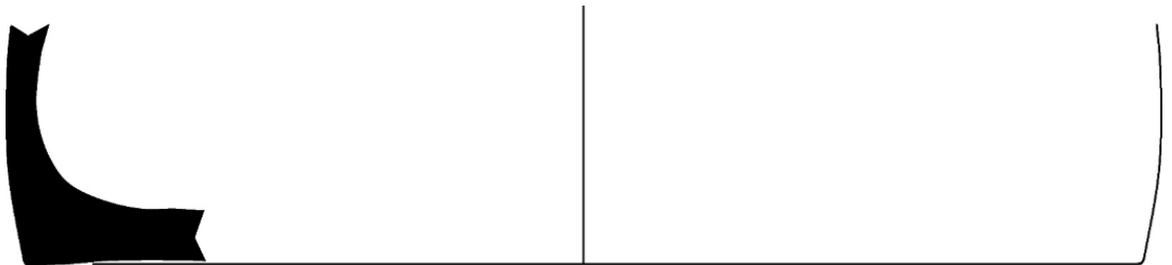
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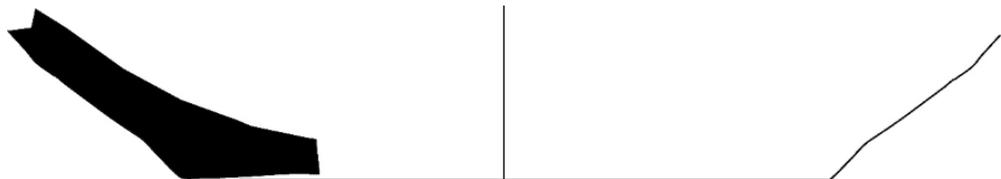
S2: 1015



S2: 1141

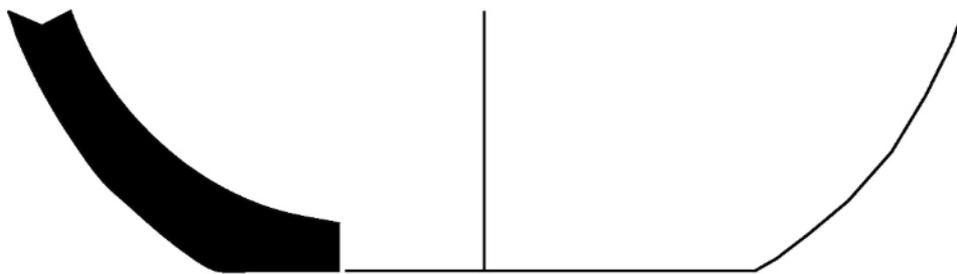


S2: 1150

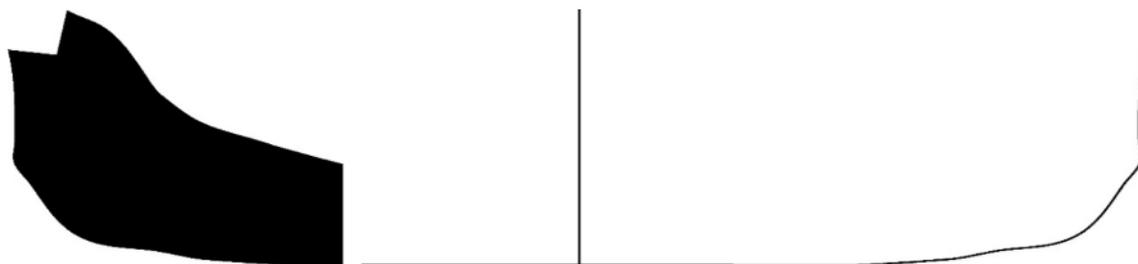


S2: 1174

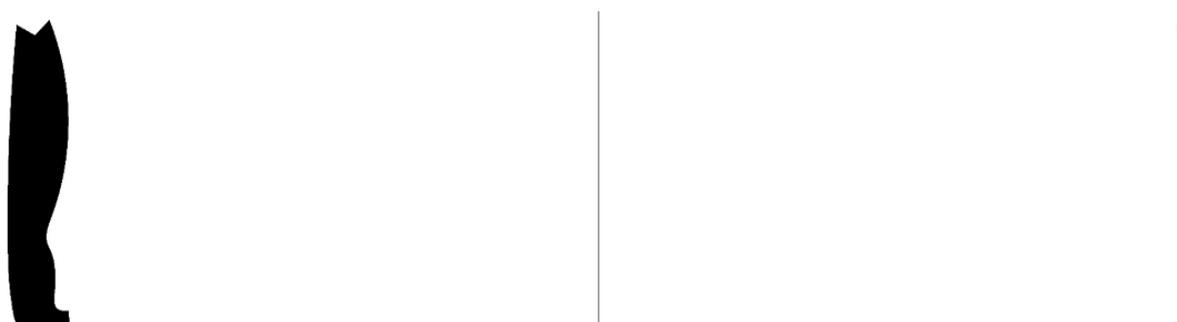




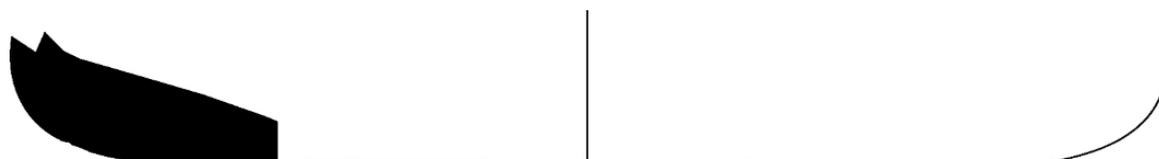
S2: 1201



S2: 1166



S2: 1330



S2: 1552

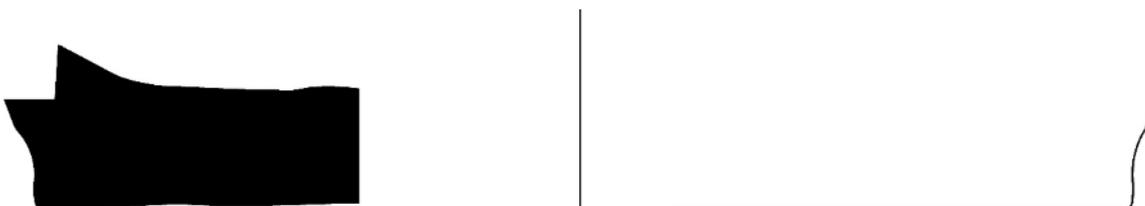




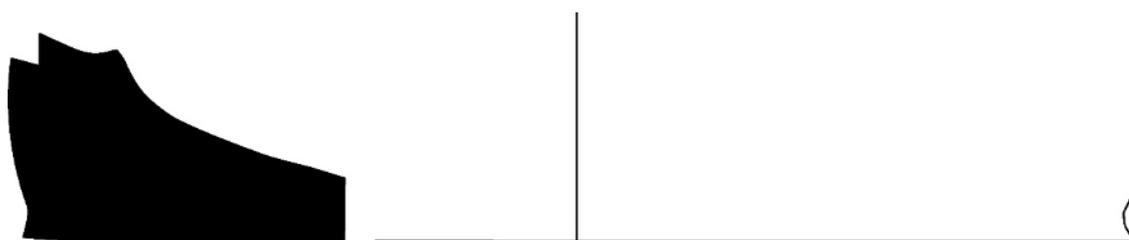
S2: 1360



S2: 1271

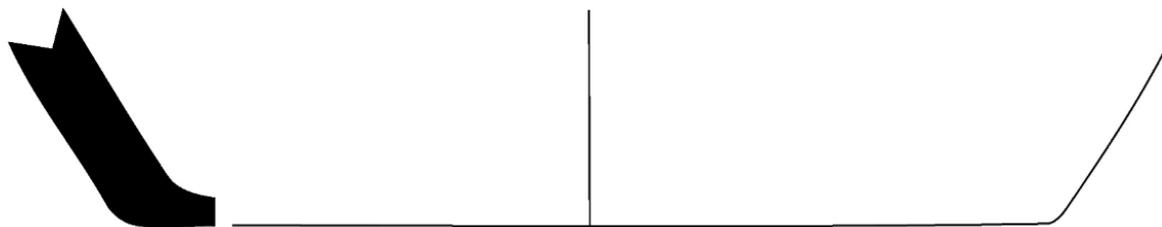


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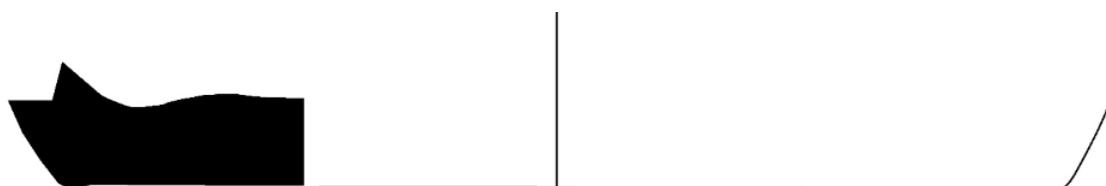


S2: 1562

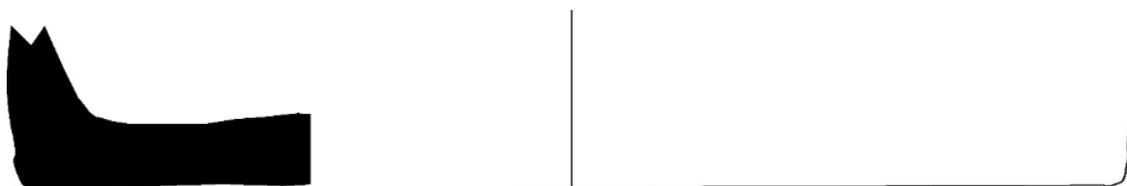




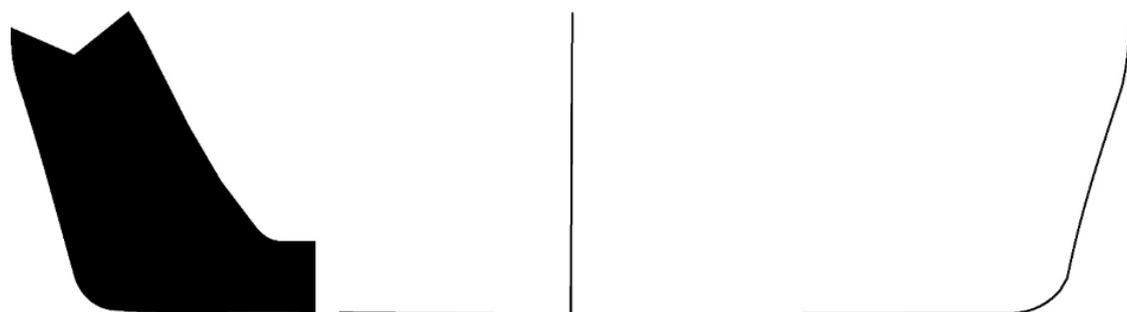
S2: 1169



S2: 1257

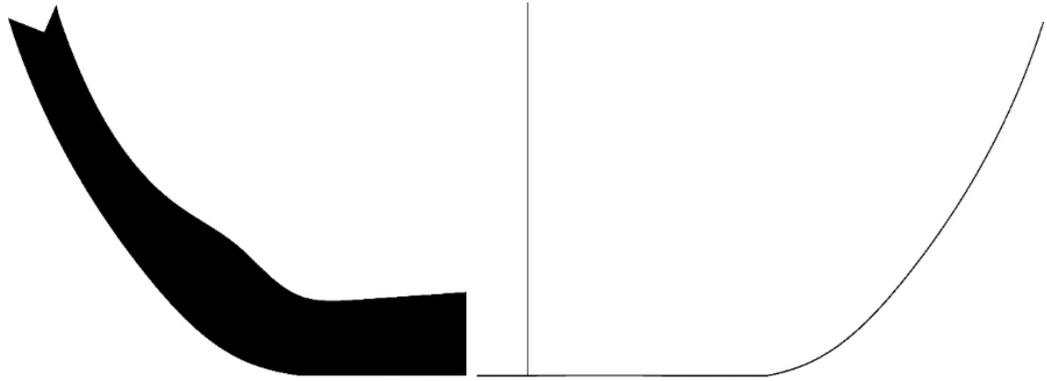


S2: 1289

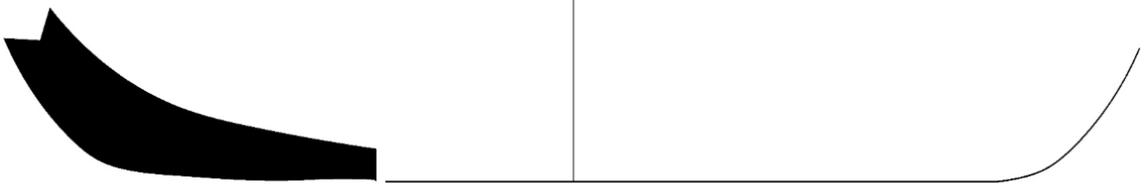


S2: 1549

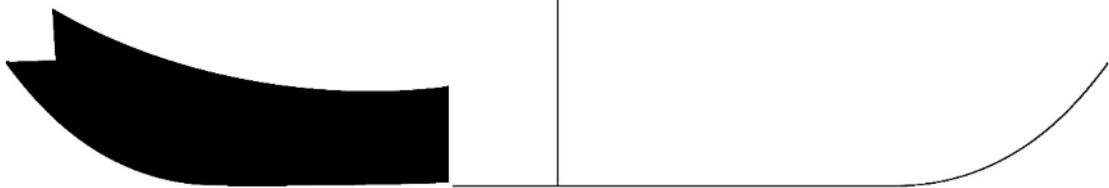




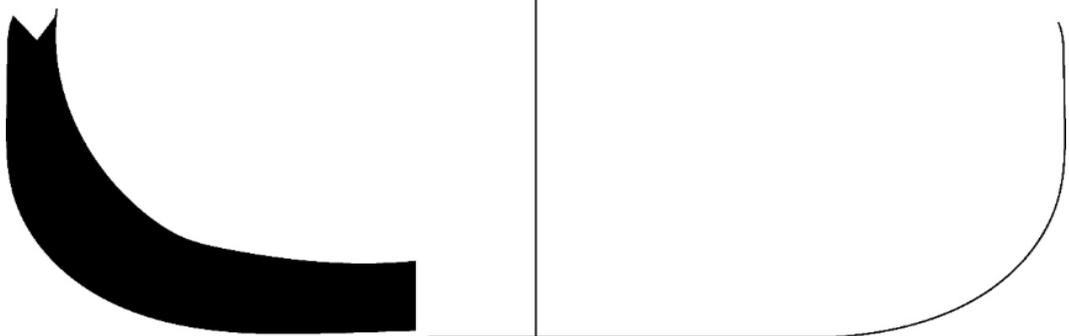
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S3: 1421



