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UNIVERSITY OF SOUTHAMPTON

CENTRE FOR MARITIME ARCHAEOLOGY, DEPARTMENT OF ARCHAEOLOGY

School of Humanities

A Quantitative Archaeological Analysis of Ceramic Exchange in the Persian Gulf and Western Indian Ocean, AD c.400 - 1275



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Abstract

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SCHOOL OF HUMANITIES

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Thesis title: A Quantitative Archaeological Analysis of Ceramic Exchange in the Persian Gulf and Western Indian Ocean, AD c.400 - 1275

by Seth M.N. Priestman

The aim of the study is to use ceramic finds data to provide a quantitative analysis of long-term patterns of change in the nature, volume and scale of maritime exchange within the western Indian Ocean between AD c.400 – 1275. Ceramic finds data are unique in providing a consistent measurable index of a wider system of commodity exchange in an age where few other dependable sources of systematic economic history survive. By using the available ceramic evidence as a proxy, the aim is to assess the significance of maritime exchange to the broader operation of the major state systems of the Middle East, in particular the Sasanian Empire and the Abbasid caliphate. Two main factors hold back the use of ceramics as a staple evidence base: the legacy of the slow adoption of quantitative finds recording within the Indian Ocean region, and an inability to provide a standardised definition of the same varieties of pottery that occur repeatedly in different regions. This study attempts to redress these issues by applying a single integrated system of ceramic classification to assemblages from East Africa, the Middle East and South Asia. Information has been collected from the largest possible range of sources by combining data from previously published reports, excavation archives, find databases, and through direct recording of archived finds collections.

By presenting the largest ever compilation of quantitative ceramic evidence for the region, it is possible to revaluate a range of key assumptions regarding the operation and significance of Indian Ocean trade. The conclusions that emerge from the analysis are surprising. While the geographic range and overall number of sites engaged with long-distance exchange *may* have changed through time, there is no notable indication of a significant increase in the volume of ceramic imports in circulation. In addition the products of long-distance exchange continue to represent a small proportion of ceramics in regular use. This does not mean that long-distance exchange was not important. What the findings do point to is the need to develop a more sensitive understanding of how specific elements of the exchange network operated. Where alternative scales of ceramic exchange can be differentiated, it can be shown that regional exchange networks represent a major contributor to the ceramic supply system. In seeking to identify the main drivers of the maritime economy, local and regional exchange networks appear to have been significantly underemphasised and now require specific focus, and to some extent, new archaeological methodologies.

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Declaration of Authorship

I, Seth Priestman

declare that the thesis entitled

A Quantitative Archaeological Analysis of Ceramic Exchange in the Persian Gulf and Western Indian Ocean, AD c.400 – 1275

and the work presented in the thesis are both my own, and have been generated by me as the result of my own original research. I confirm that:

this work was done wholly while in candidature for a research degree at this University;
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;
where I have consulted the published work of others, this is always clearly attributed;
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;
I have acknowledged all main sources of help;
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;
none of this work has been published before submission.

Signed: Seth Priestman

Date: 25th October 2013

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Chapter 1 Measuring Change in the Scale of the Indian Ocean Trade

1.1 Introduction

During the later first and early second millennia AD, several key regions of Asia, including most notably China, India and the Middle East emerged as the dominant centres of economic influence on the world stage (Frank, 1998). Historical and archaeological evidence both confirm the existence of developed systems of commercial interaction established between these key areas with the Indian Ocean serving as a particularly important medium for a wider system of goods exchange (see for example Hourani, 1951; Chaudhuri, 1985; Wink, 2002: 25-64). The current of exchange within the Indian Ocean both stemmed from, and contributed towards the power and prosperity of the major centralised state structures within the region. As such, trade becomes a crucial theme in explaining the relative success of particular regions at certain moments of time.

The influence of the Indian Ocean trading system during the later first and early second millennia AD was also extensive and far-reaching. The wealth generated from the Indian Ocean acted as a general stimulus to societies even at the outermost fringes of the Afro-Eurasian landmass[1]. The geographic extent of goods-distribution networks associated with the Indian Ocean can be clearly documented on the basis of the spread of many different types of materials and artefacts, particularly those that survive well within the archaeological record. Implicit in such evidence is the formation of networks of social, cultural and economic interdependence that mean that events taking place in one area impacted directly upon those in another. The formation of an integrated economic world-system within the Indian Ocean provides a useful framework within which to interpret the long-term trajectory of developments taking place within any given region and the

[1] This might be seen for example in simultaneous developments such as: the expansion and growth of trading communities along the riverine routes connecting the Baltic to the Middle East through western Russia (Noonan, 1997); the opening up of limited long-distance overland trade routes from the Mediterranean through 'Dark Age' Central Europe (Hodges, 1989: 42); or the development of trans-Saharan trade routes linked to emerging kingdoms in West Africa (Nixon, 2009: 218).

association of those events across a spatial or temporal dimension. At the same time, as has been pointed out:

> "It is not only the interconnections or the size of the networks but the regularity, intensity, and spread of the exchanges that result in the different regions being progressively integrated and shaped into a world-system" (Beaujard, 2005: 412).

In other words, it is not enough simply to trace the archaeological extent of finds distribution networks. To assess the degree of integration implied by a system of goods exchange, and indeed to evaluate its ultimate significance as a device for explaining broader historical processes, it is necessary to obtain evidence for the volume, scale and intensity of the exchanges that took place.

This study seeks to provide a quantitative assessment of the scale and significance of exchange within the western Indian Ocean from the 5th to 13th centuries AD on the basis of ceramic finds data. The study aims to document the volume, scale and intensity of the exchange through analysis of ceramic finds deposited through successive phases of occupation from different types of settlement sites situated on or closely connected to the areas of the Persian Gulf, East Africa and South Asia. By charting the available archaeological data for the changing volume and composition of ceramic exchange, this study seeks to infer from these data, broader patterns of trade and exchange with which to examine the commercial and economic relationship between the major state systems of the Middle East, and the wider Indian Ocean via the Persian Gulf.

Historically the region encompassed by the western Indian Ocean might be characterised according to a variety of different terminologies. Where precision or neutrality is required within the discussion, specific dates are preferred. However, in some cases, political and historical terminology is also applied. Such terminology is complicated by the fact that there is not one set of political or cultural institutions that span the entire area of the western Indian Ocean between the 5th and 13th centuries. Because this study focuses on the relationship between the Persian Gulf and wider western Indian Ocean, in general those terms that refer to the dominant political institutions and time periods with the

Persian Gulf are applied, though it is acknowledged here that such terms are not necessarily satisfactory from an East African or South Asian perspective (**Table 1.1**). The study begins within the period of the Sasanian Empire, which extends into the early 7th century and corresponds to the height of Late Antiquity. It is followed by the 'Early Islamic' period, which is used here to refer specifically to the period from the Islamic conquest in the early 7th century up to the accession of the Abbasid caliphate in the mid-8th century. The period of the 'Abbasid caliphate' then technically lasts until the mid-13th century, when the last caliph was deposed in Baghdad by the Mongols. Effectively though, the power and influence of the late Abbasid caliphate waned significantly in the early 10th century, particularly with the rise of the Buyid Dynasty in southern Iran from the AD 930s. Therefore the 'early Abbasid period' is used specifically to refer to the period covering the mid-8th and 9th centuries. Thereafter it becomes more difficult to characterise the Persian Gulf region as a whole according to a single set of political terminology, and generally dates for the later period are preferred.

Period Term	Dates
Sasanian-period (Late Antiquity)	224 - 622
Early Islamic period	622 - 749
Early Abbasid period	750 - c.930
Late Abbasid period	c.930 - 1258

Table 1.1 *General historical and political terminology applied to the period under consideration extending from AD c.400-1275*.

The later Sasanian and early Abbasid periods are both widely regarded as key periods in which the overall volume and scale of exchange within the Indian Ocean region increased, and the organisational sophistication of commercial relations intensified[2]. Two general assumptions are fundamentally built in to the conventional discussion of the Sasanian and Islamic commercial involvement in the Indian Ocean: that these both represent periods of trade growth, and that there is a direct association between political and

[2] A wide range of sources drawing on a variety of both historical and archaeological evidence could be cited. A selection of some of the most important and forcefully presented examples emphasising trade expansion include, for the Sasanian period (Whitehouse & Williamson, 1973; Piacentini, 1985; Whitehouse, 1996; Morony, 2001-02; Daryaee, 2003; 2009) and for the early Abbasid period (Hourani, 1951; Chaudhuri, 1985; Hodges & Whitehouse, 1983; Whitehouse, 1988; Hallett, 2000; Wink, 2002; Krahl, *et al*. 2010).

economic power within the Middle East and overall levels of trading activity represented within the Indian Ocean[3].

The causality widely inferred between the development of Indian Ocean maritime exchange, and the broader prosperity of the imperial economy, remains a complex issue and one that requires broader examination. A question must remain for example over the relative balance between revenues generated from land-tax, agricultural production and taxes levied on commercial transactions. Seen from this broader perspective, is it actually realistic to consider maritime trade as a major driver of the economies of either the Sasanian Empire or Islamic caliphate? Taking a specific example, would it be appropriate to regard one of the most ostentatious building projects of the Abbasid period – the construction of the royal city of Samarra – as supported by profits from trade, or was it in fact sponsored by other sources of fiscal generation such as the exceptional productivity of Mesopotamian agriculture (Kennedy, 2011)? The pioneering aspects of long-distance trade and striking profits amassed through the acquisition of exotic goods clearly feature in contemporary written sources[4], but should such references be equated wholly with the wider economic contribution of such activity, or also to some extent with its impact upon the cultural imagination of the time?

The other issue that needs to be considered is to what extent the exchange activity taking place between the imperial heartlands of Iraq and Iran and the broader Indian Ocean during the Sasanian and Islamic periods can be compared. Was there really a surge in the volume of exchange taking place during either period and are there other qualitative differences in the nature of the exchanges that took place? These larger questions remain difficult to address without first considering a more basic and immediate question: what was the nature and scale of maritime exchange and to what extent did its overall volume undergo transformation during the period under consideration?

[3] It is difficult to pick out individual expressions of this viewpoint as it appears to permeate widely through much of the underlying thinking applied within the historical and archaeological narratives surrounding the period. A clear example includes the following: “The economic weight of the capital in Baghdad and its prosperity was due in great part to the organization of the Indian Ocean trade” (Whitcomb, 2009a: 72).

[4] See for example al-Muqaddasi, *The Best Divisions of Knowledge of the Regions* trans. B. Collins 2001.

At the core of this investigation are a range of basic research questions:

- To what extent was the overall volume, scale or intensity of maritime exchange in the western Indian Ocean transformed between the 5th and later 13th centuries?

- Were there other qualitative changes in the ceramic exchange within this period, such as in the nature of products exchanged, the sources of those products or the overall diversity of the ceramic assemblage in circulation?

- Does the available quantitative ceramic evidence provide an indication of the mechanisms and organisation of maritime exchange within the western Indian Ocean?

In the light of the evidence that one may be able to obtain in relation to these questions, it is then possible to evaluate certain more fundamental considerations and ones that have generally been overlooked:

- What actually was the ultimate significance of maritime trade and did it really act as a major driver of the political and economic history of the Middle East?

- Can quantitative approaches to studying Indian Ocean exchange provide new and different insights than existing approaches and methodologies?

Necessarily, the vast majority of this study is concerned with the practical issue of setting out and analysing a select body of evidence with which to examine the changing nature of commercial exchange within the western Indian Ocean during the Sasanian and Early Islamic and Abbasid periods. Only in the conclusion is it possible to return once more to the underlying question regarding the ultimate significance of Indian Ocean maritime trade.

1.2 Sources of Evidence for the Study of Indian Ocean Exchange

Within the context of the Indian Ocean, and specifically the later first and early second millennia AD, the sources of evidence available for providing a direct measure of the changing scale and volume of economic exchange are limited. The inherent nature of the available historical evidence makes this inevitable. Within the varied body of historical sources that relate to maritime trade activity within the Indian Ocean during this period, most take the form of literary texts (Crone, 1980: 11). What is largely lacking are records connected with routine economic activity such as stock lists, transaction records, commercial charters or other legal documents. The sort of exceptional detail available particularly for the Red Sea region, and mostly for the period from the 11th – 13th centuries in the Cairo Geniza documents, is largely absent for the wider Indian Ocean in earlier periods (see Goitein, 1967-1993). In short, there are sufficient sources to clearly document the *existence* of formalised long-distance exchange, and to gain some insight into some of the more notable or exceptional products that circulated. What one cannot do is to provide a systematic and sustained record of long-term change in the overall *volume* and *nature* of the exchanges that took place. For various reasons, the dearth of contemporary historical records for the Sasanian and Early Islamic periods is particularly acute and therefore these tendencies are especially pronounced for this period (Pourshariati, 2008: 11-12; Crone, 1980: 11).

> "Unfortunately, we do not have quantitative figures to determine the level of integration of the various parts of the world-system for the eras that concern us here [i.e. the medieval Indian Ocean]. Establishing a direct measure of commercial volume is also, of course, impossible" (Beaujard, 2005: 416, Note 11).

Another important source of evidence for maritime exchange is archaeology. For the purposes of the discussion here, this can be sub-divided into two main categories. The first includes the various elements of infrastructure associated with maritime exchange. The most directly related features include the remains of boats, stone anchors and any facilities provided at the shore interface to assist with shelter and docking of boats or the offloading and storage of cargo (e.g. Agius, 2008). Infrastructure also extends to all the other wide-ranging physical structures that support commercial and subsistence activities

connected with the coastal environment such as settlements, irrigation systems, fields, road networks, etc. The economic impact of maritime exchange is often reflected directly in the structures that developed to support commercial activity and such dependences may be traced archaeologically on the ground well beyond the immediate coastal environment (e.g. Wilkinson, 2003: 204). A key example includes the regional-scale florescence of settlement and infrastructure that developed in tandem with the growth of trade around ports such as Bushehr, Siraf or Hormuz within the Persian Gulf (Carter, Challis, Priestman & Tofighian, 2006; Priestman, in press (a); Williamson, 1973a; Kennet, 2002a). The second category of evidence covers the objects of exchange themselves. This study provides a systematic examination of the second category of evidence, but draws on the general contextual information provided by the first.

A vast array of commodities circulated within the Indian Ocean region commercially or via other types of distribution networks. Of those products, a significant portion are likely to be visible archaeologically only in exceptional circumstances. Environments of preservation include those in areas free from extensive modern disturbance (Wilkinson, 2003: 41), and more particularly for organic materials, those with a high mean temperature and exceptionally low humidity. For most of the western Indian Ocean region, apart from particular desiccated areas of the Red Sea coast, many of the products that feature prominently as trade commodities such as textiles, spices and other foodstuffs are very unlikely to survive[5]. Even for more durable materials such as metals, glass and bone, environmental conditions influence preservation and there is thus a degree of variability in the find sample associated with different regions. Of all the various commodities in circulation, only a few of the most inert materials such as pottery and stone remain consistently preserved irrespective of climatic variables. In addition to the issues of preservation, the specific manner in which different materials were used and discarded is also of major significance. Of those materials that are more likely to be preserved, several have the potential to be kept in circulation through processes of recycling and reuse. Metals and glass were often systematically collected up once they

[5] For an example of exceptional preservation see the corpus of preserved textile fragments from the Red Sea ports of Berenike (Wild & Wild, 2007) and Myos Hormos (Peacock & Blue, 2006: 66; Handley & Regourd, 2009).

had served their original purpose and melted down again for reuse (Simpson, 2004: 238). Precious metals in particular are rarely encountered archaeologically due to recycling or hoarding processes. Stone cannot be altered in its entirety in the same way, but was often reused by cutting down and modifying objects to extend its use (Simpson, in press (a)). In this regard ceramics possess a range of characteristics that give them unique archaeological significance (Orton, Tyers & Vince, 1993: 32): they are relatively easily broken, so generally have a short use-life; the broken fragments of vessels have few potential uses, so they are generally quickly discarded and rarely recycled[6]; and the durability of ceramic sherds means they consistently survive within the archaeological record.

The combined issues of material preservation and the loss through recycling/reuse present some of the major obstacles to reconstructing patterns of exchange activity on the basis of exchange commodities themselves. However, there are also clearly important exceptions to the various generalisations that have been set out and a wide array of different classes of commodities are attested in specific contexts. Where some of the more vulnerable commodities do survive, much can be learned about the different aspects of exchange. Each type of commodity has the potential to offer its own particular insights into the broader exchange system. When one compares the archaeological circulation of beads, glass vessels or ceramics, for example, these products often have different sources of origin, different patterns of production, use/reuse and potential different forms of circulation 'behaviour'. Each provides an alternative perspective on aspects of the wider system of commodity exchange. Where there is a real asymmetry between different classes is in the scale and integrity of the record each provides.

The factors that influence the preservation of a material bear no meaningful correlation to the original volume or economic importance of the material as an exchange

[6] The main notable exception are modified potsherds cut down into the form of discs, rubbing implements, etc. These generally occur only as occasional finds, although within the context of East African archaeology, more significant quantities of pottery, including imported categories, were reused as 'bead grinders' (Flexner, Fleisher & LaViolette, 2008). In this specific context this could potentially have the affect of removing certain categories of pottery form the archaeological record, though the bead grinders themselves are eventually deposited and remain identifiable despite their alternation.

commodity. Establishing an accurate basis with which to rank the significance of different commodities presents its own set of methodological challenges (Appadurai, 1986). What is informative to note is the prevalent use of commodities that are generally archaeologically invisible. For example, one can consider the list of what were regarded in a contemporary source as the most notable products handled by, or exported from the main market towns of Fars Province in southern Iran towards the end of the 10th century (**Table 1.2**). These are massively dominated by textiles and food products. Admittedly the list of commodities from Fars Province includes many items that may only have circulated at a regional scale. Another list from elsewhere within the same source describes what may be a more representative though limited set of commodities available in the ports of southern and eastern Arabia[7]. These lists are clearly selective, and many other types of goods that are not mentioned are attested archaeologically. At the same time, this sort of information does provide an impression of the relative value ranking of different sorts of commodities in the eyes of a contemporary commentator. It also highlights the fact that many of those products considered most notable are unlikely to be detected within the archaeological record. Ideally it would be on the basis of the most 'important' commodities that any reconstruction of long-term economic change would be developed. As we have seen though, one is constrained by the evidence available.

[7] Commodities listed include: musk, saffron, brazilwood, teakwood, sasam wood, ivory, pearls, silk brocade, onyx, sapphire, ebony, coconuts, camphor, sandarax resin, aloe, iron, lead, bamboos, clay for chinaware, sandalwood, glass, pepper, ambergris, linen, shields, slaves, aunuchs, tiger skins (al-Muqaddasi, *The Best Divisions of Knowledge of the Regions* trans. B. Collins 2001: 83). Again only the precious stones, metal and glass are likely to be preserved archaeologically.

Type	Product	Preserves Archaeologically	Source(s)
Foodstuff	Aromatic seeds	Rarely	Darabjird, Furj
	Dates	Rarely	Darabjird, Tarum
	Figs	Rarely	Arrajan
	Fish	Often	Mahruban
	Fruits	Rarely	Mahruban, Sabur
	Jasmine	Rarely	Darabjird
	Olive oil	Rarely	Sabur
	Olives	Rarely	Arrajan
	Rice	Rarely	Istakhr
	Rose water	Rarely	Jur, Kul
	Sugarcane	Rarely	Sabur
	Syrup	Rarely	Arrajan, Darabjird, Furj, Tarum
	Walnuts	Rarely	Sabur
Textile	Blankets	Rarely	Fasa
	Brocade	Rarely	Shiraz
	Carpets	Rarely	Darabjird, Fasa
	Cloaks	Rarely	Shiraz
	Cloth	Rarely	Darabjird, Furj, Fasa
	Clothing	Rarely	Shiraz, Jur, Kul, al-Rudhan
	Coarse wool	Rarely	Arrajan
	Curtains	Rarely	Darabjird, Furj, Jahram
	Dresses	Rarely	Shiraz, Fasa
	Egyptian linen	Rarely	Siniz
	Embroidery	Rarely	Siniz, Shiraz, Kazarun
	Linen	Rarely	Furj
	Linen veils	Rarely	Siraf
	Mats	Rarely	Darabjird
	“Munayyar fabric”	Rarely	Shiraz, Fasa
	Rugs	Rarely	Furj, Jahram, Fasa
	Scarves	Rarely	Fasa, Kazarun
	Silk	Rarely	Shiraz, Fasa
	Tents	Rarely	Fasa
	Towels	Rarely	Siraf, Arrajan, Fasa
Leather	Leather	Rarely	al-Rudhan
	Leather buckets	Rarely	Tarum
	Sandals	Rarely	al-Rudhan
	Waterskins	Rarely	Mahruban, Tarum, al-Rudhan
Other	Aromatic oils	Rarely	Sabur
	Large fans	Rarely	Tarum
	Soap	Rarely	Arrajan
	Tables	Rarely	Fasa
	Willow wood	Rarely	Sabur
	Balances [metal?]	Often	Siraf
	Pearls	Rarely	Siraf
	Bottles [glass, ceramic?]	Often	Tarum
	Precious Indian goods	Rarely	Siraf, Arrajan

Table 1.2 *Notable exports of Fars province recorded in the 10th century by al-Muqaddasi in The Best Divisions of Knowledge of the Regions (trans. B. Collins 2001, pp 358-59). A broad distinction is drawn between classes that are rarely or often preserved archaeologically.*

1.3 The Ceramic Evidence Base

This study focuses on one category of evidence that is in many ways exceptional: ceramic vessels. Ceramic vessels were used almost universally, consistently survive within the archaeological record, and were frequently supplied via routine processes of exchange operating at various different geographic scales ranging from local provisioning to long-distance exchange. Even seemingly mundane and largely utilitarian products such as mixing bowls or cooking pots were at times moved over considerable distances, particularly within a maritime context (e.g. Williamson, 1987: 14; Tomber, Cartwright & Gupta, 2011). For various reasons, ceramics also generally constitute the most abundant category of find represented archaeologically, and therefore the pool of information to potential draw upon is limited only by the quantity of adequate recording that has previously taken place (**Fig. 1.1**).



Fig. 1.1 *A settlement mound at Tump-i Ali in Southeast Iran that consists almost entirely of broken fragments of pottery*. *Visited in 2005 during the Hormuzgan Survey (Kennet, Priestman, Khosrowzadeh & Aali, 2006)*.

The purpose of this study is to examine measurable changes in the composition of ceramic assemblages deposited at coastal settlements as a proxy for understanding broader patterns of exchange within the western Indian Ocean region. In contrast to a

number of previous ceramic studies undertaken within the Indian Ocean area that focus selectively on material that is in some way exceptional or distinctive (e.g. Hansman, 1985; Ciuk & Keall, 1996, Frifelt, 2001; Hardy-Guilbert, 2005), what is of interest here is the way in which ceramic assemblages are constituted as a whole. That is, how the entire composition of ceramic assemblages is formulated in terms of the relative proportions of majority elements, such as common coarse wares, compared with imported categories from different sources. By undertaking a quantitative inter-site comparison of chronological changes and spatial variation in assemblage composition, it is possible to provide an assessment not only of the changing nature of ceramic exchange, but also of its overall volume and content.

1.4 Chronological Trajectory of Development

The long-term trajectory in the development of Indian Ocean trade has generally been considered from the perspective of the changing nature and geographic location of the dominant political power structures of the time. Periods of political stability and power consolidation have generally been seen as providing conditions that are conducive to the development of commercial activity, particularly long-distance trade (Beaujard, 2005: 421-22). This has been a particularly dominant theme in the history of the Middle East, given the strategic position of the region at the geographic crossroads between the Mediterranean and the major eastern markets of Indian and China (Frank, 1998: 75).

Another pervasive theme related to the interaction between the Middle East and the Indian Ocean has been the concept that the Red Sea and Persian Gulf operated as two alternative and often competing routes of access linking Asia and East Africa to the Mediterranean and Europe (see for example Hourani, 1951: 40-41). These broad structuring principles are outlined below in relation to some of the prevailing historical narratives that have been constructed around the political and economic history of the period. Although the primary point of concern is with the period from the 5th – later 13th centuries, it is worth briefly referring to earlier developments associated with the period of Indo-Roman trade. Arguments surrounding this period have a direct bearing on how

the subsequent activity associated with the Sasanian and Islamic periods have generally been viewed.

1.4.1 Indo-Roman Trade

Ideas related to the nature and chronology of the so-called 'Indo-Roman' trade axis, which operated primarily between the Red Sea and India in the early centuries AD, have been substantially revised in recent years (e.g. Tomber, 2008). At this juncture, it is useful to briefly outline what might be regarded as the 'traditional' view of Indo-Roman trade, as this has fed in a significant way into the understanding of subsequent developments. Other more recent developments in the understanding of this period are returned to below (**Section 1.4.5**). The historical narrative that has been constructed around the long-term development of trade within the western Indian Ocean during the 1st millennium AD, put simply, involves an active phase of Indo-Roman trade channelled through the Red Sea during the Classical period (see for example Hourani, 1951: 40-41). This was seen as largely bypassing eastern Arabia and the Persian Gulf, although those areas were connected via significant trans-Arabian overland exchange networks that became prominent from the Achaemenid period onwards (Crone, 2004). The Persian Gulf was also itself commercially developed to some extent during this period (Whitehouse, 1992), and Roman goods did enter the region, as is attested for example by finds from ed-Dur (Whitehouse, 1998; Rutten, 2007). Through time it is generally agreed that a switch of emphasis occurred with the growing influence of the Sasanian Empire mounting increasingly effective opposition to the Indo-Roman trade axis via the Persian Gulf (Whitehouse & Williamson, 1973: Daryaee, 2003; Morony, 2001-02). The traditional view widely held and outlined by Hourani amongst others, was that the imperial crisis within the Western Roman Empire in Europe during the 2nd and 3rd century, resulted in the breakdown and withdrawal of Roman trade networks from the Red Sea and the Indian Ocean (Hourani, 1951: 36). This has been an attractive and durable hypothesis reinforced by various important strands of archaeological evidence, such as the abandonment of prominent ports in this period like Myos Hormos in the Red Sea or Arikamedu in India, or the dramatic drop-off in occurrence of Roman coinage in India during the 2nd – 3rd centuries (Turner, 1989). Likewise in the Persian Gulf, the withdrawal of Indo-Roman

trade networks has been invoked as one possible explanation for the decline of a number of prominent Hellenistic and Parthian settlements between the 1st and 2nd centuries AD (Kennet, 2007: 108-09).

1.4.2 Sasanian Trade

The ascendancy of Sasanian power in the Middle East has been documented archaeologically most clearly within the area of the Tigris/Euphrates floodplain in central and southern Iraq. Large-scale settlement surveys undertaken largely in the 1960s and 1970s indicate that the maximum extent of land-usage and population density was reached during the Sasanian period and that this was supported by a massive state-sponsored canalisation programme that brought previously unutilised land under use for the first time (Adams, 1962; 1965; 1981; Neely, 1970; 1974; Wenke, 1975-76; Christensen, 1993). Evidence of flourishing activity in the heartlands of the Sasanian Empire provides the backdrop to considerations of Sasanian activity across a broader geographic area, including commercial development within the Persian Gulf. Still the most direct and original treatment of the issue is the seminal paper written by Whitehouse and Williamson (1973). They argue that the origins of the wide-ranging contacts witnessed between the Persian Gulf and regions such as East Africa, South, Southeast and East Asia in the Early Islamic period, can be traced back directly to the Sasanian era. In support, they draw together a selection of historical references from Classical, Arabic, Syriac and Chinese sources, which refer (often in elusive terms) to pre-Islamic commercial activity within the wider Indian Ocean emanating from the Persian Gulf. This information is reinforced by significant archaeological discoveries from the Sasanian occupation levels at the port of Siraf (Whitehouse, 1971a), and the large-scale Sasanian coastal settlement at Bushehr (Williamson, 1971a; 1971b; 1972).