S3: 1474



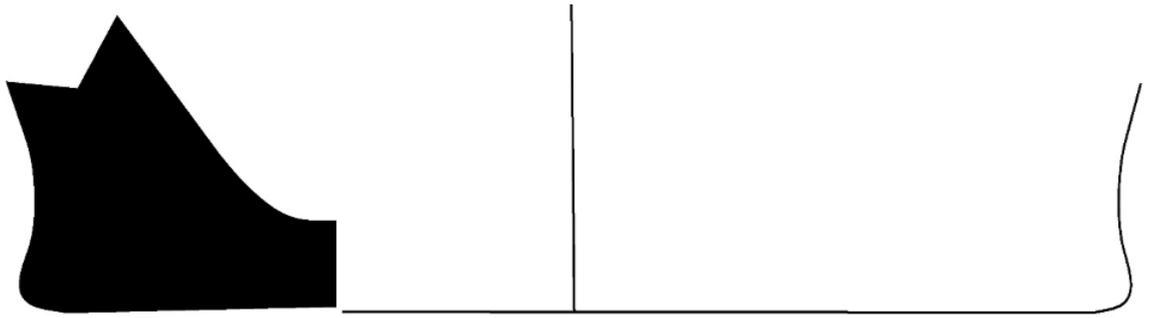
S3: 1525



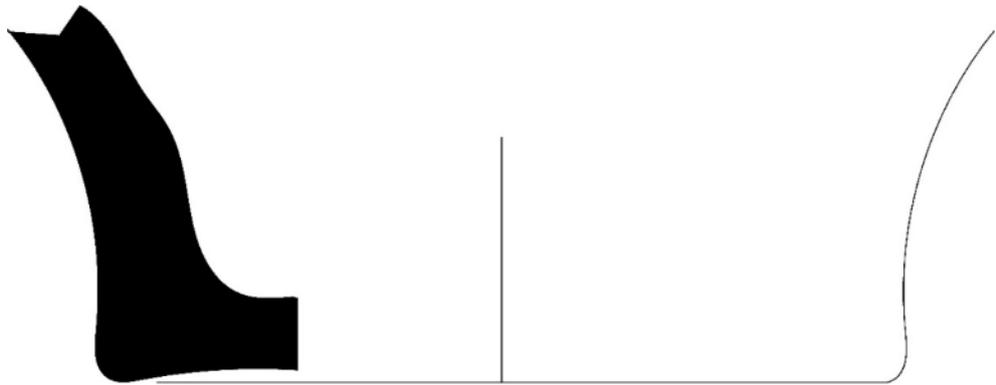


S3: 1519

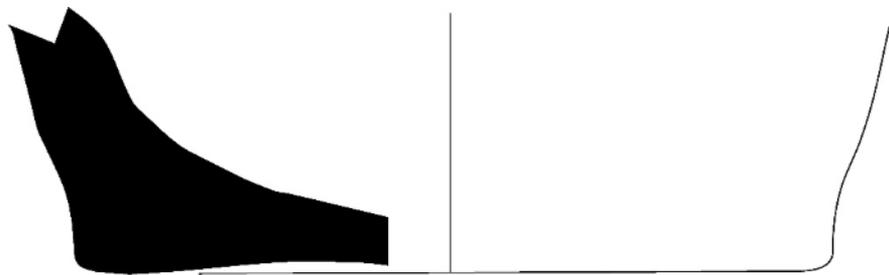




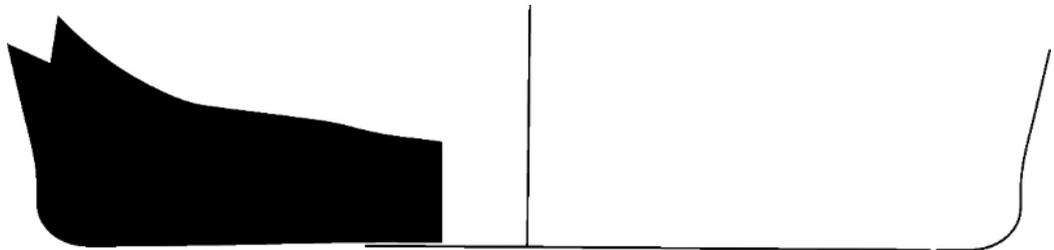
S2: 1550



S2: 1296

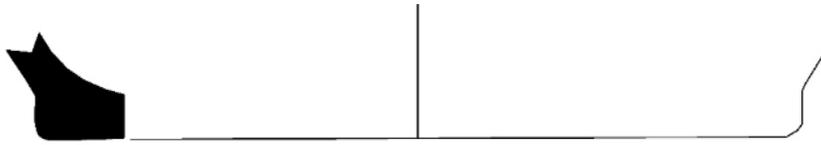


S2: 1170

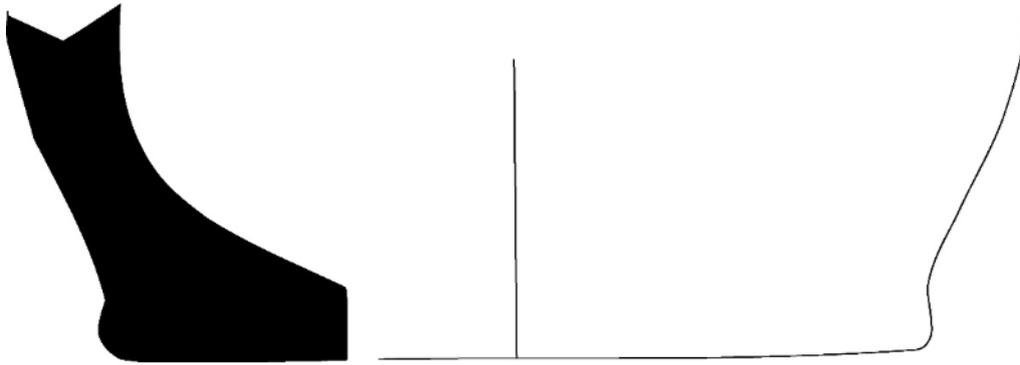


S2: 1383

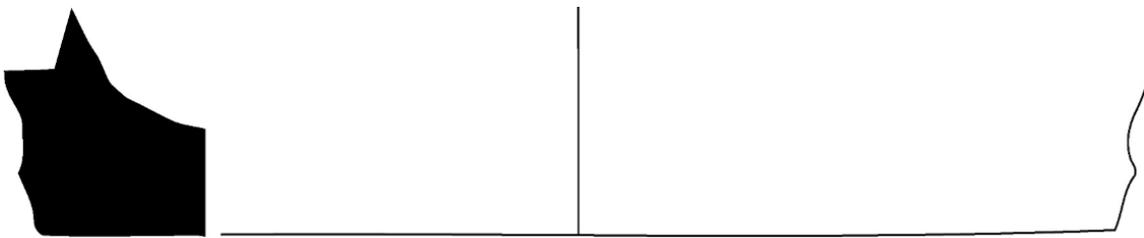




S2: 1359

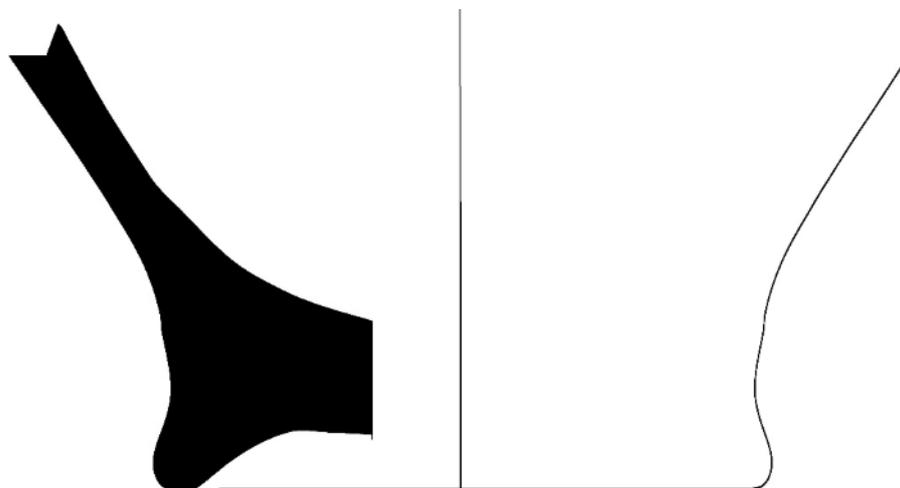


S2: 1356



S2: 1255

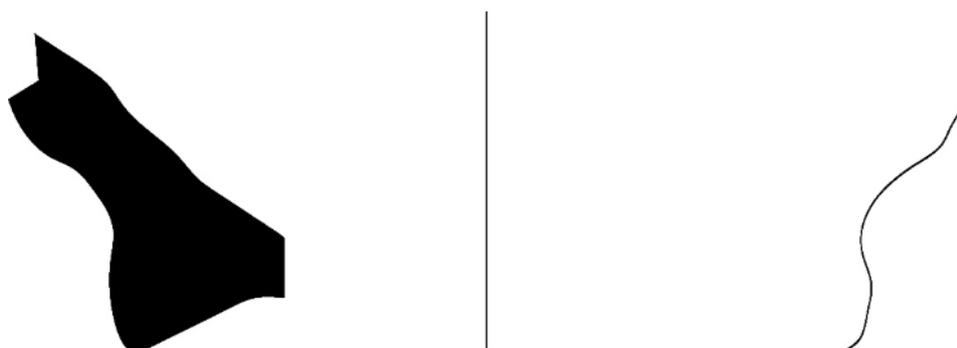




S2: 2192

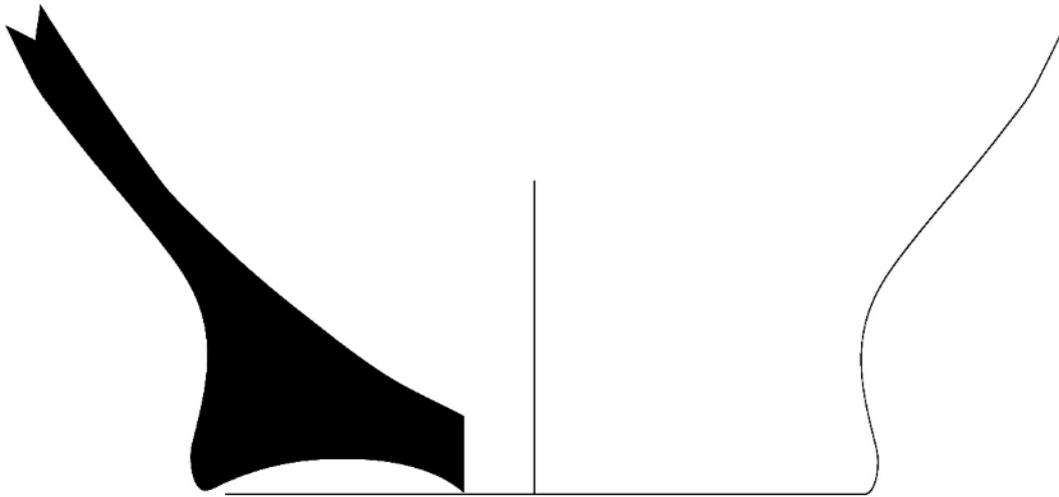


S2: 1297

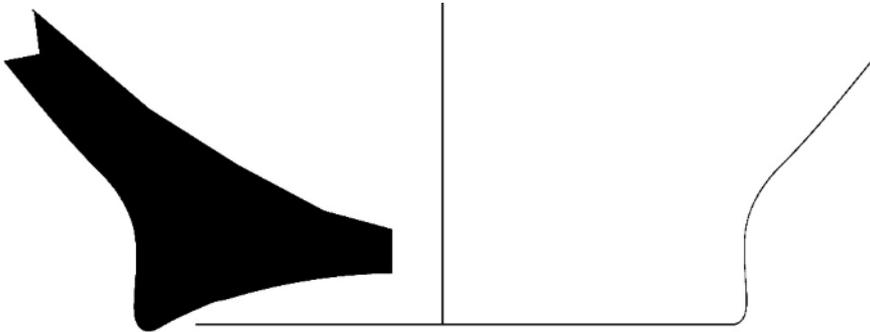


S2: 1029

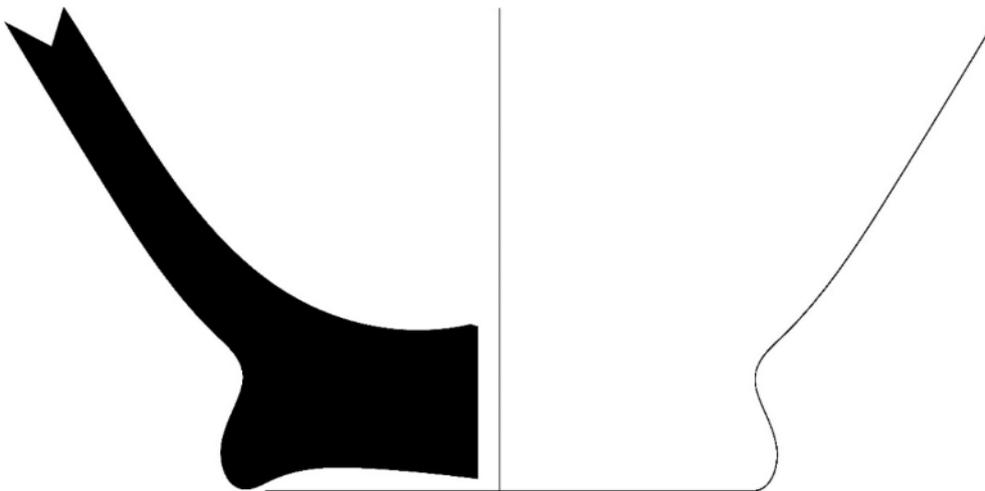




S3: 4700

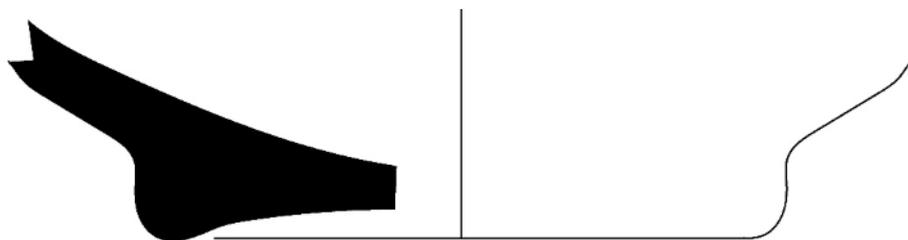


S3: 4660

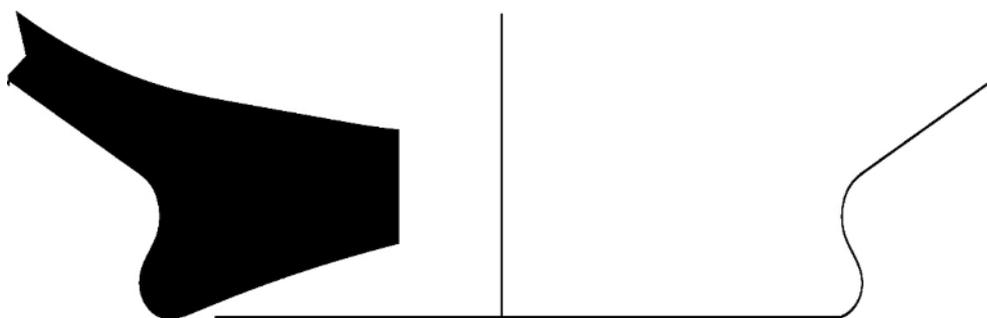


S3: 1288

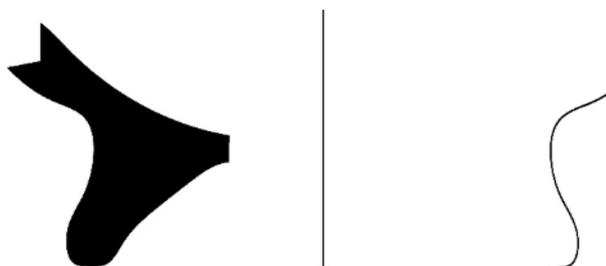




S3: 1495

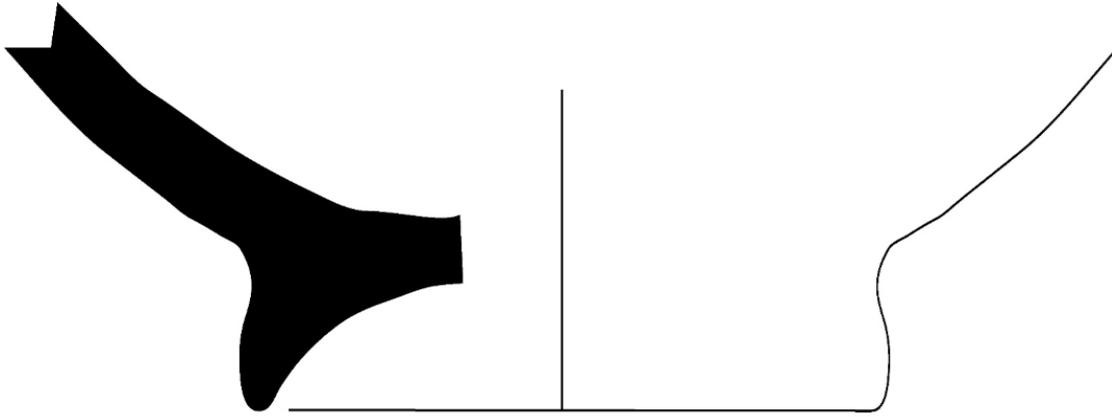


S3: 1444

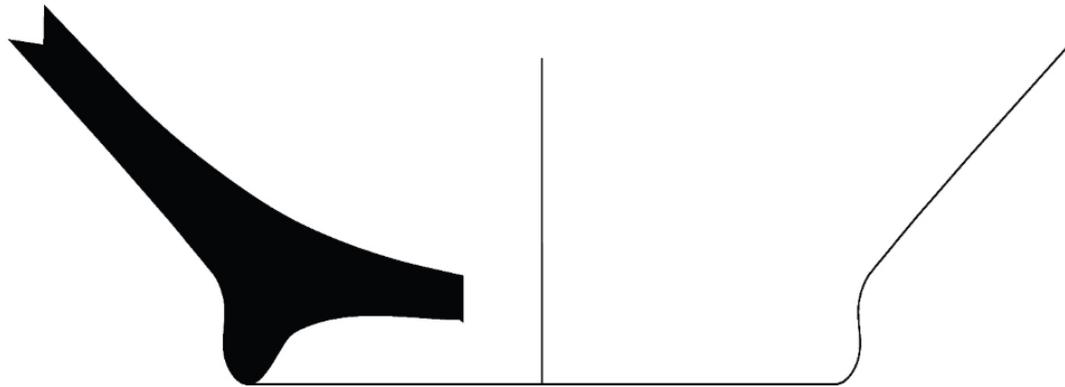


S3: 1486

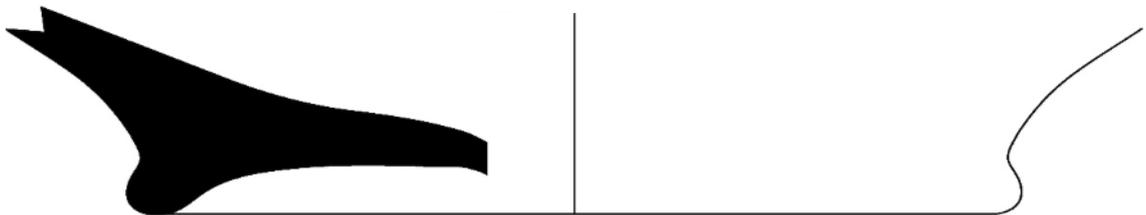




S2: 2606

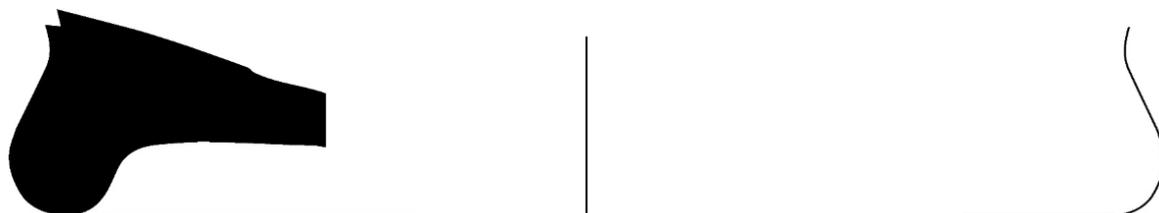


S2: 1011

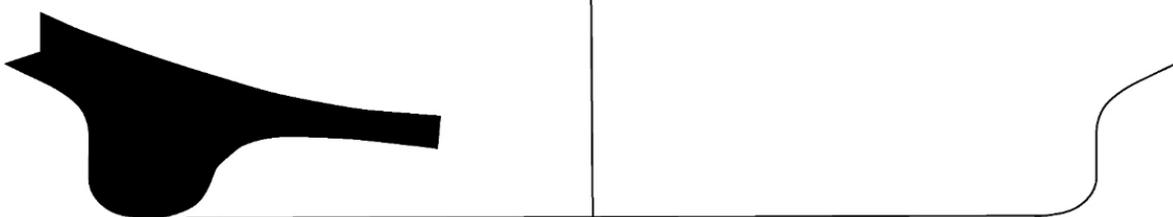


S2: 1013

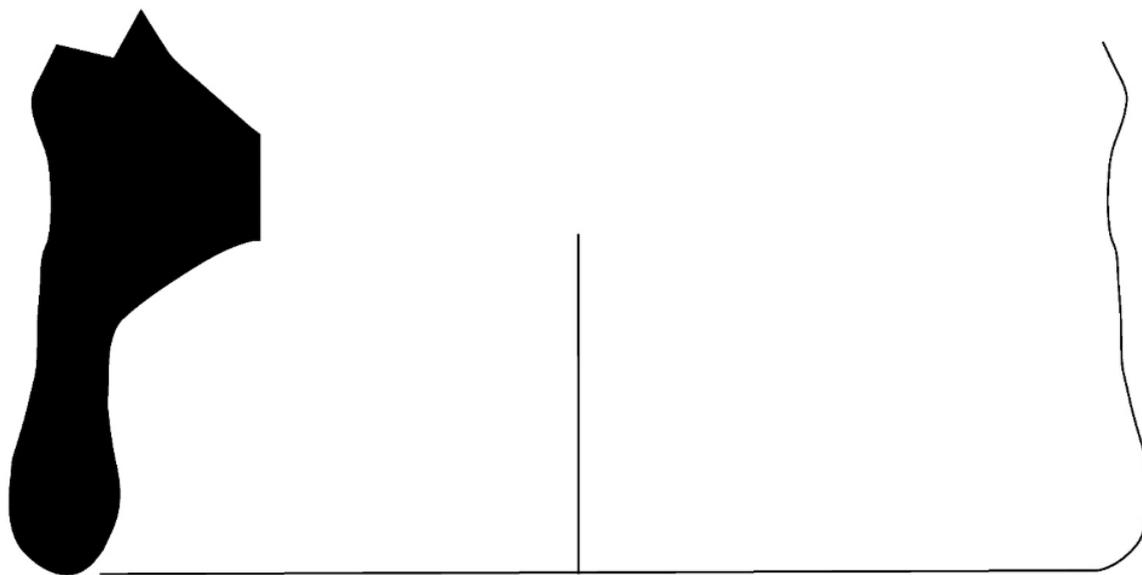




S2: 2473

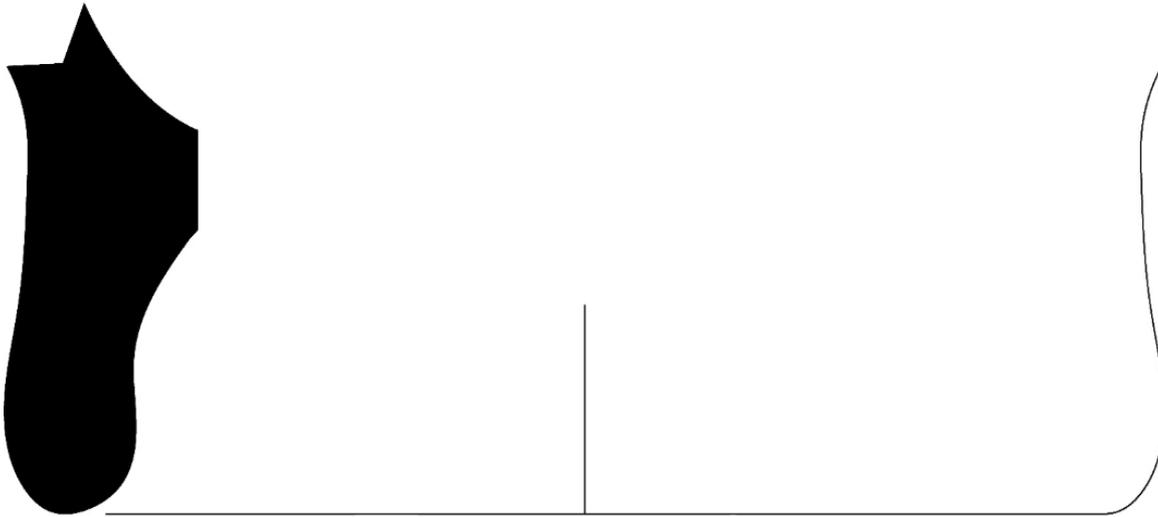


S2: 2161

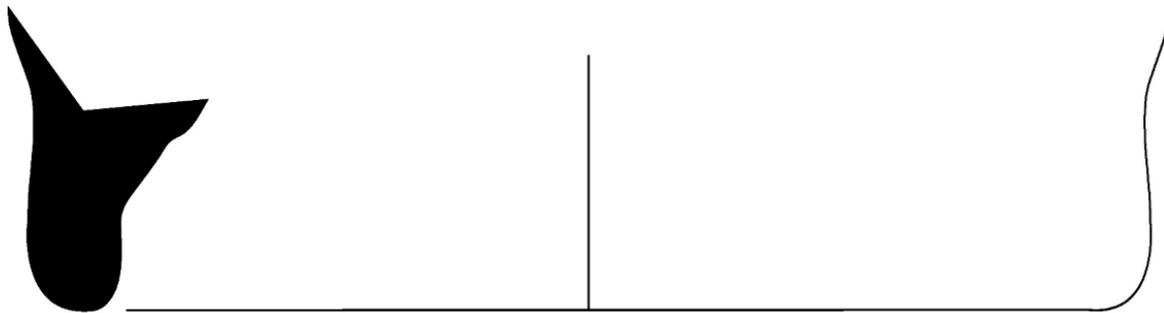


S2: 1016

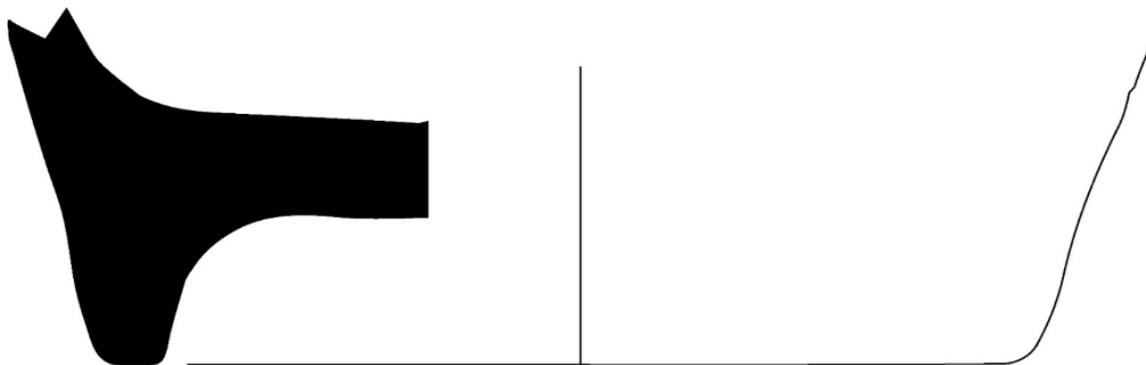




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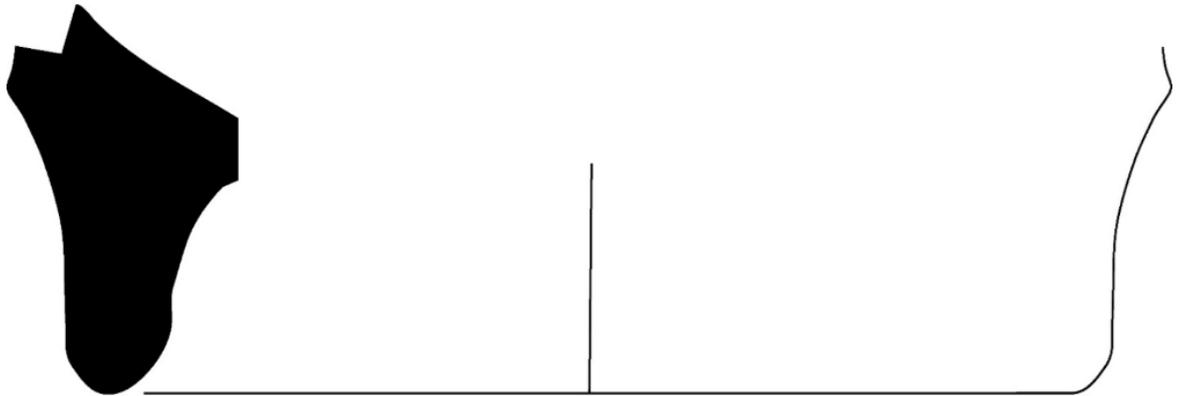


S2: 1571

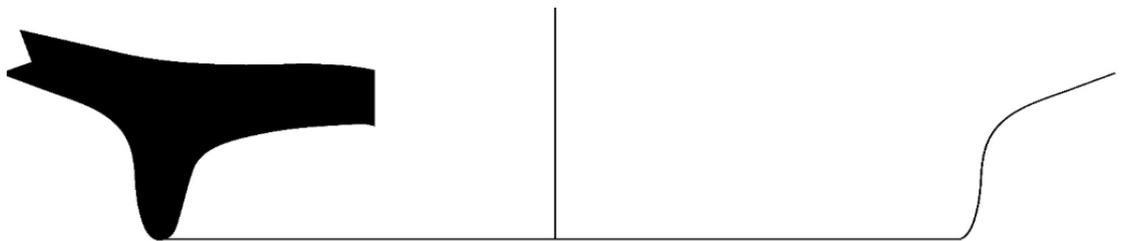


S2: 1585

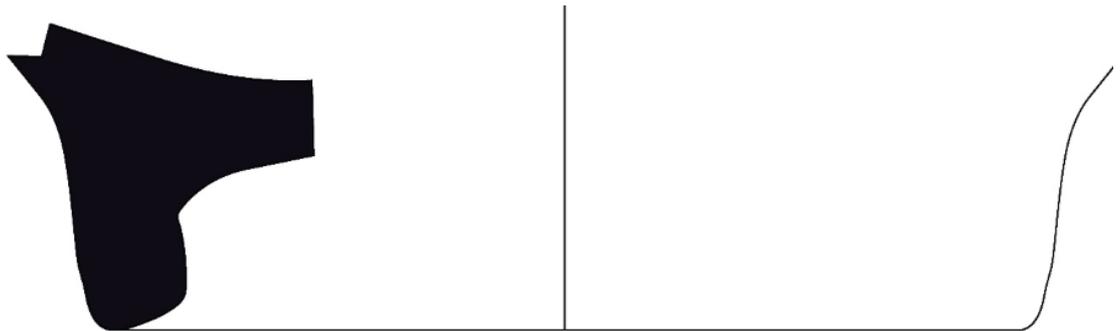




S2: 1641

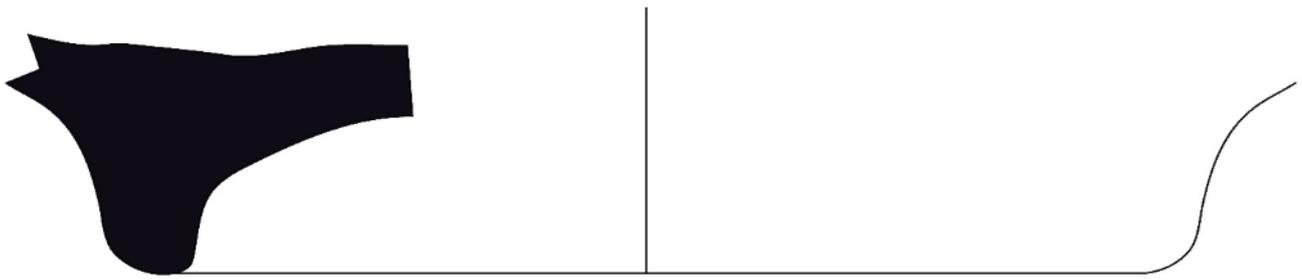


S2: 1014

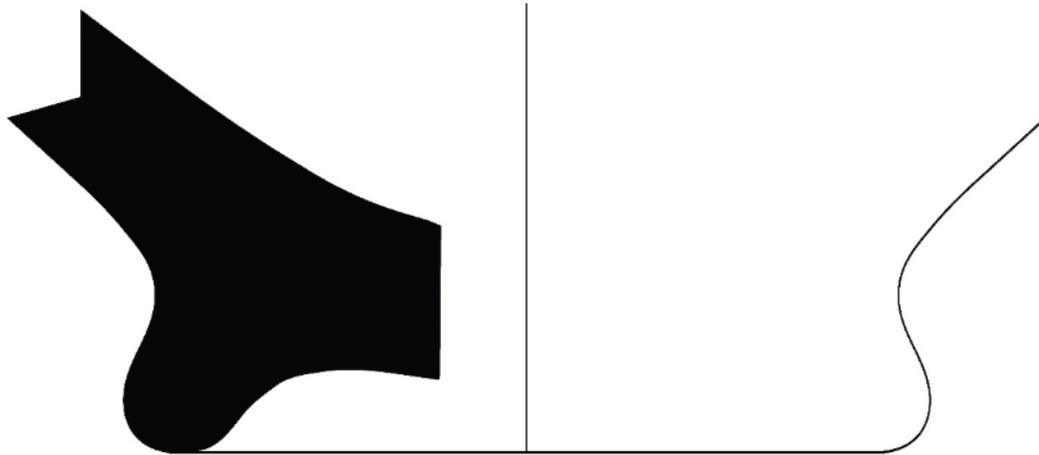


S2: 1008

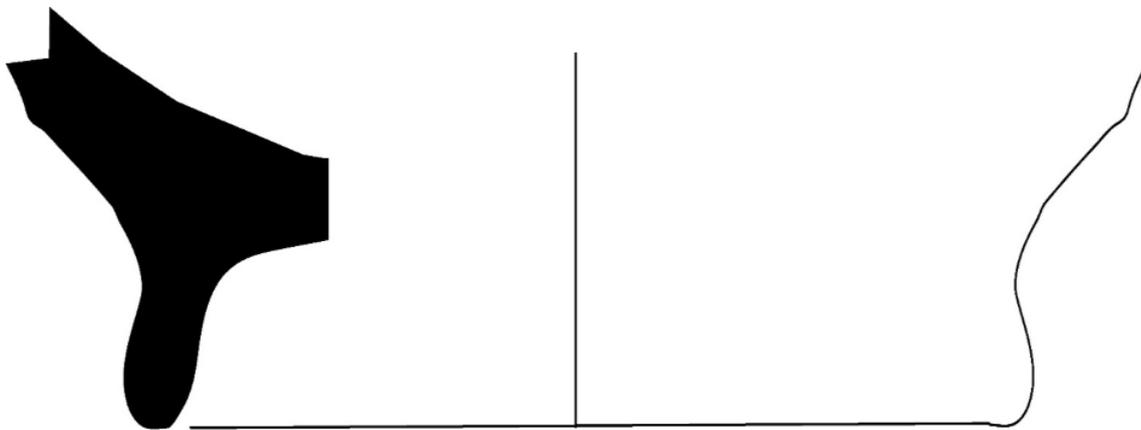




S2: 1010

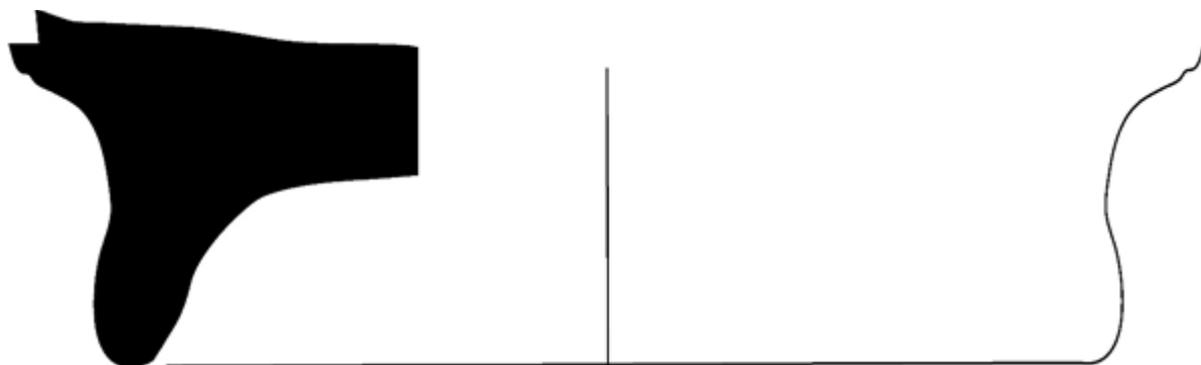


S2: 1012

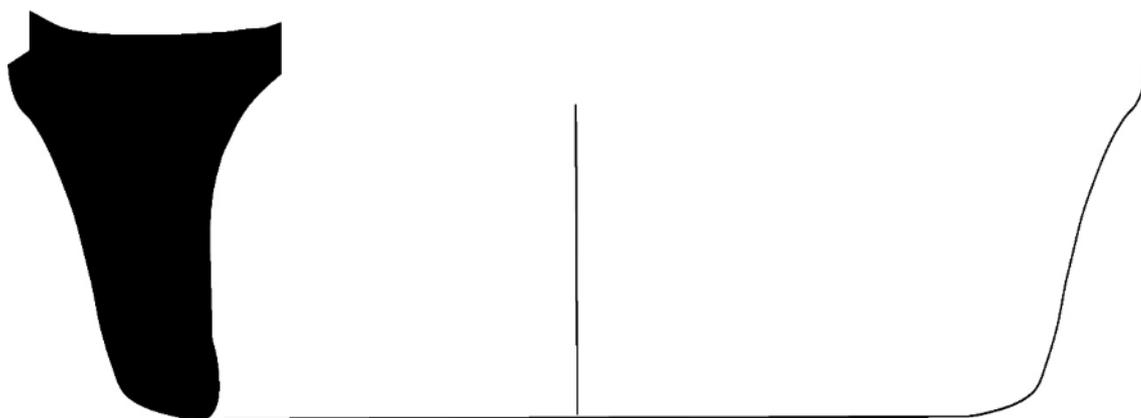


S2: 2490



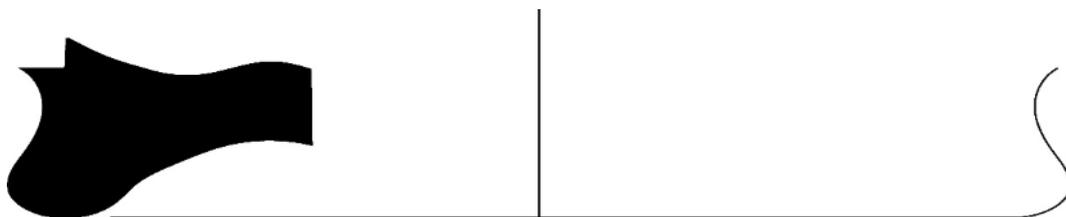


S2: 2243

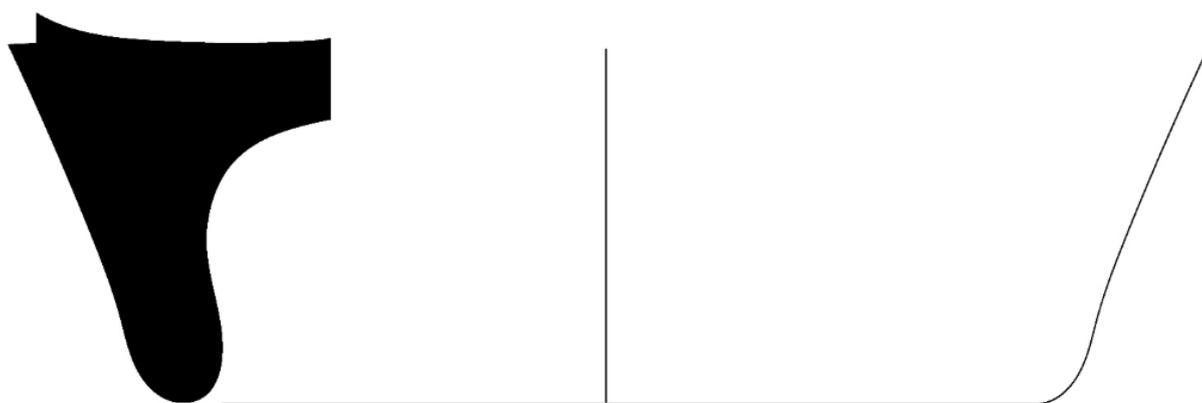


S2: 2438

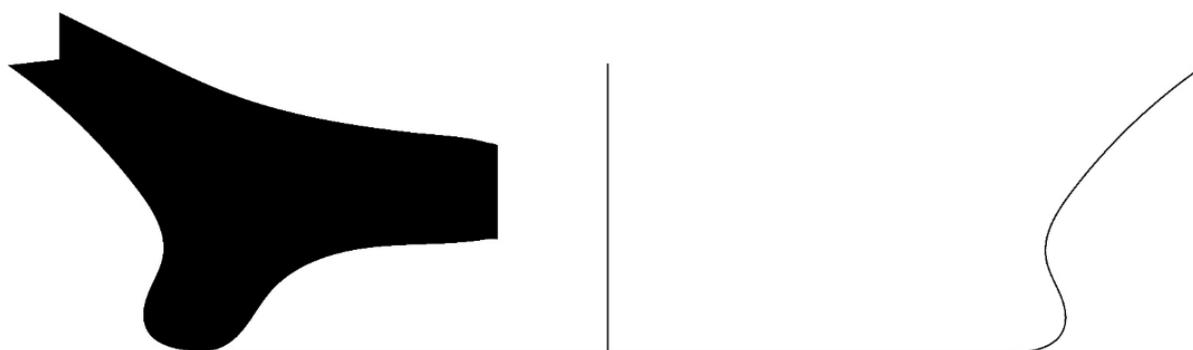




S3: 1504

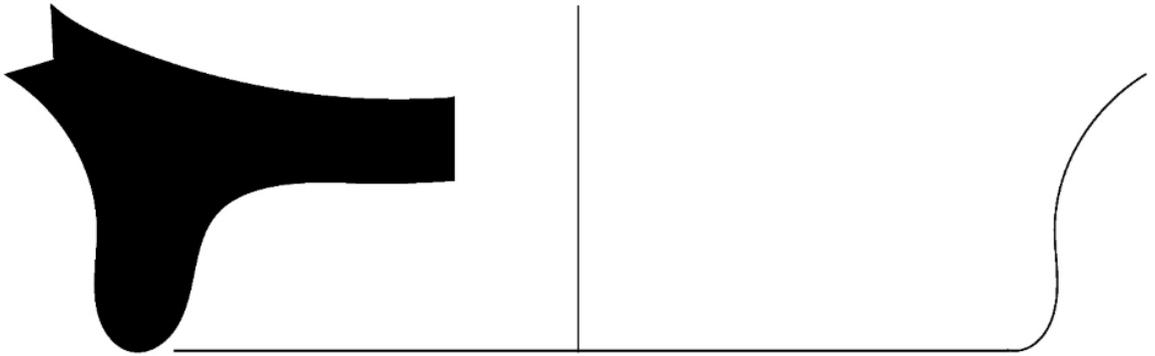


S3: 1415

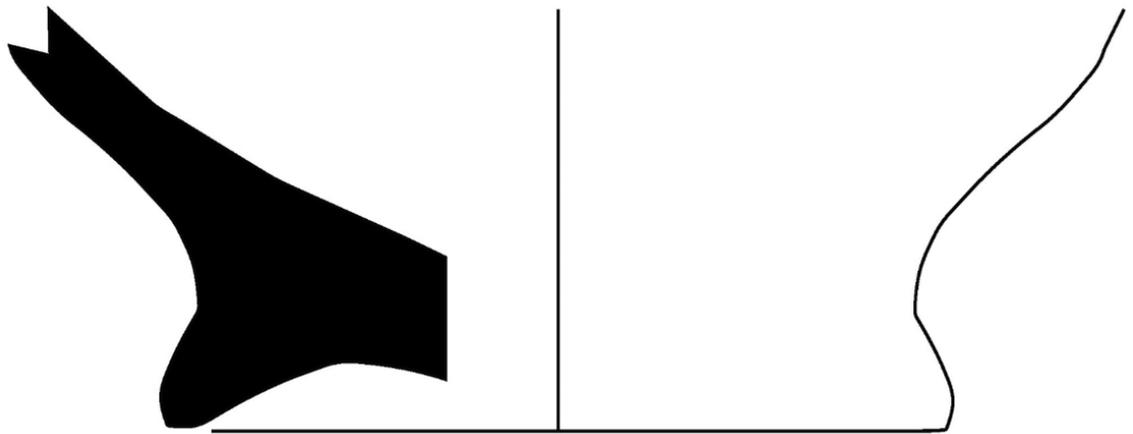


S3: 1440





S3: 1895



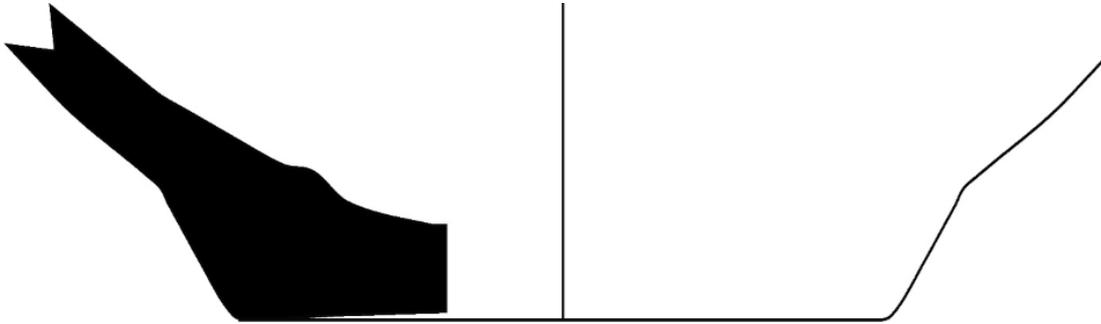
S3: 1003



Base - Wheel-made

Plate 158

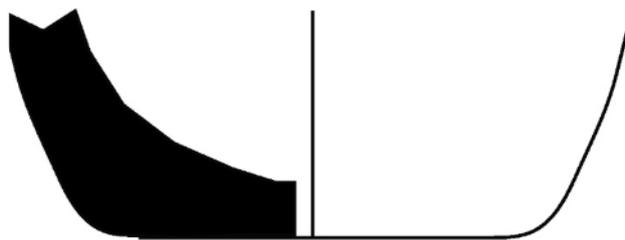
Type WMB-A: Base - Wheel-made



S2: 1093



S2: 1173



S2: 1197



S2: 1320

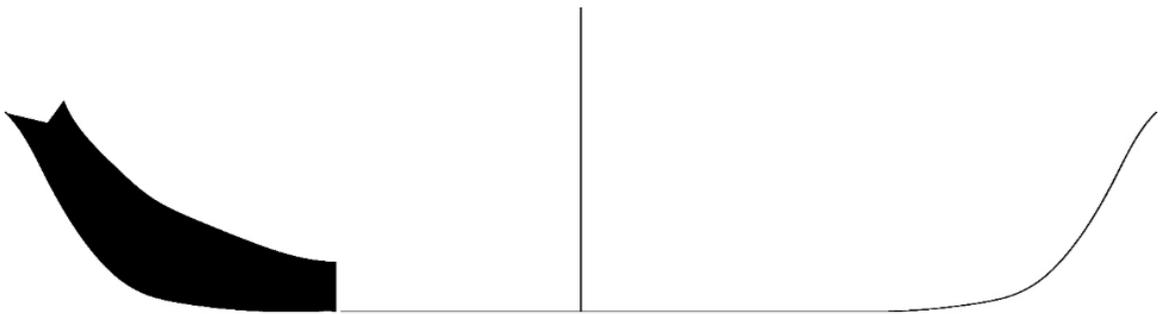




S2: 1294



S2: 1286



S2: 1273

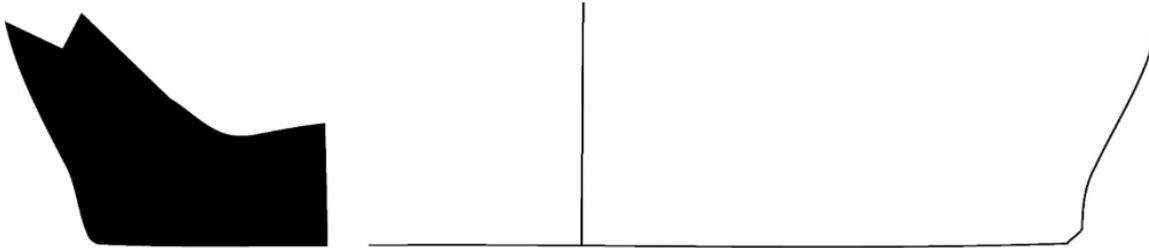


S2: 1249

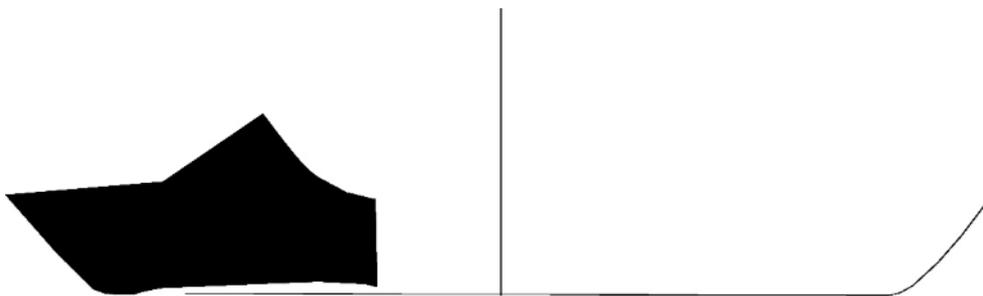




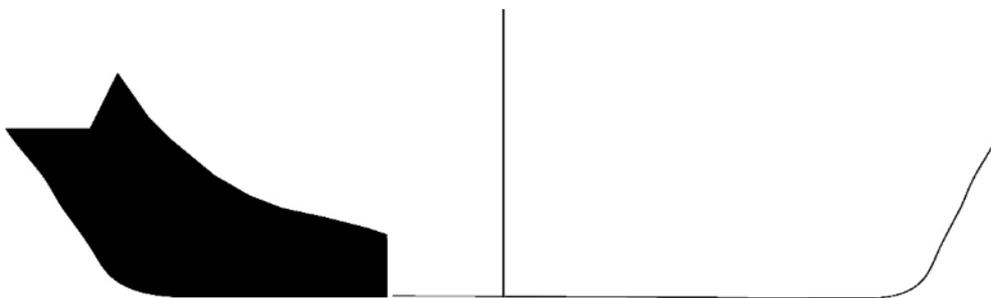
S2: 1290



S2: 1570

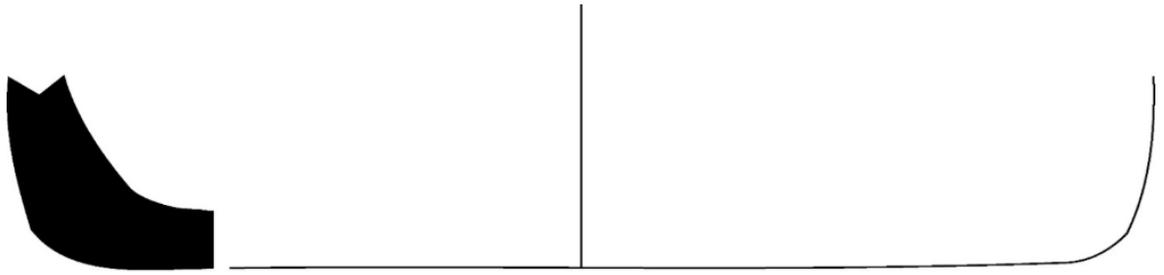


S2: 1132

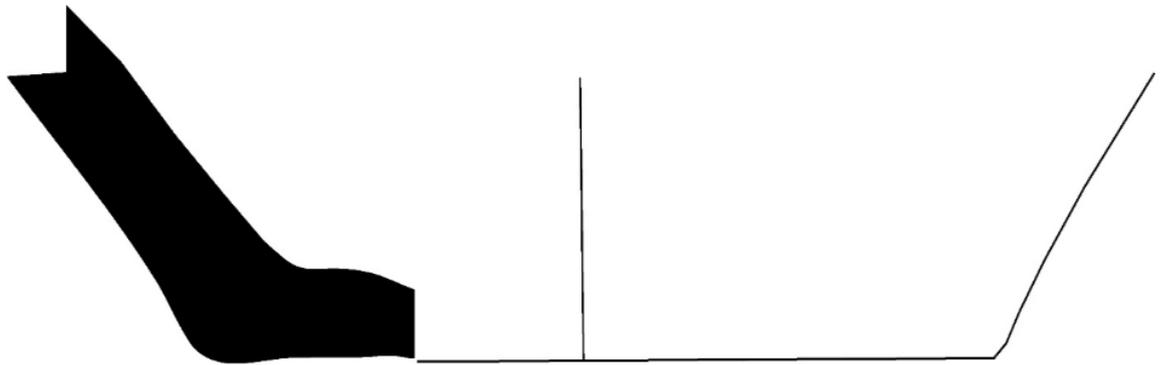


S2: 1181

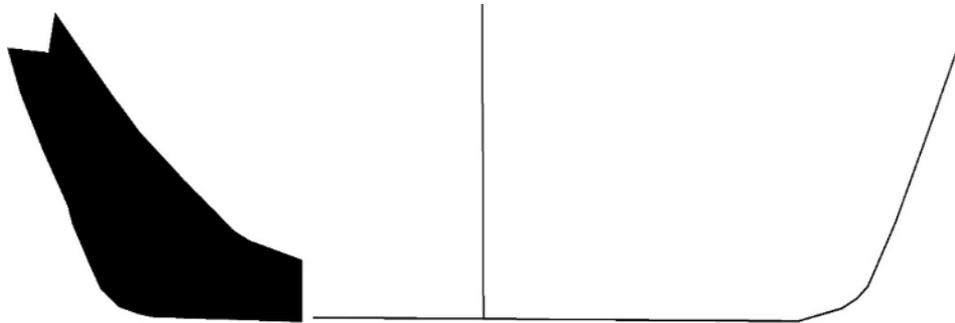




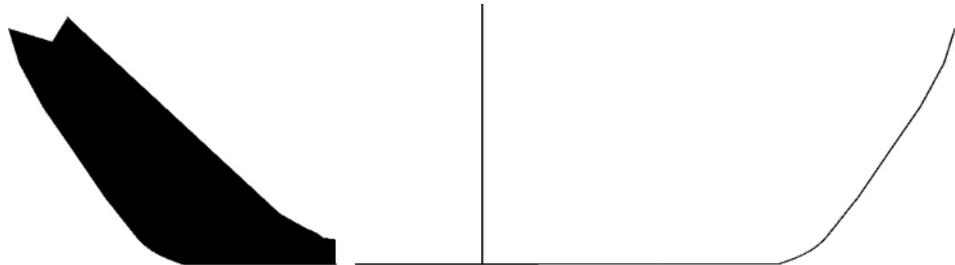
S2: 1167



S2: 1149

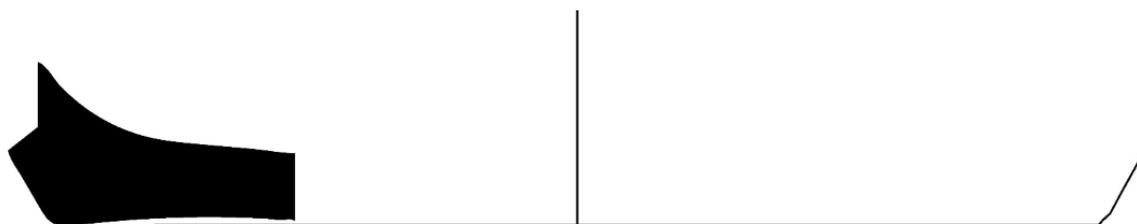


S2: 1146

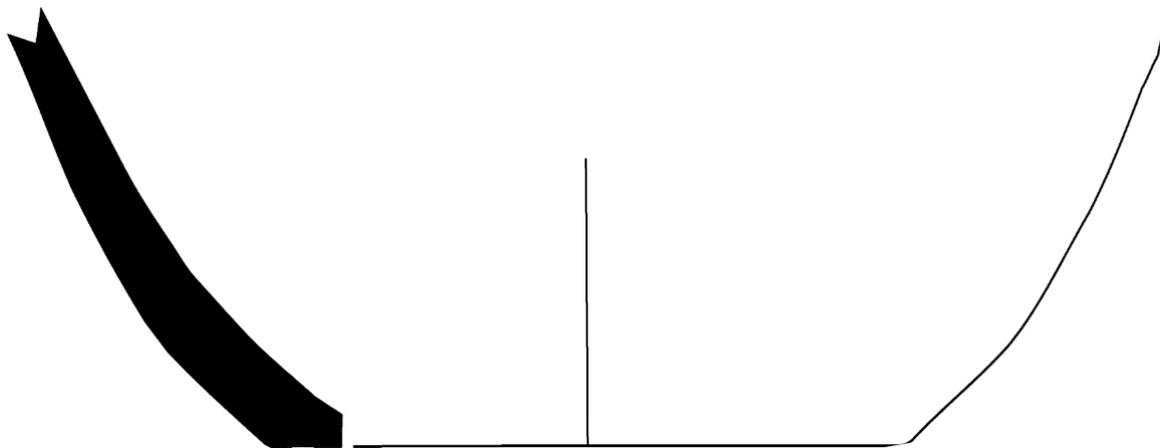


S2: 1104

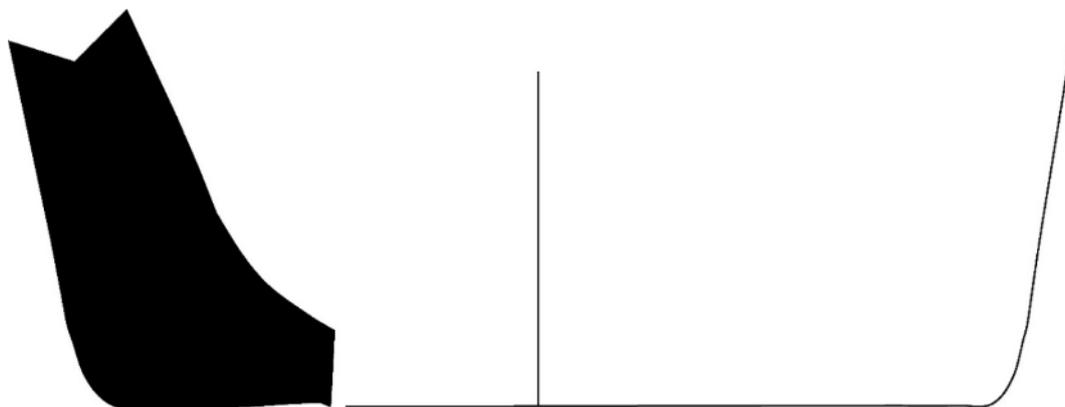




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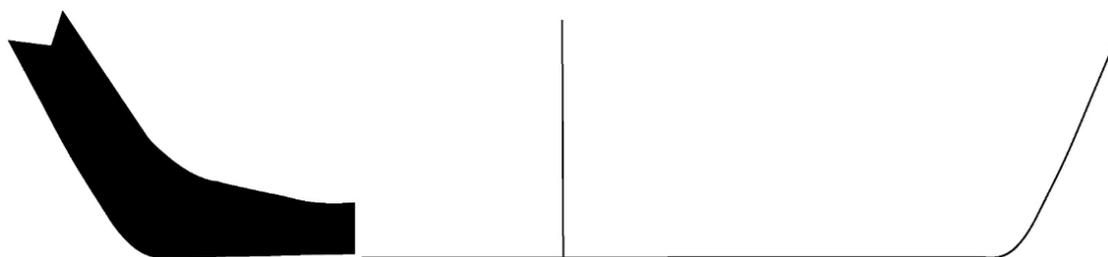


S2: 1969

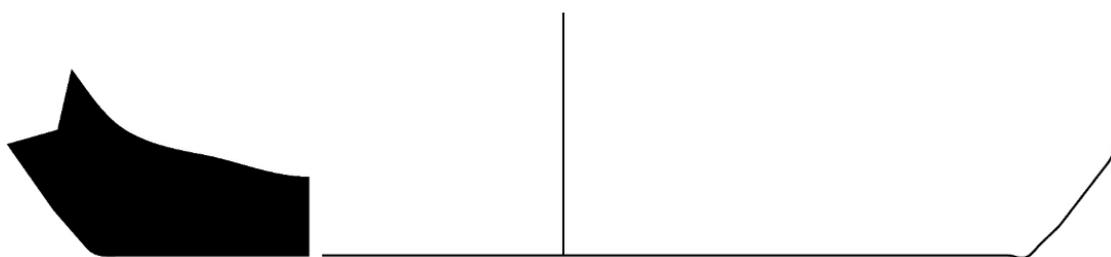


S2: 1809

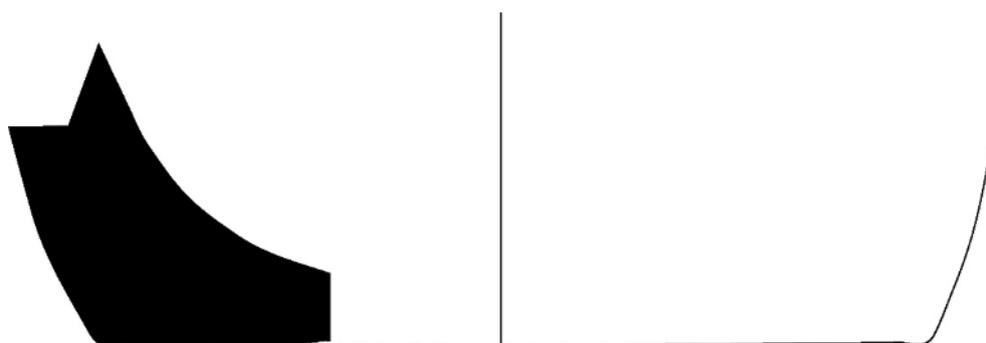




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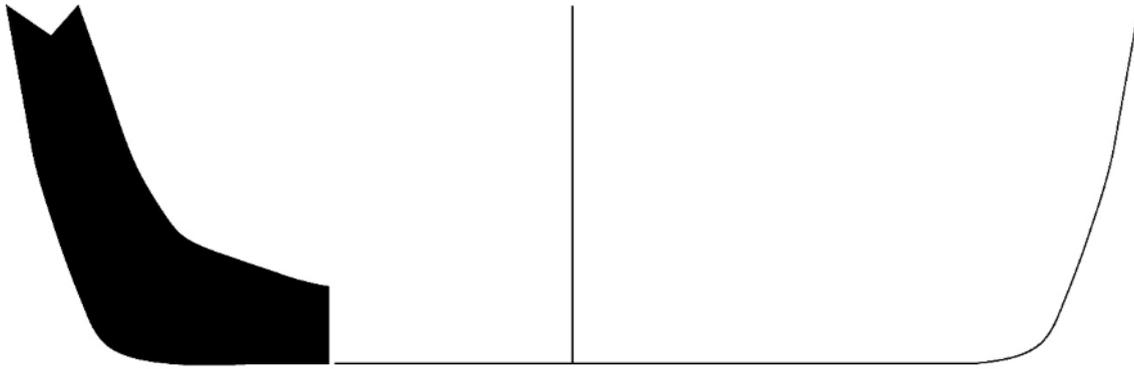


S2: 1139



S2: 1311

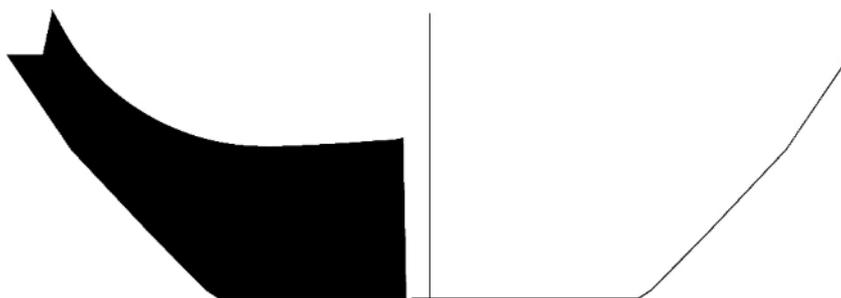




S3: 1369



S3: 1367

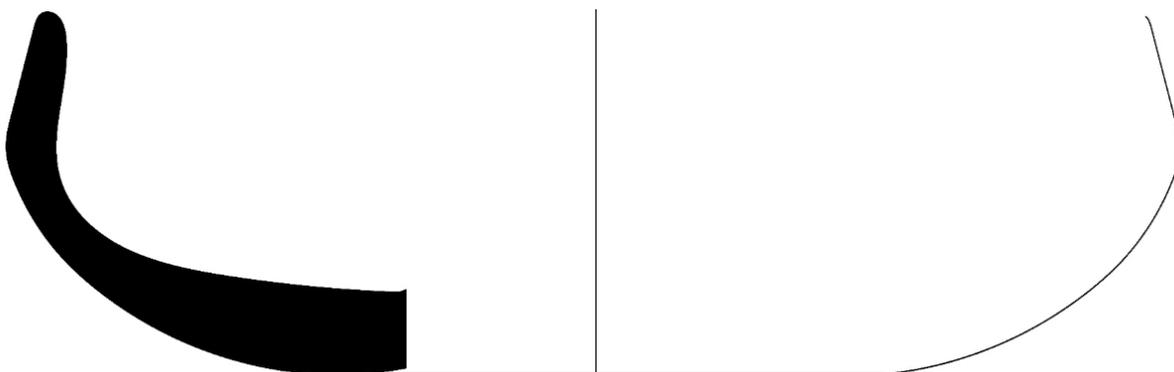


S3: 4726



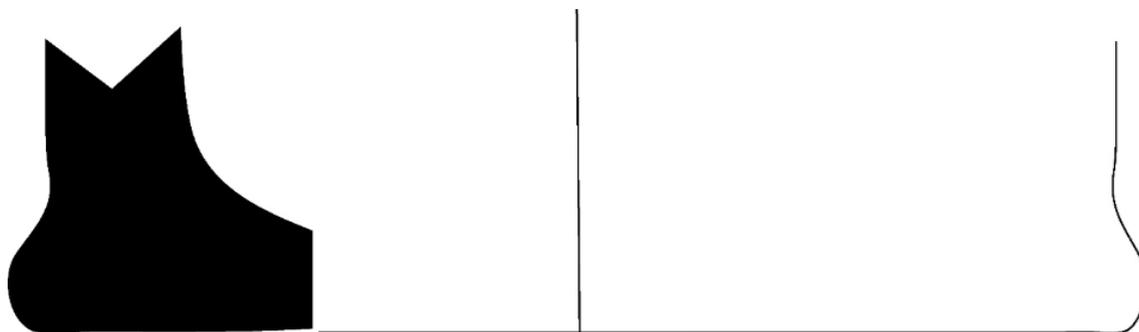


S3: 1489

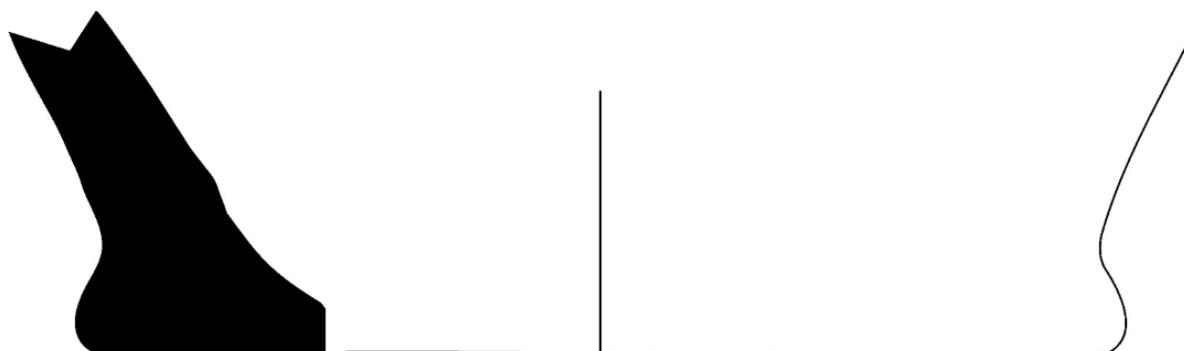


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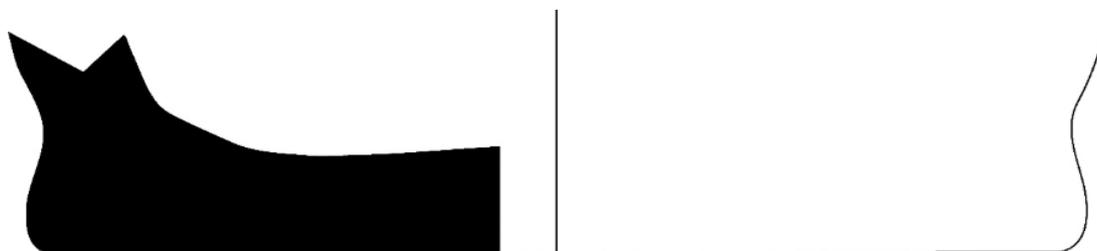




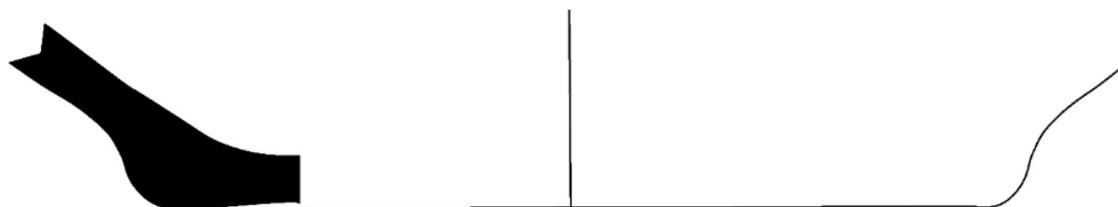
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S2: 1561

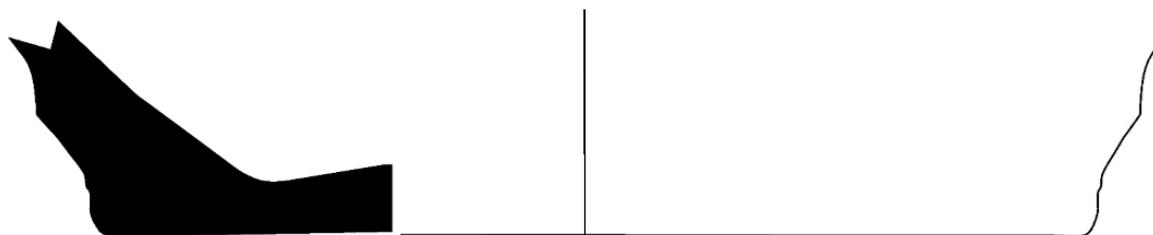


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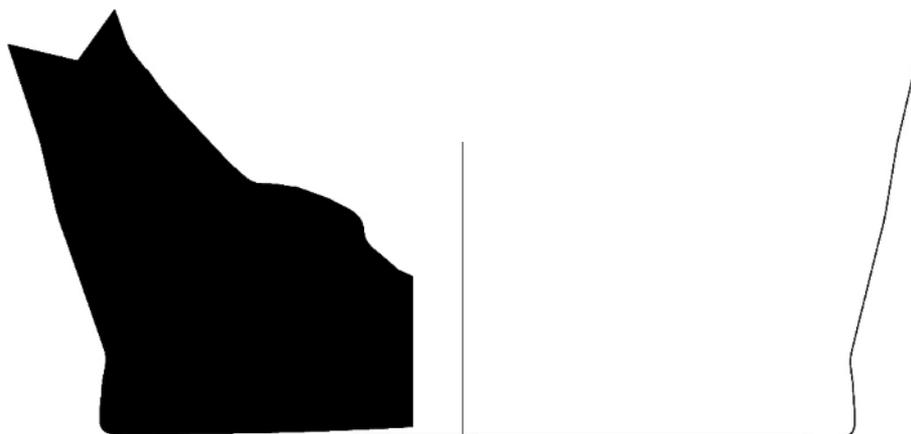


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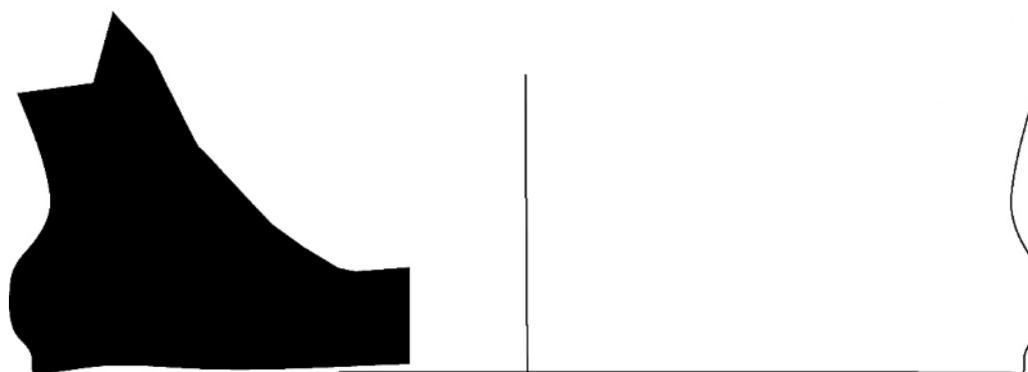




S2: 1848

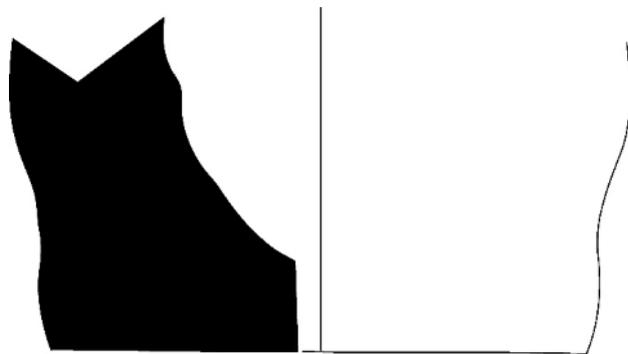


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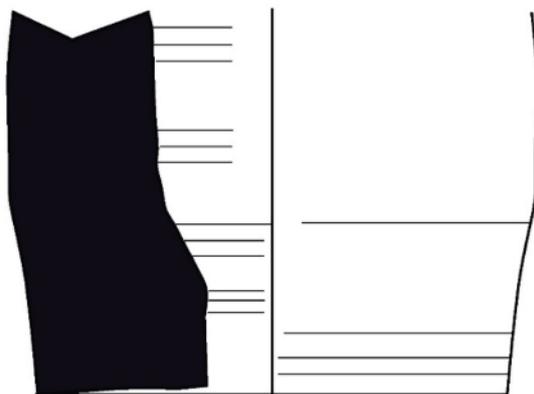


S2: 2082

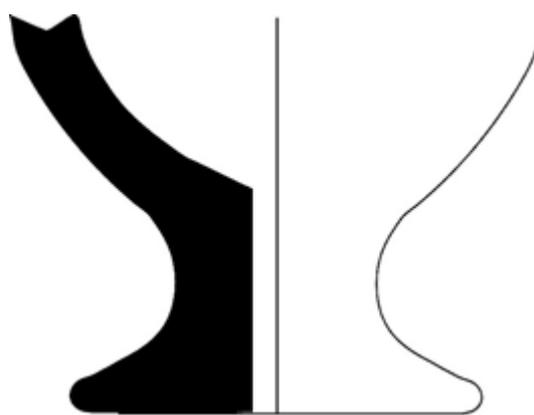




S2: 2489

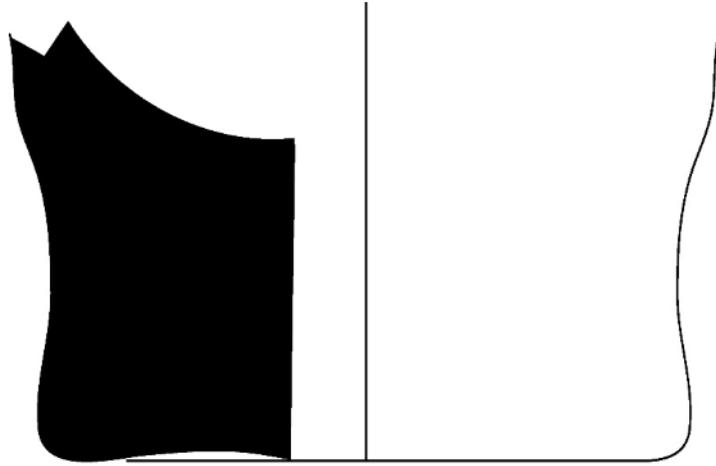


S2: 1121

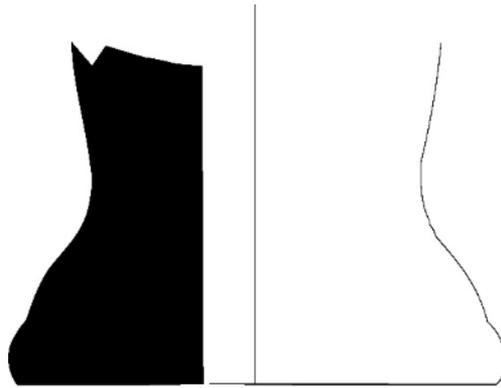


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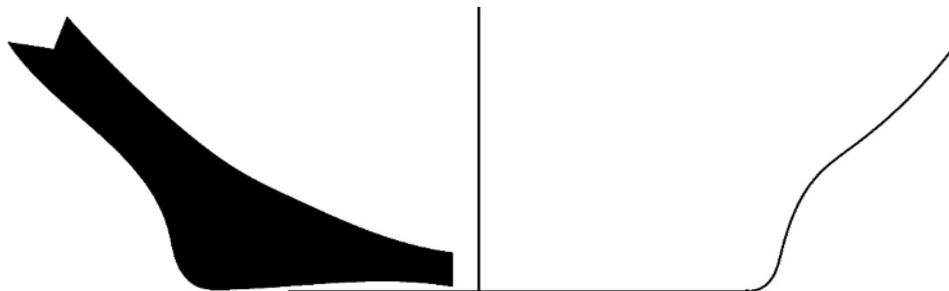




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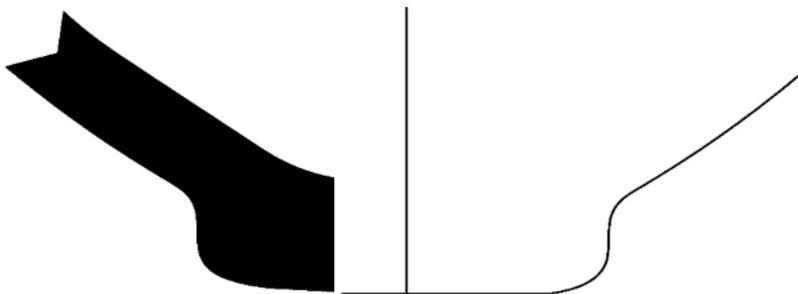