The Whitehouse/Williamson thesis has since been very widely accepted and closely followed by other scholars. Piacentini in particular has looked again at the available later Arabic histories of the Sasanian period and concluded that the initial Sasanian conquest of southern Iran was strategically motivated by the desire to secure access to the Persian Gulf region in order to develop its economic potential (Piacentini, 1984: 57-58). Similarly,

she traces the origins of the port-city of Siraf back to a military installation attested at the time of the Islamic conquest and most likely to have been founded around the 5th century as part of the Sasanian strategic interest in maritime trade (Piacentini, 1992: 124-25). Daryaee repeats much of Piacentini's argument and sees the Sasanian commercial expansion as part of an even broader strategic process that enabled the Sasanian Empire to monopolise the Indian Ocean economy and cut out Roman competition operating between the Red Sea and India (Daryaee, 2003: 9). Another perspective is to see Sasanian monopolisation of the Persian Gulf less in terms of trade and motivated more by the desire for political expansion and the need to secure valuable resources within the Arabian Peninsula, again as an act of competition directed against the Late Roman Empire in the West (Morony, 2001-02: 37).

Whatever the precise motivations preferred, this cumulative movement has gained increasing momentum to the extent that the majority view, held by archaeologists and historians working within the Persian Gulf, Iran, the Arabian Peninsula, East Africa and possibly other areas, is that evidence for significant pre-Islamic commercial activity will continue to emerge if this period is specifically targeted (e.g. Horton, 1996a: 450). The expectation is that the Sasanian period should be one that is well represented within the archaeological sequence in many parts of the region. This seems to have created a willingness to accept such evidence wherever it is identified[8]. This tendency is particularly clearly illustrated in connection with the discussion of archaeological sites associated with the activity of the Church of the East in the Persian Gulf. Because of the traditional association between the Church of the East and historical sources associated with their activity dated to the Sasanian period, most archaeological evidence connected with Christian activity within the region has been dated by extension to the Sasanian period. This includes for example, the monastery on Kharg Island (Ghirshman, 1960; Steve, 2003) and a number of church sites within the Persian Gulf or the surrounding area such as al-Qusur in Kuwait (Bernard & Salles, 1991), al-Jubayl in Saudi Arabia (Langfeldt, 1994) and Sir Bani Yas in Abu Dhabi (King, 1997; Elders, 2001; 2003). Indeed the situation of churches on islands, references to Christian involvement in commercial navigation, and

[8] For a detailed commentary of the impact of this process on our understanding of the 'Sasanian' archaeology particularly along the southern shores of the Persian Gulf see Kennet, 2007.

the wide jurisdiction of the Metropolitan of *Rev Ardashir* between the 6th – 8th centuries over parts of Arabia, southern India, Sri Lanka and Socotra, have all been cited as important evidence for the expansion of commercial activity within the Indian Ocean during the Sasanian period (Whitehouse & Williamson, 1973: 42; Gropp, 1991: 85). Actually in this case, refinements in the dating of ceramics and other finds connected with these sites (Simpson, in press (b); Kennet, 2007: 89-94; Carter, 2008: 71-72, 97-103), and an important re-dating of the key historical source on Christianity in the Persian Gulf (Payne, 2011: 97), suggest that the main episode of visible church building across the region should now be attributed to the period following the Islamic conquest in the 7th and 8th centuries (see more below).

1.4.3 Early Islamic Trade

There is still considerable uncertainty surrounding the likely impact of the breakdown of the Late Antique order and the spread of the Islamic conquest on the commercial activity within the Persian Gulf and wider Indian Ocean. Part of this assessment hinges on the interpretation of the scale of commercial activity in the Sasanian period. Should the Early Islamic period be viewed from the perspective of trade reaching a high level of intensity in the Sasanian period, or has this aspect been exaggerated and actually the pattern is one of slow incremental growth starting much further back in time? For many, the first century and a half after the Islamic conquest has been seen as a period in which trade networks were disrupted and the overall level of activity fell into decline (e.g. Hourani, 1951: 61; Piacentini, 1992: 141). This point is particularly clearly emphasised in relation to the historical narrative surrounding the early foundation and development of the port of Siraf:

> "…With the breaking up of the Sasanian structure at the beginning of the seventh century…the unitary political and military structure of the Gulf too, ceased to exist. Trade – formerly so flourishing – experienced not so much a halt as an inevitable decline and above all a diversion of its routes due to international political circumstances. In the Gulf a situation of uncertainty and insecurity arose, which saw the resumption of piracy – the chronic plague of these waters. But with the coming of the 'Abbasids (749 AD), with the shifting of the political centre of

> gravity of the Arab empire from Damascus to Baghdad…the trading and urban life of the Gulf…received new impetus and began to flourish again" (Piacentini, 1992: 141).

As has been emphasised in connection with the archaeological evidence associated with the activity of the Church of East, the clear differentiation of Late Sasanian and Early Islamic material culture has caused considerable confusion in our understanding of this period. Recent advances, particularly in ceramic dating combined with an improving absolute chronology, is starting to yield evidence that is sufficiently sensitive to provide a credible understanding of this period. The indications from the available archaeological evidence are not necessarily consistent. The exceptional productivity facilitated by the expansion of irrigated agriculture in Iraq and the concentration of population in this area exerted a powerful influence on the economic configuration of the rest of the region during the Sasanian period. While Adams' suggested that the Islamic conquest initially caused large-scale disruption to irrigated agriculture within the area (1965: 80-81), it is clear that a number of the ceramic type-fossils that he used to attribute surface features to the Sasanian period actually have a dating that extends into the 7th and 8th centuries. While it remains difficult or impossible to review Adams' survey results because of the way that they were published[9], the likely implication of this re-evaluation is that the Sasanian settlement pattern should now be extended into the Early Islamic period (Simpson, 1992).

The reanalysis of survey evidence appears to be in keeping with other lines of historical evidence that suggests that existing structures of landholding survived significantly unaltered into the Early Islamic period, while the upper sphere of the administrative system were transformed under the new ruling Arab elite (Morony, 1982: 39). Certainly there is compelling historical evidence for new agricultural investment programmes continuing in areas adjacent to major urban centres such as Basra and Baghdad up to the 9th century (Kennedy, 2011: 187-88, 194). What is also clear though is that there was a widespread and catastrophic collapse of the irrigated agriculture across the Tigris/Euphrates floodplain beginning on a significant scale by the later 9th century

[9] Adams published his 'type fossils' used to date sites to a given period (1965: fig. 14), but did not publish which sites they were found at. Although it is possible to re-evaluate the date of a given type, it is not possible to re-interpret the dates of the sites where they were found.

(Wilkinson, 2003: 97). This is likely to have had a wider impact upon the economic configuration of the entire Persian Gulf area and potentially the western Indian Ocean as a whole.

In terms of the wider archaeological evidence for the development of the maritime economy during the Early Islamic period, there are several potential lines of evidence. Across the Persian Gulf, the important evidence for Christian activity during the 7th and 8th centuries has been mentioned. From coastal settlements with occupation sequences falling within or spanning the Early Islamic period such Siraf, Kush, Jazirat al-Hulaylah and Sohar, for example, all contain significant quantities of imported pottery from South Asia and other regional-scale imports from within the Persian Gulf, but few if any finds from East Asia until around the mid-8th century (Whitehouse, 1988: 65-66; Kennet, 2004: table 3; Sasaki & Sasaki, 1996; Kervran, 1996). Recent results from survey and excavation of sites spread out along a 50km long portion of Kuwait Bay are informative (Kennet, Blair, Ulrich & Al-Duwīsh, 2011). Within the survey area, a number of single-period settlements were identified together with concentrations of sherds next to the shore. The latter belong to small groups of amphorae or isolated vessels most likely used to transport commodities from southern Iraq. Both the settlements and amphora scatters point to a pattern of activity within the area involving small-scale, regional level trade between the later 7th and 8th centuries. This activity appears to have come to an end with all sites being abandoned across the area by the early 9th century (Blair, Kennet & Al-Duwīsh, 2012: 17, 24). It is not clear if this is a localised phenomenon, or one tied into broader settlement trends affecting a wider area. There is some evidence to suggest that there was a split within the region with the 'Upper Persian Gulf' tied more closely to the Mesopotamian system with many areas falling into decline in the 8th or 9th century, while the 'Lower Persian Gulf' region experienced an upward trajectory of growth beginning in the same period (Priestman, 2005a: 102; in press (a)).

1.4.4 Abbasid Trade

A key component in the power and prosperity of the early Abbasid caliphate in Iraq was the significant agricultural potential of the region coupled with the unprecedented scale

of the urban population in that area (Kennedy, 2011). The geographic configuration of Iraq was also crucial, with major urban centres such as Baghdad connected by a system of navigable waterways that extended via the Shatt al-Arab to the major ports of Basra and al-Ubullah and from there into the Persian Gulf. The Abbasid period is also marked historically by a flourishing literary revival (Crone, 1980: 6). From the 9th century onwards there are an increasing range of surviving sources that describe – anecdotally at least – the huge wealth derived from long-distance commercial exchange extending from the Persian Gulf to East Africa, or to India and the Far East[10].

There are also important archaeological indications that have been used to support the argument for significant expansion in maritime trade across the western Indian Ocean during the early Abbasid period. Within the Persian Gulf, this period is marked by the clear ascendancy and large-scale investment at the port cities of Basra, Siraf and Sohar (Pellat, 1960; Whitehouse, 2009: 12-13; Williamson, 1973b). This is also the period when East Asian ceramic imports first started to arrive within the region (Rougeulle, 1996: 160-61), indicating the formation of new more extensive maritime trade networks within this period. The timing and nature of the influx of East Asian ceramic imports can be particularly clearly documented on the basis of the information presented from the pre-foundation and construction sequence associated with the Great Mosque at Siraf (Hodges & Whitehouse, 1983: 146). Within an extensive set of deposits that are most likely to span the period from the 7th to 9th centuries and a ceramic assemblage that includes over 400,000 sherds, there are no East Asian imports in stratified levels predating the mid-8th century. As one moves from the mid-8th into the early 9th centuries, a small but significant growth in the volume of East Asian imports occurs with a shift from 0.2 to 0.7% as a proportion of the overall assemblage. At the same time, the overall variety of East Asian imports increases, with the mid- to late 8th-century assemblage dominated by storage jars, supplemented by a range of fine tablewares such as Yue and porcelain as one moves into the 9th century (Whitehouse, 1973). On this basis it is stated, “we cannot avoid the conclusions that [by the 9th century] wealth and foreign trade had reached unprecedented levels” (Whitehouse, 1988: 67).

[10] See for example al-Muqaddasi, *The Best Divisions of Knowledge of the Regions* trans. B. Collins 2001.

The ceramic evidence for the development of maritime exchange contacts between East and West Asia is also now supported to some extent by the important discovery of a mid-9th century shipwreck off the coast of Indonesia (Krahl, *et al*. 2010). The Belitung wreck is a sewn hull vessel of at least 15m long and 5m wide, built according to the construction tradition of the Middle East employing timber drawn from sources in East Africa and possibly India (Flecker, 2010: 114-17). The main preserved elements of the cargo consist of around 10 tons of lead ingots and an estimated total of 70,000 ceramic vessels from China (Guy, 2010). These are predominantly large green glazed 'Dusun' jars from Guangdong Province in southern China (Krahl, 2010a: 195). Many of the largest storage jars within the cargo were used to transport tightly packed stacks of bowls. Other smaller jars were used for the transport of other largely perishable commodities. In one case the contents of a jar were preserved and can clearly be identified as star anise (Guy, 2010: 20, fig. 11). Tablewares within the assemblage are massively dominated by the products of the single kiln complex of Changsha in Hunan Province, consisting of over 56,500 relatively standardised painted bowls together with large numbers of carefully constructed spouted ewers (Krahl, 2010b: 52). The cargo also includes small numbers of fine-grade products from a variety of kiln sites scattered through different areas of both northern and southern China. Other than two other 10th century wrecks associated with the regional trade of Southeast Asia (Guy, 2010), the Belitung wreck represents the only known vessel firmly dated to period of this study anywhere within the Indian Ocean. It is therefore an extremely important find that will continue to shape our understanding of the period. At the same time, its isolation means that its true significance remains difficult to evaluate (see **Section 8.6.2**).

Another significant component in the discussion of early Abbasid period trade expansion is the evidence for ceramic exports from the Persian Gulf, which show clear evidence of a wide pattern of dissemination across the western Indian Ocean (e.g. Hallett, 2000; Glover, 2002). In East Africa in particular, the arrival of imports from the Persian Gulf appears to roughly coincide with a significant transformation of settlement and subsistence practices along the coast. There remains considerable debate surrounding the issue of whether the development of a distinct coastal culture engaged in long-distance trade heralded the arrival of foreign settlers within the region (Allan, J. de V. 1982), or the transformation of

indigenous society under the influence of new commercial opportunities (Horton, 1986; 1996a). What is clear is that the arrival of imported goods within the region is closely tied to the foundation of substantial and increasingly permanent settlements, often on islands or relatively isolated positions along the coast (Horton, 1996a: 454; Wilson, 1982: 213). Such settlements may have been positioned to provide access to local commodities for which an external market existed. At the same time, despite a clear demand for the acquisition of resources available within the continental interior, there is limited evidence for the penetration of imported goods further into the African mainland.

1.4.5 Reappraisal of the Debate

A basic outline has been provided above of some of the widely accepted ideas related to the long-term trajectory of development of the maritime economy within the western Indian Ocean during the Classical, Late Antique, Earlier Islamic and early Abbasid periods. These ideas continue to be reshaped by new research. Within the Red Sea, relatively recent excavations at Berenike and Adulis together with the sequences known from Aila, Clysma, Abu Shaar and Marsa Nakari, show increasingly that many of the Classical period ports and coastal sites continued to flourish and maintain active trade contacts with India into the Late Roman period up to around the 5th – 7th centuries (Tomber, 2008: 161). The same picture seems to be repeated in South Arabia with the continued occupation of the most prominent incense trading ports of Qana and Khor Rori up to a similar date (Salles & Sedov, 2010; Avanzini, 2002). In India the argument surrounding the potential role of European Roman influence in stimulating trade within the region has been eroded by highlighting the longer pre-Roman foundation sequences at sites such as Arikamedu (Begley, 1983), and the likely role of indigenous communities in establishing prominent coastal settlement within the area (e.g. Abraham, 2009: 15). More refined studies of artefact distributions also show that the disproportionate concentration of Early Roman coinage occurs as coin hoards from south India, and that specific factors may be responsible for their pattern of deposition, rather than a general trend in Indo-Roman trade (Tomber, 2008: 30-37). Similarly with finds of Roman amphorae, which have traditionally been assigned to the Early Roman period, more detailed study has resulted in increasing volumes of material being reattributed either to the Late Roman period, or

to the separate tradition of Torpedo Jar amphora (TORP.S) originating within the Persian Gulf and dated any time from the Sasanian period up to the 9th century (Tomber, 2007). A view developed throughout a recent study of Indo-Roman trade is that such activity should be seen as extending over a broader time period and involving the activity not only of Romans operating between the Red Sea and India, but of many different communities distributed throughout the region (Tomber, 2008). Seen from this perspective, any growth in trading activity during the Sasanian period involving the Persian Gulf would simply represent another part of the existing mix and a continuum of a pattern of commercial activity set on a continuous upwards trajectory from late centuries BC.

Within the Persian Gulf, there has also been a significant reappraisal of the debate surrounding the nature of state sponsored commercial expansion during the Sasanian period. At the heart of the debate is a controversy surrounding the dating of Sasanian and Early Islamic period sites, which rests largely on the available ceramic chronology for this period. Results generated from Kennet's work on ceramics obtained from survey and excavation in Ras al-Khaimah in the United Arab Emirates, have resulted in a far better appreciation of the main varieties of ceramics associated with different stages of the crucial Late Sasanian to Early Islamic transition (Kennet, 2002b; 2004). This has forced a re-examination of much of the evidence that has previously been put forward for Sasanian activity within the Persian Gulf, which as has been discussed above, appears to have been influenced by ideas concerning the assumed prominence of a Sasanian presence within the area. The example of the Church of the East activity has already been considered. Other key examples include the Sasanian foundation sequences proposed for the major ports of Siraf and Sohar (Whitehouse, 1971a; 2009: 9; Kervran, 2004: 293-96). In both cases the dating is based to a significant extent on the presence of a ceramic assemblage that is clearly distinct from that which circulated during the Abbasid period, and which contains elements such as Indian Red Polished Ware (IRPW) and plain Turquoise Alkaline-Glazed Ware (TURQ.T). Actually the assemblage associated with the foundation layers from these sites compares most closely with material that can now be dated more securely to the 7th and 8th centuries (Kennet, 2007: 97-99; Priestman, in press (a)).

A systematic review of the available archaeological evidence comparing levels of Hellenistic/Parthian and Sasanian activity in Eastern Arabia based on settlement sites, coin finds and burials, has led Kennet to conclude that the Sasanian period, at least within this area, is actually marked by a prolonged episode of decline (Kennet, 2005; 2007). Kennet's argument is based essentially on the absence of evidence from one side of the Persian Gulf. Whether this will withstand the long-term test of scrutiny across the wider region remains to be seen. What the argument does do is to provocatively swing the debate back the other way in terms of our understanding of the potential strategic involvement of the Sasanian Empire within the Persian Gulf region as whole. Seen within the context of the wider western Indian Ocean, it is also notable that there is currently very little secure archaeological evidence for Sasanian commercial activity. In East Africa, few if any ceramic imports from the Persian Gulf region can be securely attributed to the Late Sasanian or Early Islamic periods. Some recent radiocarbon dates push back the foundation of occupation at sites such as Unguja Ukuu, Fukuchani or Tumbe into the 7th or 8th centuries (Flexner, Fleisher & LaViolette, 2008: note 3; Crowther, *et al*. 2013), but claims of an early 6th century dating for Unguja Ukuu for example remain unlikely (Juma, 1996; 2004: 84). In South Asia, one of the most important recent archaeological contributions to the debate has been the realisation that many of supposed Roman amphorae finds are actually sandy Torpedo Jars (TORP.S), a class of amphora originating within the Persian Gulf region (Tomber, 2007). This evidence has been viewed mostly from the perspective of Sasanian commercial contacts with South Asia (Tomber, 2007; Stern, et al., 2008). Actually though Torpedo Jars continued to circulate up to the 9th century and it may have been during the Early Islamic period that they were used most intensively.

Ideas about the extent of Sasanian commercial expansion directly influence how any subsequent developments should be viewed. Are we looking at an undulating cycle of development that entered a trough between the 7th and earlier 8th century and expanded again during the early Abbasid period as some have proposed (for example Piacentini, 1992: 141)? Alternatively is there is a different trajectory of development? The archaeological evidence for prosperity and trade expansion during the mid-8th to 10th centuries is not necessarily clear-cut. Within Iraq itself, there is clear evidence for a

catastrophic breakdown of intensive irrigated agriculture across the countryside setting in within the 9th century (Wilkinson, 2003: 97). This may have been caused by a variety of factors including environmental degradation of the area and particular stored up problems brought about through intensive irrigation (Adams, 1965: 82). It may also have been caused by a general lack of state investment in the countryside. Some have sought to link this to an underlying preoccupation within the Islamic society in urban institutions and an inherent detachment from the interests of a native rural population (Crone, 1980: 29-30).

The results of this growing discord within Iraq may well be manifest in the widespread disruption caused by the uprising of slave workers engaged in digging irrigation projects in southern Iraq during the 9th century (Popovic, 1999), and higher up within society, by the turbulent politics and violent factionalism surrounding the leadership of the Islamic caliphate (Bennison, 2009: 14-46). It has been highlighted that there was continued significant investment and expansion of irrigated agriculture in Iraq up to the 9th century (Kennedy, 2011: 196), but this may only have been in limited places within the vicinity of the most prominent urban centres. The extensive surveys of the region conducted by Adams and others indicate that the wider pattern was one of decline within the wider region during the 9th century (Adams, 1965: 84-96; Wilkinson, 2003: 97). Some of the developments in urban expansion during the earlier Abbasid era were on an unprecedented scale, but the short-lived foundation and abandonment of the colossal city of Samarra during the 9th century, for example, speak not of a stable society, but one reaching a point of major impending crisis (Hodges & Whitehouse, 1983: 156-57).

Within the Persian Gulf, apart from the impressive medieval ports of Siraf and Sohar, it is striking that there are actually few documented substantial settlements dated to the 9th and 10th century period. Settlement surveys in Ras al-Khaimah first picked up on the fact that this potentially marks a low point of activity within the area (Kennet, 2002a: 160). While the arrival of fine glazed ceramic imports from Mesopotamia indicates the continued importance of regional-scale exchange, there is limited evidence for permanent settlement within the area. The main regional administrative centre of Kush seemingly falls into decline or is abandoned altogether during the 9th century (Kennet,

2004: 14), and the main settlement activity that has been identified consists of ephemeral and potentially more transient occupation on the coast (Kennet, 2002a: 160). The main exception to this pattern is the substantial settlement of Jumayrah near Dubai, but unfortunately there remains very little archaeological information available from this site (Kennet, 2007: 97). A similar sort of settlement to that at Jazirat al-Hulaylah in Ras al-Khaimah may well be in evidence from the 9th century and later at Ras al-Hadd in Oman (Priestman, 2011a: 20-24, figs. 4-6). Here again there is clear ceramic evidence for extensive exchange contacts extending to all areas of the western Indian Ocean and the Far East. At the same time occupation deposits sampled through trial excavation prove to be only a few centimetres thick and with no substantial structural remains (Cleuziou, Reade & Tosi, 1990: 34, 36-37). On the northern shore of the Persian Gulf, reanalysis of the finds from the extensive settlement survey completed by Williamson indicate that the 9th to 11th century is marked by the lowest frequency of sites and finds from any time between the Sasanian period and the 17th century – in other words the chronological limits of the survey (Priestman, 2005a: 83, figs. 9-10). These ideas clearly need to be tested now through the acquisition of additional regional data.

1.4.6 Summary of the Major Models

A range of different positions have been outlined above in the debate regarding the potential extent of commercial activity witnessed in the Persian Gulf and wider western Indian Ocean, particularly focusing on the period from the 5th to 10th centuries. Ceramic data related to the period 11th to later 13th centuries is also included within the analysis below (**Chapters 6 and 7**), but this is largely in order to contextualise the main period under consideration. Effectively the key concern is with comparison between the later Sasanian through to early Abbasid periods (**Table 1.1**). Other sources of evidence, such as that provided by other classes of find could potentially be included within the discussion of the development of maritime exchange in the Indian Ocean. However, this is not the purpose of this study. What is important to consider here is the broad thrust of these various different perspectives and how they impact upon our understanding of the trajectory of development of commercial activity within the period. To summarise briefly,

there are four main positions which encompass much of the relevant literature, each of which carries with it different implications regarding the observed cycles of development.

1. Following the decline of the early Roman Empire there was a lull in commercial activity within the Indian Ocean that was only reversed by a powerful Islamic state in the early Abbasid period. This thesis has not been fully articulated as such, but is at least implied by those emphasising the unique qualities of the 9th – 10th century Abbasid/T'ang axis, for example Hourani (1951), Bivar (1970), Chaudhuri (1985), Wink (2002).

2. Following the collapse of the early Roman Empire and Indo-Roman trade via the Red Sea during the 3rd century, the Sasanians immediately began the process of filling the vacuum left and actively developed commercial interests within the Indian Ocean via the Persian Gulf. During the Islamic period a pre-existing trade pattern was merely continued, perhaps with some upsurge in the volume and scale of activity. This represents the majority held view presented by Whitehouse and Williamson (Williamson, 1972, Whitehouse & Williamson, 1973; Whitehouse 2006) and accepted by most others, e.g. Piacentini (1985), Daryaee (2003), Morony (2001-02).

3. Sasanian maritime trade has been over-emphasised and recent re-dating of sites and ceramics of this period has left little evidence for active economic development at least along the Arabian shore of the Persian Gulf. The work of various individuals could be seen as contributing towards such a perspective such as Simpson (in press (b)), Kennet (2005; 2007), Carter (2008) and Priestman (in press(a)) though they themselves may not necessarily have framed their arguments within the context of the Sasanian maritime debate. The natural implications of this argument would be that any subsequent expansion of trade during the Early Islamic and Early Abbasid periods would have started from a low point in previous activity.

4. The collapse of the Roman Empire has been over-emphasised, as has the dichotomy between the Red Sea and the Persian Gulf. Actually both regions (and others) have been actively trading through the Late Antique and Early Islamic periods. With properly targeted research the evidence for this will emerge over time and has already begun to do so at sites such as Pattanam. The main recent exponent of this position is Tomber (2007; 2008) though it clearly has many other followers and contributors such as Power (2010) for the Red Sea, Horton in East Africa (Horton, 1986), and quite possibly many others, including some covered under the second group described above.

A wide range of different types of evidence potentially feed into our understanding of the long-term trajectory of economic development within the Indian Ocean region. Many of the arguments presented above rest on wider data sets, such as the interpretation of historical sources, occupation sequences from individual prominent sites, or evidence from archaeological survey. Despite this, the same underlying problem remains: there are very few ways of directly measuring changes in the overall volume of commercial exchange that took place. The available ceramic evidence is crucial, both as one of the most prominent and widespread sources of evidence for directly documenting exchange contacts and as a source of evidence for helping to date different forms of archaeological evidence. Although the view afforded by ceramic finds data is itself constrained, what it does provide is a rare measureable index against which to test and compare existing narratives and other datasets.

1.5 Thematic considerations

As well as looking at the course of development of the Indian Ocean economy, quantitative data on routine patterns of ceramic consumption also allow one to consider aspects related to the structure and organisation of maritime exchange. Different aspects of the available evidence are important. Key elements including the composition of assemblages, both in terms of the origin of products and the types of products represented. It is already clear that disproportionate attention has been directed towards those products that are rare, particularly elaborate or which come from unusual sources

(e.g. Mason, 2004; Watson, 2012). A quantitative analysis allows such material to be evaluated according to the same comparative standards as the rest of the ceramic products in regular use. In a broader sense, as has been outlined above, Indian Ocean trade has been given substantial prominence as a core component in the cultural and economic history of the Late Antique and Islamic age (e.g. Chaudhuri, 1985; Frank, 1998; Wink, 2002). At the same time, levels of trading activity have generally not been measured or tested. As such, it remains difficult to substantiate the broader impact of commercial activity or to accurately disentangle the potential contribution of Indian Ocean trade from the other potential sources of economic generation that fuelled the history of the period. Long-distance exchange networks in particular have been widely placed at the centre of most thinking related to the subject.

> "Over the centuries…exchanges transformed the Indian Ocean into a unified space. Trade – above all, long distance trade – played a central role in this process" (Beaujard, 2005: 411).

A proposal for the developmental stages associated with the evolution of long-distance trade has been set out by Chaudhuri (1985: 37). He concludes that through time there was a significant switch from a single integrated zone of exchange operating across the whole of the Indian Ocean and monopolised to a significant extent by merchants from the Middle East (**Fig. 1.2**), to a faster, more efficient and low risk segmented pattern involving smaller, intersecting interaction spheres encompassing the areas of the western Indian Ocean, the eastern Indian Ocean and the South China Sea (**Fig. 1.3**). In a similar manner, Abu-Lughod has set out a model in which the mid-13th to mid-14th century world can be parcelled up into eight major spheres of interaction (**Fig. 1.4**). Whether or not the geographic or chronological limits of these large-scale interaction zones are accurate, is not the point of importance here. Historical and archaeological evidence leaves no doubt that exchange did occur over vast distances and there is every possibility that such models have a credible basis in reality. What they assume however, is that the key component in the interaction that took place within the Indian Ocean world operated at a trans-continental level (Beaujard, 2005: 411; 2010). The available ceramic data, which provide evidence for various different forms of routine interaction, provide an opportunity to quantitatively evaluate the relative contribution of different scales of

interaction taking place within the Indian Ocean world. This issue will be returned to again once the core data on the subject has been examined in further detail (see **Section 8.6.3**).