S2: 1551



S2: 1289

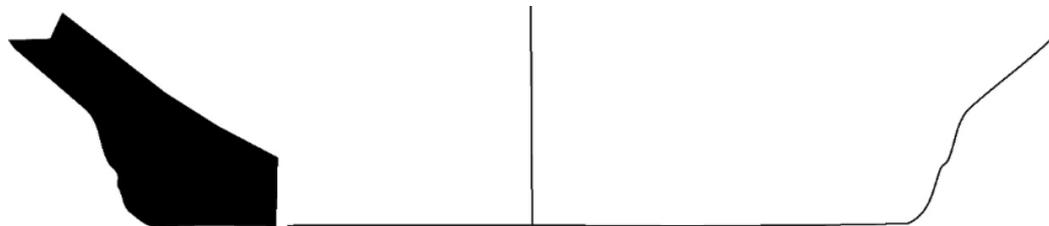




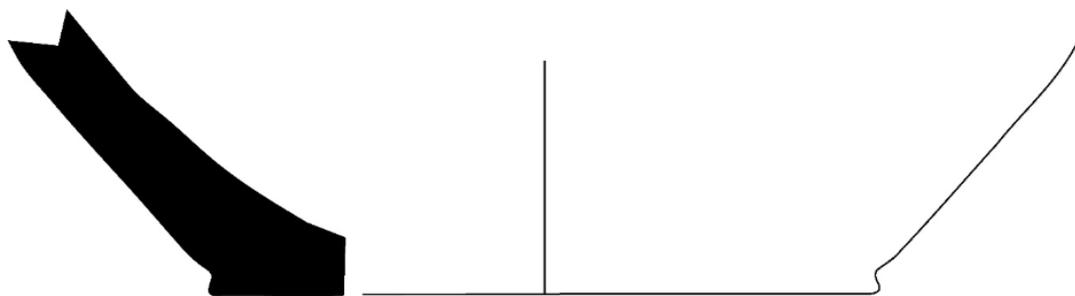
S2: 1292



S2: 1237

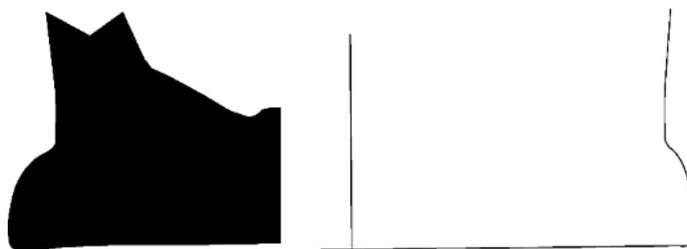


S2: 1355

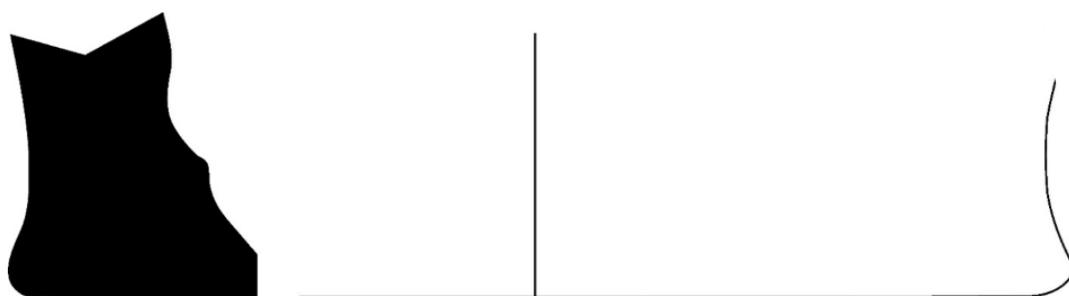


S2: 1354

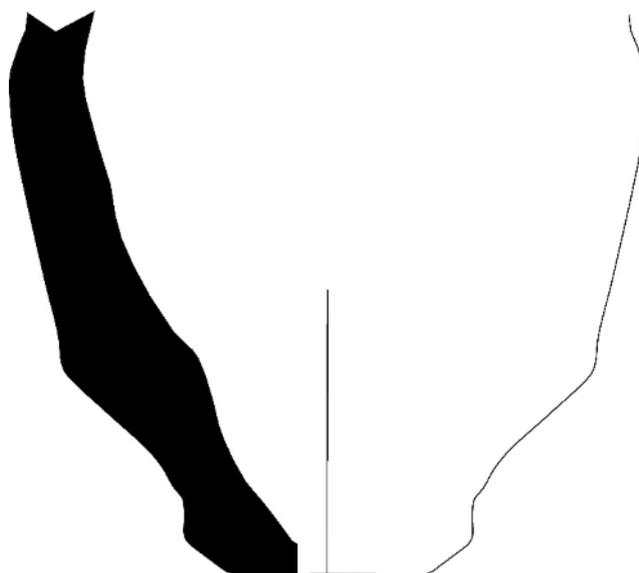




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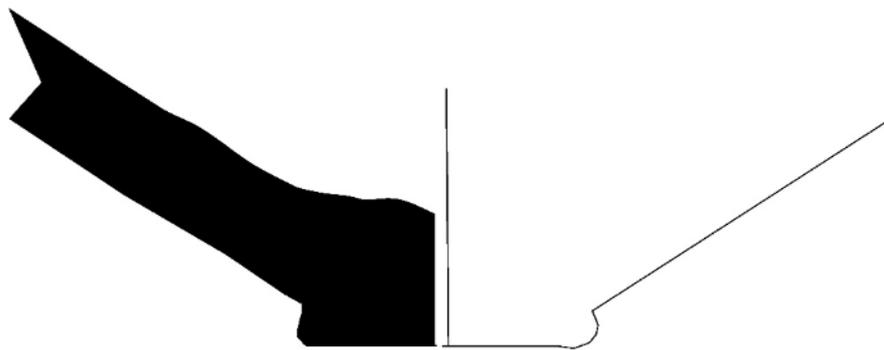


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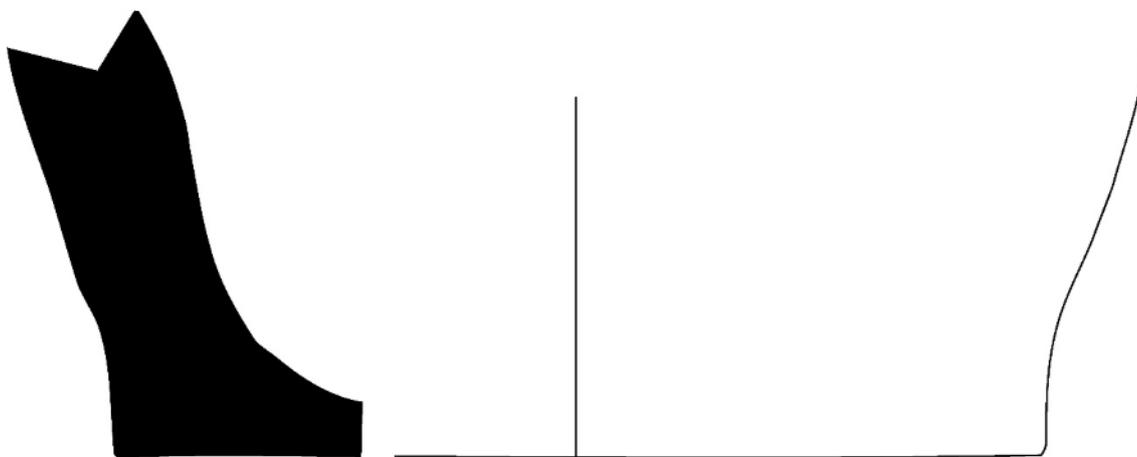


S2: 1162

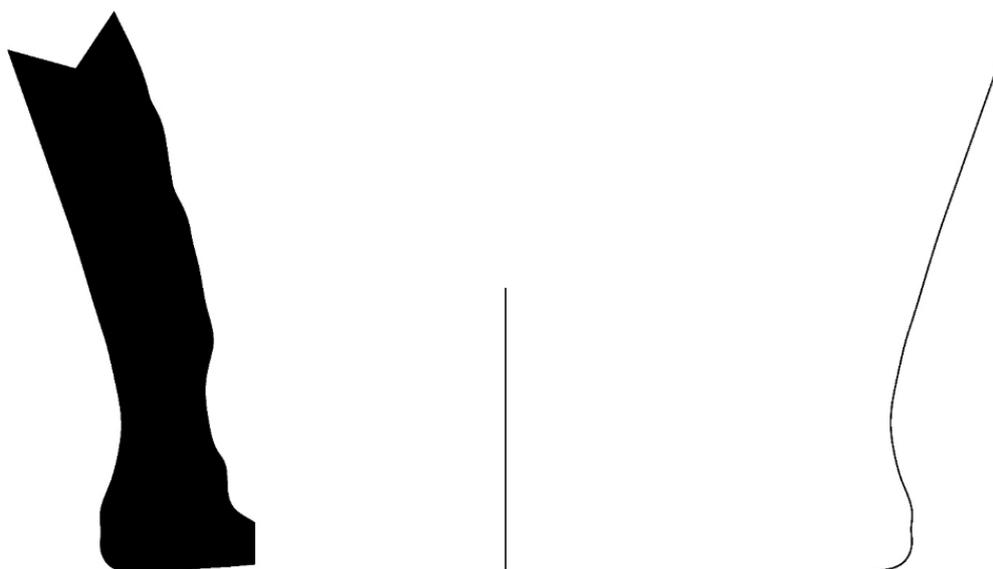




S2: 1123

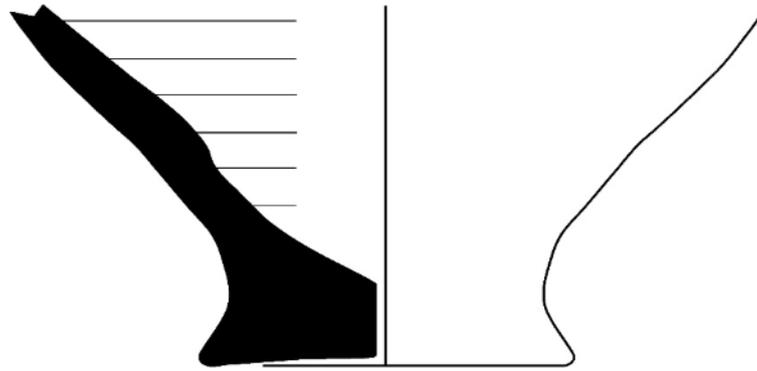


S2: 1171



S2: 2488

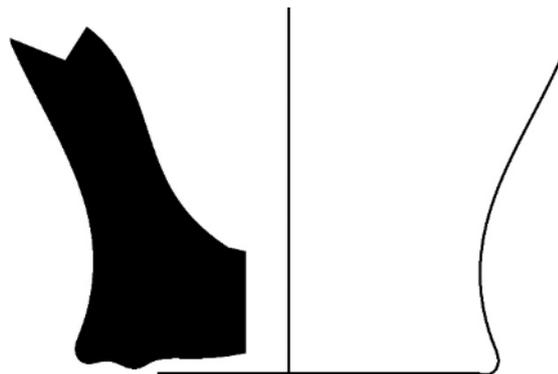




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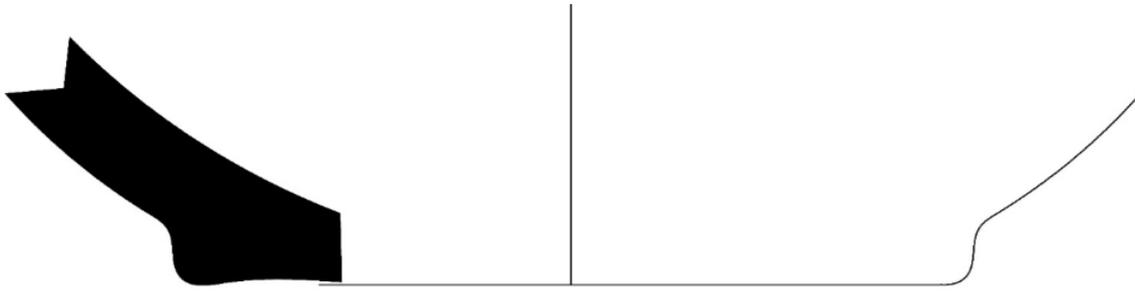


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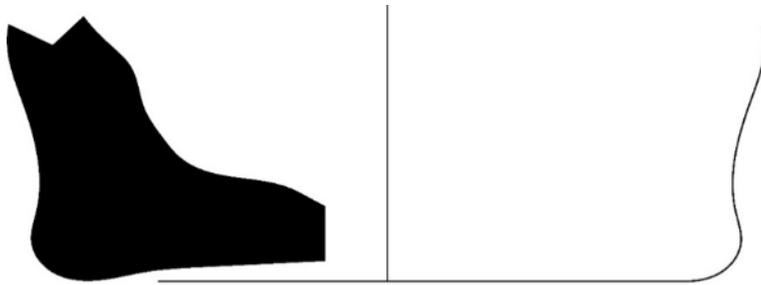


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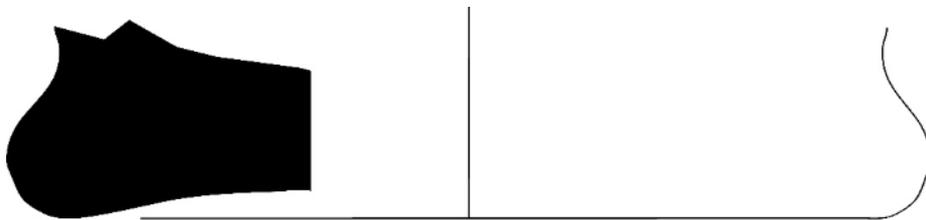




S2: 1299



S2: 1302

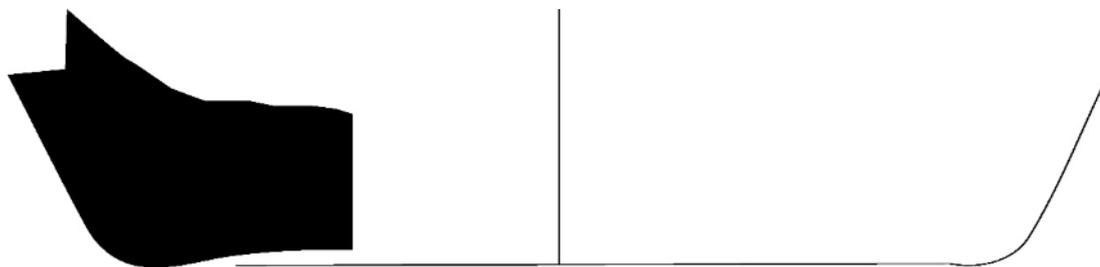


S2: 1240

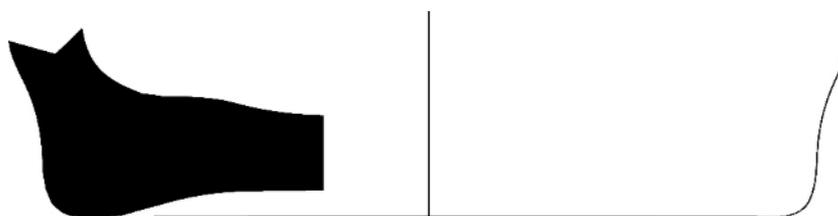


S2: 1143

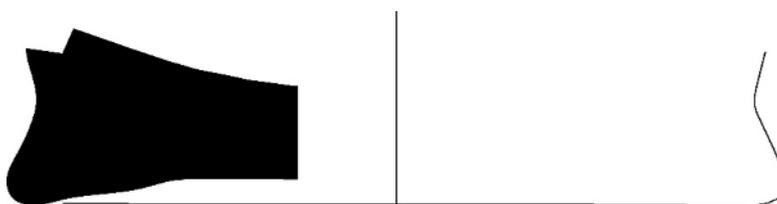




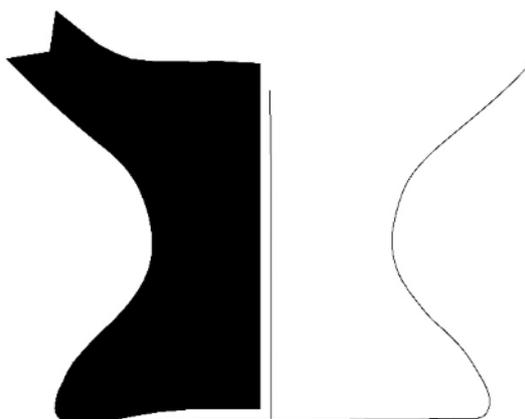
S2: 1116



S2: 1115

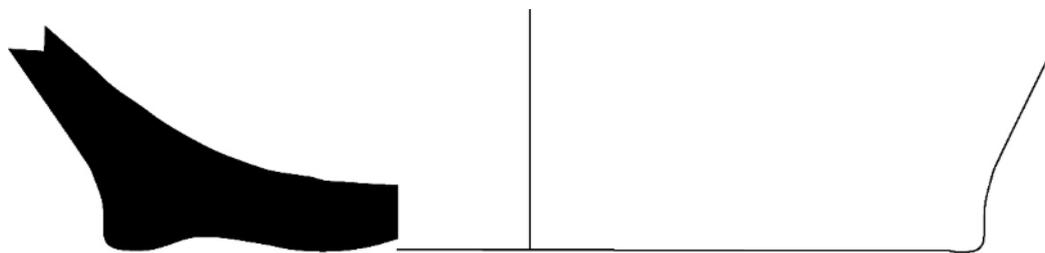


S2: 1030



S2: 1282

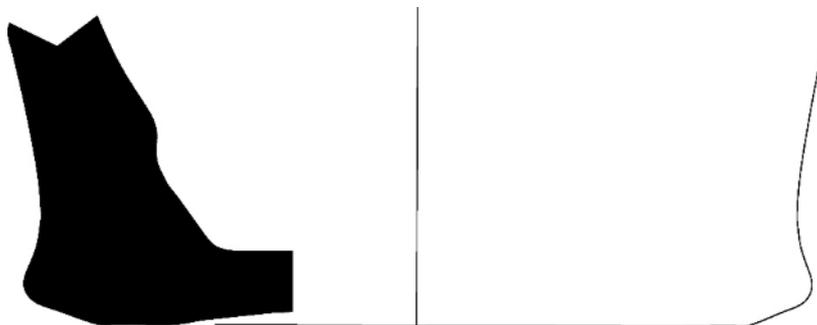




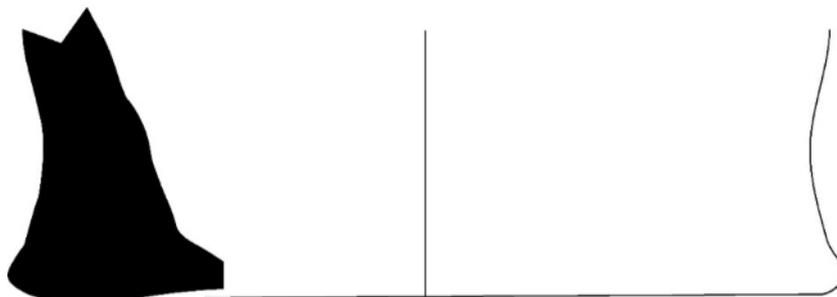
S2: 1312



S2: 1279

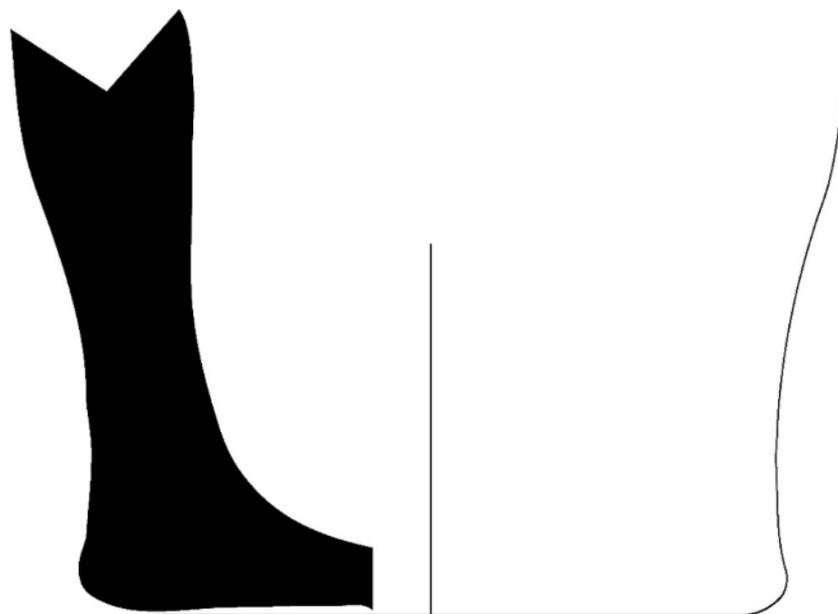


S2: 1422

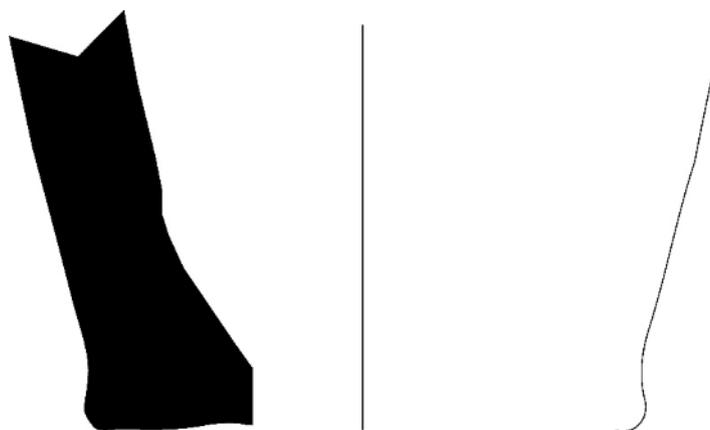


S2: 1291



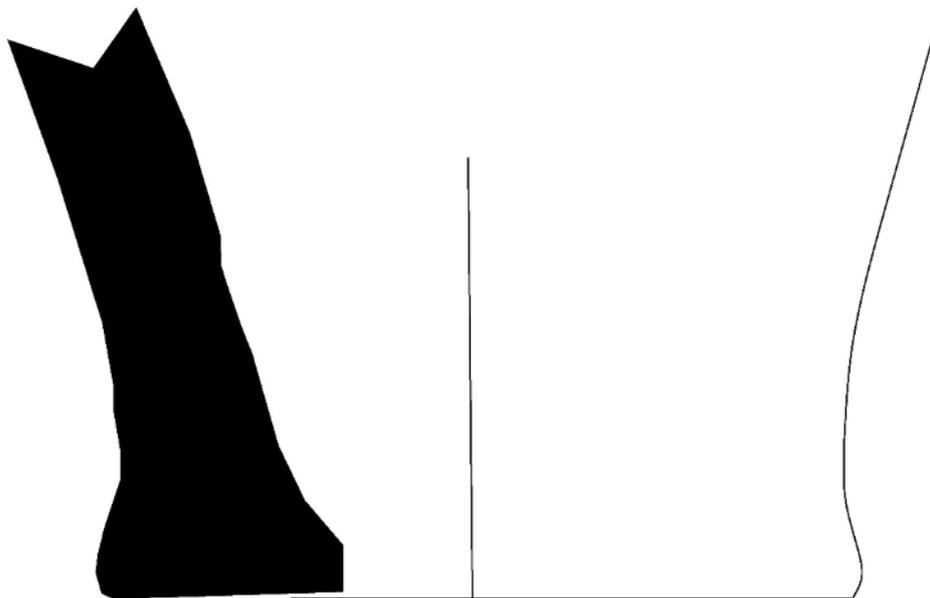


S2: 1150

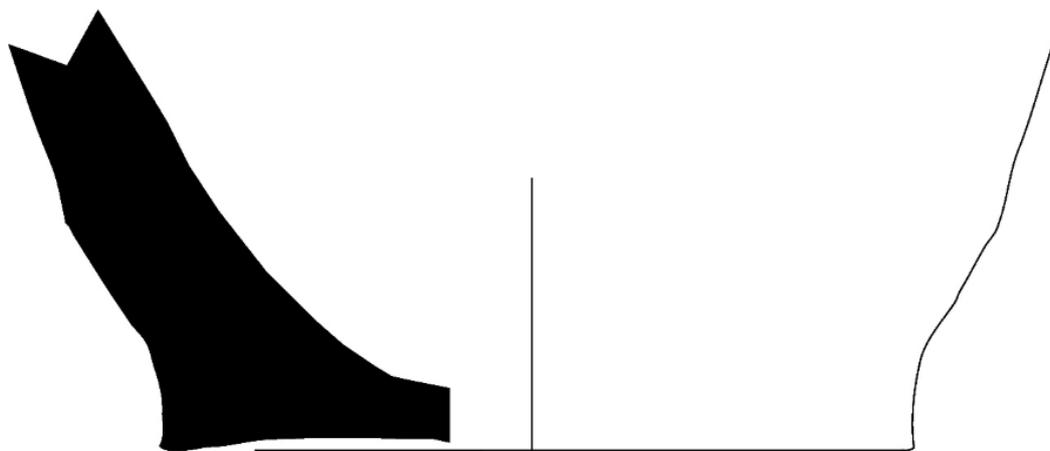


S2: 1128



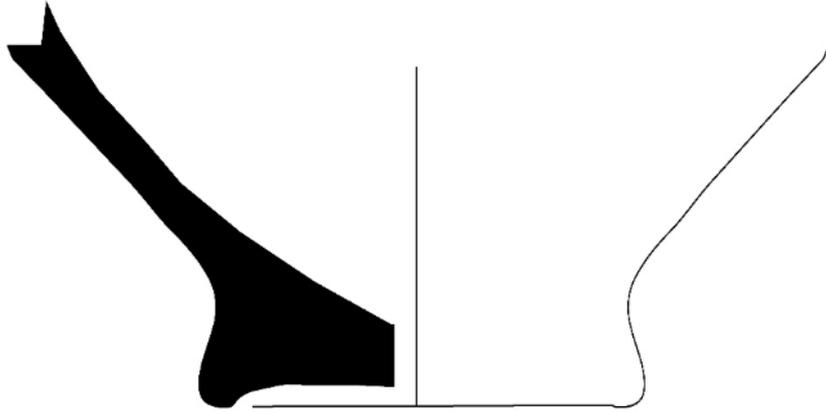


S2: 1107

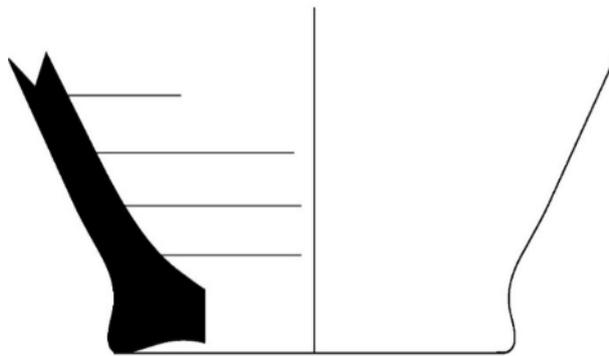


S2: 1168

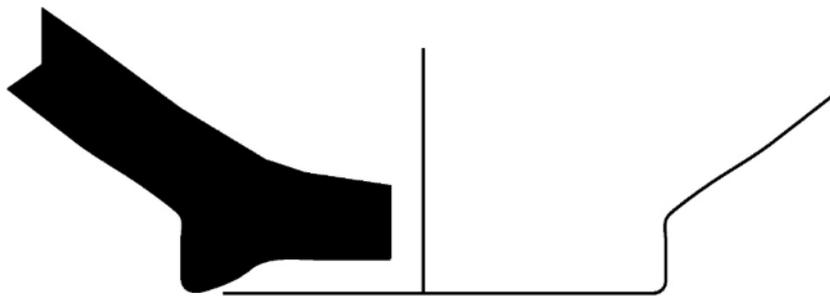




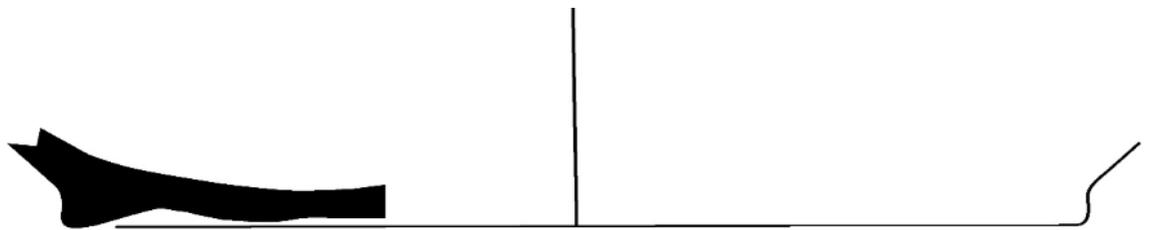
S2: 3310



S2: 1094

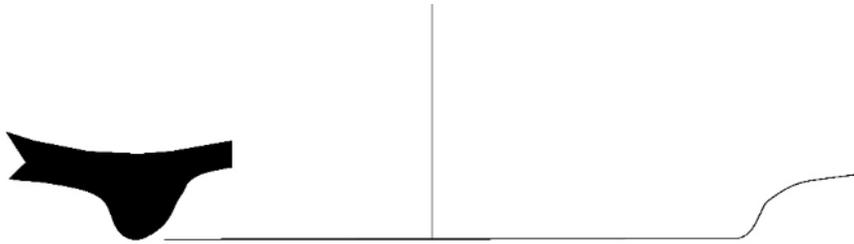


S2: 1168

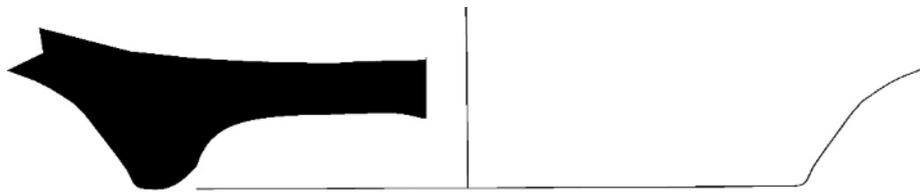


S2: 1478

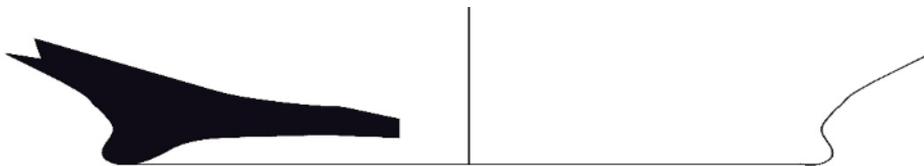




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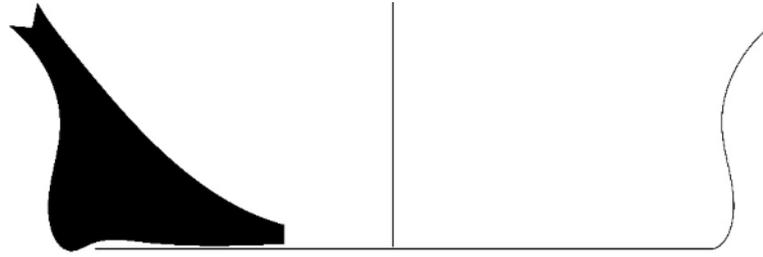


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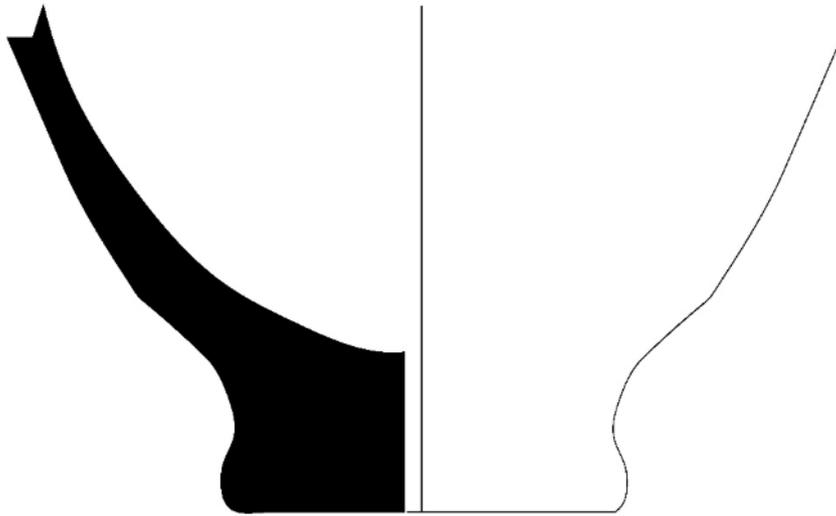