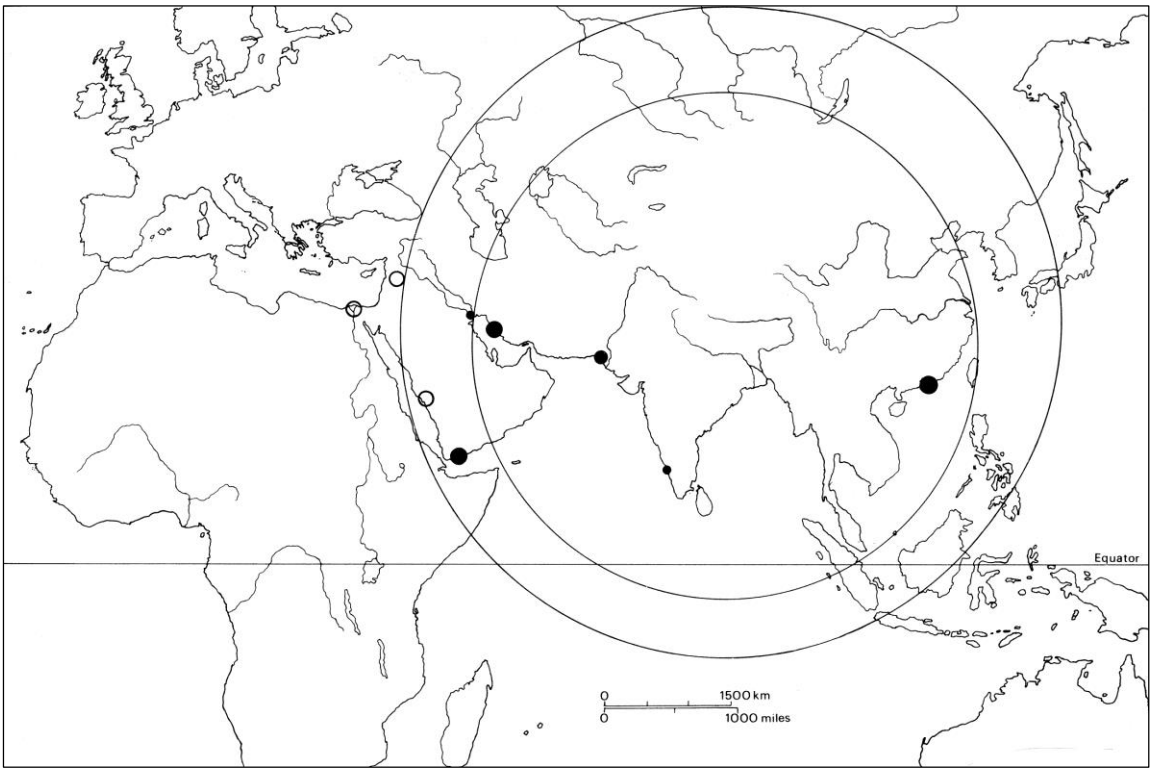


Fig. 1.2 *World-system model showing the Indian Ocean as a unified zone of interaction connected by several major ports between c.700-950, after Chaudhuri, 1985: map 8*.

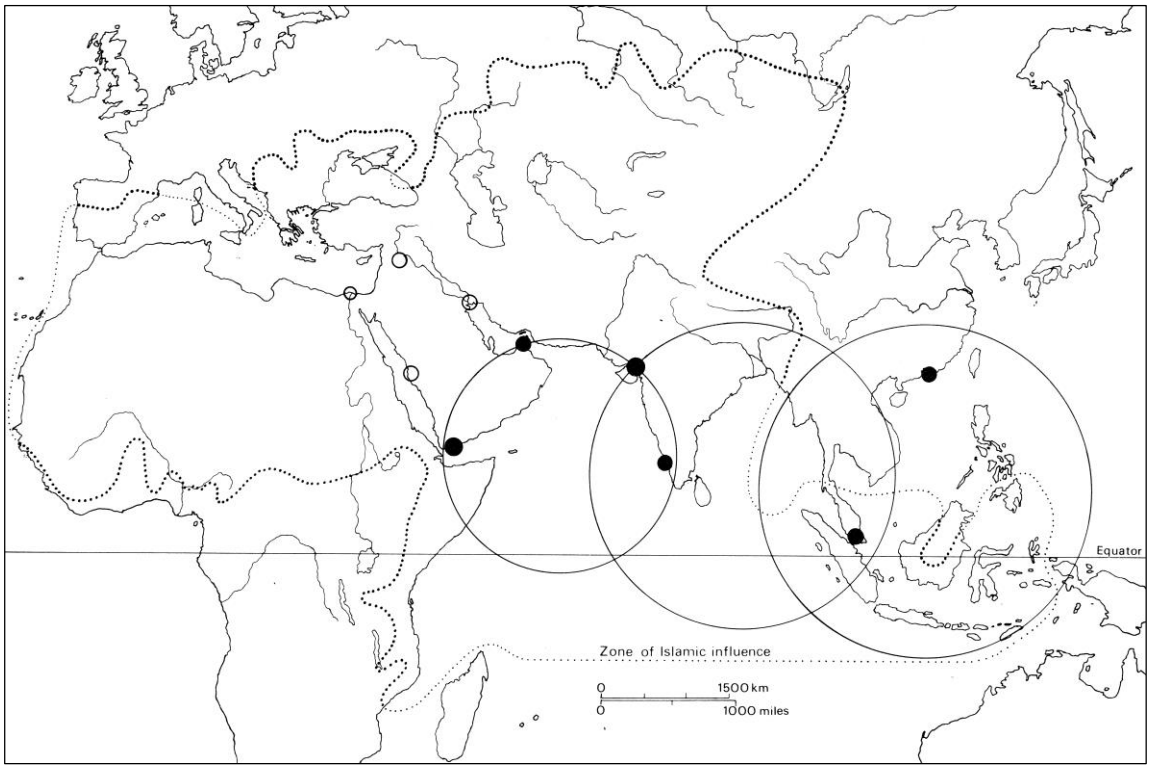


Fig. 1.3 *World-system model showing a more segmented pattern with the Indian Ocean broken down into three intersecting zones of interaction associated with the period from c.1000-1500, after Chaudhuri, 1985: map 9*.

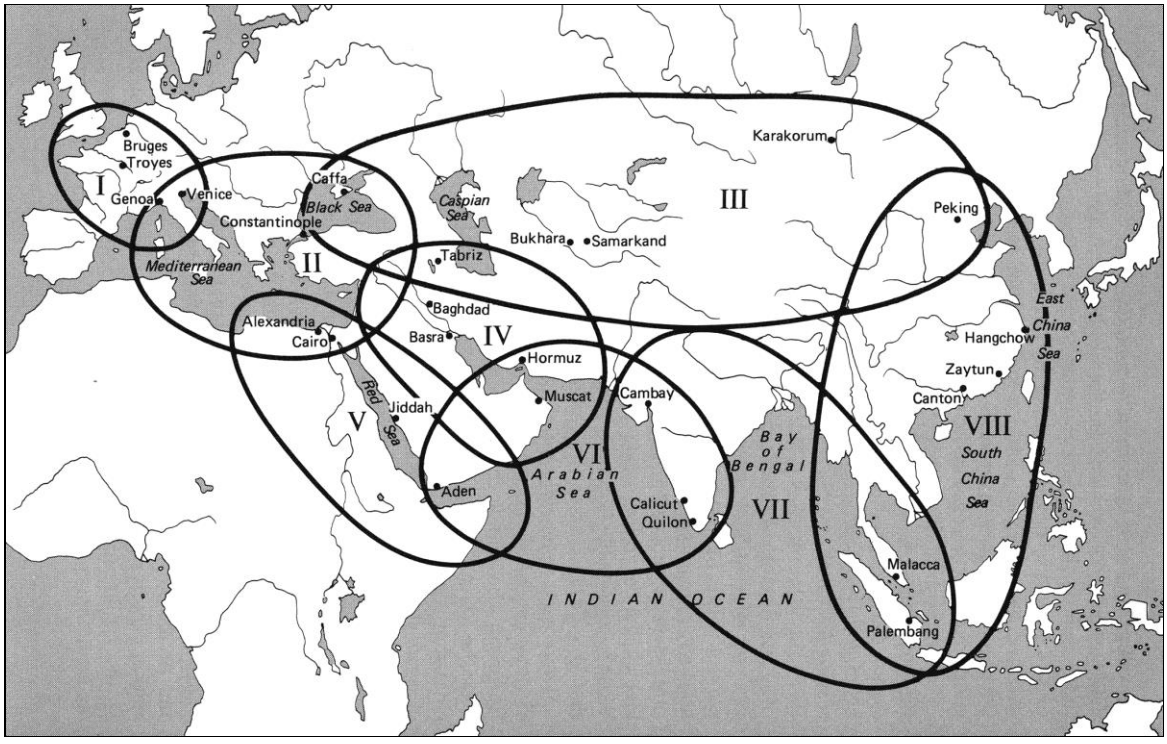


Fig. 1.4 *Mid-13th to mid-14th century world-system consisting of eight main zones of interaction extending from western Europe to East Asia, after Abu-Lughod, 1989: fig. 1*.

1.6 Testing Alternative Narratives

This thesis will test various alternative narratives related to the nature of development of maritime exchange in the western Indian Ocean through a detailed quantitative comparison of pottery assemblages from a number of archaeological sites within the region. A methodology has been developed to deal with the classification and quantification of the main varieties of ceramics in circulation within the area that enables the data from an increasing range of sites to be directly compared for the first time (**Chapter 2**). While the main aspect of this study is concerned with the practical issue of presenting an analysis of the available ceramic finds data, the ultimate aim of this analysis is to consider the nature and significance of maritime trade as a component in the economic history of the Indian Ocean and Middle East. There are two principal elements that require consideration. The first is chronological. The second is thematic. The chronological aspect relates to the general trajectory of the development of commercial activity within the region. Ceramics provide a unique opportunity to test a range of key assumptions related to the rise or decline in economic activity during specific periods. This is in turn closely connected to the prevailing understanding surrounding the nature of political developments within the period. The available ceramic data also provide a basis for the critical examination of certain broader thematic considerations. In particular, how exchange systems may have functioned and what impact the Indian Ocean maritime exchange network had in terms of the broader operation of the Afro-Eurasian economy. Within the next part of this chapter we will examine the main factors that define the scope of the investigation, including the area of geographical coverage (**Section 1.6**), the chronological scope (**Section 1.7**) and parameters set in terms of the nature and quality of ceramic finds data (**Section 1.8**).

1.7 Geographical Scope

This study focuses exclusively on the area of the western Indian Ocean. The continental landmasses that delimit the western, northern and eastern borders of the western Indian Ocean include East Africa, the Middle East and South Asia. Within this area, there are two further sub-systems represented by the Red Sea and the Persian Gulf. The geography of the western Indian Ocean varies extensively from the subtropical environments that

characterise the often densely vegetated coastlines of East Africa and South Asia, to the arid conditions that characterise the coastlines of much of the Middle East. The broad variation in environmental conditions and the uneven distribution of primary resources across the region appears to be one the central underlying factors that shaped the development of exchange within the Indian Ocean region from very early times (Chaudhuri, 1985: 27). Sailing and navigation within the Indian Ocean were determined to a large extent by the seasonal monsoon cycle, but also by many other localised factors related to the currents, winds and coastal morphology.

At the core of the investigation is the aim to examine the economic relationship between the key political entities of the Middle East, particularly the Sasanian Empire and Early Abbasid caliphate, with the maritime exchange network operating via the Persian Gulf with the Indian Ocean. The decision to limit the scope of the investigation to the western portion of the Indian Ocean and at the same time to include the full extent of this area, is informed by four main considerations:

- The western Indian Ocean forms a natural geographically bounded zone of interaction within which there is also a strong degree of interaction as demonstrated by the occurrence of related archaeological finds within the period of the investigation.

- The western Indian Ocean is already sufficiently large to examine the key processes of interaction including local, regional and long-distance scales of interactions.

- Within the western Indian Ocean, the degree of similarity in terms of the dominant categories of imported ceramics is close enough both to recognise common categories of finds and to generate direct comparative analysis. This appears to be less true for the eastern Indian Ocean were Middle East ceramic exports occur as a significant minority compared to those from the Far East (Glover, 2002).

- There are now a sufficient number of quantified ceramic assemblages to generate a comparative analysis of the main areas of the western Indian Ocean: East Africa, the Middle East and South Asia. Furthermore, it remains a realistic objective to include all of the quantitative ceramic data currently available for the western Indian Ocean region covering the period from the 5th to later 13th centuries[11]. At present there appear to be very few if any comparable data sources available from the eastern Indian Ocean or the area of the Red Sea (Power, 2009; 2012). As a result, the potential for including these wider areas within the remit of the investigation are still fundamentally limited.

1.8 Chronological Scope

The outer limits of the period of investigation extend from AD c.400 to 1275. The chronological scope of the investigation is determined by the combined considerations of providing sufficient breadth to view the full profile of developments across the later Sasanian and Early Islamic and early Abbasid periods, the need to constrain as far as possible the parameters of the research and the practical considerations imposed by the chronology associated with the available ceramic finds data. The last of these aspects is discussed in further detail below (**Section 2.4**). What is important to emphasise here is that the outer chronological limits of the investigation are defined by moments of recognisable change across a set of ceramics commonly encountered within the western Indian Ocean.

The period that starts from around the beginning of the 5th century allows one to take in the developments associated with the mid to late Sasanian period, which has been widely associated with the peak period of Sasanian influence within the Persian Gulf and Indian Ocean region (e.g. Whitehouse & Williamson, 1973; Daryaee, 2009). Similarly at the

[11] As has been highlighted elsewhere, quantitative finds recording has experienced a dramatic and exponential growth in the last few years and as a result, new data is now appearing in publication at a rapid pace. All known data-sets for the 5th – 13th centuries for the western Indian Ocean have been incorporated in this study, excluding the finds from Mantai in Sri Lanka that appeared too late to be included (Carswell, Deraniyagala, Graham, 2013). There are also some preliminary results that have been excluded, for example interim results from the 7th – 10th century settlement of Tumbe in Tanzania (Flexner, Fleisher & LaViolette, 2008: Table 2) and the incomplete data from the important 7th – 8th century occupation of Jazirat al-Hulaylah in the United Arab Emirates (Sasaki, 1995; Sasaki & Sasaki, 1996; 1998; 2000).

opposite end of the chronological range, the peak period of Abbasid influence, which occurred between the mid-8th and early 10th centuries (see **Section 1.1**), is most clearly viewed in comparison to the period that immediately followed. This is encapsulated by a body of ceramic finds dated to between the 11th to later 13th centuries (see more below). While data for these later periods is presented here for comparative purposes, far less attention is given to the implications of the evidence within the context of what, by the 11th century, was very likely to been a significantly different set of political and economic circumstances to that which existed during the early Abbasid period (e.g. Ricks, 1970; Whitehouse, 1983; Wink, 2002: 20).

1.9 The Ceramic Finds Sample

The final critical and perhaps most obvious parameter applied within this investigation is the use of quantified ceramic finds data. Such evidence has been obtained either from sites where ceramic finds have already been quantified and published, or where it has been possible to extract quantitative data via renewed work on the finds themselves. Such sites are limited by the slow adoption of the methodology of finds quantification in Indian Ocean archaeology (see **Section 2.2**). Compared with the level of sophistication reached in ceramic studies associated for example with medieval Europe (e.g. Gaimster, 2006) or the Roman world (e.g. Tomber, 2006), work within the Indian Ocean region lags far behind in a number of important areas. Very few production sites have been securely identified, and overall the volume of systematic investigation and publication remains limited. In most cases, there has still been no concerted attempt made to undertake the primary task of reliably distinguishing between the outputs of different production centres. The lack of progress made is also reflected to some extent in the state of methodological progress. Aspects of recording and analysis such as the use of multiple volumetric measures, quantitative analysis, and the systematic recording of functional markers – which have been incorporated as part of common practice in ceramic studies within Europe for a number of decades (e.g. Peña, 2007) – have only started to be adopted more widely within the Indian Ocean during the past few years (e.g. Kennet, 2004; Carter, 2005). Within the Islamic period in the Middle East in particular, ceramic studies have been dominated by the concerns and preconceptions arising from the

discipline of art history (see **Section 2.2.1**), and as will be argued in Chapter 2, this has distracted from the primary interests in rigorously defining the output of specific industries, determining vessel use, and tracing the distribution of related products. Where important archaeological contributions have been made, this has largely been with the publication of a limited number of individual site assemblages (e.g. Chittick, 1984; Horton, 1996b; Kervran, 2004; Nanji, 2011).

At this point in time, detailed quantitative ceramic studies are now for the first time being undertaken in multiple locations across many different areas of the western Indian Ocean and on assemblages covering a variety of time periods (**Table 1.3**). The general adoption of quantitative recording is clearly acquiring momentum. What is important to stress is that this widespread uptake can only really be considered as a development of the last few years. It is likely that within the next half-decade, we can look forward to the number of quantified and published assemblages more than doubling. For now, many recently initiated fieldwork projects are still in progress or have not yet reached the stage of final publication. The information utilised within this study is derived from a combination of a still limited number of earlier pioneering applications of quantitative finds recording (Sasaki, 1990; Horton, 1996b; Kennet, 2004; Carter, 2005; Seely, Canby & Coningham, 2006; Carter 2008; Nanji, 2011), preliminary results made available from current excavation projects (Guérin & al-Na'imi, 2010; Cherian, 2011), and other data-sets that it has been possible to personally access[12]. An important feature of the pre-existing studies of individual assemblages is that each has been conceived to deal with the ceramics finds from a particular site. As such there is still a degree of variation in the terminology used to categorise and describe associated ceramic finds, and in the methodologies employed to record the material. These factors are accentuated by the tendency for area specialisation within different geographic sectors of the western Indian Ocean.

[12] This includes data-sets from Bushehr, Siraf, Sohar and Manda.

	Site Name	Country	Directed By	Fieldwork Year	Period
Published	Kush	UAE	Kennet	1994-2001	$4^{th}/5^{th} – 14^{th}C$
	Bilad al-Qadim	Bahrain	Insoll	2001	$8^{th} – 15^{th}C$
	Anuradhapura	Sri Lanka	Coningham	1989-1994	5^{th} C BC – 11^{th}C AD
	Sanjan	India	Nanji	2002-2004	$8^{th} – 15^{th}C$
In Process	Kadhima	Kuwait	Kennet	2009-Cont.	$7^{th} – 8^{th}C$
	Murwab	Qatar	Guérin	2008-09	$9^{th}C$
	Al-Ain	UAE	Power & Sheehan	2011-Cont.	$17^{th} – 20^{th}C$
	al-Nudud	UAE	Carter	2010	$14^{th} – 16^{th}C$
	Qalhat	Oman	Rougeulle	2008-Cont.	$12^{th} – 15^{th}C$
	Ras al-Hadd	Oman	Tubb	2013-Cont.	Iron Age, $17^{th} – 20^{th}C$
	Sharma	Yemen	Rougeulle	2001-06	$10^{th} – 12^{th}C$
	Tumbe	Tanzania	Fleisher & LaViolette	2004-06	$7^{th} – 10^{th}C$
	Fukuchani	Zanzibar	Crowther, Horton	2011	$6^{th} – 8^{th}C$
	Unguja Ukuu	Zanzibar	Crowther, Horton	2011-12	$7^{th} – 14^{th}C$
	Songo Mnara	Tanzania	Fleisher & Wynne-Jones	2009-Cont.	$14^{th} – 16^{th}C$
	Dembeni	Comoros	Pradines	2013-Cont.	$8^{th} – 13^{th}C$
	Pattanam	India	Cherian	2007-Cont.	$4^{th}C$ BC – $10^{th}C$ AD
	Mantai	Sri Lanka	Bohingamuwa	2009-Cont.	$3^{rd}C$ BC – $11^{th}C$ AD
	Kirinda	Sri Lanka	Horton	2013	$8^{th} – 9^{th}$ C

Table 1.3 *Recent and on-going excavations within the western Indian Ocean region employing quantitative ceramic finds recording that are either still pending publication or published within the past decade*[13].

In terms of a broader inter-site or inter-regional comparative analysis, previous work can be sub-divided into three main categories. The vast majority of 'conventional' ceramic publications deal with the occurrence of the same varieties of ceramics on different sites by the process of citing selective parallels (for example Horton, 1996b; Kervran, 2004, etc.). The purpose of this is often to support arguments related to site chronology or general characteristics of ceramic distribution. Another approach has been to provide more detailed studies of particular individual wares (for example Glover, 2002; Tomber, 2007; Priestman, 2011b; Tomber, Cartwright & Gupta, 2011, etc.). Finally, there is the approach pursued here that looks at the overall composition of the ceramic assemblage and thereby attempts to consider the general broad characteristics of ceramic exchange, including an appreciation of changes in the range of products in circulation, their relative proportion to one another and ultimately changes in the overall volume of ceramic exchange. Very limited attention has been directed towards this form of holistic analysis.

[13] I am extremely grateful to Stephanie Wynne-Jones and Nicole Boivin for the assistance they have provided in obtaining details related to recent and on-going archaeological investigations within the western Indian Ocean. I of course accept all responsibility for any inaccuracies in the information given here.

The most significant previous study compares the results from just two assemblages: Kush in the Persian Gulf and Shanga in East Africa (Kennet, 2004). The analysis presented here represents an attempt to bring together data from a far wider range of sources.

Three main elements provide the essential building blocks required to establish a comparative analysis of long-term changes in the composition of ceramic exchange:

- The ability to reach consensus regarding the classification of the same varieties of ceramics found on different sites
- A synchronised chronology
- A system of measuring quantities of ceramic finds

The foundation of this study is a system of ceramic classification and ceramic chronology that can be used to integrate the available quantitative data from separate areas of the western Indian Ocean. This is based on a programme of research concentrated initially in the area of the Persian Gulf that now stretches back over the course of two decades (see **Section 2.3**). Much more work remains to be done to accurately define the full range of ceramic industries in circulation within the western Indian Ocean and to improve the information available surrounding the issues of accurate provenance and dating. What it has already been possible to achieve is a relatively wide-ranging framework of ceramic classification that allows many products in common circulation to be recognised and compared across assemblages (see **Section 2.3.5**).

1.10 Outline of the Study

Deeply embedded factors related to conventional practises of describing and recording ceramics within the western Indian Ocean area appear to have held back progress in clearly defining associated industries and establishing broader consensus in areas of nomenclature and classification. These factors are explored in further detail through the first part of Chapter 2. The second part of the Chapter goes on to describe the attempts made here to develop a classification and typology that can be applied to the ceramics in circulation on a cross-regional basis. The foundation for this work is provided by the

integrated results of previous inter-related studies undertaken on the excavated assemblages from Kush and al-Mataf in the United Arab Emirates (Kennet, 2004), finds from Williamson's surface survey of over a thousand sites in southern Iran (Priestman & Kennet, forthcoming), and a substantial portion of the excavated finds from Siraf (Priestman, forthcoming). The combined results of these studies capture a broad range of the ceramics in common circulation within the Persian Gulf and wider western Indian Ocean during the Sasanian and Islamic periods, and provide a basis from which to standardise the recording of ceramic types and classes in assemblages from across the region. The final part of the chapter addresses the issue of chronology. The date ranges associated with individual categories of pottery are grouped together to provide an overarching periodisation covering the 5th to 13th centuries. This periodisation is split into six parts defined by moments of significant change in the ceramic record. The proposed ceramic chronology forms the basis for examining contemporaneous events taking place across individual site occupation horizons.

A closely allied factor to the issue of traditional ceramic recording practices and the ability to effectively categorise the range of related industries in circulation, is the lack of attention given until recently to the central importance of quantitative finds recording. The issue appears to be less that there has been any specific challenge expressed to the importance of quantitative finds recording, but rather that the value of the approach has often simply been overlooked. The factors that have enabled this situation to persist longer within the Indian Ocean than in many other parts of the world are examined in Chapter 3. This analysis again helps to explain the extent and nature of the evidence currently available. Chapter 3 also examines the various advantages and limitations associated with alternative ceramic quantification techniques, and sets out an argument for adopting a straightforward pragmatic approach that enables the widest possible range of information to be utilised.

The second part of the thesis presents the information currently available on quantified ceramic assemblages covering the relevant time period within the western Indian Ocean. Later chapters analyse the data and explore the potential conclusions that can be drawn. The sites that are available for a detailed cross-regional analysis of Indian Ocean ceramic

exchange are identified in Chapter 4. For each site, an overview is provided of the individual site occupation history, the archaeological investigations that have been undertaken there, and the relationship of the sites to the coastal environment. The contextual detail provided for the individual sites from which ceramic assemblages are drawn, forms the backdrop against which the data can be interpreted. The actual characteristics of the available data sets are then set out in Chapter 5. This includes an examination of the size, nature, significance and representativeness of each ceramic assemblage, factors related to how the ceramic assemblage was recorded, quantified and phased and how the material has been processed for the purposes of this study. Having set out the available source material, Chapters 6 and 7 present a comparative analysis of the data. In Chapter 6 the assemblage is considered in terms of its general compositional characteristics; in particular the varying proportions of glazed to unglazed ceramics, and distinctions based on non-local/local or local, regional and exotic imports. In order to understand more specifically how the dynamics of ceramic circulation operated, Chapter 7 looks more closely at the kinds of ceramic that were exchanged: that is, from where they originate, how they might be characterised and the types of vessels that were involved. The chapter also considers ceramic exchange from the perspective of the vessel functions and the different exchange processes that these functional categories imply. Finally in Chapter 8, the results of the comparative quantitative analysis are considered in relation to the broader issues of long-term economic change within the western Indian Ocean during an episode of major historical transition.

Chapter 2 An Integrated Ceramic Classification and Chronology

2.1 Introduction

The rationale for focusing specifically on the ceramics as a source of evidence for examining long-term trends in economic activity within the Indian Ocean is set out in Chapter 1. Such an analysis cannot be undertaken without first establishing a reliable basis with which to identify the same categories of ceramics where these are encountered on different sites and in different regions. The range, quality, and suitability of the ceramic finds data available for cross-regional comparative analysis, is fundamentally shaped by recording practises. Substantial difficulties persist in establishing a shared ceramic classification that can be applied across all areas of the western Indian Ocean and this issue has been shaped to a significant extent by historic interests and concerns prevalent within the discipline. Because of this impact of past recording practises on the ceramic evidence currently available for use within this study, and the continued significance of ceramic recording methodologies going forward, an examination of these issues is provided through the first part of Chapter 2 (**Section 2.2**).

The next part of the chapter describes the attempt made to provide a single integrated system of ceramic classification that can be applied to the western Indian Ocean region as a whole (**Section 2.3**). This work is based on the amalgamated results of previous ceramic studies undertaken on large assemblages derived from survey and excavation within the Persian Gulf and assemblages worked on during the course of the study presented here. This classification has been established on the basis of observed visual characteristics formally arranged according to three main variables: vessel forms or 'type'; the material pots are made from or the 'fabric'; and the combined attributes that make up a specific category or 'class'. The integrated ceramic classification presented here includes 184 different classes and 334 vessel types that encompass in varying levels of detail, the full spectrum of ceramic finds that commonly occur on sites within the Persian Gulf and wider western Indian Ocean (see **Section 2.3.5**). These ceramic products originate from many different sources including the Persian Gulf, Arabia, East Africa, South Asia and East Asia. The chronological range covered by the ceramic classification is also broad,

extending from the Sasanian period up to the early modern period. Within the context of the 5th to later 13th century, which forms the outer limits of the research presented here, the post 13th century assemblage obviously has no immediate relevance. However, information on these later periods has been systematically gathered as part of a broader programme of research on the ceramic traditions of the Indian Ocean and information on later dated categories is included within the class catalogue as part of a continuing effort to integrate ceramic data from across the region (see **Section 2.3.5** and **Appendix I**).

The final part of the chapter addresses the issue of chronology (**Section 2.4**). The date ranges associated with individual categories of pottery are grouped together to provide an overarching periodisation covering the period from c.400 - 1275. This periodisation is split into six parts defined by moments of obvious change in the ceramic record. The proposed ceramic chronology forms the basis for examining contemporaneous events taking place across individual site occupation horizons in different parts of the western Indian Ocean. The methodology advanced here aims to address a range of perceived deficiencies in previous ceramic research outlined through the first part of the chapter.

2.2 Previous Studies of Sasanian and Early Islamic Pottery

The discussion presented here relates specifically to the approaches developed in connection with the study of ceramics originating within the area of the Persian Gulf. There are a number of factors that justify this narrow focus and omission of a wider discussion of the development of ceramic research in other areas such as East Africa and South Asia. Within the wider western Indian Ocean, the ceramic traditions of the Persian Gulf region hold a particularly central position. Geographically, the Persian Gulf can be seen as a point where many of the significant distribution networks converge. As a result, the full mix of ceramics that occur across the western Indian Ocean as a whole, are generally represented in assemblages from the Persian Gulf (Tampoe, 1989; Kennet, 2004). Equally if not more importantly, ceramic exports from the Persian Gulf represent one of the most abundant and widely represented categories encountered elsewhere (e.g. Wilding, 1977; Prickett-Fernando, 1990; Glover, 2002). The systematic study of the Persian Gulf exports offers the potential to tie together the chronology of most other

categories of ceramics represented across the region as a whole. Ceramic studies in South Asia, the Red Sea, East Africa, etc. follow their own somewhat separate courses of development that are not addressed specifically here. At the same time there are many points of commonality and the following discussion has broader points of applicability.

2.2.1 Art Historical Approaches

The study of ceramics originating within the area of the Middle East and the Persian Gulf dated to the later 1st and early 2nd millennia AD has been dominated by a narrow focus on decorative glazed traditions dated predominantly from the early 9th century and later. Since at least the latter half of the 19th century, there has been a sustained interest in the acquisition of Islamic ceramics as 'art pieces' (Watson, 2004: 11) and today there is a high demand and large value placed on well-preserved vessels that display attractive aesthetic characteristics. Closely allied with the market for Islamic ceramics, is the study of such pieces within the field of Islamic ceramic art history[14], which borrows directly in its techniques from the study of the fine or applied arts (Watson, 2004: 11). Here the principal concern has been with the style and iconographic content of surface decoration. Related products or 'wares' are defined primarily on the basis of decorative techniques and within each technical 'family', a decorative style; be that a particular colour scheme or repertoire of motifs (Watson, 2004: 35). The underlying assumption – even if this is not necessarily explicitly stated – is that a ware represents a body of material manufactured in the same place at the same time. Wares have generally been classified according to a particular technique, such as decoration scratched through slip (i.e. sgraffiato), or in terms of a place name associated with a decorative style (for example 'Kashan Lustre' or 'Gabroon Ware'). Both approaches are potentially somewhat problematic; firstly because decorative techniques were often widely copied across multiple centres of manufacture (e.g. Morgan, 1994a) and secondly because the recorded provenance associated with art pieces are often unreliable (Watson, 2004: 35).

[14] See for example Hobson, 1932; Lane, 1947; 1956; 1957; Fehérvári, 1973; Grube, 1976; Philon, 1980; Allan, J. 1981; Soustiel, 1985; Watson, 1985; Allan, J. 1991; Fehérvári, 2000; Watson, 2004 and many others.

Because the discipline of Islamic ceramic art history is concerned mostly with the development of stylistic traditions, the issue of place-attribution has generally assumed secondary importance. Instead the history, development and relationship between wares have mostly been considered in relation to the artistic evolution of decorative forms: debasement or evolving complexity, or in terms of historical interpretation of specific aspects of symbolism and iconography. One of the important characteristics of the discipline of Islamic ceramic art history is that individual ceramic vessels are treated as type-cases that can be used to expand the information available about the technical or stylistic tradition to which that vessel belongs. In this sense, factors such as a vessel's intended use, how it was disposed of, its relative importance in relation to other products within an assemblage, and even its provenance and dating, all assume a secondary importance. In short, contextual detail may well be of interest to the discipline of Islamic ceramic art history, but such information is not central to its operation. In this sense conventional approaches to the study of Islamic ceramics are at odds with those of archaeology.

Another in-built factor in the discipline of Islamic ceramic art history is the subject's chronological focus. Because of the relatively non-embellished, often 'utilitarian' character of the majority of ceramics within the Persian Gulf region dated to the period before the early 9th century, Sasanian and Early Islamic ceramic have by comparison to later material been relatively neglected (Huff, 1987: 307). To some extent this holds true for research on the Sasanian period more generally. "The archaeology of the Sasanian empire (224-642 C.E.) remains a frustratingly underdeveloped field of study...rigorous comparative study of the empire's material culture (as opposed to its fine arts) is still in its infancy" (Walker, 2009: 148). Such problems seem to be compounded by the highly regionalised character of the Sasanian ceramic assemblage (Simpson, 1997: 74; Trinkaus, 1984: 45-46, see also Puschnigg, 2006 for a useful recent summary of Sasanian ceramic research). A statement by Arthur Lane succinctly encapsulates the general perception: "it may be fairly said at once that before the 9th century Islamic pottery was of almost negligible interest" (Lane, 1947: 5). Imposing chronological constrains of this nature creates obvious difficulties for the use of ceramics as a tool for understanding longer-term processes of historical and economic transformation within the later historic period.

Today the discipline of art history appears to be becoming increasingly aware of some of the scientific limitations of its approaches. Watson sets out a range of pertinent issues (Watson, 2004: 11-21). Art historical study of Islamic ceramics deals only with what are commonly regarded as the most technologically sophisticated or aesthetically refined products. Typically this includes decorated glazed ceramics and occasionally some moulded, painted or incised decorated coarse wares. As Watson clearly acknowledges, these make up only a tiny proportion of the full range of ceramic products that circulated at different levels of society and across a broad spectra of activity (Watson, 2004: 11). At the same time, Watson justifies focusing explicitly on "those [wares] at the very tip of an enormous industrial pyramid" because he regards 'fine' ceramics as being potentially the most culturally sensitive. Finewares provide "insight into cultural worlds of the past in a way that their more functional counterparts cannot hope to match" (Watson, 2004: 12).

The rationale behind the 'cultural pyramid' argument is easy to appreciate. Ceramics that display the greatest sophistication would have been imbued with the most thought and consideration by their makers and could potentially provide the most sensitive reflection of elite taste, which itself was often the driver of contemporary fashion across the rest of society. Looking at this construction more critically, it seems that it may actually carry with it significant dangers. Most obviously, defining what is a 'fine' product and therefore worthy of study and what is not, is ultimately an arbitrary process and the likelihood of imposing a meaningless value-judgements seems great (Raby & Vickers, 1986: 221). As has been acknowledged, the selection of 'fine' products has been heavily influenced by arbitrary trends in collectors' tastes, which have shifted over the course of time and have in turn impacted on the types of ceramics salvaged, circulated, collected and discussed (Watson, 2004: 18). Contemporary museum collections are likewise simply an artefact of this process and cannot be regarded as an accurate reflection of the various kinds of ceramics originally in circulation or of broader trends expressed in the societies from which they are drawn (these arguments are set out in detail with supporting evidence by Heath, 2007: 108-09, 146).

No doubt the discipline of art history will continue to redress these issues by developing an ever more inclusive approach toward the overall ceramic corpus. Nevertheless, there

are significant unintended consequences of giving special emphasis to the most technically sophisticated or elaborately decorated products. One, appears to be, to potentially elevate the value and significance of such material. This process permeates through much of the discourse connected to the interpretation of Islamic ceramics. Abbasid blue-on-white or Lustre Wares, for example, are almost universally regarded as 'luxury' products and markers of elite consumption by art historians and archaeologists alike (e.g. Tamari, 1995; Frifelt, 2001: 33; MacLean & Insoll, 2003; Mason, 2004 and many others). What these interpretations ignore is the fact that:

- Ceramics generally occupy a low position within the social hierarchy of specialised craft production (for a useful ethnographic commentary on this see Posey, 1994).
- Technically elaborate production procedures and refined decoration are capable of replication on a mass scale. Furthermore the repetitive and highly derivative designs commonly encountered on pottery may not be well suited to study as a form of cognisant 'art'.
- The quantities of sherds of products such as Lustre Ware encountered archaeologically, the broad geographic distribution of the material, and the strong degree of standardisation of forms and decoration, all point to the fact that this pottery is likely to have been manufactured in numbers of tens of thousands or possibly millions of items (Priestman, 2011b).
- The archaeological find contexts for products such as Lustre Ware (OPAQ.L#) or cobalt decorated Opaque Glazed Ware (OPAQ.C) reinforce the impression of wide availability, with pieces, for example, recovered from the bottom of mine shafts or churned up amongst domestic refuse scattered as manuring material on fields in Oman (Whitcomb, 1975: 125-26, figs. 5: w-z; 7: k-l).

An even more significant issue of concern is what the 'tip of the pyramid' ignores. Whatever measures one uses to define 'fine' ceramics, the unavoidable fact remains that the vast mass of undecorated or less decorated material make the most significant contribution to the cultural record of the past. In its most direct form, this contribution can be measured in terms of the far larger quantities of coarse wares used and produced.

For example in the quantified ceramic study from Kush/al-Mataf in the United Arab Emirates, glazed wares account for between 4 - 14% of the entire ceramic assemblage, and a large proportion of these are associated with types most likely designed for common usage (Kennet, 2004: fig. 46). This point takes on added significance within the context of Indian Ocean trade. As will be discussed in specific terms below, less embellished ceramics circulated very widely from their production source and seem likely to account for a far larger share of cargo bulk than finewares throughout the period under consideration. While it would be difficult to establish which categories of ceramics provided the greatest economic return, in terms of the more measurable constructs of cargo bulk or overall volume of exchange, it would seem that the small fraction of finewares make a minimal contribution.

Finally and perhaps most significantly of all, is the potential role that ceramics might play in enabling a systematic reconstruction of various aspects of the past, or put in another way: "insight into cultural worlds" (Watson, 2004: 12). This covers a variety of different areas. Ceramics were used across most sections of society and for a wide range of different purposes, ranging from food preparation, serving, storage or transportation, to all manner of small or larger-scale industrial processes, ritual performance and even occasionally perhaps, social aggrandisement. To add complexity, none of these functional categories appear to be particularly fixed, and often vessels were used for multiple purposes or transferred across functional spheres[15]. As a resource for understanding past activity, whatever its complexities, the value of ceramics is best measured not so much in terms of exceptional qualities, but simply as a marker of routine activity. Whatever particular angle one wishes to adopt, as soon as ceramics are seen as a tool to broader interpretation, not simply a manifestation of human ingenuity, it seems clear that *all ceramics* from a storage jar to a fine lustre bowl essentially hold equal value. Certainly within the sphere of economic history, there seems no reasonable justification for excluding the largest contributors to the ceramic record.

[15] A good example includes Torpedo Jar (TOTP.S) amphora vessels that were presumably initially used primarily for the waterborne transport of liquid commodities such as wine (Simpson, 2003: 354-55), which were later re-used – particularly in the Bushehr area – as ossuaries and placed in alignments in the ground in cemetery areas (Simpson, 2007: 153-57).

2.2.2 Archaeological Approaches

The treatment of ceramics within the discipline of art history, and the embedded preconceptions that arise from that treatment, have had a significant impact on the course of development taken within the younger field of archaeology. If one traces this back to the development of archaeology in the Middle East in the 19th and early 20th century, early excavations that included significant Islamic period occupation focused on mining deposits only for those finds that matched the interests of the Islamic ceramic art market. Important examples include the highly selective assemblages of finds retrieved and presented in publication from the excavations at Susa (Koechlin, 1928a), or Samarra (Sarre, 1925). These early finds tend to be presented with minimal attention to find context and no discussion of the selection criteria applied in relation to the wider finds sample.

An increasing focus on stratigraphic recording in excavation[16] and the on the detailed study of changing artefact typology during the earlier 20th century, encouraged further uses of ceramic finds specific to the interests of archaeology. The use of ceramics as a tool for dating archaeological deposits has been a particularly significant factor. One could also point to expanding interests through the 20th century in ceramic production, ceramic distribution and ceramics as a marker of certain types of activity or social status. Within the context of Indian Ocean archaeology, there has been an obvious focus for many decades on long-distance exchange and the use of ceramics as a marker of trade relations (for a few early examples see Koechlin, 1928b; Hobson, 1932; Lane, 1947).

At the same time, it could be argued that the weight of scholarship built up around art historical approaches and methodologies within the field of Islamic ceramic research, and the way the field is embedded within existing institutional frameworks, means that the default position has been for archaeologists to defer to the expertise of art historians or for art historians to partially apply themselves to field of archaeology (e.g. Bivar, 2000). The result is clearly manifest in the ceramic finds publications traditionally associated with Middle Eastern archaeology or indeed those of the wider western Indian Ocean area.

[16] This gained particular impetus through the influence of Wheeler and Kenyon (Hawkes, 1982; McIntosh, 2004).

Generally these include only a selective body of finds, give most attention to decorated 'fine wares' and fail to acknowledge the central significance of ceramic quantification (e.g. Schenk, 2001; Hardy-Guilbert, 2005; Salles, & Sedov, 2010). Faced with large quantities of pottery typically associated with excavations in the Middle East, the accepted course of action has been to rely on the experience and perceptive ability of the finds specialist to select out the most 'important looking' finds, and to present a narrative summary of the material backed up by appropriate illustration. If this formula appears essentially effective for answering basic questions of site chronology, or describing the main elements represented within an assemblage, no real pressure exists to record ceramics in further detail. While the influence of art history may not be the only contributing factor to the persistence of selective finds treatment, and the general absence of quantification that has characterised traditional ceramic research within the region, it is at least the contention advanced here that this has been one of the central contributing factors.

The now considerable body of technical scientific studies of Islamic ceramics have also tended to follow the same conventional value paradigm. Most studies have focused on what are perceived to be the most technically sophisticated or aesthetically refined products[17]. Again a restricted focus on the most elaborate decorative techniques such as lustre has been justified on the grounds that such products represent the 'cutting edge' of medieval alchemy and 'science' (Caiger-Smith, 1985). While such studies help to expand our understanding of certain distinctive technical aspects of the ceramic production, the results, by definition, cannot necessarily be related to the bulk of material encountered in common use within the archaeological record.

An additional factor associated with the traditional *modus operandi* of Sasanian and Islamic ceramic publications, is the approach taken to ceramic classification. There are two aspects to this. The first relates to the process of non-systematically selecting a small sample of what are regarded as the most informative pieces from a larger body of material. Typically this might presented on the basis of selected illustrations of diagnostic

[17] e.g. Frierman, Asaro & Michel, 1979; Rawson, Tite & Hughes, 1987-88; Mason, 1991; Mason & Keall, 1991; Kleinmann, 1991; Mason, 1997a; 1997b; Mason & Tite, 1997; Tite, *et al*. 1998; Hallett, 2000; Hill, Speakman & Glascock, 2004; Mason, 2004; Wood, *et al*. 2007; Pradell, *et al*. 2008a; Pradell, *et al*. 2008b; Wood & Tite, 2009; Wood, Doherty & Rosser-Owen, 2009 and many others.

forms plated up by excavation phase or vessel type, and accompanied by short individual sherd descriptions (e.g. Whitcomb, 1985a; Kervran, 2004). Another format that has sometimes been adopted has been to separate out each of the main variables: fabric, vessel forms, decoration, etc., and to present information on each in its own section within a report (see for example Adams, 1970). What both approaches essentially avoid is the same thing. That is, for a full and accurate description of the key attributes related to each class of ceramics recognised within an assemblage to be formally stated. This in turn creates substantial problems with identifying particular varieties of ceramics, systematically extracting information on those categories from published reports, and establishing secure associations between the same varieties of pottery found in different assemblages.

The second factor relates to the process of correlating the categories of ceramics identified in the archaeological record, to those more widely recognised within the field of art history. Most of the conventional terms used to describe different categories of ceramics relate to specific decoration techniques (for example Slip-Painted Ware, Sgraffiato, Splashed Glazed Ware, etc.). While such terms clearly retain a useful descriptive value, they do not necessarily correspond to categories manufactured in a particular time and place. Indeed, the reality is often complex with decoration techniques being widely copied between multiple production centres, or multiple decorative techniques being applied in parallel. A good example of the latter is provided by the excavated glazed ware assemblage from Sirjan where Slip Painted Wares, Opaque Glazed Wares and Monochrome Sgraffiato all occur in association with the same distinctive forms and characteristic local fabric (Morgan & Leatherby, 1987: e.g. figs. 9: 5-6; 24: 1-7; 35: 10). The inherent danger of treating these stylistic schools as monolithic categories is that of missing the core relation between sets of material based on place of production and date. Such relations are only likely to be established through the more painstaking process of classifying ceramics based on a suit of combined attributes, most significantly fabric.

Various elements appear to have come together over a long time period since the inception of Sasanian and Islamic period archaeology that inhibit the development of a

broad understanding of ceramics in this region and time period. It is the contention advanced here that they include, and really begin with, the biases developed in the field of art history, which singles out the most elaborately decorated pieces and assumes that these are expensive luxury goods used by an elite and created by artisans with active cognisance of the contemporary language of religious, political and social symbolism, which they manipulated within their designs. Such core assumptions have impacted fundamentally on the younger discipline of archaeology, resulting in a general disregard toward the central importance of the full spectrum of ceramics and of ceramic quantification. This, in turn, detracts from our understanding of the relative importance of different varieties of ceramics and especially the main contributors to the ceramic assemblage – coarse wares – which have generally been relegated to an inferior position or altogether ignored. These factors have on the whole influenced the course taken during the excavation of Sasanian and Islamic period archaeological sites within the Persian Gulf region throughout the majority of the 20th century and often up to the present day. Only very recently has there been a significant and growing shift in practises, which we will return to below.

2.2.3 Implications for Indian Ocean Research

Because of a range of factors, which we have attempted to explain, key studies of large and representative ceramic assemblages undertaken at the point of source of Middle Eastern ceramic exports have tended to pay less attention to common coarse wares, and have been largely unable to offer any form of standardised classification, even for many glazed wares. This has had clear consequences for ceramic studies undertaken more widely within the western Indian Ocean. Two sorts of responses can be seen. In small assemblages where there is generally less opportunity to clearly define the range of products represented, often only the most conspicuous categories have been identified[18]. The possibility of missing drab varieties of coarse wares altogether seems substantial. In any case, the identification of pottery is likely to follow the same procedures as are

[18] See for example sites in the Comoros (Wright, 1984), Chibuene in Mozambique (Sinclair, 1982), Unguja Ukuu in Zanzibar (Juma, 2004) or al-Shihr in Yemen (Hardy-Guilbert, 2001; 2005).

applied within the Middle East more generally, with generic categories identified in a narrative format and more specific descriptions given for individual illustrated sherds.

The second type of response, particularly for larger assemblages of imports, has been to handle the material largely on an individual site basis. Key examples include important ceramic studies undertaken on the assemblages from Kilwa, Manda and Shanga in East Africa (Chittick, 1974; 1984; Horton, 1996b) and Sanjan in India (Nanji, 2007; 2011). In each case the author has sought to develop an essentially independent classification based on the particular contents of the site assemblage, linked where possible to similar categories encountered elsewhere. This process of linked association is critical and depends on the quality of information available and more than anything else, the effective transfer of knowledge. This point is particularly pertinent within the context of research on such a large and geographically diverse area as the Indian Ocean. Quite naturally archaeological research in different parts of the Indian Ocean has developed along independent trajectories, and the exchange of knowledge, where it occurs, often seems to have been uneven.

One example from East Africa usefully illustrates this point. This involves a distinctive class of coarse wares manufactured at Siraf during the 9th – 10th centuries, which has been found on a number of sites in East Africa, often in substantial quantities (see classes HARLIM, REBROS and CREAC below). In this case, a specific transfer of knowledge occurred largely because Neville Chittick and David Whitehouse were both working on contemporary port assemblages of Manda and Siraf at the same time, and were able to recognise the point of association through personal communication. As a result, the otherwise little-known category of Sirafi coarse ware, was positively identified within the Manda publication (Chittick, 1984: 83-84) and has subsequently been recorded in East African assemblages elsewhere (for example Wilding, 1977: 219-24; Horton, 1996b: 296-97; Juma, 2004: 113). Conversely exactly the same category of material has gone unrecognised in South Asian archaeology or even within contemporary studies undertaken within the Persian Gulf (Nanji, 2011: e.g. 'WSPW' 62-64; Carter, 2005: e.g. figs. 4.1: 18-20; 4.5: 4-5).

This example highlights the benefits accrued via effective information dissemination and the need to systematically collate information on the common varieties of ceramics exported from the Middle East. The general inability to bring together clear information on standardised categories of Middle Eastern trade ceramics has other consequences, notably the patchy and uneven identification of material in different regions, and the heavy reliance on just a few of the most obvious and widely recognised ceramic markers. Indeed, when one looks at the wealth of ceramic evidence for Late Antique/Medieval ceramic trade in the Indian Ocean, it is clear that we are still looking at a largely untapped resource. So far most of the work undertaken has simply been to note the existence of exotic imports in different areas of the Indian Ocean, or to cross reference ceramic imports from particular site assemblages. Far less attention has been given to collating this evidence, or to considering the total distribution of different categories, the quantities of these imports in different areas, and how these factors shifted through the course of time. Similarly very little attention has been given to the composition of ceramic exchange in relation to vessel forms and functions. Where such work has been attempted, so far only the most widely recognised categories have been considered. Notable examples include studies of appliqué decorated Turquoise Alkaline-Glazed Ware jars (TURQ.T, Type JR5) in the eastern Indian Ocean (Ho Chuimei, 1995; Glover, 2002), or Sasanian and Islamic period Torpedo Jars (TORP.S) in South Asia (Tomber, 2007). Even with these examples, many more published examples of both ceramic classes exist in the extant archaeological literature that have not yet been drawn into the discussion, largely due to issues surrounding reliability of identification.

Where major progress has been made with charting the broader distribution of particular varieties of export ceramics, this had mostly been through the direct research of particular individuals visiting particular sites or re-inspecting archived collections (see for example Tomber, 2007; 2008). While tracking the distribution of individual products continues to offer rich potential, it remains difficult to place these products within their broader context without developing a better appreciation of the composition of the ceramic assemblages in which they are located. Shifts in such composition are essential to understanding the evolving place of ceramics as an exchange item and ultimately the role of ceramics within the broader maritime economy. Again these arguments indicate

the shortcomings of selective, non-quantified approaches to ceramic classification and recording, and highlight the need for an integrated system of ceramic classification covering the full spectrum of products in common circulation.

2.3 An Integrated Indian Ocean Ceramic Classification

Having outlined the various interconnected issues and perceived shortcomings associated with conventional ceramic studies undertaken within the Middle East and their impact on our knowledge of ceramic exchange within the wider western Indian Ocean, the aim of this section is to set out the framework capable of facilitating direct intercomparison of ceramic assemblages between different areas of the western Indian Ocean. The implementation of what will be termed here, the 'Integrated Indian Ocean Ceramic Classification' or IIOCC, is an innovative approach, which while having previously been informally discussed on a number of occasions[19], has never actually been attempted for the time-period and region covered by this study. At the same time, the ideas upon which this concept is based have close parallels in other areas of the world and much of the background to the work has arisen from existing research that will be outlined in further detail below.

The task of generating direct comparative analysis requires that where the same varieties of ceramics occur in different assemblages, this relationship is formally recognised. The process of verifying such associations is complex. The most reliable form of visual matching can be achieved when pieces of pottery are compared directly against one another. This is particularly important in the case of coarse wares that often vary only in terms of subtle details such as texture, hardness or the appearance of coarse inclusions. Because of the wide physical separation of assemblages between many different countries and institutions, and indeed because of the large volume of ceramic finds from excavations and the required internal organisation of assemblages, such physical matching is generally impossible to achieve. Even where physical comparison may be possible, the only way to ultimately confirm whether different pieces come from the same production source is to employ techniques such as thin section analysis or various

[19] Derek Kennet, Axelle Rougeulle, Hélèn Renel, Robert Carter, Tim Power, pers. comms.

types of chemical composition analysis. The time, expertise and investment required to perform such techniques means that in reality they can only ever be used in limited and extremely selective cases. In order to deal with large assemblages rapidly, it will continue to be necessary to rely on basic techniques of visual matching as a primary tool in establishing class groupings. The effectiveness of such an approach, and the ability to establish cross-assemblage associations, is greatly enhanced by the use of detailed and standardised recording, description and illustration procedures. These aspects are described in further detail below (**Sections 2.3.5-6**).

The IIOCC presented here has been generated by combining the results of several previous studies, in particular work undertaken by Derek Kennet on the neighbouring settlement of Kush and al-Mataf in Ras al-Khaimah in the United Arab Emirates (2004), and this author's subsequent work on assemblages from southern Iran (**Fig. 2.1**) and the broader western Indian Ocean (Priestman, 2005a; Carter, Challis, Priestman & Tofighian, 2006; Kennet, Priestman, Khosrowzadeh & Aali, 2006; Priestman, 2011a; Priestman & Kennet, forthcoming; Priestman, forthcoming). Although this work can be described quite simply and briefly, it is important to stress that the work itself represents the major intellectual investment, with multiple contributors, without which this study could not have been undertaken. As has been made clear, the ceramic evidence available from the Persian Gulf is broadly representative of the mix of products encountered more widely within the western Indian Ocean. By bringing this body of evidence together into an integrated system of ceramic classification, it is possible to generate direct comparisons between the ceramic assemblages from different areas. Information from East Africa, South Asia, Eastern Arabia and the Persian Gulf has been directly analysed here for the first time in order to consider changes in the content and composition across a broad spectrum of commonly exchanged ceramic products found in each of these widely separated geographic areas.

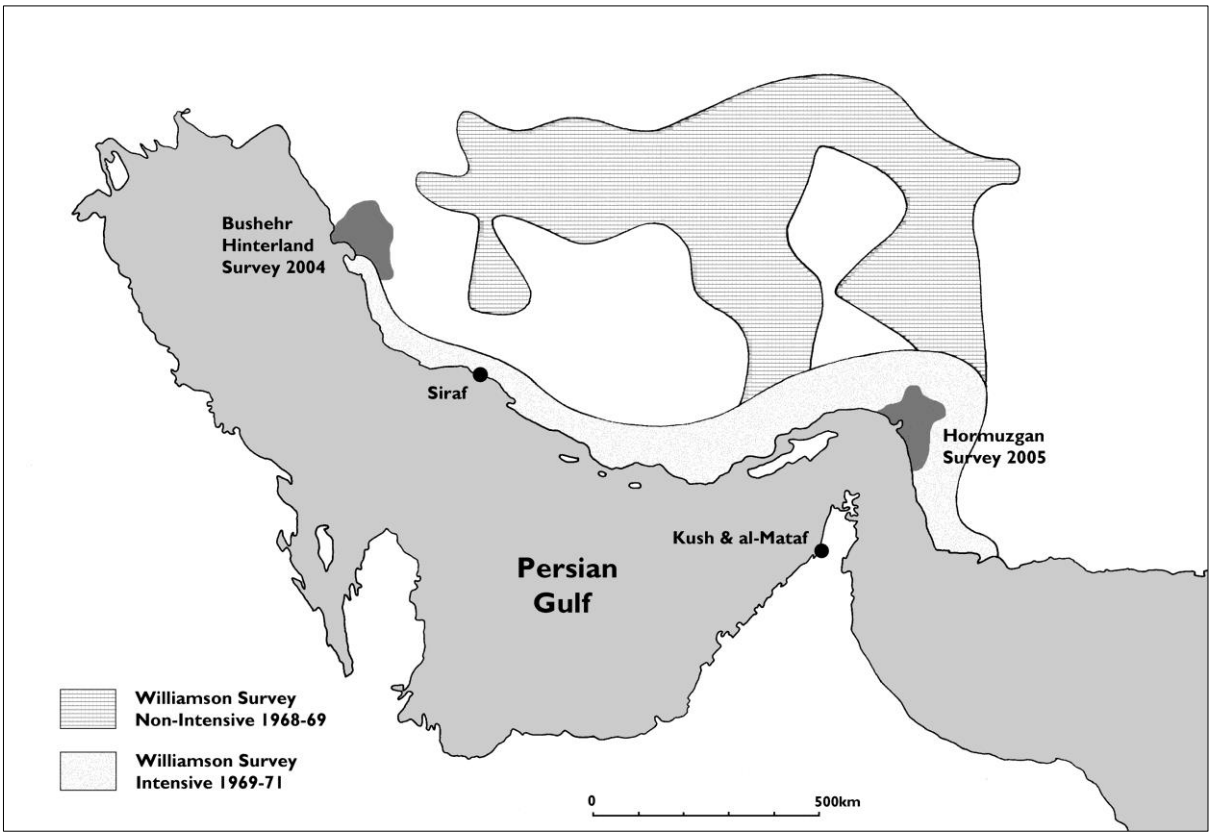


Fig. 2.1 *Map showing the location of sites and the areas covered by survey projects within the Persian Gulf that have produced ceramic assemblages that have contributed towards the formation of the Integrated Indian Ocean Ceramic Classification*.