S2: 1005

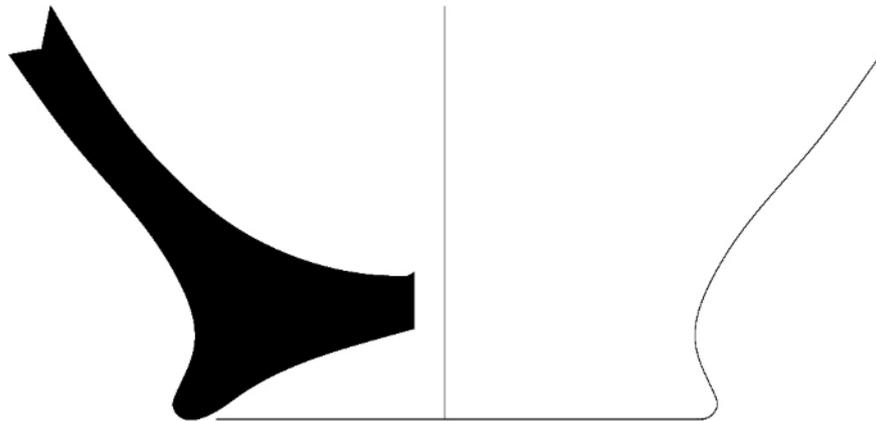




S3: 1642

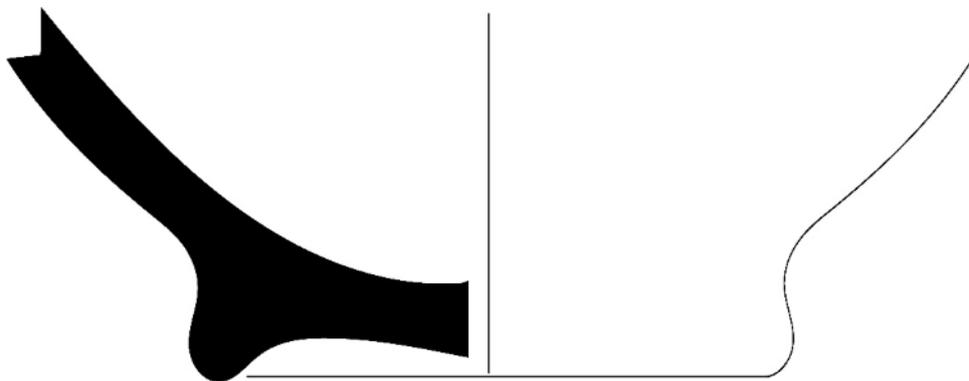


S3: 3615



S3: 1279

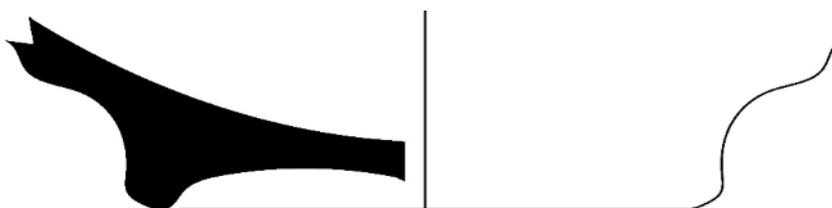




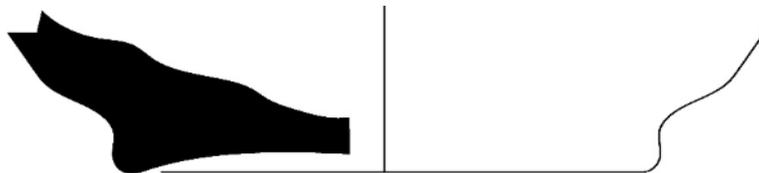
S3: 2272



S3: 1514

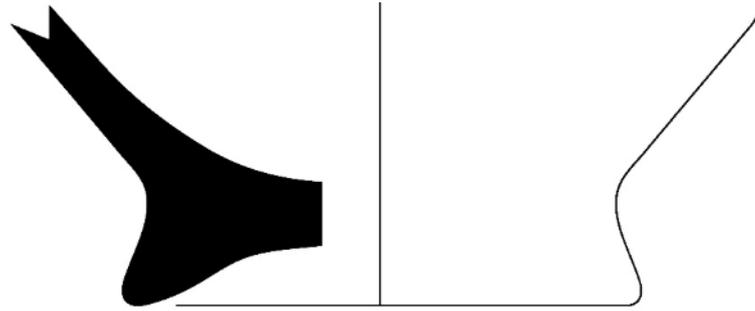


S3: 1520

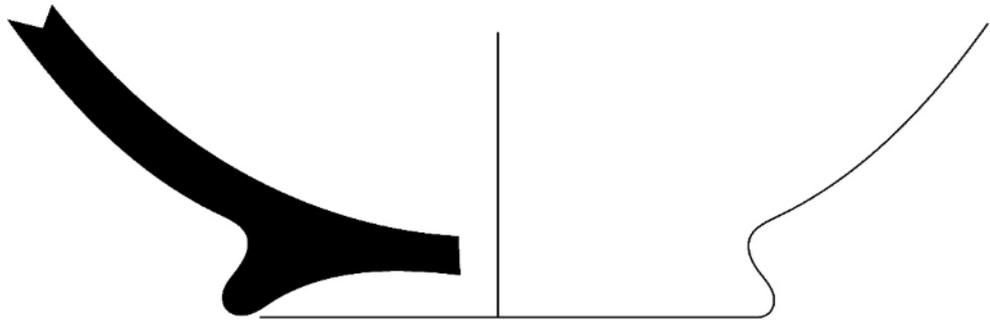


S3: 1503

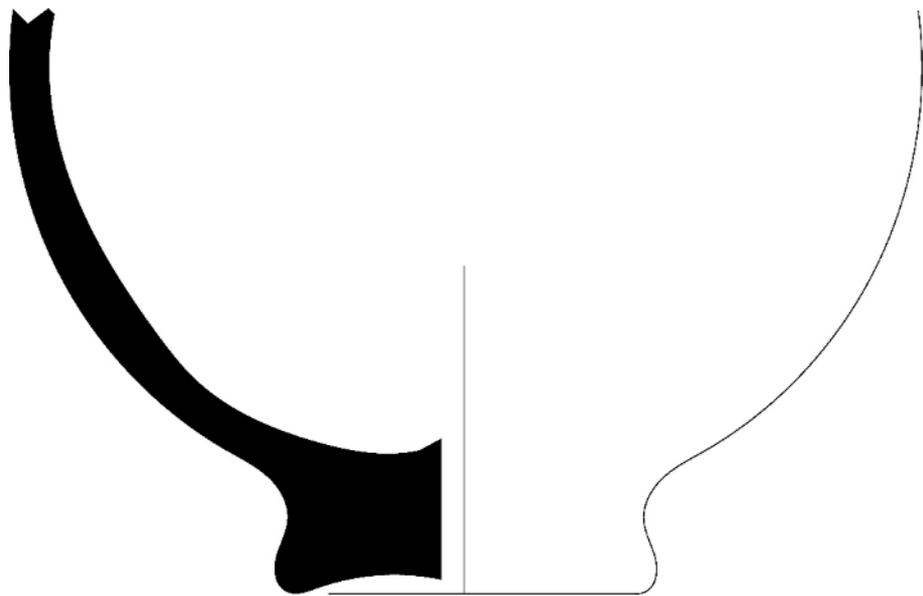




S3: 1370

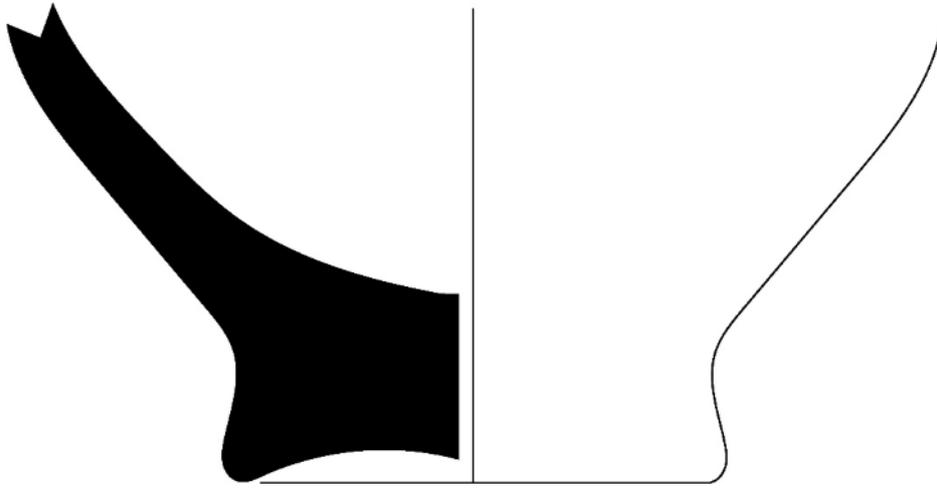


S3: 1376



S3: 1537





S3: 1384



S3: 1386



S3: 1401



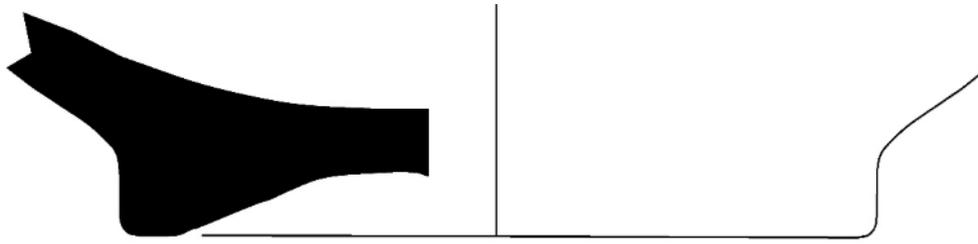


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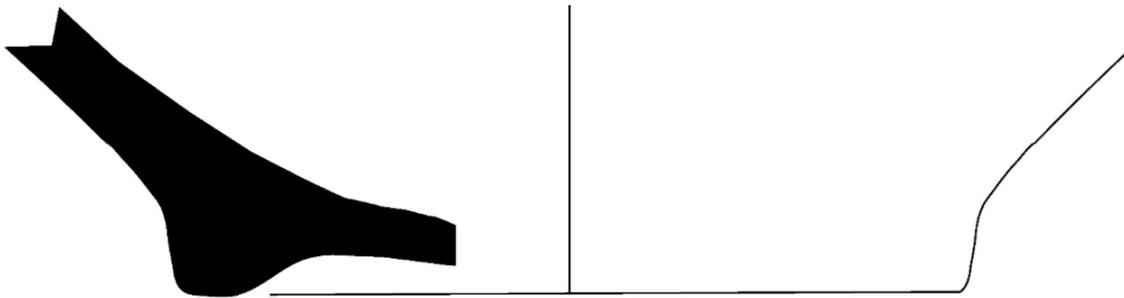


S3: 1372

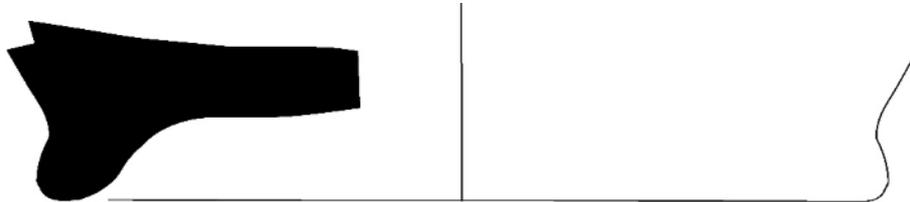




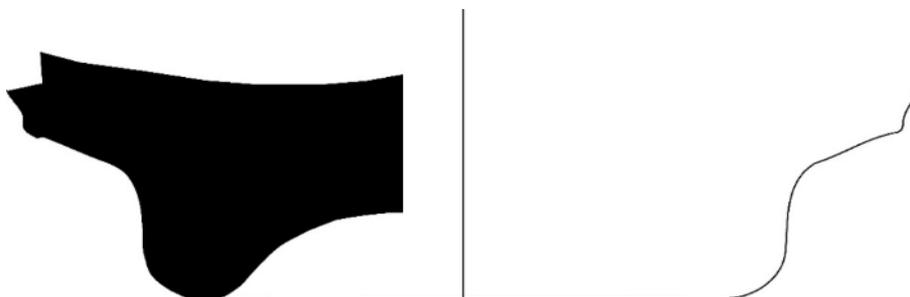
S2 1638



S2: 1392

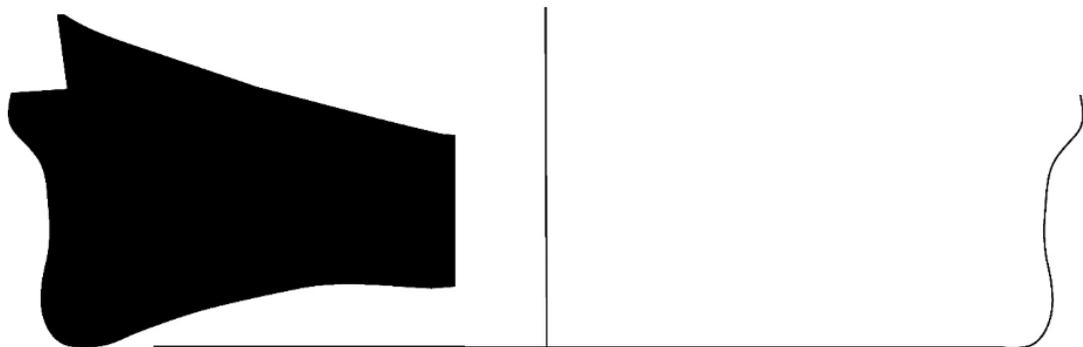


S2: 2193

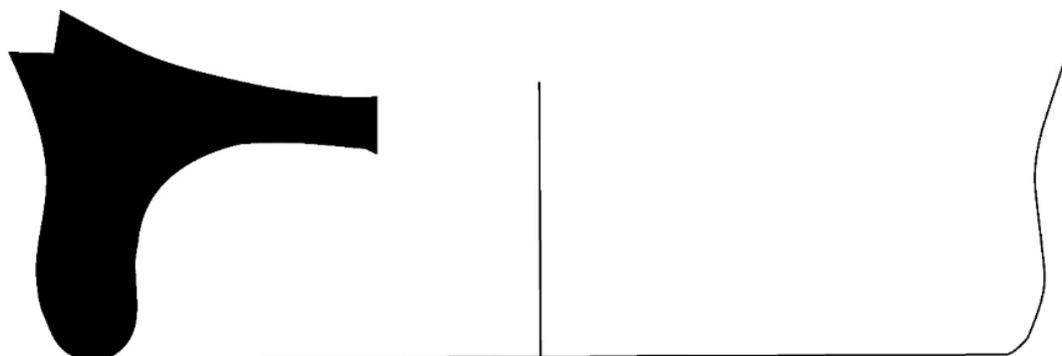


S2: 1141





S2: 1845

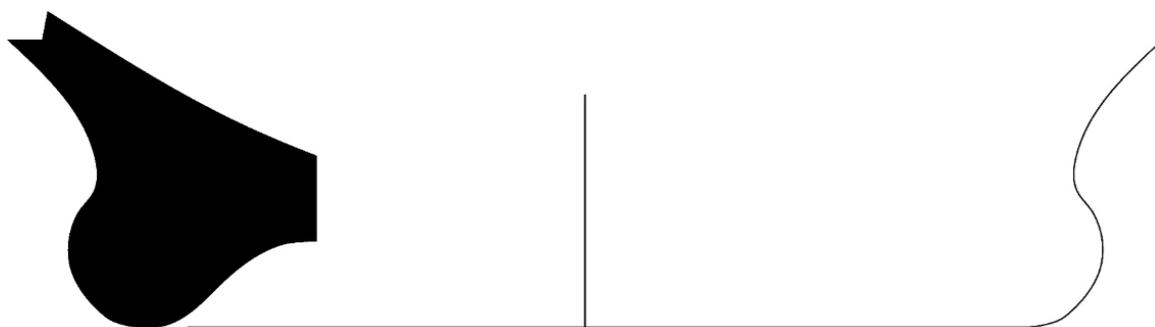


S2: 2194

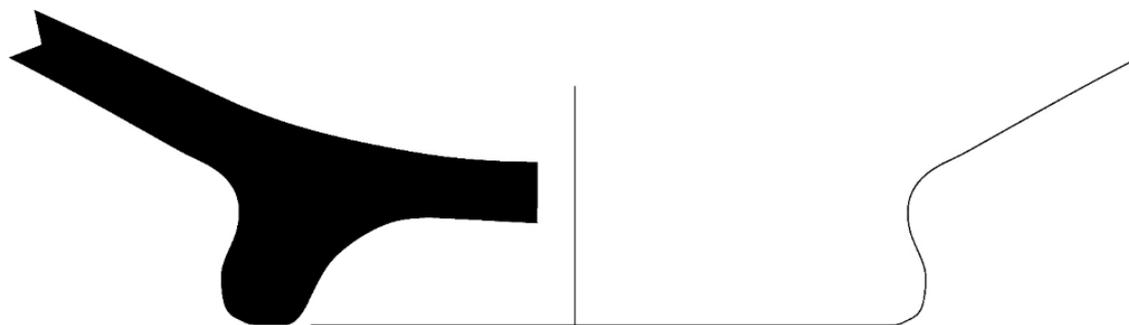




S3: 4740



S3: 4741



S3: 4764

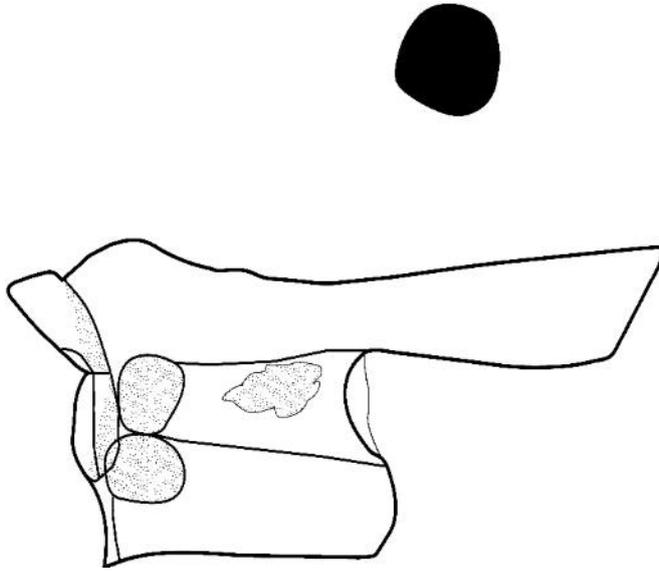


S3: 1396

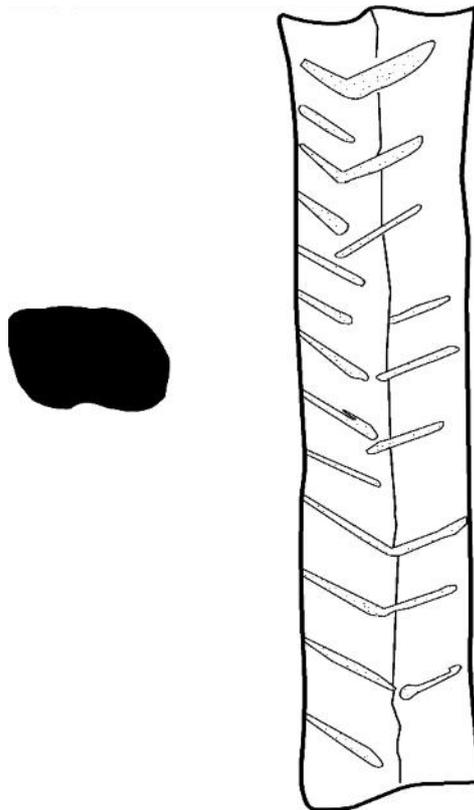


Handle - Hand-made

Type A: Handle – Hand-made

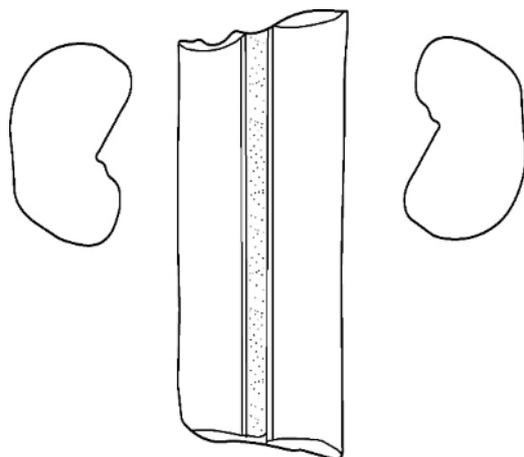


S2: 2491

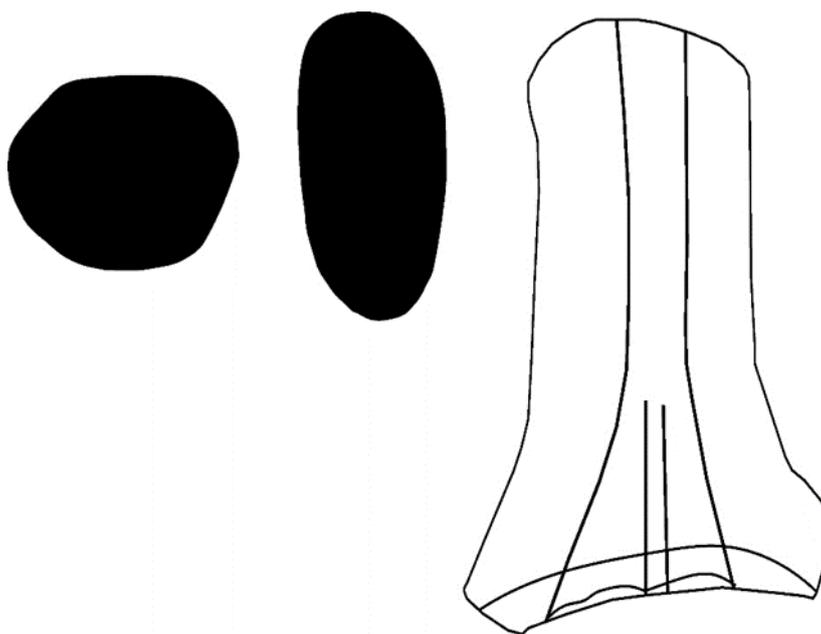


S2: 2090



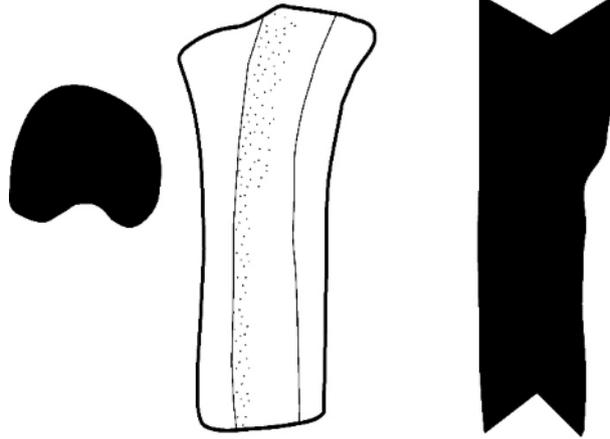


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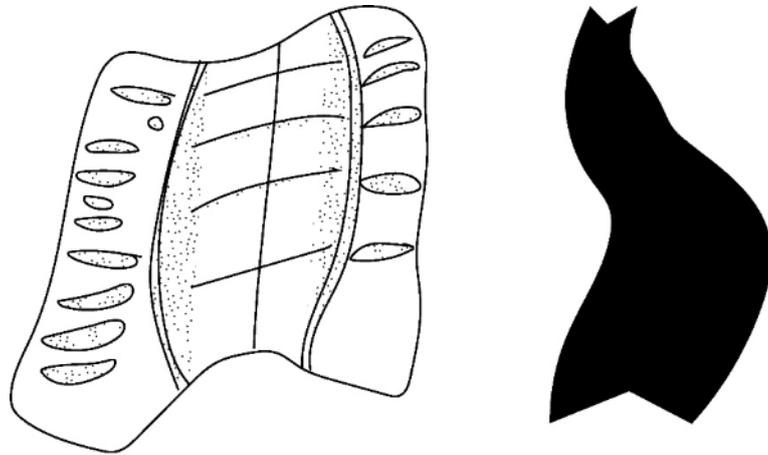


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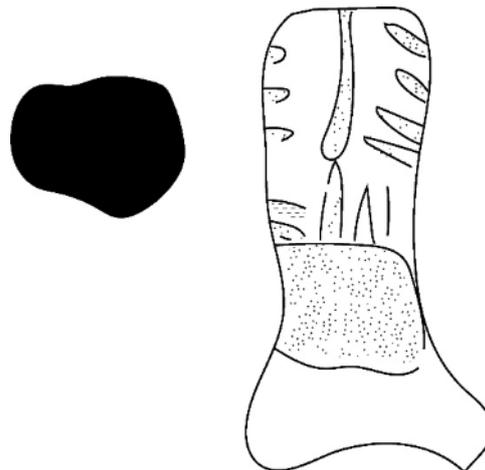




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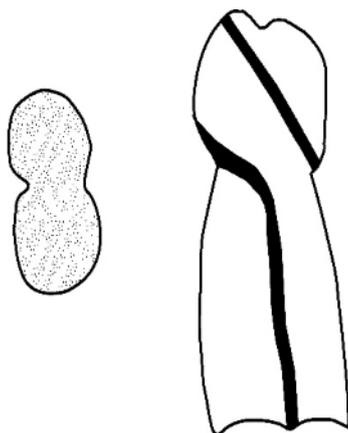


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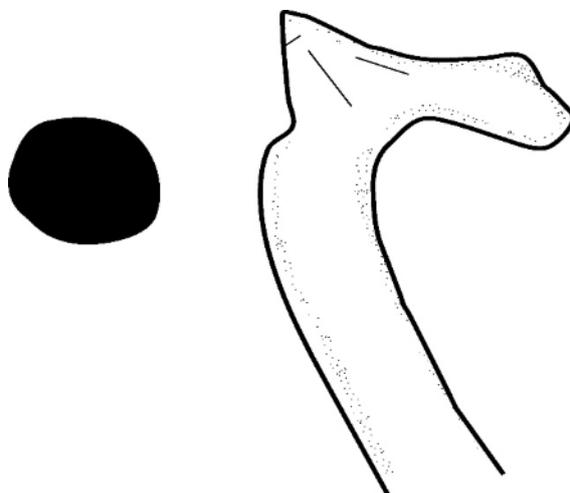


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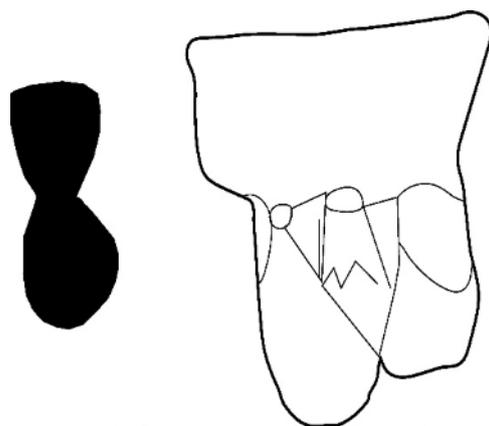




S2: 1309



S2: 1107

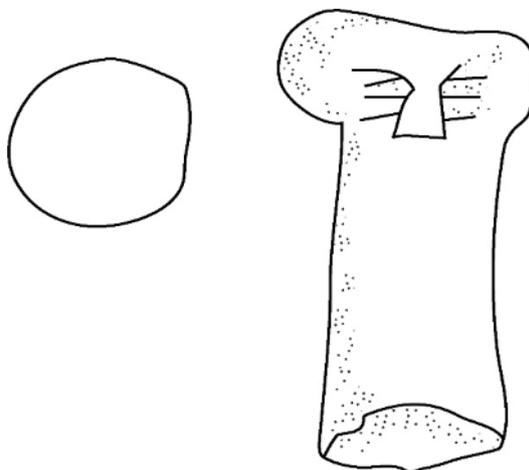


S2: 1538

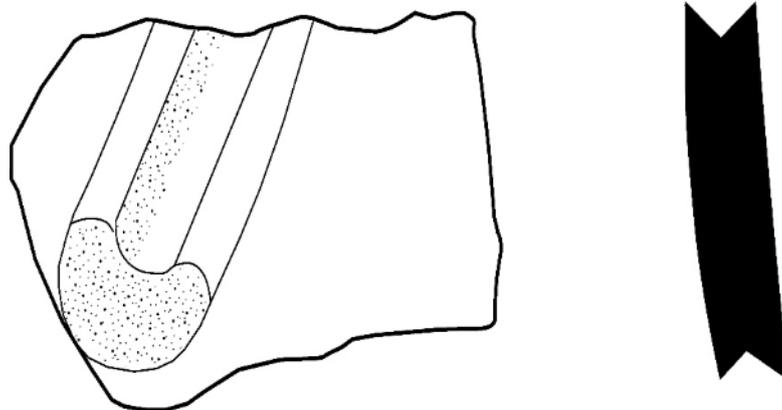


Handle - Hand-made

Type A: Handle – Hand-made



S2: 1250

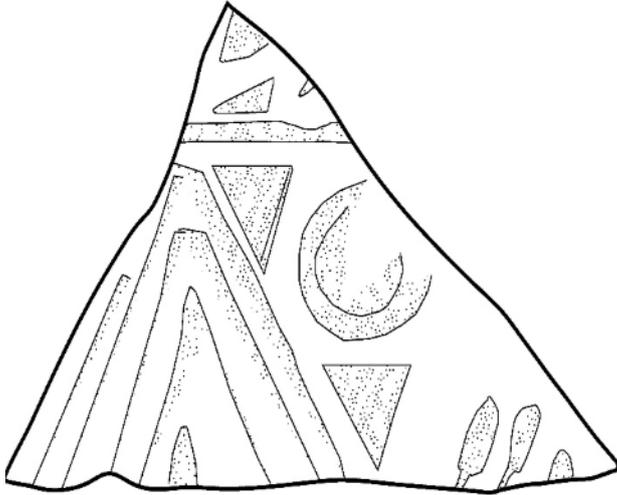


S2: 2472

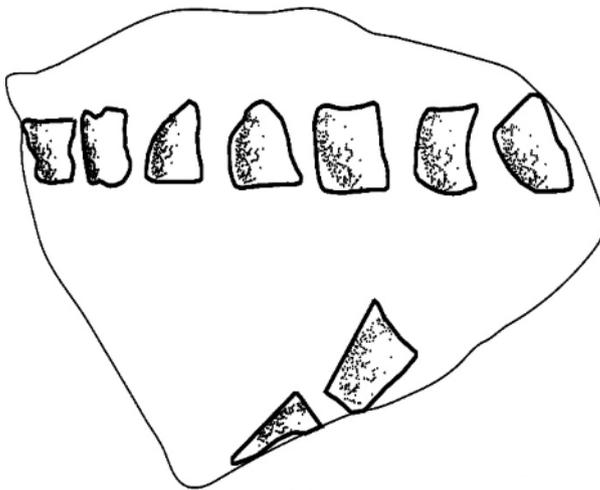


Body sherds - Hand-made

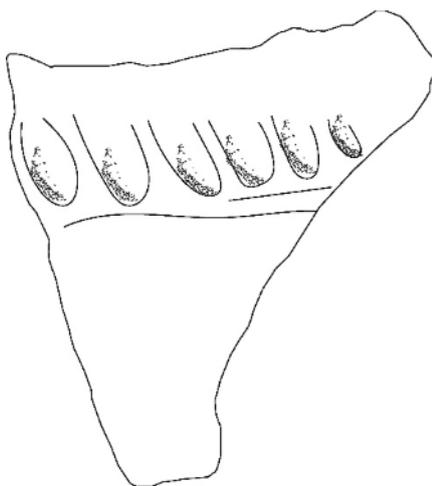
Plate 194



S2: 2181

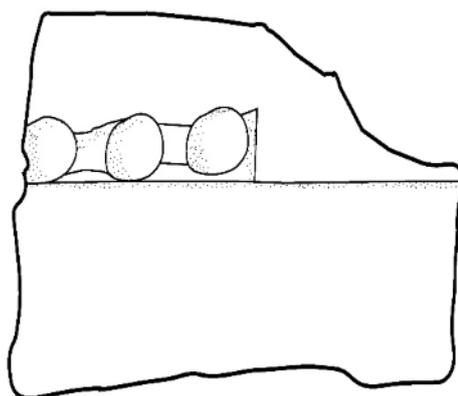


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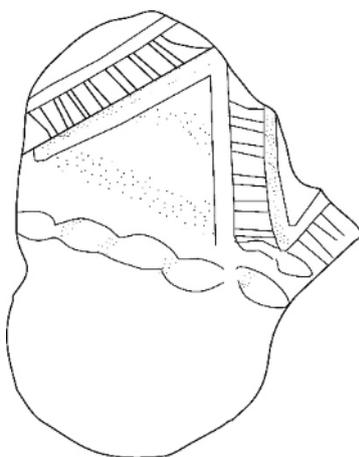


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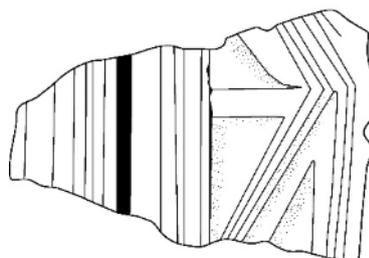




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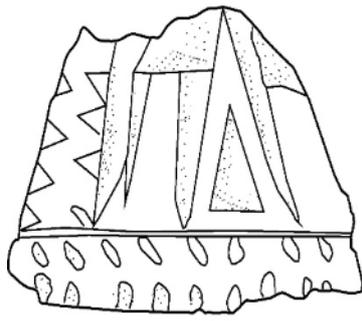


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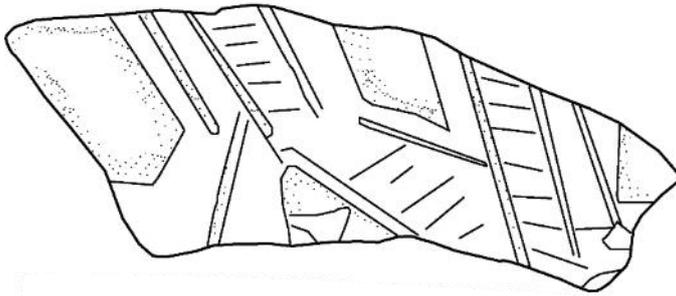