2.3.1 Previous Work in Ras al-Khaimah

The foundation for this study is the ceramic classification developed on the basis of fieldwork undertaken in Ras al-Khaimah in the United Arab Emirates, involving a series of surveys and excavations completed over a period of 10 years between 1991 and 2001 (Kennet, 2004). A major component of this project involved the excavation of the deep occupation sequence spanning the c.4th/5th to 13th centuries at Kush and a study of the ceramic finds from the c.14th to 16th/ 17th century sequence from al-Mataf (Kennet, 1997; 2001; 2003). Combined, the two sites produced an assemblage of over 124,000 stratified sherds from the two main economic centres of the Ras al-Khaimah region (Kennet, 2004: tables 3-4, 7-8). The quantified assemblage, seriated by excavation phase, provides a significant insight into the changing composition of all varieties of ceramics through a period of c.1400 years.

Organisationally the approach to ceramic classification and recording implemented in the study of finds from Kush and al-Mataf represents an important departure in a range of key areas.

- The process of class categorisation was facilitated by physically re-sorting the ceramic assemblage to identify all of the main groupings and to provide the best visual match (for the assemblage from Kush non-diagnostic coarse ware body sherds were excluded from this process).
- Instead of selectively describing and illustrating pottery typically associated with different parts of the excavation, all recognisable groups of pottery were classified and all sherds were quantified.
- The classification of the pottery was relationally structured. The significance of this point is potentially easily overlooked but it is actually of central importance. Instead of providing a catalogue of selected pieces within the assemblage, which invariably results in generic descriptions that are of limited value for detailed identification purposes, a category of pottery was first defined, then described under one entry for the entire group, and then recorded in terms of its presence through relational referencing keys such as context numbers. Because of its overall efficiency and the manner in which information is recorded, this approach enables (and encourages) far more detailed information to be recorded. It also provides an effective format for clearly setting out the relationships between classes, and internal variability that constitute the parameters of definition for a particular class. This in turn opens up the potential for ceramic classes to be reliably identified elsewhere on the basis of published descriptions.

While emphasising the important features that characterise the Kush/al-Mataf study, the intention is to acknowledge but not to overstate the significance of the work. Clearly the study draws on features that were already to a greater or lesser extent manifest in existing ceramic studies and which are already well established practises in other regions; perhaps, most notably, those associated with the Roman period in the Mediterranean or medieval Europe. Even within the Indian Ocean, the study published nearly a decade earlier from Shanga in East Africa incorporates many of the same central components

(Horton, 1996b); namely, quantification, a relational format and physical sherd sorting to establish a more comprehensive and accurate visual classification. What is unique and important about the Kush/al-Mataf study is that this was the first time that the approach had been systematically applied and published for a Sasanian or Islamic period site from within the Persian Gulf. The work has also established a particular clear presentational model and associated methodology that is now increasingly being adopted as a template for work being undertaken across the wider region (see for example Priestman, 2005a; Nanji, 2011; Power & al-Kaabi, forthcoming).

2.3.2 Williamson Collection Project

The first opportunity to apply the Kush/al-Mataf framework within a broader geographic context arose with the study of a collection of around 17,500 mostly diagnostic sherds held by the Ashmolean Museum in Oxford from Andrew Williamson's surface survey of southern Iran (Priestman & Kennet, 2002; Priestman, 2003; 2006). Williamson's fieldwork was undertaken over a three-year period between 1968 and 1971 and involved the collection of grab samples of ceramics from the surface of over 1,200 Sasanian and Islamic period settlements along the coastal and inland regions of southern Iran (Williamson, 1971c: 1). The results of Williamson's survey remained largely unpublished due to Williamson's untimely death a few years after the survey was completed (Allan, J. 1987). In an effort to utilise the results from Williamson's pioneering study, all of the finds were transferred to the University of Durham in 2001 to be processed by the present author under the supervision of Derek Kennet.

Before the results of the Williamson survey could be analysed, all of the ceramic finds were registered on a database and as many as possible of the sites were relocated (**Fig. 2.2**). The ceramic assemblage was also physically re-sorted in order to identify the various class groupings. This provided the basis for establishing an independent classification specific to the characteristics of the collection. The classification was recorded using standardised-format class descriptions, drawings and photographs (Priestman, 2005a; Priestman & Kennet, forthcoming). For a significant component of the assemblage, the class categories developed appear consistent with those recognised from Kush and al-

Mataf. At the same time, a number of significant additions and amendments have been made in particular areas that take into account the different nature of the ceramic assemblage (**Table 2.1**). In general though, the level of inconsistency between the classifications arising from the Williamson or Kush/al-Mataf assemblages appears minimal, and where the most significant differences occur, this is often due to a particular category of material being more fully represented in one or other of the assemblages.

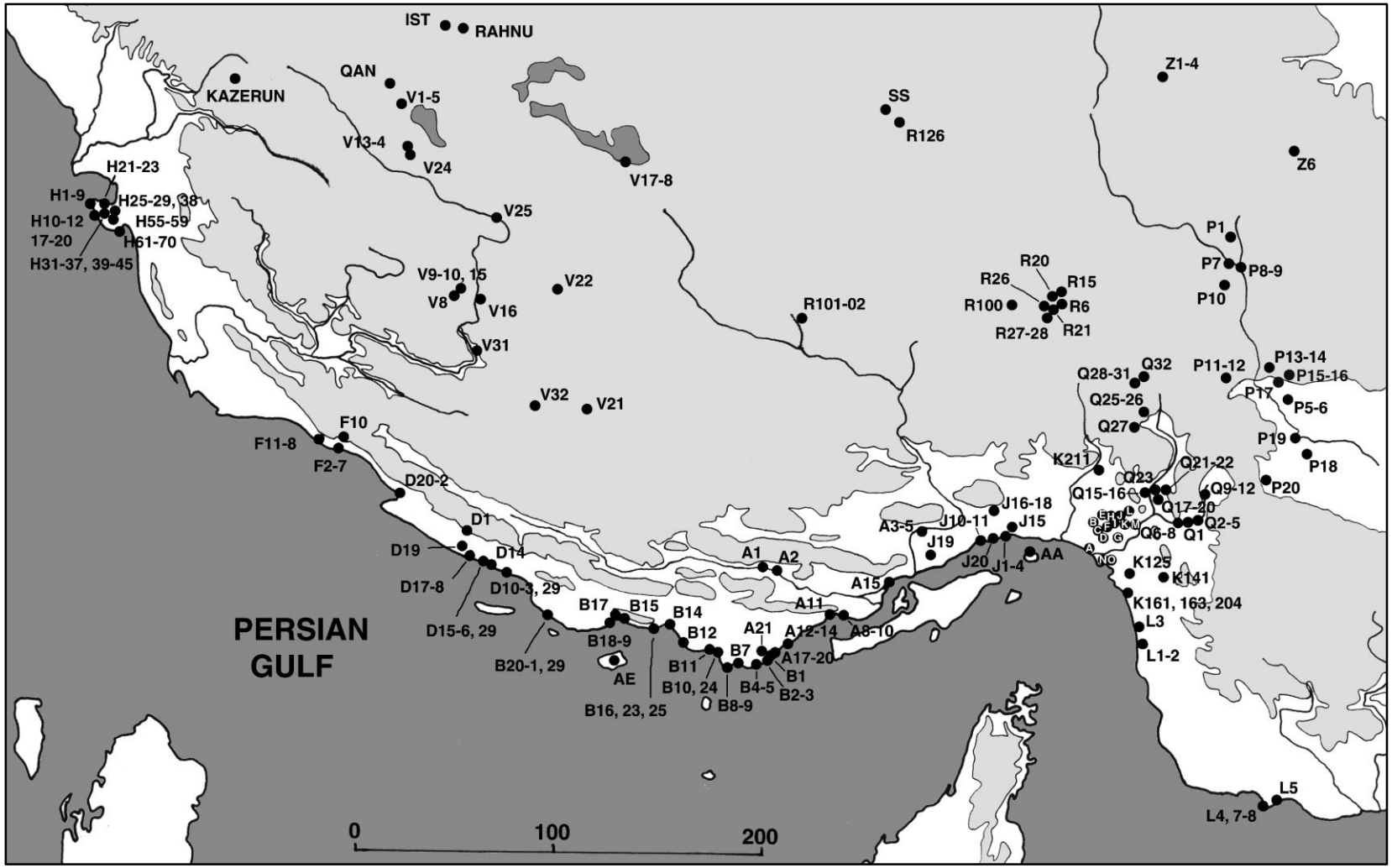


Fig. 2.2 *The Williamson survey of southern Iran showing sites re-located as part of the study of the collection. The map shows the major rivers and ground above 500ft (shaded in grey). The sites lettered A – M in the Minab area are: A = K7-8; B = K6, K70; C = K33; D = K9, K13; E = K19; F = K14-15, K66, K169; G = K143, K145; H = K20-25, K27-28, K62-63; I = K29-30; J = K40-43, K54, K67-69; K = K26; L = K1-2, K51; M = K162, 170; N = K103; O = K102, K130-31.*

2.3.3 Other Assemblages

Since completing the study of the ceramics in the Williamson collection, the resulting classification has been applied in a number of different settings (**Fig. 2.1**). Inevitably, as an increasing body of material is examined, and as new assemblages are encountered with their own particular strengths in certain areas, the classification itself has undergone further revision. This is effectively a continuous process that is likely to require further modifications for many years to come. At the same time, one can anticipate a trend whereby an increasing level of consensus should emerge in relation to the definition and understanding of the most standardised, common and widely distributed ceramic products. For now the rate of progress is still moving at a relatively fast pace, and with each subsequent study, new modifications need to be incorporated. The relevant studies include: work on the Sasanian and Islamic period finds from Sir Aurel Stein's survey of southern Iran held in the British Museum (Priestman, 2004)[20] and the Peabody Museum in Harvard[21]; field surveys in the Bushehr area (Carter, Challis, Priestman & Tofighian, 2006) and the Minab Plain (Khosrowzadeh, Aali, Kennet & Priestman, 2007; Priestman & Kennet, forthcoming)[22]; detailed work on a substantial sample of around 10,000 pieces of pottery in the British Museum from David Whitehouse's excavations at Siraf (Priestman, 2007; forthcoming)[23]; and most recently, work on the excavated assemblages from Manda and Shanga in Kenya, Sohar in Oman and Kush in the United Arab Emirates undertaken in preparation for this study (see more below).

[20] The work was undertaken during my time as Sackler Fellow in the Ancient Near East Department at the British Museum during a six-month period in 2003.

[21] Work on the ceramic finds from Sir Aurel Stein's survey of southern Iran in the Peabody Museum, Harvard was made possible by a travel grant awarded from the British Academy's Stein-Arnold Exploration Fund in 2006.

[22] The Hormuzgan Survey project was undertaken as a collaboration between the Iranian Centre for Archaeological Research and the University of Durham by Derek Kennet, Alireza Khosrozadeh, Seth Priestman and Abolfazl Aali in 2005 with support from the British Institute of Persian Studies.

[23] The British Museum Siraf project took place between 2007 and 2009 with the support of the British Institute of Persian Studies and the British Museum Challenge Fund.

2.3.4 British Museum Siraf Project

Of all the projects described above that have been undertaken subsequent to the study of the Williamson Collection, work on the ceramic assemblage from Siraf in the British Museum has been the most significant. Large-scale excavations at the medieval port of Siraf in southern Iran between 1966 and 1973 generated an assemblage of around three million ceramic finds from different areas of key activity within the city such as the Great Mosque, the city bazaar, residential quarters (Whitehouse, 1987: 1). In a manner that is truly exceptional for the period of the investigation, the stratigraphic recording from Siraf was carefully controlled and well documented including the full non-selective recording of the large ceramic finds assemblage. Unfortunately due to a variety of circumstances, the finds assemblage from Siraf has never been adequately published. A previous attempt to utilise some of the primary excavation records to provide an analysis of the ceramic finds data (Tampoe, 1989), makes a number of critical interpretive errors (see Kennet, 2004: 38) and in general the results from this work cannot be relied on with any assurance. In any case, the analysis attempted only covers selected elements of the excavations that were undertaken.

Fortunately a large and representative portion of the finds from Siraf was transferred to the British Museum as part of the finds division agreement (Whitehouse, 2009: 8). A study of this collection was undertaken between 2007 and 2009 (Priestman, 2007; forthcoming). The main aim of the project was to register and record the finds in the collection and to provide a detailed and accurate presentation of the ceramic finds assemblage typically associated with the site occupation sequence. As with the study of the Williamson Collection, the starting point for the classification and characterisation of the ceramic assemblage from Siraf was the pre-existing framework set out through the course of the studies outlined above. What Siraf has been able to uniquely contribute is a much more extensive corpus of material covering the peak period of the site's commercial activity between the 8th to early 11th centuries. Added to this is the status of Siraf as a leading hub of the Indian Ocean trade network in the Persian Gulf; a feature that is reflected in the particularly extensive range of imported ceramic products especially from East Asia and India. Finally, Siraf was itself a major producer and exporter of unglazed ceramics. The characterisation of the Sirafi coarse ware assemblage based on

a large body of source material, has enabled significant progress to be made in defining the standard 9th – 10th century ceramic assemblage represented throughout much of the Persian Gulf and western Indian Ocean.

2.3.5 Integrated Classification

The Integrated Indian Ocean Ceramic Classification presented below (**Table 2.1**) brings together the results of a number of previous ceramic studies. By working toward an integrated classification, which also includes information on the repertoire of common vessel forms (**Section 2.3.6**), the intention is to provide the broadest available base of knowledge. This can be employed in a number of different ways. As will be discussed more fully below, one of the specific aims of this study will be to move away from considering individual varieties of ceramics, and instead to try to reach an understanding of how the entire composition of ceramic exchange shifted through the period under consideration. Such an approach obviously depends in the first instance on a holistic view of the ceramic assemblage in circulation. In addition to this more ambitious aim, the IIOCC fulfils a range of more conventional functions including: the dating of site sequences to determine when individual sites were active; recording temporal changes in the relative frequency of specific varieties of ceramics to document changing patterns of ceramic consumption; and charting the distribution of particular varieties of pottery spatially to provide an indication of the direction, volume and composition of trade between different sectors of the Indian Ocean. Fundamentally our ability to interrogate any of these questions depends on the quality of information held regarding the definition and dating of the ceramic source material.

In all of the ceramic studies described above, the classification is based on characterisation of three main variables: fabric, type, and class. These terms are used exclusively to describe specific aspects of the ceramic classification. ‘Fabric’ is the material that a pot is made from. It pertains to the ceramic matrix, the inclusions, texture, hardness, etc. A ‘type’ is used to describe a distinct, recognisable and standardised element of a vessel form such as the rim, base or handle. A ceramic ‘class’ encompasses all of the other potential variables: fabric, type, surface treatment, decorative style, etc.

The definition of a ceramic class is a specific concept (Orton, Tyers & Vince, 1993: 67-86), the meaning of which needs to be clearly established. A ceramic class is a group of products that appear to be related in terms of the time and place where they were produced. At the most accurate level, this will include all of the products of a single kiln or workshop. Where such precision is not possible, it is more likely to include the products of a group of workshops producing similar material following a similar set of procedures but spread out over a wider geographic area. At the crudest level, it may include products that exhibit clear variability, but which display certain general traits that allow their general provenance and date to be established. The concept of the ceramic class is thus flexible and can change according to the type of information that one has available. This is necessary because the scale of ceramic production is subject to such extensive variation (Peacock, 1982), and because the available information on the origin of products is always going to be subject to variation in quality.

The important feature of a ceramic class that makes it distinct from the more widely applied term 'ware' is that the basis of definition is explicitly stated. An important component of the class description is a statement of how the class has been defined and the extent of consistency or variability that the class exhibits. Even the products of a single kiln or firing will display variability, and it is the purpose of the classification to establish the acceptable parameters of variation. In this sense, the term 'class' represents a deliberate attempt to disassociate the process of ceramic classification from the more generic usage that has been built up around the widely used term, 'ware'. In an accurate sense a ware should describe the product of a particular centre of production where the relation between those products has been clearly established. Instead the term is now commonly applied in many different contexts to describe technically related products, such as 'Lustre Ware' or – particularly in art historical literature – to describe stylistically related products such as 'Bojnurd Ware', where the provenance remains doubtful and where it is not even certain whether all pottery decorated in that style originate from a single source.

In practical terms, the definition of classes on the basis of the Williamson Collection and Siraf assemblages – as at Kush – has been implemented via the process of physical sherd

sorting (**Fig. 2.3**). That is the creation of a class through physically sorting and matching related sherds within an assemblage. The advantage of being able to work on the classification through direct visual comparison is significant. It is only really at this stage that it becomes possible to recognize the full range of variants represented within the assemblage and the extent of variation across individual class categories, fabrics and types. This is particularly important where an agreed classification has not already been established. Once a ceramic class has been defined, that category is documented in the form of a standardised class description combined with supporting photographic and drawn illustration (Kennet, 2004; Priestman & Kennet, forthcoming, Priestman, forthcoming).



Fig. 2.3 *Pottery from Siraf in the British Museum being laid out and sorted by class and type*.

The process of class naming also forms an important component of classification structuring process. All classes identified are given a full descriptive class name. These are then referred to by a shortened acronym of this title written in upper case letters (See **Appendix I**). Acronyms are designed in most cases to be pronounceable and in this way serve as a mnemonic making them more usable than a simple list of class numbers or letter strings (Orton, Tyers & Vince 1993: 59). Class codes also serve to provide a degree

of hierarchical structuring within the classification. In cases where a number of sub-classes have been defined within a broader class group, the class code is composed of a two-part string with a period separator. For example, with GRAF.H, 'GRAF' = Sgraffiato and 'H' = hatched, i.e. Hatched Sgraffiato. As far as possible, the class codes used by Kennet in the Kush/al-Mataf classification have been followed in subsequent studies (Kennet, 2004). Unfortunately, these codes were assigned on a piecemeal basis over a number of years and without giving attention to the issue of standardised syntax. As a result, there are inconsistencies in the way that codes have been constructed and applied. For example, all of the Frit classes follow the system outlined above. Kennet's Sgraffiato codes, on the other hand, are prefixed by the sub-class division followed by the major group designation, i.e. HGRAF for Hatched Sgraffiato. Similarly there are problems with class codes applied within Kennet's study that relate to vessel types such as Large Incised Storage Vessels (LISV), which actually belong to a broader class group including other vessel types including small jars and bowls. After some deliberation, a decision has been taken to change class codes where structure of the classification requires rationalisation. While this will inevitably cause some inconvenience and confusion, it is hoped that the measure will be of benefit in the long-term. A concordance between different naming and definition systems used up to this point is given below (**Table 2.1**).

Further modifications to the methodology applied during the Kush/al-Mataf study have also been applied during the subsequent studies that have been undertaken, particularly in the areas of fabric recording. In the Kush/al-Mataf classification, only seven fabrics are individually described (Kennet, 2004: 117). Although macroscopic identification of clay fabric remains a somewhat problematic exercise – particularly compared with the possibilities of more powerful methods such as petrology or 'chemical fingerprinting' techniques[24] – fabric represents one of the core variables, which when studied closely, aids significantly in areas of identification. In order to give greater importance to fabric characterisation, the fabric of all classes has been systematically recorded using conventional procedures. Particular attention is given to colour, texture/feel, porosity and macroscopic inclusions (i.e. those of c. >0.1mm). All macroscopic inclusions have

[24] Examples of the latter include instrumental neutron activation analysis or scanning electron microscopy.

been examined and described using a 10x achromatic hand lens. The following characteristics related to fabric and inclusions are recorded using various visual measurement aids:

- An approximate size range for inclusions is given using a set of callipers measuring to within 0.1mm.
- The degree of roundedness or angularity of inclusions is estimated from Powers' Scale of Roundedness (Orton, Tyers & Vince 1993: fig. A.5).
- The degree of particle sorting estimated using the Scale of Pebble Sorting (Orton, Tyers & Vince 1993: fig. A.6).
- The frequency of inclusions in the fabric matrix estimated using the improved white on black Visual Percentage Estimates charts (Matthew, Woods & Oliver 1991: 216-63).
- The range of colours represented within a fabric group is estimated using a Munsell Soil Colour Chart (Munsell, 1994). Where a wide range of tones is represented within a single fabric group, both extremes of the spectrum – from oxidised to reduced – is recorded. Where the colour range is narrow, a typical example is selected and recorded. All features related to fabric colour and inclusions are recorded through the examination of the fresh section break.

Even in the case described here of three relatively large-scale ceramics studies being undertaken in a similar region and period by two individuals working in close collaboration and deliberately building on the same classificatory framework, it is not always possible to achieve a clear integration of results. In large part this is because although continual cross-references have been maintained, each study has worked independently and within the specific parameters offered by the individual collections. Throughout all three studies, the definition of classes has been continually refined through further sub-division, re-amalgamation and renaming (**Table 2.1**). While this creates a situation of complexity for the user, what the process represents in reality is a body of knowledge in rapid flux. What is in effect starting to emerge is an increasingly refined and comprehensive view of a wide range of common varieties of ceramics that

circulated widely within the Persian Gulf region and wider Indian Ocean during the Sasanian and Islamic periods.

The IIOCC represents an attempt to capture the broadest possible range of classes that circulated within the Persian Gulf during the Sasanian and Islamic periods, from roughly the 4th – 19th centuries (**Table 2.1**). The table presented below provides a representation of the way in which particular groups have been subdivided, amalgamated or recombined based on revised information that has come to light at each stage of the study. Where clear consensus can be achieved after examining all three studies, this is either in the areas where a certain category of the ceramics is clearly and obviously defined, or where one of the studies makes a disproportionate contribution to the definition of that class. In the areas where consensus is more difficult to reach, this is inevitably in the areas that are by their nature, more difficult to define. Finally the table attempts to include within the IIOCC only those classes that appear to be relatively coherent and well defined. Cells shaded in grey indicate instances where the class has not been recorded or where it has been discontinued within the IIOCC. These are classes that appear to be poorly defined and which offer little likelihood of being recognised elsewhere. Also excluded are all classes in the Williamson Collection study that pre-date the Sasanian period. These classes cover a patchy and non-systematically defined group within the survey collection dated to between the 5th millennium BC to the Parthian period (Prickett & Williamson, 1970). All classes included within the IIOCC are listed below. The full description of classes and associated illustration is due to appear in publication elsewhere and will therefore not be reproduced again here (Priestman & Kennet, forthcoming; Priestman, forthcoming).

Group	IIOCC	Siraf	Williamson	Kush/al-Mataf	Date	Origin	Class Name
Early Plain Coarse Wares			SMAG.C				Small Grey Vessels, Group C
	HARLIM	HARLIM		BEARTH	7th-(early)9thC	Southern Iran	Black-Fired Earthenware
			SMAG.A	SMAG	6th-8thC	Southern Iran	Hard Lime Spalled Vessels
			LISV.A	LISV			
	FINLIM	FINLIM			6th-8thC	Southern Iran	Fine Lime Spalled Vessels
			LISV.FI				Large Incised Storage Vessels, Fine Fabric
	HARLIM.E		LISV.B		4th-6thC?	Southern Iran	Early Hard Lime Spalled Vessels (catchall category created for IIOCC)
			CLINKY	CLINKY			
			SMAG.B				
			SMAG.C				
	REBROS	REBROS	SMAG.RC (some)		(late)8th-10thC	Siraf	Gritty Red/Brown Slipped Ware
				RBSLIP			
	BEARTH			BEARTH			Black-Fired Earthenware
	FLAKEY			FLAKEY	7th-8thC?		Flaky Earthenware
			GRIT				Grit Tempered Ware
			GRIT.LV				Large Grit Tempered Vessels
			FIG				Fine Grit Tempered Ware
			FIG.LV				Large Fine Grit Tempered Vessels
			VITFIG				Semi-Vitrified Fine Grit Tempered Ware
	CONG.G				3rdC-8thC?	Southern Iran	Grey 'Conglomerate' Coarse Ware
			CORVIT				Coarse Semi-Vitrified Ware
			FINT				Fine Non-Tempered Ware
			FINT.B				Fine Non-Tempered Ware, Group 'B'
			FINT.LV				Large Fine Non-Tempered Vessels
	CREAC	CREAC	GROG (some)		(late)8th-10thC	Siraf	Grog Tempered Ware
			GROG.LV				Large Grog Tempered Vessels
			ORG.H				Hard Organic Tempered Ware
			ORG.I				Intermediate Organic Tempered Ware

Group	IIOCC	Siraf	Williamson	Kush/al-Mataf	Date	Origin	Class Name
			ORG.S				Soft Organic Tempered Ware
			ORG.HS				Handmade Soft Organic Tempered Ware
	ORGPIN				7thC-9thC	Oman	Pink Organic Tempered Ware
Buff Coarse Wares	TORP.S	TORP.S	TORP.1	TORP	3rd-10thC	Iraq	Sandy Torpedo Jars
			TORP.2				
			TORP.3				
			TORP.4				
	TORP.RG	TORP.RG			(mid)8th-10thC	Iraq	Red Grit Tempered Torpedo Jars
	TRC		TRC.1		3rd-10thC	Iraq	Torpedo Related Class
			TRC.2				
	SPORC	SPORC			(late)8th-10thC	Iraq	Soft Porous Cream Coloured Ware
	HONEY	HONEY	HONEY	HONEY	8th-9thC	Iraq	Honeycomb
				HONEYF			Honeycomb Fabric
	STAMP	STAMP			8th-9thC	Iraq	Stamp Marked Jars
	RUST	RUST				Iraq	Rusticated Ware
	EGG.R			RED.EGG	9th-11thC	Iran?	Eggshell Ware, Red
	EGG.PI	EGG.PI	WINC	EGG	8th-10thC	Iraq	Eggshell Ware, Plain or Incised
	EGG.M	EGG.M			8th-10thC	Iraq	Eggshell Ware, Moulded
	WHITE.PI	WHITE.PI		WHITE.C & F	(mid)8th-12thC	Iraq	White Ware, Plain or Incised
	WHITE.M	WHITE.M	MEW.C		12th-13thC	Iraq	White Ware, Moulded
			MEW.CC				
	MEW.MO		MEW.MO		12th-13thC	Southeast Iran	Ewer Moulds
	WHITE.A				(mid)8th-12thC	Iraq	Applique Decorated White Ware
	MEW		MEW.LG		12th-13thC	Southeast Iran	Light Grey Moulded Ewers
			MEW.DG				Dark Grey Moulded Ewers
			MEW.O				Orange Moulded Ewers
			MEW.BR				Brown Moulded Ewers
			MEW.MF				Misfired Moulded Ewers
	BUFF.I	BUFF.I			10th-12thC	Iraq	Incised Decorated Buff Coloured Ware
	BUFF.S	BUFF.S			10th-12thC	Iraq	Stamp Decorated Buff Coloured Ware

Group	IIOCC	Siraf	Williamson	Kush/al-Mataf	Date	Origin	Class Name
	BUFF.P	BUFF.P			(mid)8th-(late)10thC	Iraq	Pained Buff Coloured Ware
	FIBIC	FIBIC			9th-12thC	Southern Iran	Fine Incised Buff Coloured Ware
Fine Slipped Coarse Wares	FOPW.1	FOPW	FOPW.3?	FOPW.2	3rd-6thC	Southeast Iran	Fine Orange Painted Ware, Group 1
	FOPW.2		FOPW.1	FOPW	3rd-6thC	Southeast Iran	Fine Orange Painted Ware, Group 2
			FOPW.2				Fine Orange Painted Ware, Group 2
			FOPW.4				Fine Orange Painted Ware, Group 4
	SLIP.R	SLIP.R	SLIP.R		2nd BC-6thC	Southeast Iran	Coarse Red Slipped Ware
	SLIP.B		SLIP.B		3rd-8thC	Southern Iran	Coarse Black Slipped Ware
	SLIP.TB		SLIP.TB		3rd-8thC	Southern Iran	Thick Brown Slipped Ware
	SLIP.PBR		SLIP.PBR		Not known	Southern Iran	Painted Brown Slipped Ware
Hand Made Coarse Wares	CHAM	CHAM	CHAM.1		Not known	Southern Iran?	Crude Handmade Ware
			CHAM.2				
			CHAM.3				
				PROTO+ JULFAR.5			
	CHAM.N-ID	CHAM.N-ID	HM.N-ID		Not known	Southern Iran	Non-Identified Crude Handmade Wares
			HMP.N-ID				
			WMP.N-ID				
	JULFAR.RW	JULFAR.RW	JUL.RW	JULFAR.1	(late)15th-17thC	Julfar	Julfar Ware, Red & White Painted
	JULFAR.PB	JULFAR.PB	JUL.PB	JULFAR.2	16th-17thC	Julfar	Julfar Ware, Purple Painted
	JULFAR	JULFAR	JUL	JULFAR.3	14th-16thC	Julfar	Julfar Ware
				JULFAR.4			
				THIN			
			JUL.RC				
	HMPW.1	HMPW.1	PAW.SCC		11th-13thC	Southern Iran	Handmade Painted Ware, Group 1
	HMPW.2	HMPW.2			11th-13thC	Southern Iran	Handmade Painted Ware, Group 2
	HMPW.BST		PAW.BST		3rd-6thC?	Southeast Iran	Brittle Stone Tempered Painted Ware

Group	IIOCC	Siraf	Williamson	Kush/al-Mataf	Date	Origin	Class Name
	HMPW.CC		PAW.CC		11th-13thC	Southern Iran	Handmade Painted Ware
	HMPW.ORG		PAW.ORG				
	HMPW.RB		PAW.RB				
	HMPW.SA		PAW.SA				
	INCIMP		INCIMP		17th-19thC	Hormuz Island	Incised and Impressed Ware
	INC.M	INC.M			14th-15thC	Hormuzgan	Minab Incised Ware
		SURLIN					Fired Clay Surface Lining
Late Plain Coarse Wares				BUFF			Buff
	REGTEC	REGTEC			12th-15thC	Southern Iran	Red-Grit Tempered, Cream Coloured Ware
	HARC	HARC			12th-15thC	Southern Iran	Hard, Fine Cream Coloured Ware
	HAGRIT	HAGRIT			12th-15thC	Southern Iran	Hard Gritted Cream/Pink Coloured Ware
	CHOC		CHOC	CHOC	17th-19thC	Eastern Arabia	Chocolate Chip / Black Angular Inclusions
	LIME	LIME	LIME	LIME	14th-16thC	Bahrain?	Lime-Tempered
				LSANDY			Large Sandy White Storage
	WAPO			WAPO	12th-14thC	Eastern Arabia	Cream Pots with Incised Wavy Decoration
	SPOT			SPOT.C+SPOT.F	10th-12thC	Eastern Arabia	Spotty Ware
				REDSPEC	10th-12thC	Eastern Arabia	Red Speckled Ware
				WPINK			Pink & White
Indian Coarse Wares	IRPW	IRPW	IRPW	IRPW	7th-8thC	Gujarat	Indian Red Polished
	IRPW.RC	IRPW.RC			7th-8thC	Gujarat	Indian Red Polished Ware - Related Class
	BRISAN	BRISAN		PAINT	8th-10thC	South Asia	Painted Indian Earthenware
	SBBW	SBBW	SBBW	SBBW	7th-9thC	Gujarat	Black Burnished Ware
	LINVES	LINVES			8th-10thC	India	Large Indian Storage Vessels
	HARMIC		FIRE	FIRE	8th-10thC	South Asia	Fine Indian Red
		HARMIC	BPCR (some)	IRAB	8th-10thC	South Asia	Coarse Red Black Painted Ware
	BUFRAB	BUFRAB	IRBS		9th-10thC	India	Buff Red & Black Ware
	IRAB	IRAB	IRAB		11th-14thC	Gujarat	Indian Red & Black
	INCOP	INCOP		INDIA	Not known	South Asia	Unclassified Indian Ware

Group	IIOCC	Siraf	Williamson	Kush/al-Mataf	Date	Origin	Class Name
			GIB		Not known	South Asia	Gritty Brown Ware
				RSLIP			Coarse Red-Slipped
African	EACOP	EACOP	EACOP		8th-10thC	East Africa	East African Cooking Pots
Alkaline Glazed	TURQ.YG	ALK.YG	ALK.2	TURQ.1	5th-(mid)8thC	Iraq	Yellow-Green Alkaline-Glazed Ware
				TURQ.2			
	TURQ.T	ALK.T	ALK.1	TURQ.3	(late)8th-(late)10thC	Iraq	Turquoise Alkaline-Glazed Ware
				TURQ.4			
			ALK.3	TURQ.5			
Glazed Mounded	GLAMO.Y	YEMO			(late)8th-9thC	Iran?	Yellow Glazed Moulded Ware
Opaque Glazed	OPAQ.W	OPAQ.W	TIN.W1	YBTIN	(early)9th-10thC	Iraq	Monochrome White Opaque-Glazed Ware
			TIN.W2				Opaque White Glaze with an Orange Body
	OPAQ.C	OPAQ.C	TIN.CT		(early)9th-(mid)9thC	Iraq	Cobalt Decorated Opaque-Glazed Ware
	OPAQ.WC	OPAQ.WC			(early)9th-(mid)9thC	Iraq	Bichrome White on Cobalt Opaque-Glazed Ware
	OPAQ.TS	OPAQ.TS	TIN.TBS	COBALT	(mid)9thC-10thC	Iraq	Turquoise Splashed Opaque-Glazed Ware
	OPAQ.TBS	OPAQ.TBS			(mid)9thC-10thC	Iraq	Turquoise & Black Opaque-Glazed Ware
	OPAQ.BT	OPAQ.BT			(mid)9thC-10thC	Iraq	Bichrome Black on Turquoise Opaque-Glazed Ware
	OPAQ.PS	OPAQ.PS			(mid)9thC-10thC	Iraq	Polychrome Splashed Opaque-Glazed Ware
	OPAQ.B	OPAQ.B			(mid)9thC-10thC	Iraq	Bichrome White on Black Opaque-Glazed Ware
	OPAQ.BW	OPAQ.BW		BTIN	(mid)9thC-10thC	Iraq	Black Decorated Tin Glaze
	OPAQ.T	OPAQ.T	TIN.T		(mid)9thC-10thC	Iraq	Monochrome Turquoise Opaque-Glazed Ware
			TIN.B				Opaque Monochrome Blue Glaze
	OPAQ.LG	OPAQ.MGL	TIN.ML	LUSTRE	10thC	Iraq	Opaque Glazed Ware with Monochrome Gold Lustre
	OPAQ.LR	OPAQ.MRL	TIN.PL		(mid)9th-(late)9thC	Iraq	Opaque Glazed Ware with Monochrome Ruby Lustre
	OPAQ.LP	OPAQ.PL			(mid)9th-(late)9thC	Iraq	Opaque-Glazed Ware with Polychrome Lustre

Group	IIOCC	Siraf	Williamson	Kush/al-Mataf	Date	Origin	Class Name
	OPAQ.N-ID		TIN.N-ID		(early)9th-10thC	Iraq	Non-Identified Opaque Glazed Ware
	OPAQ.CP	WHITE.CP			9thC	Iraq	Glaze Painted White Coloured Ware
Splashed Glazed	SPLASH.P1	SPLASH.P1	SPL.P	SPLASH	(mid)9thC-10thC	Iraq	Polychrome Splashed Glazed Ware, Group 1 - Cream Body
	SPLASH.P2	SPLASH.P2		YSPLASH	(mid)9thC-10thC	Southern Iran	Polychrome Splashed Glazed Ware, Group 2 - Orange Body
	SPLASH.GW1	SPLASH.GW1	SPL.GW		(mid)9thC-10thC	Iraq	Green & White Splashed Glazed Ware, Group 1 - Cream Body
	SPLASH.GW2	SPLASH.GW2			(mid)9thC-10thC	Southern Iran	Green & White Splashed Glazed Ware, Group 2 - Orange Body
				YSPLASH			Bright Yellow Splash
Sgraffiato	GRAF.EP1	GRAF.EP1	GRAF.EP		(early)10th-(mid)11thC	Iraq	Early Polychrome-Glazed Sgraffiato, Group 1
	GRAF.EP2	GRAF.EP2		EGRAF		Southern Iran	Early Polychrome-Glazed Sgraffiato, Group 2
	GRAF.EG	GRAF.EG			(early)10th-(mid)11thC	Southern Iran	Early Monochrome Green-Glazed Sgraffiato
	GRAF.EY	GRAF.EY		YGRAF	(early)10th-(mid)11thC	Southern Iran	Early Monochrome Yellow-Glazed Sgraffiato
	GRAF.TL	GRAF.TL	GRAF.TL		(early)10th-(mid)11thC	Iraq	Thin Lined Sgraffiato
	GRAF.H	GRAF.H	GRAF.H	HGRAF	(mid)11th-12thC	Tiz	Hatched Sgraffiato
	CHAMP	CHAMP	CHAMP	CHAMP	(mid)11th-13thC	Tiz	Champlevé
	GRAF.DI		GRAF.DI		(late)11th-13thC	Southern Iran	Deeply Incised Sgraffiato
	GRAF.LP	GRAF.LP	GRAF.LP	PGRAF	11th-13thC	Southern Iran	Late Polychrome Sgraffiato
	GRAF.GYB		GRAF.B		11th-13thC	Southern Iran	Green, Yellow and Brown Sgraffiato
				BGRAF	(late)11th-13thC	Southern Iran	Two-Tone Sgraffiato
	GRAF.GW				(late)11th-13thC	Southern Iran	Green on White Splashed Sgraffiato
	GRAF.S		GRAF.S		11th-12thC	Southern Iran	Spotted Sgraffiato
	GRAF.LG	GRAF.LG	GRAF.G	GGRAF	11th-13thC	Southern Iran	Monochrome Green Sgraffiato
	MONO.G	MONO.G	MONO.G	GMONO.1	11th-13thC	Southern Iran	Monochrome Green Glaze
				LGJARS			Large Glazed Jars

Group	IIOCC	Siraf	Williamson	Kush/al-Mataf	Date	Origin	Class Name
			GRAF.Y				Yellow Monochrome Sgraffiato
	GRAF.M	GRAF.M	GRAF.M	MGRAF	11th-13thC	Southern Iran	Monochrome Mustard Sgraffiato
	GRAF.LY	GRAF.LY			11th-13thC	Southern Iran	Late Monochrome Yellow Sgraffiato
	MONO.Y	MONO.Y	MONO.Y		11th-13thC	Southern Iran	Monochrome Yellow Glazed Ware
	GRAF.N-ID		GRAF.D	DGRAF	11th-13thC	Southern Iran	Degraded Sgraffiato
				BGRAF	(late)11th-13thC	Southern Iran	Two-Tone Sgraffiato
			GRAF.N-ID		11th-13thC	Southeast Iran	Non-Identified Sgraffiato
Slip Glazed	SPW.YB		SPW.YB		10th-12thC	Southeast Iran	Yellow and Brown Slip-Painted Ware
	SPW.BG		SPW.BG		10th-12thC	Southeast Iran	Slip-Painted Ware with a Brown Ground
	SPW.BW		SPW.BW		10th-12thC	Southeast Iran	Brown on White Slip-Painted Ware
	SPW		SPW.N-ID		10th-12thC	Southeast Iran	Non-Identified and Degraded Slip-Painted Ware
Frit Bodied Glazed	FRIT.EM			FRIT.F	11th-13thC	Southern Iran	Fine Frit
		FRIT.W (some)		FRIT.W			White Frit
		FRIT.T	FRIT.T (some)	FRIT.T			Turquoise Frit
		FRIT.B	FRIT.B (some)	FRIT.C			Cobalt Frit
		FRIT.P	FRIT.P (some)				Monochrome Purple Frit
	FRIT.LM	FRIT.W (some)	FRIT.W		14th-20thC	Southern Iran	Monochrome White Frit
			FRIT.G				Monochrome Green Frit (imitation celadon)
				FRIT.B			Coarse Frit
	FRIT.GW		FRIT.GW		14th-20thC	Southern Iran	Green and White Decorated Frit
	FRIT.EI		FRIT.EI		14th-20thC	Southern Iran	Enamel Imitation Frit
	FRIT.MIN	FRIT.MIN			(late)12th-(early)13thC	Kashan	Enamel Painted 'Minai' Frit
	FRIT.L	FRIT.L	FRIT.L	FRIT.L	12th-14thC	Kashan	Frit with Lustre
	FRIT.BL	FRIT.BL	FRIT.BL		12th-13thC	Kashan	Blue Glazed Frit with Gold Lustre
	FRIT.I	FRIT.I	FRIT.IW		14th-16thC	Southern Iran	Incised Decorated Monochrome Frit
			FRIT.IT				
	FRIT.M	FRIT.M	FRIT.MT		12th-13thC	Southern Iran	Moulded Monochrome Frit

Group	IIOCC	Siraf	Williamson	Kush/al-Mataf	Date	Origin	Class Name
			FRIT.MW				
	FRIT.BW	FRIT.UGP	FRIT.BW	FRIT.BW	14th-20thC	Southern Iran	Blue-and-White Frit
	FRIT.TB		FRIT.TB	FRIT.TB	14th-20thC	Southern Iran	Turquoise and Black Underglaze-Painted Frit
			FRIT.TBU				Turquoise and Blue Underglaze-Painted Frit
	FRIT.UGP						Underglaze-Painted Frit
	FRIT.N-ID		FRIT.DEG	FRIT.DEG	14th-16thC	Southern Iran	Degraded Frit
Late Glazed				MOTTLE			Mottled Green Monochrome
	MONO.LG1	MONO.LG1			14th-17thC	Siraf	Late Monochrome Green-Glazed Ware, Group 1
	MONO.LG2	MONO.LG2	GREG.1	GMONO.2	14th-17thC	Southern Iran	Late Monochrome Green-Glazed Ware, Group 2
			GREG.2				
			ALK.RC				Alkaline Glazed Related Class
	KHUNJ	KHUNJ	KHUNJ	KHUNJ	14th-17thC	Band-e Kong	Khunj or Bahla Ware
				DKHUNJ			Dark Khunj
				BLACK			Black Glazed Earthenware
				IRONGL			Iron Glazed Storage Jars
	SPECLE.1	PERSIA	PERSIA.2	PERSIA	14th-17thC	South Arabia?	Blue Speckled Ware, Group One (cream fabric blue/green glaze)
	SPECLE.2		PERSIA.1		14th-17thC	South Arabia?	Blue Speckled Ware, Group Two (red fabric, mixed colour glaze)
	MONTUR	MONTUR			15th-17thC	Southern Iran	Monochrome Turquoise Glazed Ware
				MUSTARD			Mustard Glaze
			YSPEC				Monochrome Yellow Speckled Glazed Ware
				IMITCEL			Imitation Celadon
				LGREEN			Light Green Glaze/Creamy Imitation Celadon
	YEMEN		YEMEN	YEMEN	13th-(early)14thC	Yemen	Yemeni Yellow
	MGPAINT.1	MGP.1	MGP.1	MGPAINT.1	11th-13thC	Bahrain?	Manganese Purple Underglazed-Painted, Group 1

Group	IIOCC	Siraf	Williamson	Kush/al-Mataf	Date	Origin	Class Name
	MGPAINT.2	MGP.2	MGP.2	MGPAINT.2	17th-19thC	Southern Iran	Manganese Purple Underglazed-Painted, Group 2
	UGP.BW	UGP	MGP.3	UNDERGL	14th-20thC	Southern Iran	Blue-and-White Underglaze-Painted Ware
			UGP.G1	BWEARTH/ UNDERGL			
			UGP.C2				
			UGP.F2				
			UGP.BW				
	UGP.TB		UGP.G2	MGTURQ/ UNDERGL	14th-20thC	Southern Iran	Turquoise & Black Underglaze-Painted Ware
			UGP.C1				
			UGP.F1				
	UGP		UGP.GEN	UNDERGL	15th-17thC	Southern Iran	Non-Identified Underglaze-Painted Ware
	UGP.CB		UGP.TTB		15th-20thC	Southern Iran	Crude Black Underglaze-Painted Ware
	UGP.GB		SPL.L		17th-19thC	Southern Iran	Green and Brown Underglaze-Painted Ware
	REDYEL	REDYEL	REDYEL	REDYEL	17th-20thC	Southern Iran	Red and Yellow
	CHIN		CHIN	WILLOW	18th-20thC	Europe	Willow Pattern
	STONE.EU		STO.EU		17th-19thC	Europe	European Stoneware
	GW.N-ID	GW.N-ID	GLAZ.DEG	UNCLASS-G	Not Known	Not Known	Unclassified Glazed
			GLAZ.N-ID	UNIQG			Unique Glazed
Other Glazed Objects	GT	GT	GT.1		Not Known	Southern Iran	Glazed Tiles, Group One
			GT.2				Glazed Tiles, Group Two
			GT.3				Glazed Tiles, Group Three
			GT.4				Glazed Tiles, Group Four
			GT.5				Glazed Tiles, Group Five
	KD.1		KD.1		Not known	Southern Iran	Kiln Debris, Group One (Trivets)
	KD.2		KD.2		Not known	Southern Iran	Kiln Debris, Group Two (Bars)
	KD.3		KD.3		Not known	Southern Iran	Kiln Debris, Group Three (Clinker)
	KD.4		KD.4		Not known	Southern Iran	Kiln Debris, Group Four (Wasters)
Early East Asian	STONE.BLU	STO.BLU			7thC	China	Green Glazed Stoneware Jars with Blue Highlights
	STONE.BG1	STONE.BG1			(mid)8th-(early)9thC	Southeast Asia	Black Iron-Glazed Stoneware Jars, Group 1

Group	IIOCC	Siraf	Williamson	Kush/al-Mataf	Date	Origin	Class Name
	STONE.BG2	STONE.BG2			(mid)8th-(early)9thC	Southeast Asia	Black Iron-Glazed Stoneware Jars, Group 2
	DUSUN	DUSUN	DUSUN	DUSUN	(late)8th-11thC	Guangdong	Dusun Stoneware Storage Jars
			LIB (most)				Light Brown Glazed Stoneware Jars
	CHANG	CHANG	CHANG	CHANG	(mid)8th-(early)10thC	Changsha	Changsha polychrome
	WWSL	WWSL.G	WWSL		(mid)9th-10thC	Henan	Slipped White Ware
		WWSL					
	GWSG	GWSG.1	GWSG		9th-10thC	Hunan	Green on White Splashed Glazed Stoneware
		GWSG.2					
	GYSG	GYSG			(mid)9th-(late)9thC	China	Green & Yellow Splashed Glazed Ware
	GM	GM			10thC	China	Green Moulded Ware
	STONE.PLG	STONE.PLG			(mid)8th-(early)9thC	China	Patchy Light-Green Glazed Stoneware
	STONE.GU	STONE.GU			(early)9th-(mid)9thC	Guangdong	Guangdong Green Glazed Stoneware
East Asian Green Glazed	YUE	YUE.1		YUEC	(early)9th-(mid)9thC	Shanglinhu	Yue Ware, Group 1
		YUE.2	GDC.1		(mid)9thC	Shanglinhu	Yue Ware, Group 2
		YUE.3			9thC	Shanglinhu	Yue Ware, Group 3
		YUE.4	GDC.2		10thC	Shanglinhu	Yue Ware, Group 4
	LQC	LQC	LQC.1	LQC	13th-(early)14thC	Zhejiang	Longquan Celadon, Group 1
			LQC.2		14thC	Zhejiang	Longquan Celadon, Group 2
			LQC.3		15thC	Zhejiang	Longquan Celadon, Group 3
			LQC.4		14th-15thC	Zhejiang	Longquan Celadon, Group 4
	GDC.1		GDC.3		11th-12thC	Guangdong	Guangdong Celadon, Group 1
	GDC.2		GDC.4		13th-14thC	Guangdong	Guangdong Celadon, Group 2
	JDC		JDC		15th-16thC	Jingdezhen	Jingdezhen Celadon
	YAOZ	YAOZ			11thC	Yaozhou	Yaozhou Ware
	STONE.GRY	STONE.GRY	STO.GRY		13th-(mid)14thC	China	Grey Glazed Stoneware
	STONE.BUR	STONE.BUR	STO.BUR	SCHINA	15th-17thC	Burma (Myanmar)	Burmese Green Glazed Stoneware
	STONE.THAI		STO.THAI		15th-(early)17thC	Thailand	Thai Green Glazed Stoneware

Group	IIOCC	Siraf	Williamson	Kush/al-Mataf	Date	Origin	Class Name
	EAST.N-ID	STONE.N-ID	STO.N-ID	GRE	Not known	East Asia	Non-Identified Stoneware
				CEL			Unidentified Greenware
East Asian Black Glazed + Other			FE.N-ID	CHIN	Not known	East Asia	Unidentified celadon
			IGSJ				Iron Glazed Stoneware Jars
			DAB				Dark Brown Glazed Stoneware Jars
	MTB.1		MTB.1	MTB	14th-17thC	Southeast Asia	Martaban
	MTB.2		MTB.2?	BSTONE			Light Brown Glazed Stoneware
				GBSTONE			Grey-Bodied Dark-Glazed Stoneware
	CIZHOU		CIZHOU		14thC	Hebei	Cizhou Ware
	CREAM		CREAM	EASTIN	15th-17thC	Southeast Asia	Far Eastern White Glaze
East Asian Porcelain	XING	XING			9th-10thC	Hebei	Xing Ware
	WW	WW.1-5	WWG.3?	GGW	10th-13thC?	China	Yue-type Wares
			WWG.1?	GWW			South Chinese White Stoneware (Song)
			WWS.1-10, WW.0-5	WHT & WPORC			Unidentified Whiteware
							White Porcelain
			WWF				Fujian White Ware
			WWJ.1				Jingdezhen White Ware One
			WWJ.2				Jingdezhen White Ware Two
			WWJ.3				Jingdezhen White Ware Three
			WWJ.4				Jingdezhen White Ware Four
	CWW	CWW	WWG.2	CWW	11th-13thC	Guangdong	Carved White-Stoneware Lotus Bowls
	QING	QING	QING.1		11th-13thC	Jiangxi	Qingbai One
			QING.2				Qingbai Two
	DEH	DEH	DEH.1	DHM	12th-13thC	Fujian	Dehua Moulded Whiteware
				DHP			Dehua Plain Whiteware
			DEH.2				Dehua Moulded Whiteware, Group 2
	CBW.1	CBW.1	CBW.18	SWATOW	15th-(early)17thC	Jingdezhen	Chinese Blue & White, Group 1
			CBW.19-21	KRAAK			
			CBW.1-17,22-33	CBW			
	CBW.2	CBW.2	CBW.34-38,41-		17th-19thC	Jingdezhen	Chinese Blue & White, Group 2

Group	IIOCC	Siraf	Williamson	Kush/al-Mataf	Date	Origin	Class Name
			45				
			CBW.39-40	MOD			
	VBW		VBW.1-2	VIET	14th-16thC	Vietnam	Vietnamese Blue & White
				NONCHIN			
				POLY			Polychrome Glazed
				VPOLY			Vietnamese Polychrome
	ENAM		ENAM	ENAM	(late)16thC	China	Enamelled Porcelain
Degraded/Unclassif-ied	CW.N-ID	CW.N-ID	CGW.N-ID	UNCLASS-+UNIQU	Not known	Not known	Non-Identified Coarse Wares
			CRW.N-ID				
			CCW.N-ID				
				RESIDUAL	Pre-Sasanian	Eastern Arabia	Residual Pottery
	GW.N-ID	GW.N-ID	GLAZ.DEG	UNCLASS-G	Not Known	Not Known	Unclassified Glazed
			GLAZ.N-ID	UNIQG			Unique Glazed

Table 2.1 *Key to the Integrated Indian Ocean Ceramic Classification (IIOCC) showing how groups have been formed in relation to the previous ceramic studies undertaken on the finds from Siraf (Priestman, forthcoming), the Williamson Collection (Priestman, 2005a) and the assemblages from Kush and al-Mataf (Kennet, 2004).*

2.3.6 Integrated Typology

The class categories considered above consist of groups defined on the basis of a range of different variables including surface treatment, vessel forms and the characteristics of the raw material or fabric. Within each class there are generally a variety of different vessel types produced. The recognition of vessel types often provides an important key to identification and in itself may be used to facilitate certain types of analysis (see Chapter 7). Ceramic 'types' as defined within the context of this research, refer to elements within a vessel profile (most often the rim), which have a particular recognisable shape. As such, they do not describe the overall vessel form, though generally there is a close correlation between recognisable elements of a vessel profile and the form as a whole.

Categorising the range of individual types in common circulation provides various kinds of information. Typological characteristics can be particularly effectively communicated through illustration and publication, and form matches often provide a particularly secure means of identification when using published sources. Types also interact with class categorisations in a number of different ways. In some cases a class will include a narrow range of well-defined forms that are associated specifically with that class. At the opposite end of the spectrum, one may encounter particular types that are widely copied across a number of distinct productions traditions. In another frequently encountered situation, a class can only be sub-divided chronologically on the basis of the dating provided by individual types. Particularly notable examples include Alkaline Glazed Wares (TURQ) or Yue Ware (YUE). More generally, it is important to establish the repertoire of forms associated with each class as part of the classification process. This often gives some indication of what the vessels may have been used for and in what context or for what purpose the class was manufactured. Ultimately in terms of the interpretation of the assemblage, vessel forms are likely to offer the strongest form of evidence for distinguishing different types of ceramic usage, for example vessels used as packaging or containers, or ceramics exchanged as a commodity in their own right (see **Chapter 7**). The major difficulty in the use of typological data for the purposes of quantitative analysis is the fact that diagnostic sherds only make up a small proportion of the overall sherd assemblage.

A formal vessel typology is presented here to accompany the integrated class data (**Appendix II**). As with the information on classes, an attempt has been made as part of this study to integrate a broad range of sources to provide a more comprehensive typology spanning the period and region under consideration. The starting point for the present typology is the study of a sample of 8,693 sherds from the excavations at Siraf held by the British Museum (Priestman, forthcoming). The typology established on the basis of this assemblage was developed during the sherd sorting and ceramic classification process. All of the pottery from Siraf in the British Museum was spread out together over a large number of trestle tables and manually sorted by ceramic class (**Fig. 2.3**). Within each class, sherds were then sub-divided by type. Often the recognition of types itself helped in the definition of the class groupings and both aspects of the sorting were in effect conducted as part of an integrated process. Wherever a form is encountered on repeated occasions, the form is assigned a number within the type series and a number of representative examples selected for illustration (Priestman, forthcoming[25]). An attempt has also been made throughout to define cross-class type associations, and where these occur, the same type has been recorded under a single type number. All numbered types are prefixed with a code indicating whether the type is a rim, handle, spout or base, and whether the vessel is a bowl, jar, cooking pot or storage vessel. Where isolated examples of a form occur these have been assigned a non-differentiated type code: 'OO' (one-off).

The Siraf collection in the British Museum is large enough to provide a reasonable overview of the main types represented within the Siraf sequence. These are also types which often circulated widely both within the Persian Gulf region and the western Indian Ocean. There are however two main sources of deficiency in the Siraf sample. The first is that the actual number of diagnostic sherds in the collection does not capture all of the

[25] I am particularly grateful to Mohaddeseh Mansouri Razi of the Iranian Cultural Heritage Handicrafts and Tourism office in Gorgan who undertook much of the illustration work for the publication of the assemblage from Siraf. Her participation in the project was facilitated by an Iran Heritage Foundation Fellowship to the British Museum in 2008. A portion of the illustrations undertaken on the project were also completed by Mizue Yoshimura and by this author.

forms characteristically associated with the assemblage[26]. The number of diagnostic sherds is still large enough to capture the most common forms and in some cases there are very large numbers of examples of the same type represented within the collection. For those types that are not so common, chance factors come into play and there are many examples of types being represented by only a few examples. In this case it becomes more difficult to establish with confidence the main parameters of variation. The second problem with the Siraf typology it is that it is very much focused on the period when Siraf was at the height of its prosperity (roughly late 8th early 11th centuries) and outside this range the quantity and thus reliability of the sample drops away.