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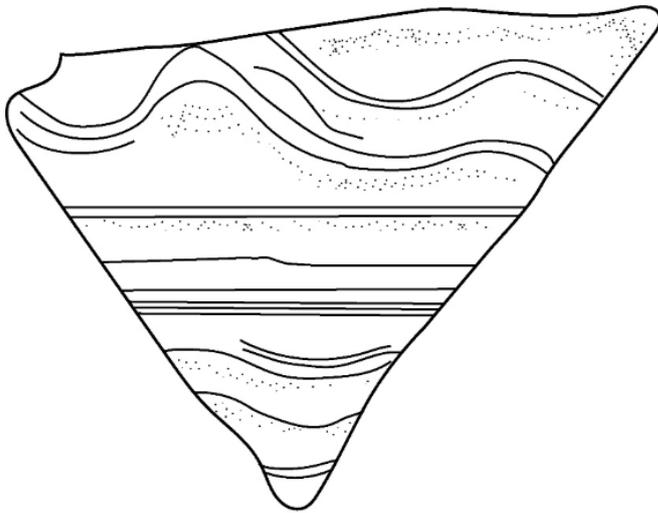




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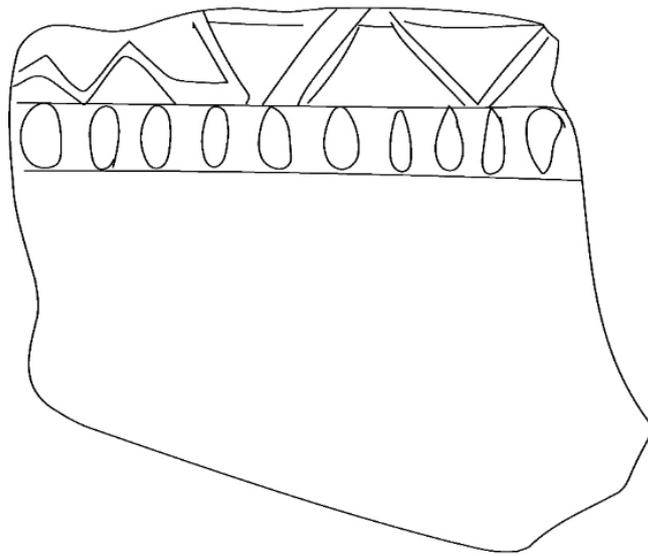


S2: 1130



S2: 1360

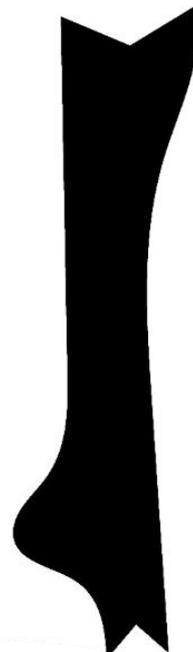


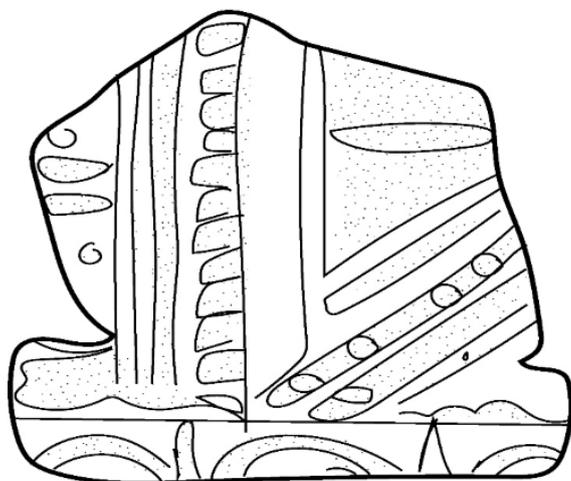


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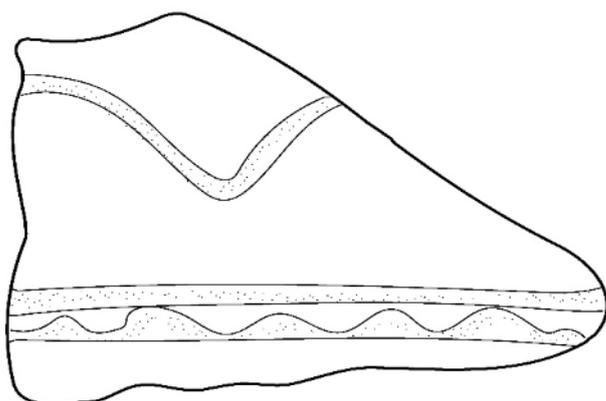


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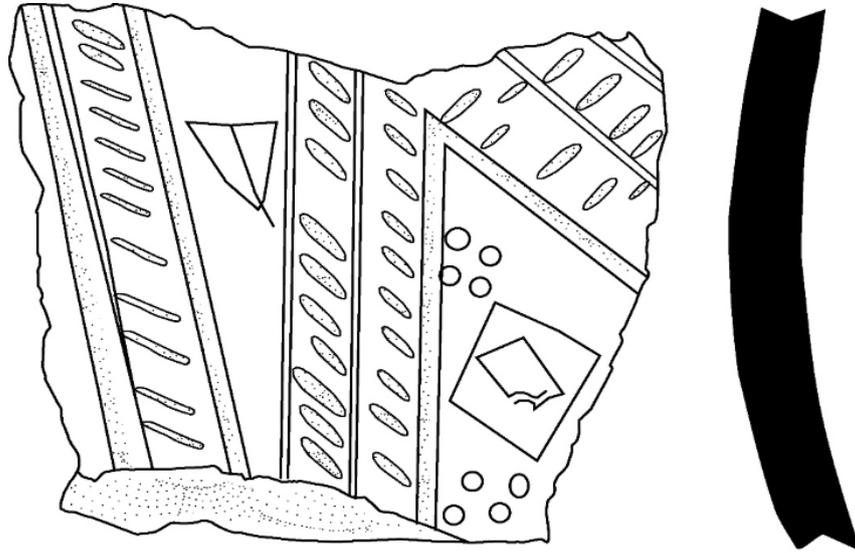


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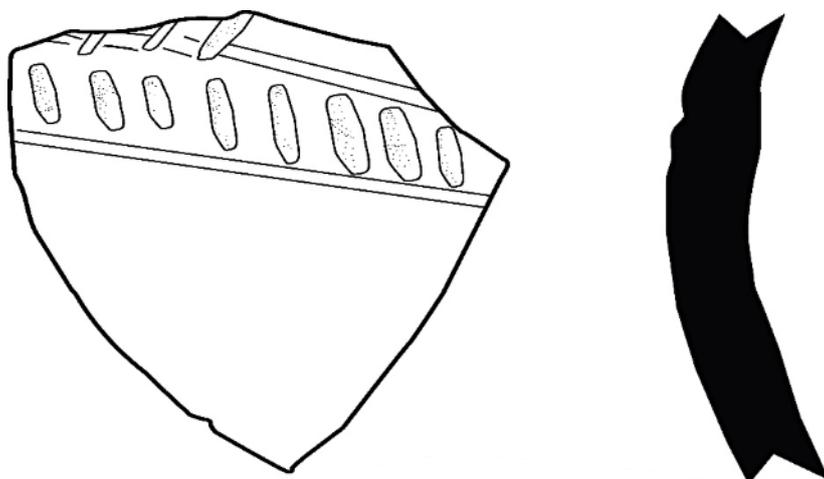
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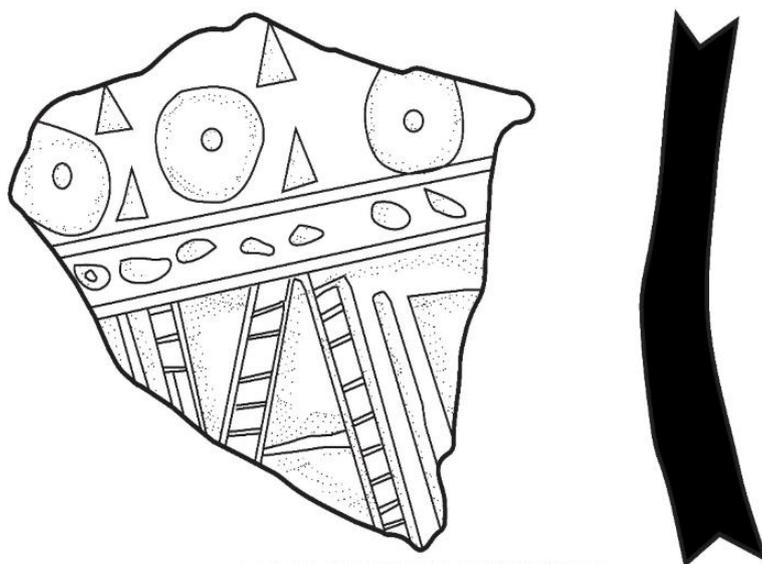


S2: 1154





S2: 1134

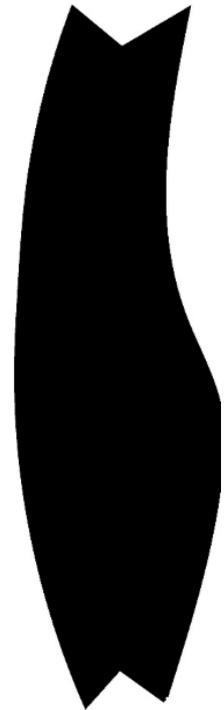


S2: 1121



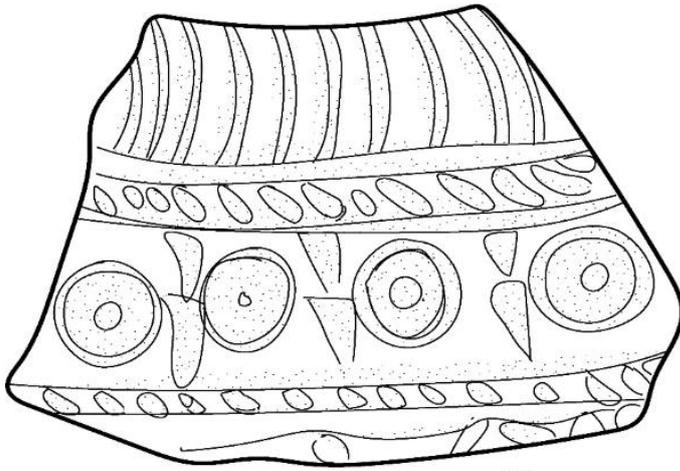


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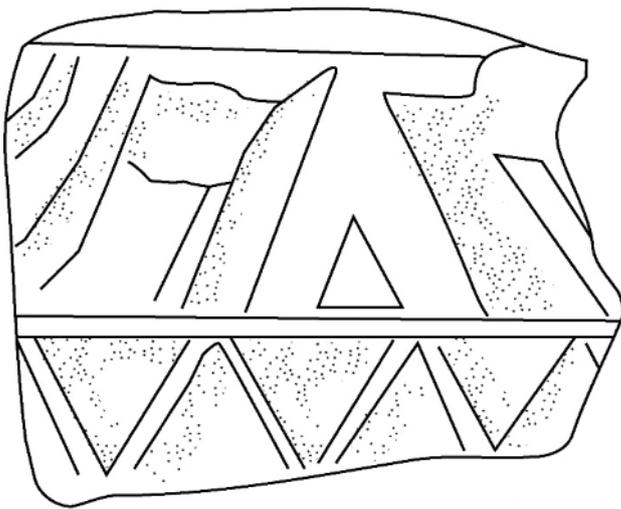


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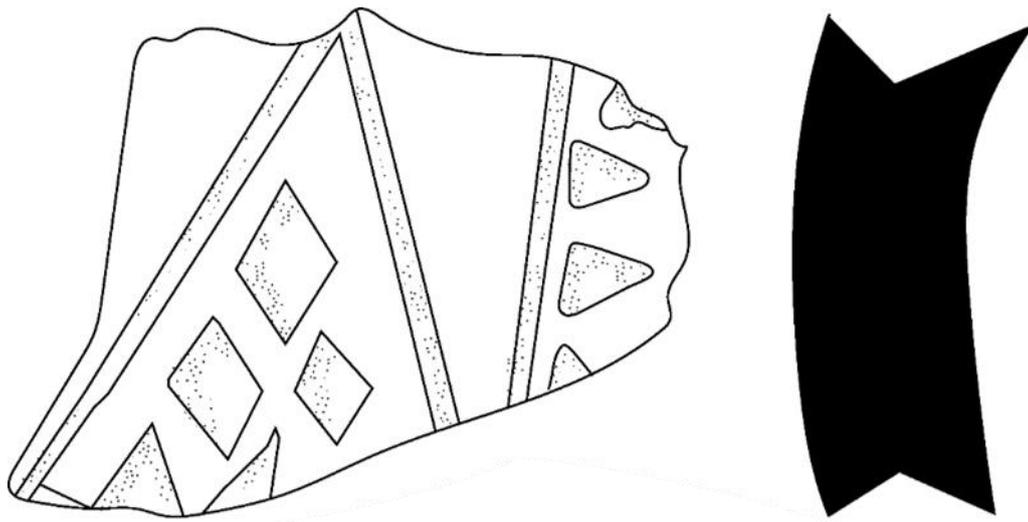


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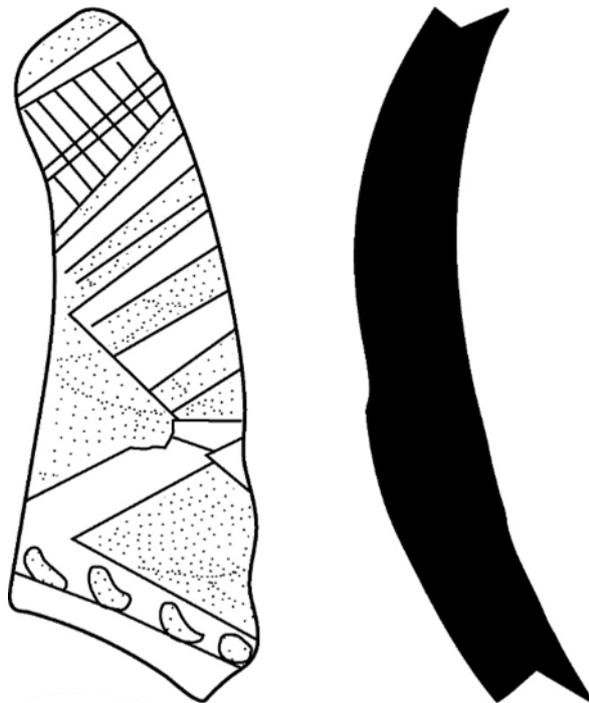


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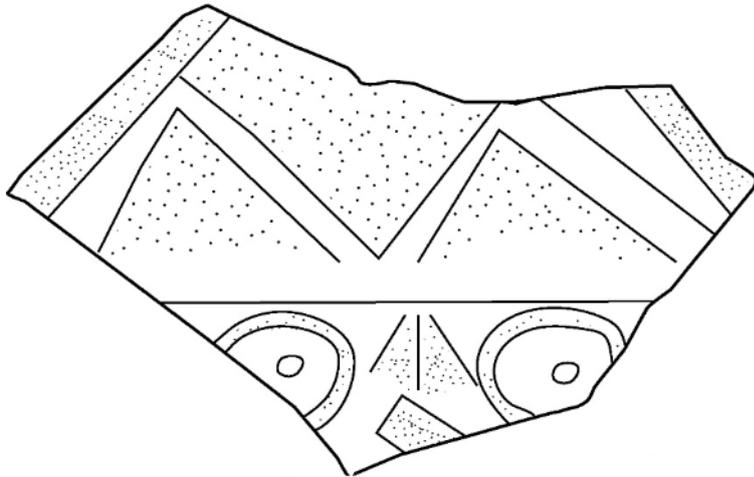


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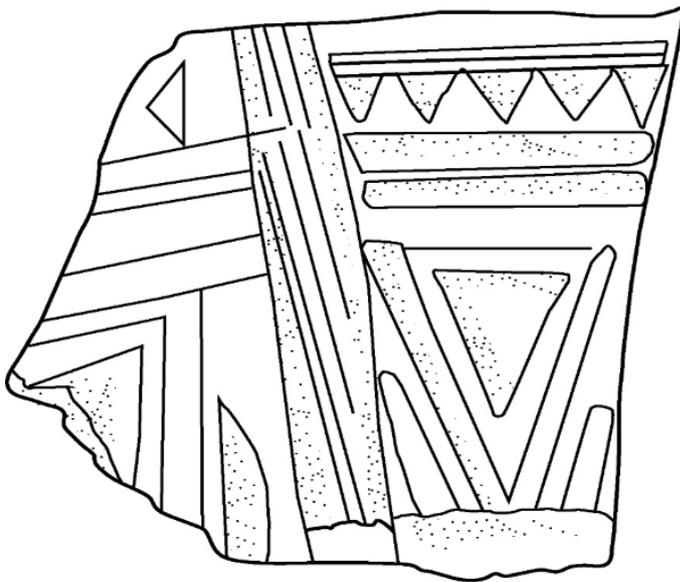


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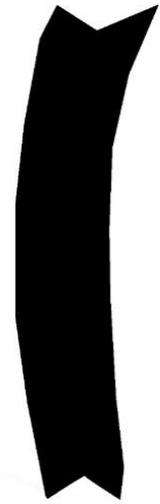
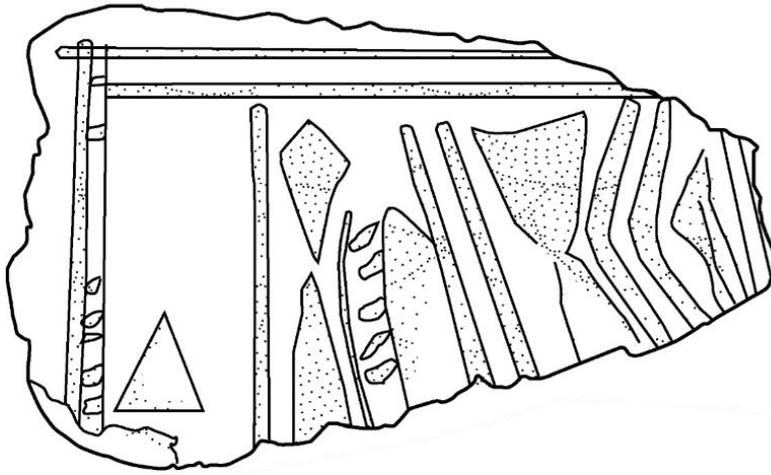


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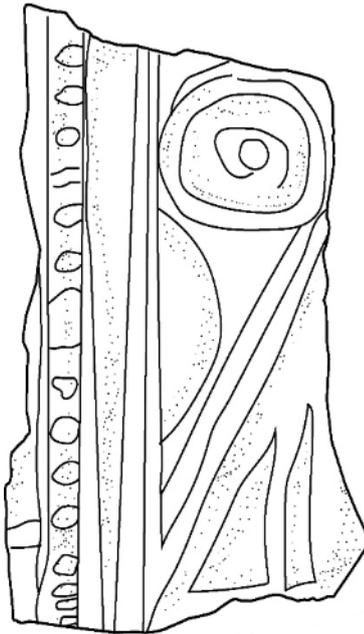


S2: 1164



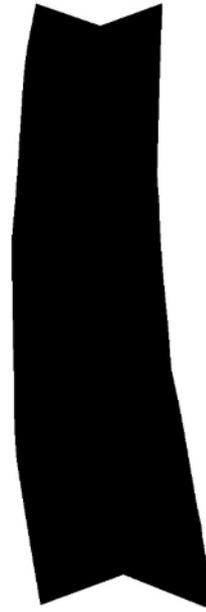
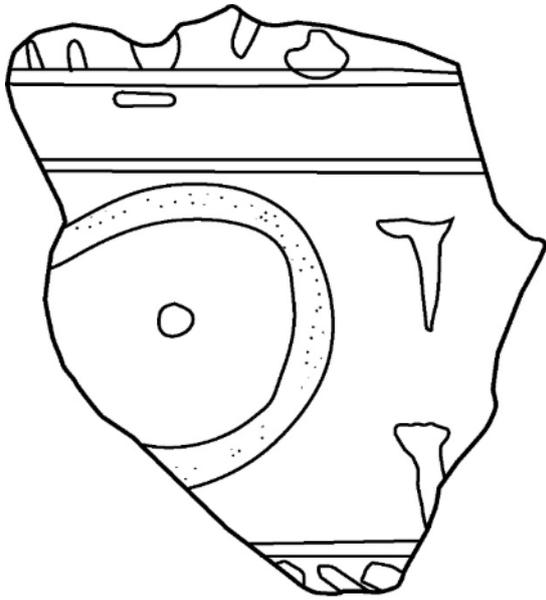


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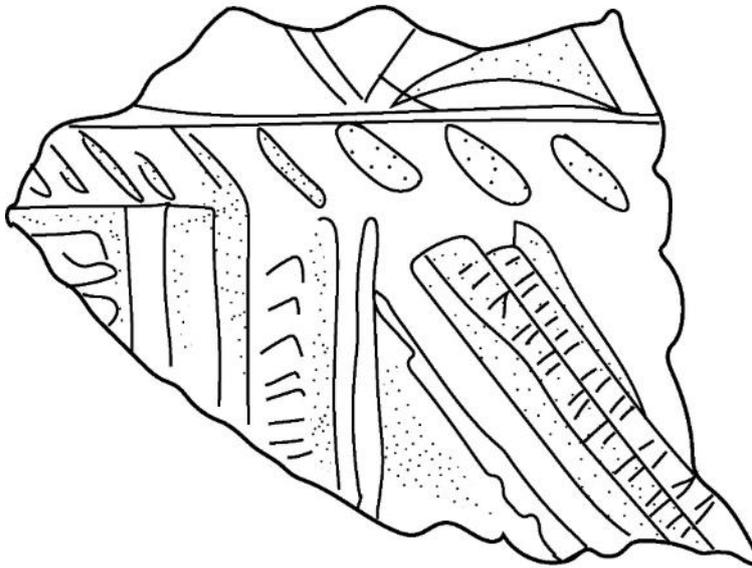


S2: 1175



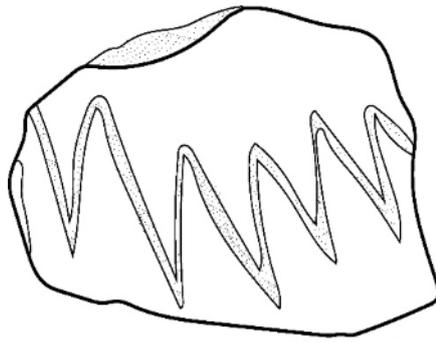


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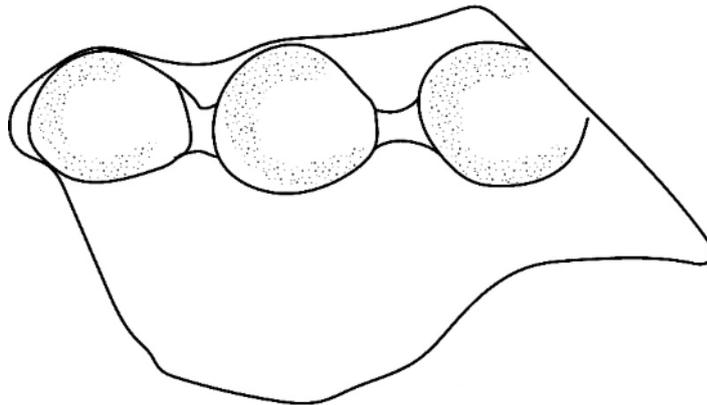


S2: 1171

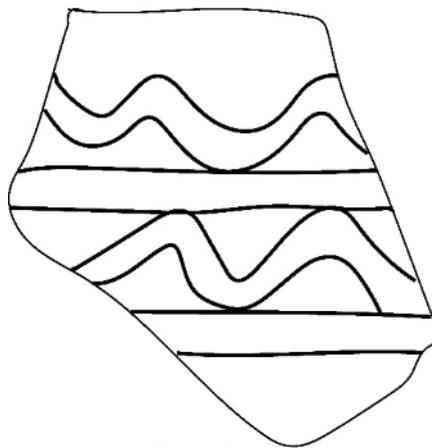
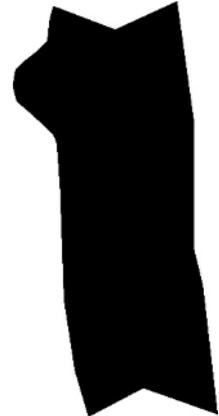




S3: 1387



S3: 3248



S3: 2329



Glossary

<i>Bi'r</i>	A deep digging in the ground to access groundwater/ water well.
<i>K'abāt Najran</i>	Square building similar in shape to the <i>K'abāh</i> , qibla of Muslims in Makkah.
<i>Kaslūl</i>	The name of month in the Babylonian calendar. It meets the month of December.
<i>Maḥram Bilqis</i>	Awwam temple near Ma'rib in Yemen.
<i>Malik</i>	King.
<i>Mukarrib</i>	King.
<i>Mūsnad</i>	The ancient Yemeni alphabet or the old South Arabian letters.
<i>Al-Nafūd</i>	A huge desert region in northern Saudi Arabia.
<i>Qibla/ Qiblah</i>	The direction of Muslims during prayer time (<i>Al- K'abāh</i> in Makkah).
<i>Al-Qarya Al-Qadima</i>	The old village.
<i>Qaryat Al-Fāw</i>	Village (Village of Al-Fāw or Al-Fāw village).
<i>Qaṣr Al-Emara</i>	Palace, usually, it takes the shape of fort and uses as the seat of the governor and the government.
<i>Al-Rub' Al-ḳḥālī</i>	The Empty Quarter desert.
<i>Sadd Al-Jalad</i>	Dam.
<i>Saīl Al-'Arim</i>	Stream or a great flood due to extremely heavy rain and Al 'Arim is the name of the flood.
<i>Sh'aib</i>	Dray wadi of valley contains water only during the heavy rain seasons.

Wadi Valley (Wadi Najran on Valley of Najran).

'Uyūn a point at which water flows from an aquifer to the Earth's surface. In Arabic, the singular of 'uyūn is 'uyn.

References

Primary sources

- Al-Bakrī, A., (1945/ 1949). *Al-Mu'jam*. Cairo: Fouad I university [In Arabic]. [1876-1877, Paris].
- Al-Balādhurī, A., (1957). *Futūḥ Al-Buldān*, v 1. Cairo: Al-Nahdah Egyptian Library. [1863 and 1866, Leiden].
- Caton Thompson, G., (1944). *The tombs of Moon temple of Hureidha (Ḥaḍramawt)*. Oxford: Oxford University Press.
- Al-Daynūrī, A., (1960). *Al-'Akhbār Al-Ṭiwāl*. Cairo: Ministry of Culture [In Arabic]. [1888, Leiden: Brill].
- Al-Ḥamawī, Y., (1957). *Mu'jam Al-buldān*. Beirut: Dar Sader [In Arabic]. [1865, Leiden].
- Al-Hamdānī, H., (1990) *Ṣifaa² Jazīraa² Al-'arab*. Riyadh: Dar Al-Yamāmah for research and translation [In Arabic]. [1884, Leiden: Brill].
- Al-'aṣfahānī, A., (2008). *Kitāb Al-'aghānī*. 3rd ed. Beirut: Dar Sader. [1868; 1888, Leiden and 1905, Būlāq].
- Al-Iṣṭakhrī, I., (1927). *Al-Masālik Wa al-Mamālik*. Lugduni-Batavorum: Brill.
- Al-Maqdisī, S., (1877). *Aḥsan al-taqāsīm fī ma'rifat al-aqālīm*. Leiden: Brill.
- Al-Mas'ūdī, A., (1988). *Murūj al-Dhhab Wa M'ādin Al-jawhar*. Beirut: The modern library [In Arabic]. [1861-1871, Paris].
- Al-Ṭabarī, M., (1979). *Tārīkh Al-Ṭabarī*. Beirut: Masterpieces of Arab heritage [In Arabic]. [1879, Leiden].
- Al-y'qūbī, A., (1883). *Al-Tārīkh*. Leiden: Brill.
- Dayton, J and A., (1978/ 1979). Pottery from the Philby-Ryckmans-Lippens expedition to Arabia, 1951 - 1952. *Proceeding of the seminar for Arabian studies*, 9, pp.31-39.

- Hogarth, D., (1904). *The Penetration of Arabia: A Record of the Development of Western Knowledge Concerning the Arabian Peninsula*. New York: Frederick A. Stokes Company.
- Habshush, H., (1941). *Travel in Yemen*. Jerusalem: The Hebrew University Press.
- Halevy, J., (1872). Rapport sur une mission archeologique dans le Yemen. *Journal Asiatique*, 19 (6), pp.5-98, pp.129-266, pp.489-547.
- Halevy, J., (1873). Voyage au Nedjran. *Bulletin de la societe de la geographie*, 6 (6), pp.5-31, pp.249-273, pp.581-606.
- Halevy, J., (1877). De Sana au Nedjran. *Bulletin de la societe de la geographie*, 13 (6), pp.466-479.
- Ibn Al-'thīr, A., (1995). *Al-Kāmil Fī Al-Tārīkh*, 5th ed. Beirut. Dar Sader. [1850-1874, Leiden].
- Ibn Ḥabīb, M., (1942). *Kitāb al-Muḥbbar*. Hyderabad: Da'irat Al-Ma'arif Al-'Uthmaniyya.
- Ibn Ḥabīb, M., (1964). *Kitāb al-Munmaq*. Hyderabad: Da'irat Al-Ma'arif Al-'Uthmaniyya.
- Ibn Ḥawqal, M., (1992). *Ṣūra² Al-'arḍ*. Beirut: Dar Al-Haya Library. [1919, Leiden: Brill].
- Ibn Khurdādhbah, O., (1889). *Kitāb Al-Masālik Wa al-Mamālik*. Leiden: Brill.
- Ibn Mujāwir, Y., (1996). *Tarīkh Al-Mustabṣir*. Cairo: Religious Culture Library [In Arabic]. [1901; 1951-1954, Leiden].
- Lippens, P., (1956 [1999]). *Expedition en Arabie Centrale*, Translated from French by M. M. Al-Hannash. Riyadh, King Abdulaziz Foundation for Research and Archive.
- Mauss, M, (2002). *The Gift*. London: Routledge Classic.
- Niebuhr, C., (1792). *Travel through Arabia and the other countries in the east*. Edinburgh: Morison and son.
- O'Leary, D. L., (1927). *Arabia before Muhammad*. London: Routledge, Trench, Trubner & Co Ltd.
- Philby, J and Tritton, A., (1944). Najran inscriptions. *The journal of royal Asiatic society of Great Britain and Ireland*, 2, pp.119-129.

- Philby, J., (1939). *Sheb'a Daughters: being Record of Travel in Southern Arabia*. London: Methuen and Co., Ltd.
- Philby, J., (1943). Haleb in Yemen. *The Geographical journal*, 102 (3), pp.116-124.
- Philby, J., (1952). *Arabian highlands*. New York: Cornell University Press.
- Pliny., (1847/1848). *Natural History. In Thirty Seven Books*. Book VI, Trans. Philemon Holland, London: Wernerian Club.
- Pliny., (1960). *Natural History. In Thirty Seven Books*. Book XII, Trans. H. Racham, M, A, London: William Heinemann Ltd.
- Polanyi, K., (1944). *The great transformation*. New York: Farrar and Rinehart, INC.
- Polanyi, K., (1957). The economy as instituted process. In: K. Polanyi., C. Arensberg and H. Pearson, eds. 1957. *Trade and Market in the Early Empires: Economics in History and Theory*. Illinois: The Free Press. pp.243-270.
- Ptolemy, C., (2011 [1932]). *Geography of Claudius Ptolemy*. New York: Cosimo Classics.
- Serjeant, R. B., (1956). Folk-Remedies from Ḥaḍramawt. *Bulletin of the School of Oriental and African Studies*, 18 (1), pp.5-8.
- Serjeant, R. B., (1964). Some irrigation system in Ḥaḍramawt. *Bulletin of the School of Oriental and African Studies*, 27 (1), pp.33-76.
- Strabo., (1930). *The Geography of Strabo*. Trans. Horace Leonard Jones, London: William Heinemann Ltd.
- Strabo., (1932). *The Geography of Strabo*. Trans. Horace Leonard Jones, London: William Heinemann Ltd.
- Van Beek. G., (1969). *Hajar Bin Ḥumeid: Investigation at a pre-Islamic site in south Arabia*. Baltimore: The John Hopkins Press.