In order to expand the Siraf typology, an attempt has been made to integrate further relevant sources of published illustrations. The methodology employed to achieve this consists of a simple manual process of matching and collating published illustrations. Because precise class matches are often more difficult to establish on the basis of published descriptions, larger blocks within the existing ceramic classification have been handled collectively (for example all Opaque Glazed Ware types, Indian cooking pots or Alkaline-Glazed Wares). Within these larger ceramic 'families', it is also common to find a degree of sharing of vessel types, and group handling is necessary in order to recognise these points of overlap and association. Within each family grouping, the illustrations for each type defined within the Siraf typology have been separated out and manually affixed to an individual sheet of paper headed with the type code. These sheets were then spread out over a large working area and further related bodies of illustrations introduced either to augment an existing type defined on the basis of the Siraf study, or where one did not already exist, to provide an additional type category. In order to aid the process of visual matching, published illustrations of potential type comperanda were first scanned, cleaned, flipped to the same orientation, rescaled to the same reduction factor and reprinted. Where different conventions have been used for shading the profile sections (hatching, stippling, etc.), the sections have been changed to solid black. Related types from separate sources have then been cut out and added to the main type series sheets. In this way, it is possible to significantly augment the Siraf typology and to define

[26] There are 10,273 ceramic sherds from Siraf in the British Museum. This figure is reduced to 8,693 once one factors in all separately registered joining sherds. Of this 4,953 are unique diagnostic sherds.

a broad range of common types that occur repeatedly, but often as isolated examples within the available published literature (**Appendix II**).

Another important criterion for inclusion within the current exercise is the quality of illustration. Unfortunately many excavation reports include substandard illustrations. In some cases this is due to poor reproduction methods that do not allow finer details of profile contours or surface features to be recognised[27]. Similarly illustrations that include only the profile section without a reconstruction of the interior and exterior surfaces are of limited value. Where illustrations are provided to a sufficient standard, matching of types becomes considerably easier and more effective. The main published sources of types that have been of most immediate use are the illustrations from Manda (Chittick, 1984), Susa (Kervran, 1977), Sohar (Kervran, 2004) and Jazirat al-Hulaylah (Sasaki & Sasaki, 1996; 1998; 2000). Further relevant sources are no doubt available and the process of collating type data is open ended and would no doubt benefit from additional work. What it is possible to present here, is a preliminary attempt at this exercise that has already resulted in an increase in recognised form components from 247 within the Siraf study to a total of 335. In order to systematically record these types whilst working on additional assemblages, a portable type series was established by affixing one or two typical illustrations for each type to a series of index cards. This method proved effective for recording typological details for all of the finds from Manda in Kenya and Sohar in Oman (**Chapter 5**). In both cases only minor modifications needed to be incorporated with new types added to the series whilst working on the finds.

2.4 Ceramic Chronology

The final part of this chapter deals with the issue of ceramic chronology. Ceramics remain one of the most important and widely used sources of dating for archaeological sites. This is due to a combination of factors including the ready availability of ceramic finds, the distinctive and recognisable quality of particular categories of material, and the ability of ceramic finds to offer instant, on-the-spot chronological indications (see **Chapter 5**). The

[27] Perhaps surprisingly the increasing use of digital drawing software such as Adobe Illustrator appears to be resulting in many cases in a general reduction in quality.

fact that the same standardised and recognisable categories of ceramics occur on sites across the Indian Ocean is also significant in enabling chronologies to be transposed across regions. A clear example is provided by the continued importance of East Asian or Middle Eastern ceramic exports to determine the dating of sites in areas such as East Africa (e.g. Horton, 1996b) or South Asia (e.g. Nanji, 2011). The aim of this study is to compare the nature and composition of ceramic assemblages between different sites and regions. In order to do so, it is necessary to establish a direct chronological correlation between individual site occupation sequences. This is achieved on the basis of the ceramic dating evidence provided by the occurrence of individual classes and types.

Individual ceramic classes or types are themselves generally dated through a combination of available evidence including the conjunction of finds in excavation contexts with other forms of dating evidence, such as coin finds or absolute determinations. Presence/absence associations with other categories of ceramics are also of critical importance. The dating of individual classes and types is a process that is continually under review and which is likely to continue to be modified as new evidence becomes available. At the same time, a general outline for the dating of many categories represented within the western Indian Ocean is now reasonably well established, though there still remains extensive variation in the duration of date ranges associated with different categories of material. The discussion associated with the dating of individual categories is presented below (**Appendix I**).

In order to investigate long-term patterns of change in ceramic exchange or other forms of economic activity on the basis of the available ceramic evidence, the date ranges attached to particular varieties of pottery are of less immediate value. Instead it is more appropriate to work with broader time-brackets within which a range of ceramic classes or types can be assigned. Such time-brackets could and have been defined in different ways, including by regularly punctuated calendrical dates (say into periods of one or two centuries) (see for example Adams, 1970: 117-19) or by dynastic horizons (as in conventional art historical ceramic studies, for example Allan, J. 1991). The problem is that change in the ceramic record need not bear any correlation to these artificial frameworks. An alternative solution is to accept the ‘lumpy’ qualities of the ceramic

record and to develop a chronology based on the best-fit clustering provided by the dates associated with individual components of a ceramic assemblage. This clustering in itself defines a 'ceramic periodisation': in other words a relative chronology defined by moments of obvious change in the ceramic record. What is being described, are fundamental changes in the underlying material culture assemblage that may occur independently from other historical considerations. This is not only important because the data must be allowed to 'speak for itself', but because it is this approach which allows one to gain an insight into the interaction between historical events and primary aspects of cultural change.

Certain general points concerning the concept of a 'ceramic period' and the chronological breakdown of the periodisation are worth highlighting. By summarising the best available dating evidence provided for individual classes and types (**Appendix I**), what emerges are a series of individual currency ranges. These can be grouped in different ways to provide a high or low resolution ceramic chronology, depending on the quality of the ceramic dating evidence available and the requirements of the analysis that the periodisation is designed to serve. One of the first complications that one is faced with in trying to fit all of the different ceramic classes into a single chronological scheme is the lack of uniformity in the currency of different ceramic types and classes. Certain categories may be short-lived, while others may continue for many centuries. In the case of the latter, some perceptible change should eventually occur within an industry, however subtle, due to factors such as a change in demand or material supply, or other cumulative factors of transformation. Where it is less easy to generalise is in the nature of the changes witnessed. In some cases the transformation may be rapid and punctuated; in others it may be slow and progressive. Added to this is the fact that ceramic classes do not represent a uniform category: in some cases classes are defined in terms of a single production, in others a whole group of loosely related industries may all be grouped under a single class category. As a result, there is likely to be further variability in the precision of the dating associated with different groupings. Any attempt to include the full spectrum of types and classes within a single unified periodisation is always going to involve some compromise, and to a certain extent a best-fit solution. Of course one key

assumption that underlines all efforts to correlate activity is that ceramics were for the most part traded at the time when they were produced.

Based on the range of pottery included within the Integrated Indian Ocean Ceramic Classification (IIOCC), which includes 184 different ceramic classes and 334 individual types, and taking into consideration approximately seven centuries from 400-1275 AD that forms the main parameters of this study, the assemblage breaks down most readily into six periods of unequal length. These can be distinguished on the basis of consistent differences in the ceramics commonly encountered across the study area (**Table 2.2**). Each of the six ceramic periods outlined below is best defined by a variety of elements, including common and diagnostic categories of pottery that appear in that period for the first time, pottery that is representative of that period but not necessarily exclusive to that period, and categories of material that are significant in their absence. The point that is of critical importance to emphasise is that the ceramic periodisation is based on the relative sequencing of individual categories of ceramics observed across multiple sites. In this sense the sequence itself is robust and unlikely to be significantly altered as a result of refinements and improvements to the absolute chronology. Where subsequent adjustments are more likely is in connection with the dating of individual ceramic periods (CP). Based on a detailed assessment of the various types of dating evidence currently available (see below), an attempt has been made to narrow down the dating of individual ceramic periods as far as possible with the interface between periods rounded to the closest half or quarter century intervals. In actual fact, the potential margin of error may in some cases vary by around fifty years. It is important to emphasise again that the calendrical dates affixed to the ceramic periodisation are not related in any way to other types of historical chronologies. If dates happen to coincide with significant historical events – for example of the accession of the Abbasid caliphate around AD 750 – this is simply because those events themselves coincide with the half or quarter century intervals adopted as the smallest date unit. The use of this ceramic periodisation for purposes of archaeological analysis will be returned to in Chapters 6 and 7.

Period	Date	Exclusive to/first represent in period	Typical but not exclusive	Significant by its absence
CP1	c.400-650	HARLIM ('CLINKY' Type), TURQ.YG (Type 64), FOPW	TORP.S	TURQ.T (Type 72)
CP2	c.650-750	TURQ.T (Types 72, BR30, JR8), STAMP, HONEY	HARLIM ('SMAG' Type), TORP.S	TURQ.YG (Type 64), FOPW
CP3	c.750-825	TURQ.T (Type JR5), EGG.PI, TORP.RG, CHANG, STONE.BG1, DUSUN	HARLIM ('SMAG' Type), TORP.S	OPAQ
CP4	c.825-900	OPAQ.C/W/TS/LP, SPLASH#, YUE		
CP5	c.900-1025	OPAQ.LG, GRAF.E#, YUE.4	CREAC, REBROS	CHANG
CP6	c.1025-1275	GRAF.H, FRIT.EM, CHAMP, GRAF# (Late Sgraffiatos), DEH, MEW		LQC

Table 2.2 *Dating of Ceramic Periods 1-6 with characteristic ceramic markers commonly associated with each chronological stage*.

2.5 Ceramic Periodisation and Dating

The general concepts that underpin the use and formulation of a relative ceramic periodisation and the dating of the periodisation have been outlined above. The six chronological stages that can be readily identified by widespread changes in the ceramic assemblage in circulation between the 5th to later 13th centuries (**Table 2.2**) form the foundation of the analysis presented within this study below. The periodisation acts as a means of establishing direct contemporaneity and thus comparability across multiple site occupation sequences across a widely dispersed geographic area. This ceramic periodisation operates, in effect, independently from other types of considerations, for example and controversies that may still exist over the dating of individual sites advanced by excavators and other commentators. As has been emphasised, it is in the area of dating ceramic periods that disagreement between specialists is most likely to exist and for this reason it is worthwhile outlining in more detail the evidence that has been utilised here to support the chronological scheme applied throughout the analysis below. The dating attached to the periodisation (**Table 2.2**) is significant because it is this which

allows the results of the ceramic finds analysis to be related to the broader historical context in which ceramic consumption patterns occur.

2.5.1 Ceramic Period 1 (AD c.400-650)

Significant improvements in the definition and dating of CP1 have been made through the study of the common coarse ware assemblage particularly from the sites of Khatt (Kennet, 1998) and Kush (Kennet, 1997; 2002b) in Ras al-Khaimah in the United Arab Emirates. The dominant coarse ware represented through the early part of the Kush sequence has a densely fired, often heavily sintered fabric fired to a strong red, dark purple or grey and containing some red or black stone platelet inclusions and flecks of lime that spall on the surface, at times leaving a distinctive yellow halo around the void. This variety of pottery covers an extensive and varied range of vessel forms from small to medium sized bowls and jugs and small to very large jars, storage jars and vats. The classification of this tradition and our understanding of its long-term development and dating has still not been fully resolved. At Kush this category has been treated as three separate classes, each defined largely on the basis of vessel form characteristics. They include Clinky Fired Earthenware (CLINKY), which is characterised by jars with a simple rolled rim, Small Grey Vessels (SMAG), which typically include jars with more complex rim forms, and Large Incised Storage Vessels (LISV), which are large storage vessels with a very coarse fabric and incised decoration (Kennet, 2004: 78-79, 84-86). Evidence, particularly from Williamson's survey of southern Iran and the excavated assemblage from Siraf, indicates that these three categories are part of a larger class complex, referred to collectively here as Hard Lime Spalled Vessels (HARLIM) (Priestman, 2005a; Priestman, forthcoming). HARLIM is found widely distributed throughout the Persian Gulf area and appears to undergo further changes in character through time.

Returning to the Kush sequence, the internal dating evidence provided for the changes in HARLIM tradition (i.e. CLINKY, SMAG, LISV) is important. Collectively the three classes occur from the earliest phase W-01 through to phase E-04, after which they appear to drop out of circulation (Kennet, 2004: table 3). Phase E-04 forms the earlier part of Period III, which immediately pre-dates the introduction of Opaque Glazed Wares, indicating

their decline before CP4 and the early 9th century (see more below). The other significant feature of the evidence from Kush relates to chronological differences in circulation between the three categories.

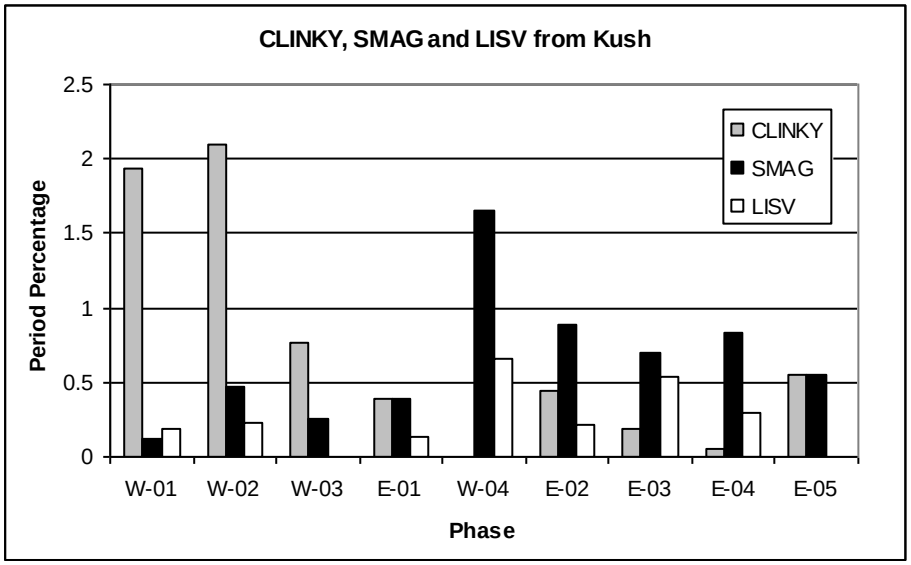


Fig. 2.4 *Number of CLINKY and SMAG diagnostic sherds (rims, bases, handles) and all LISV sherds as a percentage of the total number of sherds within each phase (after Kennet, 2004: table 3).*

One can see the fairly striking results derived from quantitative distribution of the three categories through the early part of the Kush sequence (**Fig. 2.4**). The main feature to observe is the significant decline in the proportion of diagnostic CLINKY sherds at around the same time when the proportion of diagnostic SMAG sherds is starting to increase. The figures suggest that the decisive shift occurs between phases E-01 and W-04 between Period I and II. LISV by contrast shows only a slight increase from very low levels through the early part of the sequence and a slight increase at the same time as SMAG. Bearing in mind that all LISV sherds recorded here compared with only diagnostics for CLINKY and SMAG, it is clear that LISV deposition at Kush occurred at very low levels through the period compared to the other classes.

Another important, though less well dated assemblage, dominated by ceramics of CP1 and seemingly terminating at the end of this period, is the massive Sasanian coastal settlement at Bushehr (Williamson, 1971-72; Priestman, 2005a; in press (a)). One of the most significant markers of the latest occupation at Bushehr noted by Williamson is a

yellowish-green glazed Alkaline-Glazed Ware (TURQ.YG) most often represented in the form of a small ?lidded vat with closed upright sides and a distinctive bifurcating rim (Williamson, 1971-72: 10-11) (Type 64). A few examples of the same type occur in Periods I-II at Kush, suggesting a date range between the 5th - 7th/8th centuries (Kennet, 2004: 29-31, fig. 5, table 16). Potentially also significant in this connection, is the absence of Type 64 from the assemblage at Sir Bani Yas, which has been re-dated on basis of the ceramics to between the mid-7th to mid-8th centuries (Carter, 2008: 71). Type 64 has also recently been identified in reasonably large quantities within the latest occupation levels at Pattanam[28]. Potentially this is one of the most distinctive type-fossils for the Late Sasanian period.

Another even more widely represented ceramic export from the Persian Gulf region associated with CP1, but also with later periods, are Torpedo Jars (TORP#). Two main categories have been distinguished here: sandy orange Torpedo Jars (TORP.S) and a thicker walled type with a cream coloured fabric that generally contains frequent fine red flecks and less dark sandy inclusions (TORP.RG). Torpedo Jars take their name from their shape. They are tall, elongated, handle-less jars of c.80 – 120cm in height with a narrow mouth with a thickened rim and a pointed base. The body can be straight and cylindrical or fattened and rounded. The overall shape makes Torpedo Jars closely comparable to amphorae style vessels well known from the Roman world. Torpedo Jars were manufactured from a slightly friable, porous and extremely sandy buff, brown or yellow coloured fabric and the interior surfaces are invariable coated with an even layer of bitumen. Bitumen was evidently poured into the vessel in liquid form after slow heating (Stern, *et al*., 2008: 424), swilled around inside and the remainder poured out. Traces of this process are evident in dribbles of bitumen seen running down the rim exterior on some pieces. The archaeological distribution of these vessels is heavily concentred along riverine and maritime routes. Examples of these vessels have been found on sites through the riverine networks of the Tigris/Euphrates floodplain, further upstream along these same major riverine arteries, and primarily on coastal sites through the Persian Gulf, around the Arabian Peninsula (Kervran, 2004: figs. 10: 15; 11: 6; 22: 3; 24: 2; Sedov, 2007:

[28] Derek Kennet, pers. comm 2011.

fig. 4.22: 5-7), down the coast of East Africa (Chittick, 1984: 88, figs. 43, 45), and along the west coast of India (Tomber, 2007). Those vessels found further inland, particularly within the Indian sub-continent, can often be connected with riverine routes linking the coast to the interior. Unfortunately Torpedo Jars, particularly TORP.S, are a long-lived and largely unchanging tradition that extends from at least the 3rd – 9th centuries, meaning that additional ceramic markers are required to narrow down the dating on sites where they occur.

Finally one of the particularly distinctive but less well-represented classes associated with CP1 is Fine Orange Painted Ware (FOPW). Survey evidence indicates that the greatest concentration of FOPW, and its most likely area of production, is within the Halil-Rud area in southeast Iran (Stein, 1937: 141-42; Sajjadi, 1989; Priestman, 2005a: 224-25). The class also displays a maritime distribution with generally small quantities found at a range of sites mostly within the middle and lower Persian Gulf including Siraf, Bushehr, Qala'at al-Bahrain, ed-Dur, Mleiha, Kush and the Masandam Peninsula in northern Oman (Whitehouse, 2009: 101; Williamson, 1972: 99, fig. 5; Hojland & Andersen 1997: 213-15, fig. 886-896; Lecomte, 1993: 200, fig.12, 1-4; Potts, 1998: figs. 2, 8; Benoist, Mouton & Schiettecatte, 2003: 71, fig. 9, 2,3; Kennet, 2004: 61-2, fig. 34; de Cardi, 1975, 57-58, fig. 9: 41-62). Material from outside the Persian Gulf area is known from the port of Qana in Yemen (Sedov, 1996: 21-23, fig. 6, 2-7). In terms of dating, the concentration of finds of FOPW from Area F at ed-Dur, but its absence from the main 1st – 2nd century occupation areas, suggests that this pottery first started to be produced from around the 3rd century (Potts, 1998: 209). At Kush it is concentrated mostly in Period I indicating a c. 4th – 6th century dating (Kennet, 2004: table 3). While FOPW is an important marker of CP1, only small quantities appear to have circulated within the Indian Ocean and it should probably not regarded as necessarily ubiquitous.

2.5.2 Ceramic Period 2 (AD c.650-750)

The distinction between CP1 and CP2 is marked by a range of fairly subtle changes. The major categories of ceramics in circulation remain unchanged and main chronological markers are based primarily on typological features. Particular vessel types associated with the long-lived Turquoise Alkaline-Glazed Ware tradition represent one of the most important markers for dating and defining this period. These include a small carinated bowl with a simple rounded rim (Type 72) (Carter, 2008: fig. 10: 1-6; Sasaki & Sasaki, 1996: fig. 43: 95.4-6, 78, 100), a larger carinated dish with a 'T' shaped rim (BR30) (Kervran, 2004: figs. 8: 1-2; 10: 19) and a necked jar with a collar below the rim and round-section looped handles attached on opposing sides at the neck and shoulder (JR8) (Carter, 2008: 11: 3; Sasaki & Sasaki, 1996: fig. 44: 95.7-8, 104, 102, 107, 111). These categories are particularly well represented within the single period occupation assemblages from the church site of SBY-9 on the island of Sir Bani Yas off the coast of Abu Dhabi (Carter, 2008) and the coastal settlement of at Jazirat al-Hulaylah (Area D) in Ras al-Khaimah (Sasaki, 1995; Sasaki & Sasaki, 1996; 1998; 2000).

The chronological evidence surrounding Type 72 is particularly important. Five examples occur within the phased sequence at Kush, all within Period III, late than a radiocarbon sample obtained from carbonised twig material from the end of Period II. The sample returned a date of "1340 ± 35 BP (Kennet 2004: 14, table 2), which calibrates to AD 630-780 at 2 sigma (94.5 % probability), or AD 640–690 at 1 sigma (61.3 % probability). Thus, Period III at Kush could in theory begin as early as the mid-seventh century, and almost certainly not before AD 630" (Carter, 2008: 89). Probably also significant in the definition of CP2 is the absence from Sir Bani Yas of the major Alkaline-Glazed Ware type from CP1: Type 64. Similarly as Kush, Type 64 is mostly concentrated within Period I and II and later examples from Period IV are most likely to be residual (Kennet, 2004: table 15). The implication is that CP1 represents a pre-Type 72 horizon that extends in date up to around the mid-7th century and that CP2 is the period that then follows.

Other key elements within the CP2 assemblage include the continued presence of Torpedo Jars (TORP) and Hard Lime Spalled Wares (HARLIM). The vast majority of the Torpedo Jar sherds from Sir Bani Yas appear to be of the orange sandy variety (TORP.S),

though the presence of a few cream coloured pieces equivalent to TORP.RG indicates that this predominantly later dated category probably started to circulate before the full transition to CP3 (Carter, 2008: 85). As has been discussed above, the HARLIM assemblage also witnessed a change in composition within CP1, and by CP2 jars with complex ridged rims predominate alongside a wider mix of bowls and large storage jars. Finally a crucial element in the identification of CP2 is the absence of common markers associated with the CP3; in particular applique decorated Alkaline-Glazed Ware and Eggshell Wares (see more below).

2.5.3 Ceramic Period 3 (AD c.750-825)

CP3 represents a relatively short-lived stage but one that is fairly clearly defined by the introduction of new common and distinctive varieties of ceramics and the absence of others. Perhaps the clearest and most widely distributed marker is a medium to large sized Turquoise Alkaline-Glazed Ware (TURQ.T) jar with a rounded body tapering towards the base, a short collar neck and a series of loped handles attached between the neck and shoulder (Type JR5). Within this type, jars range quite broadly in overall size and form with height varying from around 40-80cm (Priestman, in press (b)). Smaller jars within this category can have plain exterior surfaces, or a single incised 'saw-tooth' line around the shoulder, but more typically the vessels have appliqué decoration covering the upper half the body. Appliqué decoration consists of arcing frames filled with buttons, loops and wavy trails and sometimes stamp pressed rosettes (see for example Koechlin, 1928a: pl. VIII; Khan, 1960: 40; Whitehouse, 1972: pl. X: b). Some vessels also appear to have only 'chain-ridge' decoration on the body, though chain ridge itself appears to be a less useful marker as it occurs in association with a broader range of TURQ.T jar types and over a broader chronological duration.

The dating of applique decorated TURQ.T is constrained by several factors. This type appears to be very common in all the assemblages where it occurs, so its presence or absence from assemblages is unlikely to be influenced by factors of chance. This category is conspicuous in its absence from CP2 assemblages such as those from the monastery site of SBY-9 on the island of Sir Bani Yas and from Kush Period III, both in the United Arab

Emirates (Carter, 2008; Kennet, 2004). As has been referred to above, radiocarbon dating evidence from Kush indicates that CP2 begins from around the mid-7th century. The radiocarbon dating evidence from Sir Bani Yas is more complex, but by introducing various factors into the OxCal Bayesian modelling programme, it is possible to argue for a mid-7th to mid-8th century dating for this site (Carter, 2008: 90). The implication is that applique decorated TURQ.T should post-date the SBY-9/Kush Period III horizon.

Applique decorated TURQ.T then appears to have continued on in circulation into the 9th and possibly the 10th century. In defining its early horizon of use CP3, the important factor to note is the presence of applique decorated TURQ.T combined with the absence of Opaque Glazed Wares (OPAQ#) and other elements of the 'Samarra horizon' that were introduced during the early 9th century (see more below). A key example of this configuration includes the sequence from the foundation platform of the Great Mosque at Siraf (Whitehouse, 1968: 7, 14, pl. VI: c), the dating of which is described in further detail in connection with CP4 below. In East Africa, the earliest occupation of the sites of Manda and Shanga are also both characterised by a phase predating the introduction of OPAQ#, but containing significant quantities of applique decorated TURQ.T (Chittick, 1984: 76; Horton, 1996a: 87-88).

Various elements of the coarse ware assemblage associated with CP3 still require further clarification. As has been referred to above, the HARLIM coarse ware complex (equivalent to CLINKY, SMAG and LISV), which appears to represent one of the dominant common coarse wares in circulation within the Persian Gulf, appears to fall into decline by the end of CP3 (Kennet, 2004: table 3). Within the assemblage from Siraf there are three main coarse ware categories represented with what appear to be the same fabric treated in different ways during firing (HARLIM, REBROS and CREAC) with particular vessel types shared between classes while other types appear to be class specific (Priestman, forthcoming). Of the three classes, a relatively small proportion belong to the class HARLIM, while the other two categories are clearly associated with a series of large scale production centres situated in and around the medieval port city (Stein, 1937: 201, pl. XXVI: 7-9; Whitehouse, 1968: 5, 16, note 48; Whitehouse, 1971b: 12-15, fig. 6; 1972: 84). REBROS and CREAC both represent more oxidised and less heavily sintered treatments of

the HARLIM fabric and appear to be connected with the later development of tradition at Siraf mostly associated with CP4 and CP5. A full analysis of the phasing and stratigraphy of Siraf should provide important evidence for what appears to be a chronological transition in the development of these common coarse ware classes, which may have begun in CP3.

Other diagnostic elements that appear to have been introduced during what could be regarded as the post-Sir Bani Yas/pre-Samarra horizon phase include fine, mostly plain, cream coloured Eggshell Ware drinking vessels (EGG.PI), thicker walled White Wares (WHITE.PI) and Buff Wares (BUFF.I) and thick-walled Torpedo Jars with a cream coloured fabric and a distinctive internally fattened rim (TORP.RG) (Priestman, forthcoming). All of these categories continue in circulation into CP4 but again their occurrence in assemblages that predate the introduction of Opaque Glazed Wares (OPAQ#) is significant in the identification of CP3. Finally, CP3 appears to be the earliest phase commonly associated with East Asian ceramic imports. The nature of the earliest East Asian imports is well defined by the assemblage from the pre- early 9th century assemblage from the foundation platform of the Great Mosque at Siraf (Whitehouse, 1973). The assemblage is dominated by green glazed 'Dusun' storage-jars (DUSUN), closely followed by painted Changsha bowls (CHANG) (Whitehouse, 1971b: 2-3). Much less common are green glazed bowls with large squares cut out of the glaze on the interior for stacking (STONE.PLG) (Whitehouse, 1971b: pl. IX: b). A forth Chinese class is represented by handmade jars with a very coarse dark grey fabric covered with a shiny black glaze (STONE.BG1) (Whitehouse, 1971b: 3).