Secondary Sources

- Abbott, D., (2010). The rise and demise of marketplace exchange among the prehistoric Hohokam of Arizona. In: C. Garraty. and B. Stark, ed. 2010. *Archaeological Approaches to Market Exchange in Ancient Societies*. Colorado: University Press of Colorado. pp.61-83.
- Abu-Duruk, H. and Murad, A., (1985). Preliminary report on Qasr Al-Hamrā' excavations, Tayma, The second season 1404/ 1984. *Journal of Saudi Arabian Archaeology (ATLAL)*, 9, pp.55-64 [In English]/ pp.55-67 [In Arabic].
- Abu-Duruk, H. and Murad, A., (1986). Preliminary report on Qasr Al-Hamrā' excavations, Tayma, Third season 1405/ 1985. *Journal of Saudi Arabian Archaeology (ATLAL)*, 10, pp.29-35 [In English]/ pp.35-42 [In Arabic].
- Abu-Duruk, H., (1986). *Introduction to archaeology of Tayma*. Riyadh: Deputy Ministry of Antiquities and Museum, Ministry of Education.
- Abu-Duruk, H., Al-Zahrani, A., Al-Isa, A., Hashim, S., Al-Khalifa, K., Al-Salouk, M., Al-Shidukhi, A., Al-Ruweysan, S., Al-Sabhan, I., Al-Ruweyti, A., Al-Hilwah, S., Al-Anazi, S., Al-Shairiy, A., Abdalaziz, M., Al-Tayyib., Abdalaziz, I., Al-Taymai, S., Al-Najm, M. and Al-Zamil, F., (2000). A preliminary report on the excavation and finds of the first Islamic site "Al-Bujidi" at Tayma, 1412 A.H/ 1992A.D. *Journal of Saudi Arabian Archaeology (ATLAL)*, 15, pp.11-33 [In English]/ pp.13-33 [In Arabic].
- Adams, R., Parr, P., Ibrahim, M. and Al-Mughannum, A., (1977). Saudi Arabian archaeological reconnaissance-1976: Preliminary report on the first phase of the comprehensive archaeological survey program. *Journal of Saudi Arabian Archaeology (ATLAL)*, 1, pp.21-40 [In English]/ pp.21-46 [In Arabic].
- Al-Amer, F., (1996). *Pottery of Al-Deffi site*. PhD. King Saud University [In Arabic].
- Al-Ansary, A., (1982). *Qaryat Al-Fau: A portrait of pre-Islamic civilisation in Saudi Arabia*. Riyadh: University of Riyadh [In Arabic].
- Al-Ansary, A., and Al-Mareeh, S. (2003). *Najran: A staging-post for caravans*. Riyadh: DAR AL-QAWAFIL for Publishing & Distribution [In Arabic].

- Al-Ansary, A., and Al-Mareeh, S. (2007). *Najran: A staging-post for caravans*. Riyadh: DAR AL-QAWAFIL for Publishing & Distribution.
- Albright, W. F., (1950). The chronology of ancient South Arabia in the light of the first camping of excavation in Qatabān. *Bulletin of the American Schools of Oriental Research*, 119, pp.5-15.
- Al-Dayel, K., Al-Obaid, S., Al-Souaied, A., Eskoubi, K., Al-Arifi, N., Al-Ibrahim, A., Al-Jaralah, A., Al-Zahrani, M., Al-Hilwah, S., Shahin, A., Randl, B. and Driver, D., (1988). Excavations at Dûmat Al-Jandal, second season, 1406/ 1986. *Journal of Saudi Arabian Archaeology (ATLAL)*, 11, pp.37-46 [In English]/ pp.45-56 [In Arabic].
- Al- Ghamedi, A., (1995). A preliminary study of Samples of pottery from al-Ukhudud site in Najran province, S. W. Saudi Arabia. *King Saud University Journal*, 7 (2), pp.515-546 [In Arabic].
- Al-Ghamedi, A., (1996). Analytical study of pottery samples from the archaeological site of Jurash, South West Saudi Arabia. *King Saud University Journal*, 8 (2), pp.407-447 [In Arabic].
- Al-Ghazzi, A., (1990). *A comparative study of pottery from a site in the Al-Kharj, valley central Arabia*. PhD. Institute of Archaeology, University College, University of London.
- Al-Ghazzi, A., (1994). New pottery patterns from site 211-21 Central province. *Ad-darah*, 1 (19), pp.9-26 [In Arabic].
- Al-Hajri, M., Al-Seif, Z., Al-Şana'a, S., AbdulJabbar, N., Al-Nadabi, K., Al-Zahli, A., Ibrahim, W., Al-Shannar, J. and Al-Ukbar, H., (2018). Preliminary Report on the Archaeological Excavations at Al-Khobar site – First Season 1431H/ 2009 AD. *Journal of Saudi Arabian Archaeology (ATLAL)*, 25, pp.145-164 [In English]/ pp.113-129 [In Arabic].
- Al-Hajri, M., Hussain, Y., Al-Mutlag, M., Al-Juraid, J., Al-Rodhain, S. and Al-Hilwah, S., (2002). Tayma excavation, Rujom Sasa, first season 1418. *Journal of Saudi Arabian Archaeology (ATLAL)*, 17, pp.23-25 [In English]/ pp.43-67 [In Arabic].
- Al-Hashash, A., Al-Zayer, W., Al-Saif, Z., Al-Sanna, S. and Al-Hajri, M., (2001). Report on the archaeological excavations at Thaj. *Journal of Saudi Arabian Archaeology (ATLAL)*, 16, pp.23-26 [In English]/ pp.37-71 [In Arabic].

- Ali, J., (1990). A preliminary report on the southern Khiraiba, Al-Hijr excavation: 3rd season 1410/1989. *Journal of Saudi Arabian Archaeology (ATLAL)*, 13, pp.21-32 [In English]/ pp.23-37 [In Arabic].
- Al-Ibrahim, M. and Al-Talhi, D., (1989). Preliminary report on the excavation at Al-Hijr, second season. *Journal of Saudi Arabian Archaeology (ATLAL)*, 12, pp.21-28 [In English]/ pp.25-33 [In Arabic].
- Al-Ibrahim, M., Gilmore, M., Mursi, G. and Al-Talhi, D., (1985). A preliminary report on the first season of excavation at Al-Mabiyat, an early Islamic site in the Northern Hijaz. *Journal of Saudi Arabian Archaeology (ATLAL)*, 9, pp.109-125 [In English]/ pp.113-123 [In Arabic].
- Al-Jahwari, N., (2013). *Settlement patterns, development and cultural change in the Northern Oman peninsula: a multi-tiered approach to the analysis of long-term settlement trends*. Oxford: Archaeo Press.
- Al-Ma'mary, A., (2000). Two cultures of the Neolithic period in the Arabian Peninsula. *Adumatu*, 1, pp.7-29 [In Arabic].
- Al-Ma'mary, A., (2005). The "Desert Neolithic" and its affinities with South Arabian highlands. *Adumatu*, 12, 7-28 [In Arabic].
- Al-Muaikel, K., (1994). *Study of the archaeology of the Jawf region*. Riyadh: King Fahd National Library.
- Al-Muaikel, K., Al-Omeer, A., Al-Murakhy, M., Al-Shodokhi, A., Al-Ganim, K., Al-Sultan, A., Al-Zahrani, S., Jaber, A., Al-jdiei, B., Al-Amer, F., Al-Eidi, H. and Al-Suhaimi, M., (2011). Report on the excavation at Qurh site (Al-Mabbiyat): second season 1426/2005. *Journal of Saudi Arabian Archaeology (ATLAL)*, 21, pp.38-62 [In English]/ pp.28-47 [In Arabic].
- Al-Omeer, A., Al-Holiaba, S., Al-Saleem, F., Nasif, A., Al-Muraikhi, M., Al-Shaban, T., El-Hassan, A., Al-Zahrani, A., Al-Shodokhi, A., Al-Ghanim, K., Al-Zahrani, S., Al-Amer, F., Al-Eidi, H., Al-Sahimi, M., Al-Harbi, J., Jabar, A. and Al-Jadai, B., (2006). Excavation at Islamic site of Qurh (Al-Mabbiyat) Al-'Ula: first season 1425 H/ 2004 AD. *The Journal of Saudi Arabian Archaeology*, 19, pp.117-137 [In English]/ pp.217-252 [In Arabic].
- Al-Onazi, M., (2006). *Pottery from Şana'iye site at Tayma*. MA. King Saud University [In Arabic].

- Al-Otaibi, M., (2006). *Organizations and military battles in Saba' through the texts from the sixth century B.C. to the sixth century A.D.* Riyadh: Deputy of Ministry of Antiquities and Museum, Ministry of Education [In Arabic].
- Al-Rashid, S., (1986). *Al-Rabadhah: A Portrait of Early Islamic Civilisation in Saudi Arabia*: Riyadh: King Saud University. [In Arabic].
- Al-Saed, S., Al-Ghazzi, A., Sahlah, S., Al-Deeri, M., Omar, J. and Al-Amer, F., (2011). Excavations at Dadan (Second season 1426/ 2005). *Journal of Saudi Arabian Archaeology (ATLAL)*, 21, pp.24-37 [In English]/ pp.16-27 [In Arabic].
- Al-Saed, S., Sahlah, S., El-Hassan, A., Omar, J., Al-Amer, F. and Mishaby, I., (2010). Excavation at Dadan (First season 1425/ 2004). *Journal of Saudi Arabian Archaeology (ATLAL)*, 20, pp.75-99 [In English]/ pp.55-72 [In Arabic].
- Al-Saud, A., (1996). The domestication of Camels and inland trading routes in Arabia. *The Journal of Saudi Arabian Archaeology*, 14, pp.129-136 [In Arabic].
- Al-Saud, A., (1997). *Central Arabia: During the early Hellenistic period*. Riyadh: King Fahd National Library.
- Al-Saud, A., Al-Salouk, M., Al-Tamimi, S., Al-Ateeq, K., Al-Rasheed, F., Ghadi, A., Al-Qanoor, N., Al-Bassami, K., Al-dahash, M., Al-Radhiyan, S. and Al-Modbel, A., (2011). Archaeological survey of Al-Aflaj district 1428H/ 2007 AD. *Journal of Saudi Arabian Archaeology (ATLAL)*, 21, pp.154-165 [In English]/ pp.110-119 [In Arabic].
- Al-Shareef, A., (1984). *Saudi Arabia geography*. Riyadh: Dar Al-Mareekh for publishing [In Arabic].
- Al-Shehry, M., (2014). *The study of Dadan pottery of the 5th and 6th seasons 1429H/1430H: An analytical study*. Riyadh: Antiquities and Museums Section, Saudi Commission for Tourism and National Heritage [In Arabic].
- Al-Talhi, D., Al-Maiqil, A., Al-Shamri, J., Al-Otaibi, A., Raba, R., Al-Otaibi, A., Al-Dahash, M. and Al-Hamdan, F., (2010). A preliminary report on the MADÂ'IN SÂLIH excavation, fifth season 1424/ 2003. *Journal of Saudi Arabian Archaeology (ATLAL)*, 20, pp.15-37 [In English]/ pp.15-29, [In Arabic].

- Al-Talhi, D., Ibraheem, M., Mursi, J. and Askubi, K., (1986). Excavation at Al-Mabiyat, season 1404-1405/ 1984-1985. *The Journal of Saudi Arabian Archaeology (ATLAL)*, 10, pp.58-63 [In English]/ pp.71-78 [In Arabic].
- Al-Thenyan, M., (2006). *Glazed and Unglazed pottery of the Red Sea Tihami coast ports in Saudi Arabia (A sample-collection of surface sherds collected from the archaeological sites of: Al-Sirrayn, 'Ulyab (Hamdanah), Haly, 'Aththar and Al-Sharjah): An archaeological and technical study*. Riyadh: King Saud University.
- Al-Welea'y, A., (1997). *The Geology and Geomorphology of Saudi Arabia*. Riyadh. King Fahad library [In Arabic].
- Al-Zahrani, A., (2007). *Tel Al-Katheeb at Al-'Ula region: An archaeological comparative study*. Riyadh: Ministry of Education.
- Al-Zahrani, A., (2014). *Thaj, Archaeological study*. Riyadh: Saudi Commission Tourism and Antiquities, Antiquities and Museum Sector.
- Al-Zahrani, A., Al-Mashari, S., Al-Hafi, K., Al-Nafisa, A., Al-Saud, M., Al-Yahya, A., Al-Zahrani, K., Al-Zahiri, M., Al-Jaryed, J., (2012). Najran excavation report for 6th and 7th seasons 1429H / 1430H/ 2009 A.D./ 2010 A.D. *Journal of Saudi Arabian Archaeology (ATLAL)*, 22, pp.7-21 [In English]/ pp.6-26 [In Arabic].
- Al-Zahrani, A., Al-Mishari, S., Al-Hammad, A., Al-Humoud, M., Basonbol, A., Al-Zahrani, K., (2006). Brief report on Al-Ukhdud excavation 5th season – 1424 A.H/ 2004 A.D. *The Journal of Saudi Arabian Archaeology (ATLAL)*, 19, pp.11-13 [In English]/ pp.11-33 [In Arabic].
- Al-Zahrani, A., Al-Mishari, S., Al-Hammad, A., Al-Yahya, A., Al-Omari, A., (2002). Preliminary report on the excavation of Al-Ukhdud, Najran. 3rd season 1421 A.H/ 2000 A.D. *The Journal of Saudi Arabian Archaeology (ATLAL)*, 17, pp.13-16 [In English]/ pp.13-28 [In Arabic].
- Al-Zahrani, A., Al-Mishari, S., Al-Humoud, M., Al-Yahya, A., Al-Zahrani, K., Al-Mareeh, S., Al-Jabrin, F., Al-Jaryed, S., (2019). Excavation report of Najran 8th season 1434 AH. *The Journal of Saudi Arabian Archaeology (ATLAL)*, 27, pp.107-111 [In English]/ pp.97-101 [In Arabic].
- Al-Zahrani, A., Al-Mishari, S., Al-Nafisa, A., Al-Yahya, A., Al-Basyuni, A., (2001). Preliminary report on the excavation of Al-Ukhdud, Najran. 2nd season 1417 A.H/ 1997 A.D. *The Journal of Saudi Arabian Archaeology (ATLAL)*, 16, pp.13-21 [In English]/ pp.13-35 [In Arabic].

- Al-Zahrani, A., Al-Mishari, S., Al-Yahya, A., Al-Hafi, K., Al-Hammad, A., Al-Humoud, M., (2005). Al-Ukhud excavation (Najran) 4th – 1422 A.H/ 2003 A.D. *The Journal of Saudi Arabian Archaeology (ATLAL)*, 18, pp.11-17 [In English]/ pp.11-33 [In Arabic].
- Al-Zahrani, A., Al-Mushari, S., Al-Hamoud, M., Al-Hadlaq, A., Al-Hafi, K., Al-Zahrani, K., Al-Jurayad, J. and Al-Harbi, J., (2013). Report on the excavation at Jurash 2010 AD/ 1431 H. *Journal of Saudi Arabian Archaeology (ATLAL)*, 23, pp.7-14 [In English]/ pp.6-13 [In Arabic].
- Al-Zahrani, A., Al-Mushari, S., Al-Hamoud, M., Al-Hadlaq, A., Al-Hafi, K., Al-Harbi, J. and Al-Jareed, J., (2013). Report on the excavations at Jurash 2010 AD/ 1431 H. *Journal of Saudi Arabian Archaeology (ATLAL)*, 23, pp.7-14 [In English]/ pp.6-13 [In Arabic].
- Anderson, A., (1984). *Interpreting pottery*. London: B. T. Batsford Ltd.
- Aqeel, A. and Breton, J., (1996). *Shabwa "Shabwah": The capital of ancient Hadramawt*. Şan'aā': The French Centre for Yemeni Studies.
- Arbach, M., (2009). New questions about the history of the rise of the southern Arabian kingdoms in the 8th century B.C. *Chroniques Yéménites*, 4, pp.65-78 [In Arabic].
- Arbach, M., Charloux, G., Dridi, H., Gajda, I., Al-Mureeh, S., Robin, C., Al-Said, S., Schiettecatte, J. and Tayran, S., (2015). Result of four season of survey in the province of Najran (Saudi Arabia) – 2007-2010. In: I. Gerlach, ed 2015. *South Arabia and its Neighbours. Phenomena of Intercultural Contacts*. Berlin: Reichert Verlag Wiesbaden. pp: 11-46.
- Arnold, D., (1985). *Ceramic theory and cultural process*. Cambridge: University of Cambridge.
- Arnon, Y., (2007). Excavation in Marcus Street, Ramla: pottery, oil lamps and carved stone vessels. *Contract Archaeology Reports*, II, pp.38-99.
- Artzy, M., (1994). Incense, camels and collared rim jar: desert trade routes and maritime outlets in the second millennium. *Oxford Journal of Archaeology*, 13 (2), pp.121-147.
- Auge, C., Nehme, L., Bernard, V., Dal-Pra, P. and Gerber, Y., (2010). Report on the 2004, fourth season of the Saudi-French archaeological project at MADÂ'IN SÂLIH. *Journal Saudi Arabia Archaeology (ATLAL)*, 20, pp.197-222 [In English]/ pp.145-158 [In Arabic].

- Bafaqih, M., (1985). *Tarikh Al-Yemen Al-Qadeem [Ancient History of Yemen]*. Beirut: Arab institution for Studies and Publishing [In Arabic].
- BaSlamah, M., (1990). *Šhibām. Šan'āa'*: Al-Afif Cultural Institution.
- Bates, R. and Jackson, J., (1980). *Glossary of geology*. 2nd ed. Virginia: American Geological Institute.
- Bawden, G., (1979). Typological and analytical studies: Khief El-Zahrah and the nature of Dedanite hegemony in the Al-'Ula oasis. *Journal of Saudi Arabian Archaeology (ATLAL)*, 3, pp.63-72 [In English]/ pp.74-84 [In Arabic].
- Bawden, G., Edens, C. and Miller, R., (1980). Typological and analytical studies. The archaeological resources of ancient Taymā: preliminary investigations at Taymā. *Journal of Saudi Arabian Archaeology (ATLAL)*, 4, pp.69-106 [In English]/ pp.81-116 [In Arabic].
- Beck, H., (1928). Classification and Nomenclature of Beads and Pendants. *Archaeologia*, 77, pp.1-76.
- Beech, M., Hogarth, P. and Phillips, C., (2008). Zooarchaeological evidence for trade in marine resources in South-East Arabia. In: E. Olijdam and R. Spoor, eds. 2008. *Intercultural Relations Between South and Southwest Asia*. pp.329-335.
- Beeston, A. F. L., (1954). Problem of Sabaeen chronology. *Bulletin of the School of Oriental and African Studies*, 16 (1), pp.37-56.
- Beeston, A. F. L., (1972). Pliny's Gebbanitae. *Proceedings of the Seminar for Arabian Studies*, 2, pp.4-8.
- Beeston, A. F. L., (1976). "Katabān". in *Encyclopedie de l' Islam*, Nuova Series, VI, pp.776.
- Beeston, A. F. L., (1979). Some observation Greek and Latin data relating to South Arabia. *Bulletin of the School of Oriental and African Studies*, 42 (1), pp.7-12.
- Beeston, A. F. L., (1984). Chronological problems of the ancient South Arabian culture. *Studies in the History of Arabia*, 2, pp.3-6.

- Beeston, A. F. L., (1987/1988). Pre-Islamic Yemeni inscriptions. In: W. Daum, ed. 1987/1988. *YEMEN: 3000 Years of Art and Civilisation in Arabia Felix*. Frankfurt: Pinguin-Verlag, Innsbruck Umschau-Verlag, pp.111-115.
- Beeston, A. F. L., (2005). The Arabian aromatics trade in antiquity. *Proceedings of the Seminar for Arabian Studies*, 46, pp.53-64.
- Befu, H., (1977). Social exchange. *Annual Review of Anthropology*, 6, pp.255-281.
- Benoist, Q., Cordoba, J. and Mouton, M., (1997). The Iron Age in Al-Madam (Sharjah, UAE): some notes on three seasons of work. *Proceeding of the Seminar for Arabian Studies*, 27, pp.59-73.
- Bibby, T. G., (1973). Preliminary survey in East Arabia 1968. *Reports of the Danish Archaeological Expedition to the Arabian Gulf*, 2, pp.6-68.
- Bin Jrais, G., (2013). *Najran: a study of history and civilization (1st – 4th centuries hijra/ 7th – 10th A.D.)* Riyadh: Al-Homaidhi Press [In Arabic].
- Bin Tiran, S., (1992). *Die Personennamen in den altSabaischen Inschriften*, Olms Verlag Hildesheim.
- Bin Tiran, S., (2005). Primary study of inscription located in Al-Ukhud excavation, Najran. *The Journal of Saudi Arabian Archaeology (ATLAL)*, 18, pp.15-16 [In English]/ pp.15-17 [In Arabic].
- Bitzenis, A. and Marangos, J., (2007). Market economy. In: W. Darity, ed. 2007. *International Encyclopedia of the Social Sciences*. Detroit: Macmillan Reference. pp.604-605.
- Blench, R., (1982). The silent trade: An Igala version. *The Cambridge Journal of Anthropology*, 7 (3), pp.59-61.
- Bloch, M. and Parry, J., (1989). Introduction: Money and the morality of exchange. In J. Parry and M. Bloch eds. *Money and the Morality of Exchange*. Cambridge: Cambridge University Press. pp.1-32.
- Boucharlat, R. and Garczynski, P., (1985). The result of the excavations at Hili 14 site 1982. *Archaeology in the United Arab Emirates*, 4, pp.59-64 [In Arabic].

- Boucharlat, R. and Lombart, A., (1983). L'Age Du Fer Dans L'Oasis D' Al-Ain: Deux Saisons De Fouilles A Rumeilah. *Proceeding of the Seminar for Arabian Studies*, 13, pp.3-17.
- Boucharlat, R. and Lombart, A., (1985). The result of excavation at Rumeilah site/ Al-Ain 1981–1983. *Archaeology in the United Arab Emirates*, 4, pp.42-59 [In Arabic].
- Boucharlat, R. and Mouton, M., (1985). The archaeological survey in Sharjah: United Arab Emirates. *Sharjah Archaeology*, 2, pp.5-72.
- Boucharlat, R. and Mouton, M., (1986). The archaeological survey in Sharjah: United Arab Emirates. *Sharjah Archaeology*, 3, pp.5-87.
- Boucharlat, R. and Mouton, M., (1989). The archaeological survey in Sharjah: United Arab Emirates. *Sharjah Archaeology*, 5, pp.5-41.
- Boucharlat, R. and Mouton, M., (1990). Preliminary report of the excavation at Mleiha site. *Sharjah Archaeology*, 3, pp.38-87 [In Arabic].
- Boucharlat, R. and Mouton, M., (1997). The archaeological survey in Sharjah: United Arab Emirates. *Sharjah Archaeology*, 6, pp.7-59.
- Boucharlat, R. and Mouton, M., Bernard, V., David, H. and Garczynski, P., (1998). The excavations at Mleiha site. *Sharjah Archaeology*, 4, pp.24-84 [In Arabic].
- Boucharlat, R., Besancon, J., Dalongeville, R., Millet, M., Prieur, A., Benoist, A., David, A., Drieux, M., Garczynski, P., Keroulain, F. and Mouton, M., (1997). The excavation at Muwailah site. *Sharjah Archaeology*, 5, pp.9-78 [In Arabic].
- Boucharlat, R., Hesse, A., Dalongeville, R., Snavale, P., Droush, A., Quinn, P. and Mouton, M., (1985). The archaeological survey in the Emirate of Sharjah, United Arab Emirates. *Sharjah Archaeology*, 2, pp.5-99 [In Arabic].
- Boucharlat, R., Lombart, A. and Dalongeville, R., (1997). The excavation of 1990 at Jebel Al-Buhais: cemetery of the Iron Age. *Sharjah Archaeology*, 6, pp.12-16 [In Arabic].
- Bowen, R. and Albright, F., (1958). *Archaeological discoveries in south Arabia*. Baltimore: The John Hopkins Press.

- Breton, J F., (1987/1988). Ancient Shabwa, the Capital of Ḥaḍramawt.. In: W. Daum, ed. 1987/1988. *YEMEN: 3000 Years of Art and Civilisation in Arabia Felix*. Frankfurt: Pinguin-Verlag, Innsbruck Umschau-Verlag. pp.111-115.
- Cartledge, P., (1983). Trade and politics revisited: Archaic Greece. In: P. Garnsey, K. Hopkins and C. R. Whittaker, eds. 1983. *Trade in the Ancient Economy*. Berkeley and Los Angeles: University of California Press. pp.1-15.
- Castillo, C. C., Bellina, B. and Fuller, D. Q., (2016). Rice, beans and trade crops on the early maritime Silk Route in Southeast Asia. *Antiquity*, 86 (353), pp.1255-1269.
- Challinor, J., (1961). *A dictionary of geology*. Cardiff: University of Wales Press.
- Charloux, G. and Loreto, R., (2014). *Dûma 1: 2010 report of the Saudi-Italian-French archaeological project at Dûmat al-Jandal*, Saudi Arabia. Riyadh: Saudi Commission for Tourism and National Heritage.
- Cleuziou, S., (1976/ 1977). Archaeological report of the French expedition at Al-Ain, first season. *Archaeology at the United Arab Emirates*, 1, pp.6-53 [In Arabic].
- Cleuziou, S., (1978/ 1979). Archaeological report of the French expedition at Al-Ain for second and third season (Dec 77 – Mar 1978 and Dec 78 – Mar 1979). *Archaeology at the United Arab Emirates*, 5, pp.19-63 [In Arabic].
- Cleuziou, S., (1978-1979). Report of Hili 2 excavations 1976-79. *Archaeology in the United Arab Emirates*, 5, pp.8-63.
- Condoluci, C., Esposti, M. and Phillips, C., (2014). Iron Age settlement patterns at Salūt c. 1300 – 300 BC. *Proceeding of the Seminar for Arabian Studies*, 44, pp.99-120.
- Costa, P. M. and Wilkinson, T. J., (1987). The hinterland of Sohar: Archaeological surveys and excavations within the region of an Oman seafaring city. *The Journal of Oman Studies*, 9, pp.173-210.
- Costa, P., (1988). Pre-Islamic IZKI: some field evidence. *Proceeding of the seminar for Arabian Studies*, 18, pp.15-24.

- Crone, P., (2007). Quraysh and the Roman Army: Making sense of the Meccan leather trade. *Bulletin of the School of Oriental and African Studies*, 70 (1), 63-88.
- Deblauwe, F., (1992). Old South Arabia trade route. *Orientalia Lovaniensia Periodica*, 22, pp.133-158.
- De Cardi, B., (1976). Ras al-Khaima: Further archaeological discoveries. *Antiquity*, L, pp.216-222.
- De Cardi, B., (1977). Surface collections from the Oman survey, 1976. *The Journal of Oman Studies*, 3 (1), pp.59-70.
- De Cardi, B., Bell, A. and Starling, A., (1979). Excavations at Ṭāwī Silaim and Ṭāwī Sa'īd in the Sharqīya, 1978. *The Journal of Oman Studies*, 5, pp.61-94.
- De Cardi, B., Bell, A. and Starling, A., (1984). *Excavation in the area of Tawi Silaim and Tawi Said in the Eastern region 1978*. Muscat: Ministry of Heritage and Culture [In Arabic].
- De Cardi, B., Collier, S. and Doe, B., (1976). Excavations and survey in Oman, 1974–1975. *The Journal of Oman Studies*, 2, pp.101-147.
- De Maigret, A., (1988). *The Sabaean archaeological complex in the WĀDĪ YALĀ*. Rome: Istituto Italiano per IL Medio Ed Estremo Oriente, Centro Studi E Scavi Archaeologici.
- De Maigret, A., (1990). *The Bronze Age culture of Ḥawlān AṬ-Ṭiyāl and Al-Ḥadā*. Rome: Istituto Italiano per IL Medio Ed Estremo Oriente, Centro Studi E Scavi Archaeologici.
- De Maigret, A., (2009). *Arabia Felix*. 3rd ed. London: Stacey International.
- De Paepe, P., Rutten, K., Vrydaghs, L. and Haerinck, E., (2003). A petrographic, chemical and phytholith analysis of Late Pre-Islamic ceramics from ed-Dur (Umm al-Qaiwain, UAE). In: D. Potts, H. Al-Nabbdah and P. Hellyer, ed. 2003. *Archaeology of the United Arab Emirates*. London: Trident Press Ltd. pp.207-236.
- Demange, F., (2010). The frankincense caravans. In: A. Ghaban, B. Andre-Salvini, Demange, F, Juvin, C, Cotty, M, eds. 2010. *Roads of Arabia: Archaeology and History of the Kingdom of Saudi Arabia* Paris: Somogy Art publishers: pp.132-136.
- Dentzer, J. M., Kermorvant, A., Nehme, L., Tholbeeq, L. and Abu al-Hassan, H., (2002). Report on the 2001, first season of the Saudi-French archaeological project at MADĀ'IN SĀLIH. *The*

Journal of Saudi Arabian Archaeology (ATLAL), 17, pp.101-129 [In English]/ pp.199-208 [In Arabic].

Dentzer, J. M., Kermorvant, A., Nehme, L., Tholbeeq, L. and Abu al-Hassan, H., (2005). Report on the 2002, second season of the Saudi-French archaeological project at MADĀ'IN SĀLIH. *The Journal of Saudi Arabian Archaeology (ATLAL)*, 18, pp.61-80 [In English]/ pp.153-159 [In Arabic].

Department of States, United States Geological Survey, (1983). Geological map of the Yemen Arab Republic (SAN'Ā'). *Miscellaneous investigations series*, Sheet I-1143-B, 1: 500000: Virginia: Department of States, United States Geological Survey.

Dillian, C., Bello, C. and Shackley, M., (2010). Long-distance exchange of obsidian in the mid-Atlantic United States. In: C. Dillian. and C. White, eds. 2010. *Trade and Exchange: Archaeological Studies from History and Prehistory*. New York: Springer. pp.17-35.

Di Miceli, A., (2019). The occupation and space organization at the Al-Qurainiyah site from the early to late Islamic period: an overview. In: M. Ruttaky., B. Kovár. and K. Pieta, eds. 2019. *Archaeology of Failaka and Kuwaiti coast – current research*. Bratislava: Veda, Publishing House of the Slovak Academy of Sciences Institute of Archaeology, Slovak Academy of Sciences National Council for Culture, Arts and letters. pp.135-145.

Doe, B., (1971). *Southern Arabia*. London: Thames and Hudson.

Doe, B., (1983). *Monuments of South Arabia*. Naples: The Falcon Press.

Durand, C. and Gerber, Y., (2014). The pottery from Hegra/ Madā'in Sālih (Saudi Arabia) during the Nabataean period. Preliminary result, 2008-2011. *Proceeding of the Seminar for Arabian Studies*, 44, pp.153-168.

El-Amin, Y., (2003). Stone Age in the kingdom of Saudi Arabia: an appraisal. *Adumatu*, 8, pp.7-40 [In Arabic].

El-Hassan, A. and Khabir, A., (In Press). *Qaryat Al- Fau: A Portrait of Pre-Islamic Civilization in Saudi Arabia* (3rd end). (Accepted for publication August 2019).

El-Hassan, A., Ali, A. (2008). *Archaeological pottery: Study and analysis curriculum*. Muscat: Sultan Qaboos University [In Arabic].

- El-Mahi, A. and Ibrahim, M., (2003). Two seasons of investigations at Manāl site in the Wadi Samayil area, Sultanate of Oman. *Proceeding of the Seminar for Arabian Studies*, 33, pp.77-98.
- Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, ING, and the GIS User Community.
- Fedele, F., (2014). Camels, donkeys and caravan trade: an emerging context from Barāqish, ancient Yathill (Wadi al-Jawf, Yemen). *Anthropozoological*, 49 (2), pp.177-194.
- Feinman, G. and Nicholas, L., (2010). A multiscale perspective on market exchange in the Classic-period Valley of Oaxaca. In: C. Garraty. and B. Stark, ed. 2010. *Archaeological Approaches to Market Exchange in Ancient Societies*. Colorado: University Press of Colorado. pp.85-98.
- Frankfort, M. A., (1939). *Cylinder Seals: a documentary essay on the Art and Religion of the ancient near East*. London: Macmillan and Co.
- Frifelt, K., (1976). Evidence of a third Millennium B.C. town in Oman. *The Journal of Oman Studies*, 2, pp.57-73.
- Garraty, C., (2010). Investigation market exchange in ancient societies: a theoretical review. In: C. Garraty and B. Stark, ed. 2010. *Archaeological Approaches to Market Exchange in Ancient Societies*. Colorado: University Press of Colorado. pp.3-32.
- Gazdar, M., (1982). *A comparative study of pottery from Arabia in the pre-Islamic period 500 BC to AD 600*. PhD. The University of London.
- Gazdar, M., Potts, D. and Livingston, A., (1984). Excavations at Thaj. *Journal of Saudi Arabian Archaeology (ATLAL)*, 6, pp.55-108 [In English]/ pp.49-95 [In Arabic].
- Gilmore, M., Ibrahim, M. and Murad, A., (1982). The comprehensive Archaeological survey program: Preliminary Report on the North-western and Northern Region Survey 1981 (1401). *Journal of Saudi Arabian Archaeology (ATLAL)*, 6, pp.9-23 [In English]/ pp.7-21 [In Arabic].
- Google earth Pro, 2016, *Al-Ukhudud fenced area 39.96'17"28"N, 48.27'44"10"W*, DigitalGlobe. [online] Available through: <<http://www.google.com/earth/index.html>> [Accessed 24 May 2017].

- Google earth Pro, 2016, *Al-Ukhudud walled enclosure area 38.30'17°28"N, 44.81'44°10"W*, DigitalGlobe. [online] Available through: <<http://www.google.com/earth/index.html>> [Accessed 24 May 2017].
- Google earth Pro, 2016, *Wadi Najran 28.27'17°28"N, 11.40'44°07"W*, DigitalGlobe. [online] Available through: <http://www.google.com/earth/index.html>> [Accessed 31 August 2017].
- Google Earth Pro, 2018. *Najran province 27.11'18.02"N, 48.45'45.28"W, 4/10/2013*. [online] Available through: <<http://www.google.com/earth/index.html>> [Accessed 13 August 2018].
- Graf, D., Leisten, T., Glanzman, W., Rollefson, G., Rivard, J., Sidebothem, S., Schich, R. and Tairan, S., (2012). Preliminary report on the excavation at Jurash, first season 2008. *Journal of Saudi Arabian Archaeology (ATLAL)*, 22, pp.29-55 [In English]/ pp.30-35 [In Arabic].
- Gravelle, H. and Rees, R., (2004). *Microeconomics*. Essex: Pearson Education Limited.
- Groom, N., (1976). The northern passes of Qatabān. *Proceeding of the Seminar for Arabian Studies*, 6, pp.69-80.
- Groom, N., (1977). The frankincense region. *Proceeding of the Seminar for Arabian Studies*, 7, pp.79-89.
- Groom, N., (1981). *Frankincense and myrrh A Study of the Arabian Incense Trade*. Beirut: Librairie du Liban.
- Guérin, A. and Al-Naimi, F., (2008). Nineteenth century settlement patterns at Zekrit, Qatar: pottery, tribes and territory. *Proceeding of the Seminar for Arabian Studies*, 38, pp.1-13.
- Guérin, A. and Al-Naimi, F., (2010). Preliminary pottery study: Murwab horizon in progress, ninth century AD, Qatar. *Proceeding of the Seminar for Arabian Studies*, 40, pp.17-34.
- Guilbert, C. and Rougeulle, A., (1995). Archaeological research into the Islamic period in Yemen: preliminary notes on the French expedition, 1993. *Proceeding of the Seminar for Arabian Studies*, 25, pp.29-44.

- Guilbert, C. and Rougeulle, A., (1997). Al-Shihr and the southern coast of the Yemen: preliminary notes on the French archaeological expedition, 1995. *Proceeding of the Seminar for Arabian Studies*, 27, pp.129-140.
- Hains, D., Dickson, T., Carter, D., Cullen, M. and Boyd, W., (2016). *The Saudi mineral inventory and potential assessment report Kingdom of Saudi Arabia*. Jeddah: Ministry of Petroleum and Mineral Resources.
- Hally, D., (1983). Use alteration of pottery vessel surface: An important source of evidence for the identification of vessel function. *North America Archaeology*, 4 (1), pp.3-26.
- Hamburg, T., (1994). *Cedrosan Saladooid Pottery at Friars Bay St.Martin (FWI)*. PhD. University of Leiden.
- Haour, A., Nixon, S., N'Dah, D., Magnavita, C. and Livingstone, A., (2016). The settlement mound of Birnin Lafiya: new evidence from the eastern arc of the Niger River. *Antiquity*, 90 (351), pp.695-710.
- Hashim, S., (2007). *Pre – Islamic ceramics in Saudi Arabia*. Riyadh: Deputy Ministry of Antiquities and Museum, Ministry of Education.
- Hastings, A., Humphries, J. h. and Meadow, R. H., (1975). Oman in the third Millennium BCE. *The Journal of Oman Studies*, 1, pp.9-55.
- Hausleiter, A., Eichman, R., Al-Najem, M., Al-Said, S., Breitenfeldt, J., Intilia, A., Lindlar, G., Lora, S., Petiti, E., Sperveslage, G. and Tourtet, F., (2018). Tayma 2010 – 7th Report Saudi Arabian – German Joint Archaeological Project. *Journal of Saudi Arabian Archaeology (ATLAL)*, 26, pp.66-115 [In English]/ pp.63-88 [In Arabic].
- Hausleiter, A., Eichman, R., Al-Najem, M., Al-Said, S., Bruckner, H., Engel, M., Grottker, M., Hanisch-Grafe, H., Heemeier, B., Intilia, A., Lora, S. and Tourtet, F., (2017). Tayma 2008 – 5th Report on the Saudi Arabian – German Archaeological Project. *Journal of Saudi Arabian Archaeology (ATLAL)*, 24, pp.31-78 [In English]/ pp.25-60 [In Arabic].
- Hausleiter, A., Eichman, R., Al-Najem, M., Al-Said, S., Bruckner, H., Engel, M., Grottker, M., Intilia, A., Klasen, N., Lora, S., Maritan, L., Mazzoli, C., Purschwitz, C., Schaudig, H., Tourtet, F., Weigel, F. and Wellbrock, H., (2018). Tayma 2009 – 6th Report on Saudi Arabian – German

- Joint Archaeological Project. *Journal of Saudi Arabian Archaeology (ATLAL)*, 25, pp.45-105 [In English]/ pp.35-81 [In Arabic].
- Hepper, N., (1969). Arabian and African frankincense trees. *The Journal of Egyptian Archaeology*, 55, pp.66-72.
- Hepper, N., Wood, J., (1979). Where the forests in the Yemen?. *Proceedings of the Seminar for Arabian Studies*, 9, pp.65-71.
- Hoyland, R., (2001). *Arabia and the Arabs From the Bronze Age to the Coming of Islam*. Oxon: Routledge.
- Humphries, J., (1974). Harvard archaeological survey in Oman: some late prehistoric sites in the Sultanate of Oman. *Proceeding of the Seminar for Arabian Studies*, 4, pp.49-77.
- Ingraham, M., Johnson, T., Rihani, B. and Shatla, I., (1981). Saudi Arabia comprehensive survey program: preliminary report on a reconnaissance survey of the north western province (with a note on a brief survey of the Northern Province). *Journal of Saudi Arabian Archaeology (ATLAL)*, 5, pp.59-84 [In English]/ pp.53-76 [In Arabic].
- Jamme, A., (1962). *Sabaeen inscriptions from Mahram Bilqis (Marib)*. Baltimore: The Johns Hopkins Press.
- Jamme, A., (1966). *Sabaeen and Hasaeen inscriptions from Saudi Arabia*. Roma: Istituto di Studi del Vicino Oriente, Universita di Roma.
- Karacic, S., Boraik, M., Qandil, H. and David-Cuny, H., (2017). Snake decorations on the Iron Age pottery from Sarūq al-Ḥadīd: A possible ritual centre? *Proceeding of the Seminar for Arabian Studies*, 47, pp.139-150.
- Kassner, M., (2017). The economy as instituted process. Karl Polanyi's Institutionalism and its Ethical Consequences. *Annales Ethics in Economic Life*, 20 (2), pp.45-61.
- Kennet, D., (1997). Kush: A Sasanian and Islamic-period archaeological tell in Ras Al-Khaima (UAE). *Arabian Archaeology Epigraphy*, 8, pp.284-302.

- Kennet, D., (2002). The development of Northern Ras Al-Khaimah and the 14th-century Hormuzi economic boom in the lower Gulf. *Proceedings of the Seminar for Arabian Studies*, 32, pp.151-164.
- Kennet, D., (2004). *Sasanian and Islamic pottery from Ras al-Khaimah classification, chronology, and analysis of trade in the Western Indian Ocean*. [e-book] Oxford: ArchaeoPress.
Available through: ResearchGate website
<https://www.researchgate.net/publication/30052751_Sasanian_and_Islamic_Pottery_from_Ras_alKhaimah_Classification_Chronology_and_Analysis_of_Trade_in_the_Western_Indian_Ocean> [Accessed 22 November 2016 and 03 July 2017].
- Kusimba, C. M. and Oka, R. C., (2009). Trade and polity in East Africa: re-examining elite strategies for acquiring power. In: T. Falola. and M. Childs, ed 2009. *The Changing World of Atlantic Africa: essays in honor of Robin Law*. Carolina: Carolina Academic Press. pp.39-59.
- Leacock, S., (1954). The ethnological theory of Marcel Mauss. *American Anthropologist*. 56 (1), 58-73.
- Lesguer, F. and Renel, H., (2018). Un atelier de potier de la période médiévale découvert à Qalhāt (Oman). *ArchaeoPress publishing LTD*, pp.85-105.
- Lie, J., (1997). Sociology of markets. *Annual Review of Sociology*, 23, pp.341-360.
- Loreto, R., De Maigret, A., Marcolongo, A., Mascellani, M., Al-Muaykil, A., Al-Maliki, T., Al-Dayel, A., Al-Qayyid, A. and Al-Muayqil, K. (2012). Preliminary brief report: The Saudi-Italian-French archaeological project at Dûmat al-Jandal 2009. *Journal of Saudi Arabian Archaeology (ATLAL)*, 22, pp.22-27 [In English]/ pp.27-29 [In Arabic].
- Luke, C., (2010). Uluu marble vases abroad: contextualizing social networks between the Maya world and Lower Central America. In: C. Dillian. and C. White, ed. 2010. *Trade and Exchange: Archaeological Studies from History and Prehistory*. New York: Springer. pp.37-57.
- Magee, P., (1996a). Excavations at Muweilah, Preliminary report on the first two seasons. *Arabian Archaeology and Epigraphy*, 7, pp.195-213.
- Magee, P., (1996b). The chronology of the southeast Arabian Iron Age. *Arabian Archaeology and Epigraphy*, 7, pp.240-252.

- Magee, P., (2004). *Excavations at Tepe Yahya, Iran 1967-1975*. Cambridge, Massachusetts: Harvard College.
- Magee, P., (2004). The impact of southeast Arabian intra-regional trade on settlement location and organization during the Tron Age II period. *Arabian Archaeology and Epigraphy*, 15, pp.24-42.
- Magee, P., (2014). *The archaeology of prehistorical Arabia: adaptation and social formation from the Neolithic to the Iron Age*. Cambridge: Cambridge University Press.
- Map of Saudi Arabia,
https://www.google.com/url?sa=i&source=images&cd=&cad=rja&uact=8&ved=2ahUKEwiRsrzUjuTkAhUMhRoKHdd0BX4Qjhx6BAGBEAI&url=https%3A%2F%2Fes.m.wikipedia.org%2Fwiki%2FArchivo%3ANajran_in_Saudi_Arabia.svg&psig=AOvVaw3Q_Il5buTKkNc257wz1A5K&ust=1569230864292800
- Maraqten, M., (1996). Dangerous trade routes. *ARAM Periodical*, 8, pp.213-236.
- Maritan, L., Tourtet, F., Meneghin, G., Massoli, C. and Hausleiter, A., (2017). Technological transfer? Comparative analysis of 2nd-3rd/4th century CE “Late Roman” pottery from Taymā’, Saudi Arabia, and Petra, Jordan. *Journal of Archaeological Science: Reports*, 12, pp.712-725.
- Masry, A., (1977). Introduction: The historic legacy of Saudi Arabia. *The Journal of Saudi Arabian Archaeology*, 1, pp.9-19 [In Arabic].
- Mattingly, D. J. and Sterry, M., (2013). The first towns in the central Sahara. *Antiquity*, 87, pp.503-518.
- Mierzejewska, M., (2019). Pottery, fishmen, and the Gulf trade Preliminary results of four seasons of Kuwaiti-Polish excavations on Failaka island. In: M. Ruttaky., B. Kovár. and K. Pieta, eds. 2019. *Archaeology of Failaka and Kuwaiti coast – current research*. Bratislava: Veda, Publishing House of the Slovak Academy of Sciences Institute of Archaeology, Slovak Academy of Sciences National Council for Culture, Arts and letters. pp.169-180.
- Ministry of Education. (1999). *An introduction to Saudi Arabian Antiquities*. Riyadh: Deputy of Ministry of Antiquities and Museum [In Arabic].

- Ministry of Petroleum and Minerals Resources, Deputy Ministry for Minerals Resources, (1985). Geological map of the Najran Quadrangle, sheet 17G, Kingdom of Saudi Arabia. *Geoscience map series*, Sheet 17G, 1: 250000. Riyadh: Ministry of Petroleum and Minerals Resources, Deputy Ministry for Minerals Resources.
- Morris, E., (2004). Portway Roman pottery rim type series. *ARCH6029 Analysis of Assemblages*, pp.1-10.
- Mouton, M., Benoist, J., Schiettecatte, M., Arbach, M. and Bernard, V., (2006). Makaynūn. an ancient South Arabian site in the Ḥaḍramawt. *Proceeding of the Seminar for Arabian Studies*. 36, pp.229-242.
- Mouton, M., (2001). The archaeological survey in Sharjah: United Arab Emirates. *Sharjah Archaeology*, 8, pp.5-61.
- Mouton, M., Mouqdam, Q. and Garzinski, P., (1997). Mleiha area: excavations at Mleiha 1990 and 1992. *Sharjah Archaeology*, 6, pp.16-59 [In Arabic].
- Mouton, M., Mouqdam, Q. and Pinoa, A., (2001). The excavations at Mleiha. *Sharjah Archaeology*, 8, pp.12-21 [In Arabic].
- Müller, W. W., (1984). Survey of the history of the Arabian Peninsula from the first century A.D. to the rise of Islam. *Studies in the History of Arabia*, 2, pp.125-131.
- Müller, W. W., (1987/1988). Outline of the history of ancient Southern Arabia. In: W. Daum, ed. 1987/ 1988. *YEMEN: 3000 Years of Art and Civilisation in Arabia Felix*. Farnkfurt: Pinguin-Verlag, Innsbruck Umschau-Verlag. pp.49-54.
- Munsell Soil-color Chart., (2015). Munsell Color.
- Ndiema, E., Dillian, C. and Braun, D., (2010). Interaction and exchange across the transition of pastoralism, Lake Turkana, Kenya. In: C. Dillian, and C. White, ed. 2010. *Trade and Exchange: Archaeological Studies from History and Prehistory*. New York: Springer. pp.95-110.
- Nehme, L., Al-Talhi, D. and Villeneuve, F., (2010). *On the first excavation season at MADÂ'IN SÂLIH 2008 Saudi Arabia*. Riyadh: Antiquities and Museums Section, Saudi Commission for Tourism and National Heritage.

- Nehme, L., Al-Talhi, D. and Villeneuve, F., (2014). *On the second season of the MADÂ'IN SÂLIH* archaeological project 2009 Saudi Arabia. Riyadh: Antiquities and Museums Section, Saudi Commission for Tourism and National Heritage.
- Nehme, L., Al-Talhi, D., Villeneuve, F., Abu-Azizeh, W., Bouchaud, Ch., Charloux, G., Delhopital, N., Durand, C., Fiema, Z., Gelin, M., Gerber, M., Al-Hajiri, M., De Proce, S., Al-Musa, M., Rohmer, J. and Sacher, I., (2010). *Reprot on the first excavation season at Madâ 'in Sâlih 2008, Saudi Arabia*. Riyadh: Saudi Commission for tourism and Antiquities.
- Nehme, L., Arnouy, J., Bessac, J. Cl., Barun, J. P., Courbon, P., Dentzer, J., Rigot, J. B. and Sachel, I., (2006). Report on the third season 2003 of the Saudi-French archaeological project at MADÂ'IN SÂLIH. *The Journal Saudi Arabia Archaeology (ATLAL)*, 19, pp.59-90 [In English]/ pp.167-190 [In Arabic].
- Newton, L., (2007). Al-Qisha: archaeological investigations at an Islamic period Yemeni village. *Proceeding of the Seminar for Arabian Studies*, 37, pp.171-186.
- Oka, R. and Kusimba, C., (2008). The archaeology of trading system, part 1: towards a new trade synthesis. *J Archaeol Res*, 16, pp.339-395.
- Orton, C. and Hughes, M., (2013). *Pottery in archaeology*. Cambridge: Cambridge University Press.
- Osinga, E., (2017). *The countryside in context: stratigraphic and ceramic analysis at Umm el-Jimal and environs in northeastern Jordan (1st to 20th century AD)*. PhD. University of Southampton.
- Parr, P. and Ghazdar, M., (1980). A report on the sounding at Zubaidah (Al-Amara) in the Al-Qasim region – 1979. *The Journal of Saudi Arabian Archaeology (ATLAL)*, 4, pp.107-117 [In English]/ pp.117-128 [In Arabic].
- Parr, P., Zarins, J., Ibrahim, M., Waechter, J., Garrard, A., Clarke, C., Bidmead, M. and Al-Badr, H., (1978). Preliminary report on the second phase of the Northern Province survey 1397/1977. *The Journal of Saudi Arabian Archaeology (ATLAL)*, 2, pp.29-50 [In English]/ pp.31-58 [In Arabic].
- Peli, A. and Téreygeol, F., (2007). Al-Raḍrāḍ (Al-Jabalī): a Yemeni silver mine, first result of the French mission (2006). *Proceeding of the Seminar for Arabian Studies*, 37, pp.187-200.

- Phillips, C., (1997). The pattern of settlement in the Wadi Al-Qawr. *Proceeding of the Seminar for Arabian Studies*, 27, pp.205-218.
- Phillips, C., (2005). A preliminary description of the pottery from al-Hāmid and its significance in relation to other pre-Islamic sites on the Tihāmah. *Proceeding of the Seminar for Arabian Studies*, 35, pp.177-193.
- Phillips, C., (2013). Excavations at Kalbā' 1993 – 95. *Sharjah Antiquities*, 13, pp.10-27.
- Phillips, C., Irving, B., Glover, E. and Kazastka, J., (2005). An archaeological survey in the Kalbā' area. *Sharjah Archaeology*, 10, pp.3-28 [In Arabic].
- Pigulevskaja, N., (1960). Les rapports sociaux a Nedjran. Au debut du VIe siècle de l'ere Chretienne. *Journal of the Economic and Social History of the Orient*, 3 (2), pp.113-130.
- Pirenne, J., (1987/1988). The chronology of ancient South Arabia – diversity of opinion. In: W. Daum, ed. 1987/ 1988. *YEMEN: 3000 Years of Art and Civilisation in Arabia Felix*. Farnkfurt: Pinguin-Verlag, Innsbruck Umschau-Verlag. pp.116-122.
- Potts, D., Al-Mughannum, A., Frye, J. and Sanders, D., (1978). Comprehensive archaeological survey program: Preliminary report on the second phase of the Eastern Province 1397/ 1977. *Journal of Saudi Arabian Archaeology (ATLAL)*, 2, pp.7-27 [In English]/ pp.7-30 [In Arabic].
- Potts, D., (1988). Trans-Arabian routes of the pre-Islamic period. *Travaux de la Maison de l'Orient*, 16, pp.127-162.
- Potts, D., (2008). The Sasanian relationship with South Arabia: Literary, epigraphic and oral historical perspective. *Studia Iranica*, 37, pp.197-213.
- Potts, D., (2010). *Mesopotamia, Iran, and Arabia from the Seleucids to the Sasanians*. Cornwall: Ashgate Variorum.
- Power, T., Benoist, A. and Sheehan, P., (2019). An Iron Age ceramic sequence from the Bayt Bin Ati, Al-Ain, UAE. *Arabian Archaeology and Epigraphy*, 30, pp.75-102.
- Prehistoric Ceramics Research Group (PCRG)., (2010). *The study of prehistoric pottery: General policies and guidelines for analysis and publication*. [pdf] Norwich: PCGR. Available at:

<[http://www.pcr.org.uk/News_pages/PCRG%20Guidelines%203rd%20Edition%20\(2010\).pdf](http://www.pcr.org.uk/News_pages/PCRG%20Guidelines%203rd%20Edition%20(2010).pdf)> [Accessed on 10 August 2015].

Priestman, S., (2013). *A Quantitative Archaeological Analysis of Ceramic Exchange in the Persian Gulf and Western Indian Ocean, AD c.400 – 1275*. PhD. University of Southampton.

Pryor, F., (1977). *The Origins of the Economy: A Comparative Study of Distribution in Primitive and Peasant Economies*. New York: Academic Press.

Radiocarbon determination C14, *Calibrated date (calBC/ calAD)*. [online] Available through <<https://c14.arch.ox.ac.uk/oxcal.html#>> [Accessed 15 October 2018].

Rice, P., (2015). *Pottery analysis*. Chicago: The University of Chicago Press.

Robin, C., (1981). Les inscriptions d'Al-Mi'sâl et la chronologie de l'Arabie méridionale au III^e siècle de l'ère chrétienne. *Académie des Inscriptions et Belles-Lettres*, 125 (2), pp.315-339.

Robin, C., (2001). Les inscriptions de l'Arabie antique et les études arabes. *Arabica*, 48 (4), pp.509-577.

Robin, C., (2003). Saba' and the Sabaeans. *Chroniques Yéménites*, pp.15-24 [In Arabic].

Rougeulle, A., (1999). Coastal settlement in southern Yemen: the 1996-1997 survey expedition on the Ḥaḍramawt and Mahra coasts. *Proceeding of the Seminar for Arabian Studies*, 29, pp.123-136.

Rougeulle, A., (2005). The Sharma horizon: sgraffiato wares and other glazed ceramics of the Indian Ocean trade (ca 980-1150). *Proceeding of the Seminar for Arabian Studies*, 35, pp.223-246.

Rougeulle, A., Renel, H., Simsek, G. and Colomban, P., (2014). Medieval ceramic production at Qathât, Oman, a multidisciplinary approach. *Proceeding of the Seminar for Arabian Studies*, 44, pp.299-315.

Rutten, K., (2007). The Roman fine wares of ed-Dur (Umm al-Qaiwain, U.A.E.) and their distribution in the Persian Gulf and the Indian Ocean. *Arabian Archaeology and Epigraphy*, 18, pp.8-24.

- Rutten, K., (2009). South-east Arabian pottery at ed-Dur (al-Dūr), Umm al-Qaiwayn, UAE: its origin, distribution, and role in the local economy. *Proceeding of the Seminar for Arabian Studies*, 39, pp.359-372.
- Ryckmans, J., (1981). Al-Ukhud: The Philby-Ryckmans-Lippens expedition of 1951. *Proceeding of the seminar for Arabian studies*, 11, pp.55-63.
- Ryckmans, J., (1982). A short note on Sadd Al-Jalad in Wadi Najran. *Proceeding of the seminar of Arabian studies*, 12, pp.69-72.
- Sasaki, T., (1990). Excavations at A'Ali – 1988/89. *Proceeding of the Seminar for Arabian Studies*, 20, pp.111-129.
- Saudi Geological Survey, 2019. *Geology of Saudi Arabia*. [online] Available at: <http://www.sgs.org.sa/en/geology-of-saudi-arabia/> [Accessed 10 October 2017].
- Sauer, J. and Herr, L., (2012). *Ceramic finds: typological and technological studies of the pottery remains from Tell Hesban and vicinity*. Michigan: Andrews University Press.
- Sauer, J., (1973). *Heshbon pottery 1971: A preliminary report on the pottery from the 1971 excavations at Tell Ḥesbân*. Michigan: Andrews University Press.
- Schiettecatte, J., Al-Ghazzi, A., Al-Hammad, A., Chabrol, A., Charloux, G., Crassard, R., Fouache, E., Gavazzi, B., Hilbert, Y., Al-Khatib, R., Monchot, H., Mouton, M., Munduteguy, L., Munsch, M. and Simeon, P. (2017). Al-Kharj 2011 -2012. 1st and 2nd seasons of the Saudi-French Archaeological Mission. *Journal of Saudi Arabian Archaeology (ATLAL)*, 24, pp.147-180 [In English]/ pp.109-126 [In Arabic].
- Shahid, I., (1971). *The martyrs of Najran*. Bruxelles: Societe Des Bollandistes.
- Shahid, I., (2006). *Byzantium and the Arabs in the Fourth Century*. Washington: Dumbarton Oaks Research Library and Collection.
- Shopland, N., (2005). *Archaeological finds: A guide to identification*. Gloucestershire: Tempus.
- Sidqi, K., (1988). *Archaeological glossary*. Riyadh: King Saud University Press.

- Simon, R., (2002). Aelius Gallus' campaign and the Arab trade in the Augustan age. *Acta Orientalia Academiae Scientiarum Hungaricae*, 55 (2), pp.309-318.
- Sinclair, P., Ekblom, A. and Wood, M., (2012). Trade and society on the south-east Africa coast in the late first millennium AD: the case of Chibuene. *Antiquity*, 86, pp.723-737.
- Singer, C., (2007). The incense kingdoms of Yemen: An outline history of the South Arabian incense trade. In: D. Peacock and D. Williams, eds. 2007. *Food for the Gods New Light of the Ancient Incense Trade*. Exeter: Oxbow Books.
- Sinopoli, C., (1991). *Approaches to archaeological ceramics*. New York: Plenum.
- Smith, M., (1999). The role of ordinary goods in premodern exchange. *Journal of Archaeological Method and Theory*, 6 (2), pp.109-135.
- Smith, M., (2004). The archaeology of ancient state economies. *Annual Review of Anthropology*, 33, pp.73-102.
- Stark, B, and Garraty, C., (2010). Detecting marketplace exchange in archaeology: a methodological review. In: C. Garraty. and B. Stark, ed. 2010. *Archaeological approaches to market exchange in ancient societies*. Colorado: University Press of Colorado. pp.33-58.
- Study Group for Roman Pottery and Medieval Pottery Research Group (SGRP & MPRG)., (2016): *A standard for pottery studies in Archaeology* [pdf] Historic England. Available at: http://romanpotterystudy.org/new/wp-content/uploads/2016/06/Standard_for_Pottery_Studies_in_Archaeology.pdf [Accessed on 20 April 2016].
- Taha, M., (1973). Pottery of the excavations at Meliha area. *Sumer*, 29 (1-2), pp.183-196.
- Tebes, J., (2013). Investigation the painted pottery traditions of first-millennium BC north-western Arabia and southern Levant: chronological data and geographic distribution. *Proceeding of the Seminar for Arabian Studies*, 43, pp.317-336.

The Noble Qur'ān.

The Old Testament book., (2016). [pdf] New York: Watchtower bible and tract society. Available at:

<https://www.jw.org/ar/%D8%A7%D8%B5%D8%AF%D8%A7%D8%B1%D8%A7%D8%AA/%D8%A7%D9%84%D9%83%D8%AA%D8%A7%D8%A8-%D8%A7%D9%84%D9%85%D9%82%D8%AF%D8%B3/bi12/%D8%A7%D8%B3%D9%81%D8%A7%D8%B1-%D8%A7%D9%84%D9%83%D8%AA%D8%A7%D8%A8-%D8%A7%D9%84%D9%85%D9%82%D8%AF%D8%B3/%D9%85%D9%84%D9%88%D9%83-%D8%A7%D9%84%D8%A7%D9%88%D9%84/10/>> [Access 15 June 2017]. [In Arabic].

Translated by New World from the English edition, issued in 1984.

Tourtet, F. and Hausleiter, A., (2018). Tayma, Saudi Arabien. Ergebnisse der Keramilkauswertung. Die Arbeiten der Jahre 2009 bis 2018. *Forschungsberichte Des Dai*, 2, pp.126-135.

Tourtet, F., Daszkiewicz, M. and Hausleiter, A. (In Press). Pottery from Tayma: Chronostratigraphy, Archaeometric studies, Cultural Interaction. *Proceeding of the Workshop "Archaeology of the Arabian Peninsula: Connecting the Evidence"*, 10th International Congress on the Archaeology of the ancient Near East, pp.1-49.

Tripcevich, N., (2010). Exotic goods, chivay obsidian and sociopolitical change in the South-Central Andes. In: C. Dillian. and C. White, ed. 2010. *Trade and exchange: archaeological studies from history and prehistory*. New York: Springer. pp.59-73.

Van Beek, G., (1958). Frankincense and Myrrh in ancient South Arabia. *Journal of the American Oriental Society*, 78 (3), pp.141-152.

Van Beek, G., (1960). Frankincense and Myrrh. *Bulletin of the American Schools of Oriental Research*, 23 (3), pp.69-95.

Webb, M., (1974). Exchange networks: Prehistory. *Annual Review of Anthropology*, 3, pp.357-383.

Weisgerber, G., (1982). Aspects of Late Iron Age archaeology in Oman: The Samad civilization. *Proceeding of the Seminar for Arabian Studies*, 12, pp.81-93.

Whalen, N., Ali, S., Sindi, H., Pease, D. and Badein, M., (1988). A complex of sites in the Jeddah – Wadi Fatimah area. *Journal of Saudi Arabian Archaeology*, 11, pp.77-85 [In English]/ pp.92-102 [In Arabic].

- Whalen, N., Killick, A., James, N., Morsi, G. and Kamal, M. (1981). Saudi Arabian archaeological reconnaissance 1980: Preliminary report on the western province survey. *The Journal of Saudi Arabian Archaeology (ATLAL)*, 5 (1), pp.43-58 [In English]/ pp.37-52 [In Arabic].
- Wheat, J., (1991). Ceramic classification: Bradford and Shepard, types and varieties. In: R. L. Bishop and F. W. Lange, ed. 1991. *The ceramic legacy of Anna O. Shepard*. Colorado: The University Press of Colorado. pp.121-131.
- Whitcomb, D., (1975). The Archaeology of Oman: A preliminary discussion of the Islamic periods. *The Journal of Oman Studies*, 1, pp.123-157.
- Whitcomb, D., (1978). The archaeology of Al-Ḥasā' Oasis in the Islamic period. *The Journal of Saudi Arabian Archaeology (ATLAL)*, 2, pp.95-114 [In English]/ pp.109-132 [In Arabic].
- Winnett, F, V. and Reed, W, L., (1970). *Ancient Records from North Arabia*. Toronto: University of Toronto Press.
- Winnett, F, V., (1939). The place of Minaeans in the history of pre-Islamic Arabia. *Bulletin of the American Schools of Oriental Research*, 73, pp.3-9.
- Yule, P., (2007). *Himyar: Late Antique Yemen*. Aichwald: Linden Soft.
- Yule, P., (2007). The gates of Ḥimyarite Ṣafār. *Chroniques Yemenites*, 14, pp.1-13.
- Yule, P., (2016). *Ṣafār/ Yemen- A brief summary* [pdf] Heidelberg: Available at: http://archiv.ub.uni-heidelberg.de/propylaeumdok/3180/1/Yule_zafar_2Bpics_2016.pdf [Accessed 15 February 2017].
- Yule, P., Rösch, M. and Fischer, E., (2010). The highland environment of Ḥimyarite Ṣafār (Yemen): Neo-geographic determinism? *Adumatu Journal Symposium*, 2, pp.4-6.
- Zarins, J., Ibrahim, M., Potts, D. and Edens, C., (1979). Comprehensive Archaeological survey program: preliminary report on the survey of the Central province 1978. *The Journal of Saudi Arabian Archaeology (ATLAL)*, 3, pp.9-42 [In English]/ pp.9-48 [In Arabic].
- Zarins, J., Kabawi, A., Murad, A. and Rashad, S., (1983). Preliminary report on the Najran/ Ukhdud: survey and excavation 1982/ 1402 AH. *The Journal of Saudi Arabian Archaeology (ATLAL)*, 7, pp.22-40 [In English]/ pp.21-39 [In Arabic].

- Zarins, J., Murad, A. and Al-Yish, K., (1981). The comprehensive Archaeological survey program: The second preliminary report on the South-western province. *Journal of Saudi Arabian Archaeology (ATLAL)*, 5, pp.9-42 [In English]/ pp.9-36 [In Arabic].
- Zarins, J., Whalen, N., Ibrahim, M., Murad, A. and Khan, M., (1980). Comprehensive archaeological survey program: preliminary report on the central and southwestern provinces survey. *The Journal of Saudi Arabian Archaeology (ATLAL)*, 4, pp.9-36 [In English]/ pp.9-34 [In Arabic].
- Zwettler, M., (1996). 'The "era of NBT" and "YMNT": two proposal (1)'. *Arabian Archaeology and Epigraphy*, 7: pp.95-107.