2.5.4 Ceramic Period 4 (AD c.825-900)

The interface between CP3 and CP4 is marked most obviously by the introduction of the so-called 'Samarra horizon', which consists of a package of innovative coloured glazed pottery including Opaque Glazed Wares (OPAQ#), Splashed Glazed Wares (SPLASH#) and Early Sgraffiato (GRAF.E#). The dating of the introduction of the Samarra horizon has been the subject of protracted debate involving a range of different sources of evidence and different site sequences. The original notion of the Samarra horizon is based on the

idea that those classes typically associated the type-site can be dated to the period of the caliphal occupation between AD 836 and 892. An acceptance of this restricted dating has been widely challenged leading to alternative dating proposals ranging from as early as the 7th century to the later 9th century based on excavations at sites such as Tell Abu Sarifa (Adams, 1970), Susa (Kervran, 1977) and Siraf (Whitehouse, 1979b), Kush (Kennet, 2004) and further work on the surface finds from Samarra (Northedge & Kennet, 1994; Northedge, 1996). The current evidence indicates the earliest elements of the Samarra horizon were introduced during the first third of the 9th century.

Of the sites that have been considered in relation of the discussion, Siraf appears to provide the most accurate and important dating evidence. Again the critical aspect of the discussion relates to the evidence from the foundation platform fill of the Great Mosque. The Great Mosque at Siraf is a large rectangular building of 57 x 44m enclosing a square courtyard set on top of a foundation platform that is c.2 m high. The foundation platform was constructed as a series of long, thick, mortared rubble walls back-filled with loose rubble and earth (Whitehouse, 1968: 9). At the beginning of the excavation, parts of the fill of the foundation platform were removed to reveal further information about the constructional history of the mosque. Later when an extensive earlier building complex was discovered beneath the mosque, the entire rubble fill was removed. This consisted of many thousands of cubic metres of deposits containing hundreds of thousands of pieces of pottery and other finds related to the pre-mosque occupation of Siraf.

Based on the results of the first season of excavation, when much still remained unknown about the constructional history of the Great Mosque, the ceramic assemblage from the foundation platform fill was provisionally dated to the 'mid or later ninth century', based on the presence of OPAQ.W and OPAQ.C (Whitehouse, 1968: 11, 15). Subsequent investigation showed conclusively that amongst the very substantial assemblage from the foundation platform fill, none of the Samarra horizon classes are represented (Whitehouse, 1970: 6). The most likely source of the mistake made in the first report and subsequently corrected, is that the original construction deposits were confused with those belonging to a later substantial remodelling of the foundation plan, at a time when the full construction history of the mosque was still not properly understood. It has been

reported, in addition, that pottery recorded as 'Cream Coloured Ware' from the fill was initially taken to mean OPAQ when actually referring to unglazed Eggshell Ware, which, as has been described, first appeared in CP3 (Kennet, 2004: 31).

The absence of OPAQ# from the foundation platform fill is important as the mosque construction episode is itself quite closely dated by numismatic evidence, although that dating was itself revised on a number of occasions during the course of the excavation. The most important dating evidence emerged during the 4th and 5th seasons with the recovery of a series of lead coins inscribed with dates equivalent to AD 803-04, including examples from a hoard 'deposited during construction' (Whitehouse, 1971b: 3; 1972: 71). The lead coins represent the latest dated finds associated with the foundation platform fill and provide a reliable *terminus post quem* for the Great Mosque's construction. Erring, perhaps too much on the side of caution, Whitehouse used this evidence to argue for the introduction of the Opaque Glazed Wares during the second quarter of the 9th century (Whitehouse, 1979b). Elsewhere it has been emphasised that the general short use-life of lead coins might be taken as an indication of a construction date much closer to the mint date (Allan, T. 1982).

While the various changes and revisions presented in the Siraf interim reports have caused some confusion, the end conclusion is clear: the Samarra horizon cannot have appeared any time before AD 803-04. Most likely it appeared shortly after this date. Certainly the earliest elements of the Samarra horizon, namely OPAQ.W and OPAQ.C, appear by the time that construction started at the type-site in AD 836 (Northedge & Kennet, 1994). Since its publication the clarity of the Siraf dating evidence has been somewhat compromised by an attempt to review the evidence undertaken by Moira Tampoe (1989). Working independently from the excavators, but using copies of some of the original excavation archives housed at the British Museum, Tampoe came to the conclusion that there were at least 623 sherds of Islamic glazed pottery including OPAQ represented within the foundation platform fill (Tampoe, 1989: 88-89). The implication of the claim is that these pieces had been somehow been overlooked by the finds specialists at the time of the excavation, and that the 'Samarra horizon' should therefore be placed in the period leading up to the Great Mosque construction, i.e. the later 8th century. This

proposed revision has had significant consequences, particularly in East African archaeology, where the scheme has been incorporated into the phasing and discussion of the sequence at Shanga[29], a site which continues to provide the benchmark for the chronology of much of the Swahili coastal region. Unfortunately Tampoe's revision appears to be based on the same original mistakes that Whitehouse subsequently corrected (see above).

Against the strong evidence available for the introduction of the first elements of the Samarra horizon sometime between AD 803-04 and 836 when Samarra was founded, any remaining suggestions of an 8th century dating should most likely be discounted. This includes the Tell Abu Sarifa sequence where the introduction of OPAQ# is tentatively attributed to the 7th or 8th centuries, but not on the basis of any secure independent dating evidence and against a backdrop of major problems in the recording of stratigraphy, which the excavator himself acknowledges (Adams, 1970: 118). Similarly at Susa, excavations in the area of the Apadana revealed evidence interpreted as indicating a mid-8th century date for the introduction of OPAQ# on the basis of three associated coin finds (Kennet, 2004: 31, citing Kervran, 1977). Susa is a large multi-period site and as at many such sites, residuality is a major factor. All that the coins really demonstrate with any degree of certainty is that OPAQ appeared sometime later than the mid-8th century.

Finally, Mason proposes a start date for the earliest type within his OPAQ# form/decoration series (BOG1) of c.700 (Mason, 1997b: 25). This dating is based perceived similarities between the an OPAQ# bowl type with a simple rim, slightly incurved walls, and a broad disc shaped foot, with some unpublished pre-Islamic pottery from Nippur. Having failed to describe the pottery from Nippur or the dating on which it is based, this association appears tenuous. Nothing that fits the description given appears in a recent summary of the Sasanian and Islamic pottery from Nippur, suggesting that the type referred to is not a significant category within this period (Ciuk, 2000). An alternative and perhaps more likely parallel for this same form could be the 'bi-disc' foot, which is widely represented in association with Yue Ware, Xing Ware and other East Asian exports,

[29] See for example the late 8th – early 9th century dating of Phase 2 based on the first occurrence of OGW, which has implications for dating of deposits above and below (Horton, 1996b: 118).

particularly though not exclusively dated to the 9th century (Priestman & Krahl, forthcoming). Mason also cites as evidence for his early dating of the OPAQ# tradition an association between his 'early' groups (BOG2 and BOG3) with the finds from Reitlinger and Talbot Rice's 1931 excavations at Hira (Mason, 1997a: 26; Talbot Rice, 1934). Hira was supposedly abandoned in the later 8th century as the latest coins recovered from the excavation produced dates ranging between AD 762 – 783. Again though, all that these provide is a *terminus post quem* for the latest activity and the ceramics clearly demonstrate that occupation continued beyond this date. Finds of Late Sgraffiato (Rousset, 1994: 19, fig. 12; 2001) and, it could be argued, the Samarra horizon finds themselves, indicate continuous occupation at Hira up to at least the 11th – 12th centuries. The lack of 9th century coins at the site may be better accounted for by the general and widespread trend that has been noted involving a decline in coin finds from archaeological contexts of the 9th – 12th centuries across much of the Middle East (Northedge, 1996: 230).

Aside from the debate surrounding the introduction date of the Samarra horizon, there are other important features that characterise the period associated with CP4. Evidence from a number of sites indicates that within the 9th century, further changes occur within the glazed ware assemblage. The earliest elements of the Samarra horizon consist of plain white Opaque Glazed Ware (OPAQ.W) and a relatively short-lived type with an opaque white-glazed decorated with trailing streaks of cobalt blue or sometimes more carefully applied floral and pseudo-calligraphic patterns (OPAQ.C). During a second stage in the Samarra horizon, two new developments occur. Firstly the decoration of Opaque Glazed Wares becomes more diversified incorporating the use of diffuse splashed colours, a wider variety of colour schemes and new decorative techniques, most notably polychrome lustre (OPAQ.LP). A second contemporary development involved the use of a non-opacified, clear, shiny lead glaze decorated either with splashes of green (SPLASH.GW) or a polychrome combination of green, yellow, brown and purple (SPLASH.P). Although many of the same pigments would have been used on the opaque glaze, with the clear shiny glaze they appear much brighter and have a greater tendency to run. At Siraf both these later elements of the Samarra horizon occur during Period 5 of the Site A sequence, a phase later than OPAQ.W and OPAQ.C (Whitehouse, 1979b: 52, fig.

3). A recent study of surface finds from different historically dated areas of Samarra has confirmed the fact that Splashed Glazed Wares were introduced later than the earliest elements of the Samarra horizon, probably during the mid-9th century and certainly before the occupation of al-Mutawakkiliyya in AD 861 (Northedge & Kennet, 1994: 33).

Other significant developments associated with CP4 include the introduction of a variety of new and distinctive categories of East Asian ceramic imports including most notably green glazed Yue Ware (YUE), white porcelain (WW), Green on White Splashed Glazed Ware (GWSG), White Slipped Stoneware (WWSL). These categories added to the existing repertoire that was still significantly dominated by 'Dusun' jars (DUSUN) and Changsha bowls and ewers (CHANG). The composition of the 9th century East Asian export assemblage is neatly encapsulated by the composition of the mid-9th century cargo of the Belitung wreck discovered off the coast of Indonesia (Krahl, *et al*. 2010). At the same time, CP4 is associated with a marked growth in the presence of Siraf area coarse wares (REBROS and CREAC), and as we have seen earlier the full transition away from the earlier use of Hard Lime Spalled Wares (HARLIM).

2.5.5 Ceramic Period 5 (AD c.900-1025)

In terms of the range of ceramics in circulation, CP5 effectively represents and an extension and continuum of CP4. Most of the same categories of ceramics continue in circulation meaning that a clear separation is not always possible. The division between the two periods is therefore somewhat artificial and is really implemented here because of the desire to provide the maximum available chronological resolution. At the same time, particularly in the connection with some of the most elaborately decorated glazed wares, there are certain distinctive type-fossils that emerge during the late 9th or early 10th century period. The most important examples include Opaque Glazed Ware with monochrome gold lustre (OPAQ.LG) and pottery closely related to the clear Splashed Glazed Wares (SPLASH#), but with the addition of incised decoration (GRAF.E#). Evidence from the Site P1 and M2 sequences at Siraf indicate that OPAQ.LG was introduced as one of the latest elements of the Samarra horizon together with GRAF.E# (Whitehouse, 1979b: 54, fig. 4). A study of surface finds from Samarra suggests that these events took

place at the very end of the 9th or more likely the beginning of the 10th century, as there have been no finds of these classes from the main city at Samarra, which was occupied up until at least AD 885 - 895 (Northedge & Kennet, 1994: 29, 33).

The 10th century may also have been marked by the decline of certain categories frequently associated with the Early Abbasid period, in particular Turquoise Glazed Ware (TURQ.T), cream coloured Torpedo Jars (TORP.RG), fine Eggshell Wares (EGG.PI) and painted Changsha ware (CHANG). However, because of the influence of residuality on multi-period sites, it is often more difficult to identity the point at which a class declines compared to the date at which it was first introduced. Important dating evidence for the decline particularly of TURQ.T is provided by the sequence from Shanga where the class tails off dramatically after Phase 8 in the Trench 6-10, suggesting a decline in its circulation during the 10th century (Horton, 1996b: 277, fig. 197). This conclusion is further supported by the evidence from Sharma in Yemen, where only a few sherds of TURQ.T occur on the surface or in the lowest levels of the site, the occupation of which started in the late 10th century (Rougeulle, 2005: 226-27). At the same time, the 10th century appears to be associated with the peak period of production of Siraf area coarse wares (REBROS and CREAC) as indicated by the dating of the kiln complex at Siraf. A single partially legible coin was recovered from deposits that predate the development of the pottery with a date of AD 815 or 913. This indicates that the pottery did not develop before the early 9th century or possibly up to a century later (Whitehouse, 1971b: 13). In addition the assemblage of coarse wares manufactured at Site D compares most closely with the material from Period 2C-D in Site A, suggesting that the pottery was active during the later part of the Siraf's main period of prosperity (i.e. the mid-9 - 10th century) (Whitehouse, 1968: 13-14).

Finally particular categories of East Asian ceramic imports are particularly diagnostic of late 9th or 10th century period. This includes Yue Ware bowls with bar-shaped stacking marks in the interior or the foot (BB5B, BB7, BB35) and vessels with thin-lined incised decoration (YUE.4). One piece of dating evidence for Yue Ware with bar-shaped stacking marks is provided by a vessel in the Percival David Collection, which is very rare in having a date inscription equivalent to AD 978, demonstrating the persistence of this form into

the late 10th century (PDF.292). In the same collection there are examples of cylindrical lidded boxes attributed to the 10th century, one of which has fine-lined incised decoration similar to that observed on a number of YUE.4 types (PDF.267). White Slipped Ware (WWSL), fine moulded green glazed ware (GM) and certain categories of white porcelain (WW) are also all frequently associated with CP5, as is indicated for example by the absence of these categories from the Belitung cargo (Krahl, et al. 2010).

2.5.6 Ceramic Period 6 (AD c.1025-1275)

The period associated with CP6 is marked by a significant and obvious transformation in the ceramic assemblage in circulation within the Persian Gulf and western Indian Ocean, which appears to be connected to a broader process of political realignment taking place within the Middle East. Southern Iraqi exports, which previously featured significantly amongst the exports of the Persian Gulf all appear to drop out of circulation by the 11th century. This includes, for example, classes such as Turquoise Alkaline Glazed Wares (TURQ.T), Opaque Glazed Wares (OPAQ#), Eggshell Wares (EGG#), White Wares (WHITE#), Buff Wares (BUFF#) and Torpedo Jars (TORP#). In their place, the most obvious marker associated with CP6 is the Late Sgraffiato tradition (GRAF#). Late Sgraffiatos have a fine red coloured body that is clearly distinct from the cream or pink coloured Early Sgraffiato fabric. The vessels are also generally glazed on the interior only and the forms break from the previous Samarra horizon tradition and instead appear more closely connected with those associated with the contemporary Slip Painted Wares of Afghanistan and Central Asia (Whitehouse, 1979b: 58). This whole process appears to be connected with the rise to prominence of new centres of ceramic production in southern Iran.

From the 11th century, sites producing sgraffiato in southern Iran appear to have become increasingly common. As well as a number of small scale kiln sites producing a mixture of glaze and unglazed pottery – such as the kiln at Ghubayra (Bivar, 2000: 59-60) or some isolated kilns recorded at sites R67A and R67B between Buluk and Fars in inland Kerman (Prickett, 1986: 1168-9) – there appear to have been some larger production centres situated on the coast that produced pottery on a mass scale to cater for an export market. During his survey of the Minab plain, Williamson collected material from Qaleh-i Saravan

(K130F), a site that had earlier been visited and described by Stein (Stein, 1937: 183), which produced large quantities of highly standardised and evidently mass-produced, Monochrome Green-Glazed Ware (MONO.G) and Monochrome Green-Glazed Sgraffiato (GRAF.LG) (Priestman, 2005a: 123). At another site, the port of Tiz, which may have partially taken over the function of Sohar as a port after its decline (Whitcomb, 1975: note 15), Stein encountered a pottery workshop comprised of a series of small rooms containing an abundance of ceramic debris including trivets, kiln bars with glaze still adhering and lumps of glass and glaze. Nearby a test trench was opened through a large mound made up of a dense accumulation of pottery and ash. The main classes recovered were highly standardised forms of Hatched Sgraffiato (GRAF.H) and Champlevé (CHAMP) (Stein, 1937: 90-91, pl. IV). The former has thin walls, a white slip covering the interior and exterior, fine sgraffiato decoration with areas in-filled with hatching, splashes of green, purple and sometime yellow and a coating of clear yellow-tinted lead-glaze. The latter class has a white slipped interior with vertical fluting carved through the slip with a clear yellow-tinted lead-glaze or more complex floral and pseudo-calligraphic patterns carved away with a yellow or green-tinted lead-glaze.

The assemblage of GRAF.H that Williamson collected from sites in southern Iran indicated that Tiz was not the only centre where this class was produced (Priestman, 2005b: 252), however the pottery from Tiz is particularly standardised and readily recognisable. Although petrographic analysis would be needed to confirm the conclusion, it seems extremely likely that Tiz was the main source of large quantities of GRAF.H that have been recovered from East Africa at coastal sites such as Shanga (Horton, 1996b: 'Group 5a', 284, fig. 206: a-l), Manda (Chittick, 1984: 79, pl. 31: a-f), Kilwa (Chittick, ii.1974: 303, pl. 110: d) and Andaro (Priestman, 2010b) and on the south coast of Yemen at Sharma (Rougeulle, 2005: 228, figs. 3: 1-19 & 4: 1-11) and al-Shihr (Hardy-Guilbert, 2001: fig. 4). Similarly CHAMP identical to that discovered by Stein at Tiz has been recovered from the same set of sites except al-Shihr (Horton 1996b: 'Group 5b', 284, fig. 207: a-d; Chittick, 1984: 79, pl. 32: c, f; Chittick, ii.1974: 303, pl. 111: c, d; Priestman, 2010b; Rougeulle, 2005: 228, fig. 5: 1-17). During the 12th – 13th centuries monochrome sgraffiato, such as that produced at Qaleh-i Saravan in the Minab area, appears to have become increasingly common. Significantly, at sites in East Africa such as Shanga, Manda and Kilwa, small

quantities of Samarra horizon sherds were noted, but from the 11th century the quantity of imported glazed ware increased significantly. At Shanga, where this influx has been quantified, only a single sherd of early sgraffiato, possibly of Iraqi origin, was recovered from a total assemblage of 9,152 sherds of imported pottery represented in the phased sequence (Horton, 1996b: tables, 13-14). By contrast, monochrome sgraffiato made up 3.74% of the entire 12th century assemblage, rising further to a level of 4.01% in the 13th century (Horton, 1996b: table 9, 14). These figures are substantially higher than those produced from contemporary levels from Kush within the Persian Gulf (Kennet, 2004: table 3).

Late Sgraffiato is well represented within the phased sequence from Kush, where it can be shown that GRAF.H appeared earlier than other categories (Kennet, 2004: table 3). The date of introduction of this class can be reasonably accurately established on the basis of numismatic evidence from Siraf. GRAF.H was introduced subsequent to the construction of a 43 x 11m extension added onto the southeast side of the Great Mosque in Site B. The extension itself sealed a group of coins, the latest of which is dated to AD 1024, indicating that GRAF.H was introduced on the site later than this date (Whitehouse, 1970: 6). This same area of the excavation also produced important dating evidence for another important class of pottery associated with CP6. One of the bays within the southeast extension contained a rich dump of ceramics including fragments of GRAF.H. The bay was then sealed off before further deposits accumulated after this event containing fragments of Early Frit (FRIT.EM) (Whitehouse, 1969: 46). This is a class with a fine white synthetic fabric, generally covered with a plain white or turquoise coloured glazed. The vessel forms are generally thin walled bowls with a simple finely pointed lip and a high, straight, flaring foot ring. The find context of FRIT.EM indicates that it was introduced later than GRAF.H and again some time later than the coin dating evidence associated with the initial construction of the southeast extension.

Other elements of the CP6 are probably less distinctive and appear to have a more regionalised character. Siraf area coarse wares (REBROS and CREAC), which represented a major export item in CP5, drop out of circulation during the late 10th or early 11th century in parallel with the general decline in status of the medieval port city (Whitehouse, 1975).

Assemblages of the 11th – 13th centuries from within the Persian Gulf at sites such as Siraf, Bilad al-Qadim and Kush all appear to develop local, site-specific coarse ware industries during this period (Priestman, forthcoming; Carter, 2005; Kennet, 2004). There is also a decline in the variety of East Asian ceramic imports. Most of the categories typical of the 9th – 10th century period drop of out circulation apart from white porcelain. The character of this material appears to continue to develop, though the accurate classification and chronology of 11th – 12th century groups appears to be particularly problematic. By the mid- to later 13th century distinctive categories of white porcelain such as moulded Dehua Ware (DEHUA) and Qingbai (QING) start to become more common[30]. The end of CP6 is clearly and obviously marked by widespread changes in the ceramic assemblage in circulation represented by the decline of Iranian sgraffiato and the development of new categories of glazed wares such as Blue Speckled Ware (SPECLE.1-2), Yemeni Yellow (YEMEN), Underglaze Painted Wares (UGP#) and Underglaze Painted Frits (FRIT.BW, FRIT.TB, etc.). This period is also marked by the spread of glazed ware technology from the Persian Gulf south and east into Eastern Arabia, South Arabia and further east into Pakistan and India (Priestman, 2010b; Kennet, Petrie & Priestman, 2007; Bhan, 2006). At the same time the development of the Julfar industry in Eastern Arabia represents a significant example of local handmade coarse ware industry undergoing a dramatic intensification of production and becoming a significant export commodity (Kennet, 2002a). In terms of the dating of the CP6, the end of this period is marked specifically by the decline of the Iranian Sgraffiato industry and what appears to be the virtually simultaneous – and likely closely connected – introduction of high quality, mass-produced Longquan Celadon (LQC) from Zhejiang Province in South China.

[30] See for example the predominantly pre- early 14th century assemblage from Old Hormuz (site K103) in the Minab delta (Morgan, 1991).

2.6 Conclusion

In this chapter it has been possible to examine the ways in which traditional approaches to the recording and categorisation of ceramics appear to have held back progress within the discipline. This may be explained in part by the dominant influence, particularly within the Middle East of Islamic ceramic art history, which has placed strong emphasis on rare categories of ceramics and generally considered the development of production traditions in terms of the innovation and diffusion of particular decorative techniques, rather than on the basis of core attributes such as the definition and provenance of particular production traditions. Area studies have also made a significant contribution in preventing a proper integration of the available evidence.

The research presented here represents an attempt to generate a direct comparison of the composition of ceramic assemblages amongst sites distributed widely within the western Indian Ocean. In order to do so, ceramics from all sites are recorded according to a single Integrated Indian Ocean Ceramic Classification (IIOCC) and typology based on the previous work undertaken on large assemblages from the Persian Gulf region with further modifications being incorporated where necessary on the basis of further research conducted in preparation for this study. The other aspect that is crucial in enabling direct comparative analysis is the ability to compare contemporary events taking place in the different areas. A general framework for the ceramic periodisation covering the 5th to later 13th centuries is provided based on moments of recognisable change within the ceramic record. These elements: the IIOCC and the ceramic periodisation (CP1-6), form the core components of the analysis presented below (**Chapter 6 & 7**).

Chapter 3 Ceramic Quantification

3.1 Introduction

For reasons that have been explored in detail in Chapter 2, the potential value of ceramics as a primary historical resource for measuring long-term economic change has tended to be overlooked within a discipline that has been largely dominated by the concerns related to ceramics as a form of decorative art. The consequences of the prevailing paradigm surrounding the study of ceramics in the Indian Ocean have so far been considered in relation to the impact this has had on the definition and recording of related ceramic products (**Section 2.2**). A response that will enable first, the clear differentiation of ceramic products, and second, the systematic comparison of those products between assemblages is set out in the form of the IIOCC (**Section 2.3**) and the standardised ceramic periodisation (**Section 2.4**). In this chapter we are concerned not with how ceramic classes and types are defined, but how they are measured. Again, the slow uptake of quantitative finds recording in the Indian Ocean region appears to be closely linked to the same range of factors that have previously been considered. The first part of this chapter looks specifically at the issue of when and in what manner quantification as a methodology was adopted within the field of western Indian Ocean archaeology. This, in turn, impacts upon the range and nature of evidence available today. The second part of the chapter considers what forms of ceramic quantification are most appropriate to the aims of this study. Here it is necessary to review some of the main discussions surrounding alternative ceramic quantification techniques, including the respective merits of different approaches. In the end it will be possible to suggest a strategy that will enable the widest possible range of information sources to be compared.

3.2 The Value of Quantification

The quantification of artefacts and ceramics specifically – whether that be finds recovered from survey or excavation – forms a discrete field of research around which specific techniques have been developed (Orton, 1993: 169). Before discussing any of the methodological issues, what seems fairly striking is the apparent gulf that exists between

the detailed literature on ceramic quantification (see sources cited below) and the general practice of ceramic research within the western Indian Ocean region. On the one side there is a body of literature extending back to the 1950s, which provides an increasingly sophisticated appraisal of different quantification techniques, though often seemingly with little consideration of the remaining need for broader justification of the approach. On the other side are the majority of Middle Eastern, Indian or East African ceramics reports, which provide varying levels of detail regarding the physical characteristics of a ceramic assemblage, including chronological changes, external influences etc., but which include no information on how much of any particular category has been recovered and no acknowledgement of the potential importance of a quantitative approach.

Different reasons might be given for the common omission of quantification practice in the western Indian Ocean. One often appears to be the sheer volume of material encountered and the belief that this cannot be handled within the constraints of time and resources available. Certainly the volumes of ceramics produced from systematic excavation of historical period sites in the Indian Ocean region can be enormous. After six seasons of excavation at the medieval port of Siraf in the Persian Gulf, the excavators recovered over three million sherds (Whitehouse, 1987: 1). Such a large volume of material does demand substantial time and resources to process.

Sheer quantity alone though, does not provide an adequate explanation. Even with large quantities of finds, there are options for sampling. Other underlying factors need to be considered. One reason may actually be open resistance to quantification, though any such objections are unlikely to be set out in print[31]. It was certainly against a backdrop of scepticism that statistical methods of artefact seriation were experimentally developed in America in the 1940s and 1950s (Brainerd, 1951: 301). Likewise some view with pessimism the prospects of quantitative study because of the problems of marrying up quantitative results with archaeological reality:

[31] Open resistance to the concept of quantifying archaeological ceramic finds because of time constraints and doubt over the potential use of such information is something that I have personally encountered, for example in discussion with Heidrun Schenk at the *Global Geographies: the Indian Ocean in historical perspective* workshop held at the Royal Asiatic Society on the 31st October 2009.

> "A serious criticism of applying any quantitative study to excavated finds is the tenuous relationship that the finds may bear to what was in use originally on the site…My second doubt is whether, despite the massive volumes of sherds lurking in our museums and stores, we have [in Britain] evidence of sufficient quality for any kind of statistical study to be valid" (Jones, 1979: 3-4).

While specific objections have occasionally been raised, a far more common and straightforward factor appears to be simply a lack of appreciation for the critical importance of artefact quantification and consequently for the need to outlay added expenditure to record such information during the excavation and finds recording process. This corresponds to issues explored in depth in Chapter 2. Full, and to many, adequate cultural histories can be constructed simply by sifting the most notable finds from the masses of common material encountered in excavation.

The results of traditional non-quantitative approaches to pottery study are consistently the same. The majority of reports dealing with ceramic assemblages from the western Indian Ocean are organised essentially as a narrative commentary supported by relatively generalised structured description. Contained within, might be many interesting details concerning chronology, methods of production and potential sources of origin, but such reports do not provide the raw material required to systematically reconstruct past patterns of consumption, or long-term cycles of economic change (see for example Chittick, 1974; Schenk, 2001; Juma, 2004; Kervran, 2004; Salles & Sedov, 2010). This is a fundamental loss. Arguably one of the greatest strengths archaeology holds over any other branch of the humanities, is the ability to *measure* processes of change over time periods and geographic scales that transcend the individual historical experience (for related comments see Wilkinson, 1999: 45). There are various ways that this might be achieved, for example by measuring spatial changes in land-use and settlement, or in this case, the nature and rate of flow of ceramic exchange within the western Indian Ocean. Seen from this perspective, quantitative approaches are fundamental to some of the most unique and powerful aspects that archaeology alone is placed to consider.

3.3 Quantification in Western Indian Ocean Archaeology

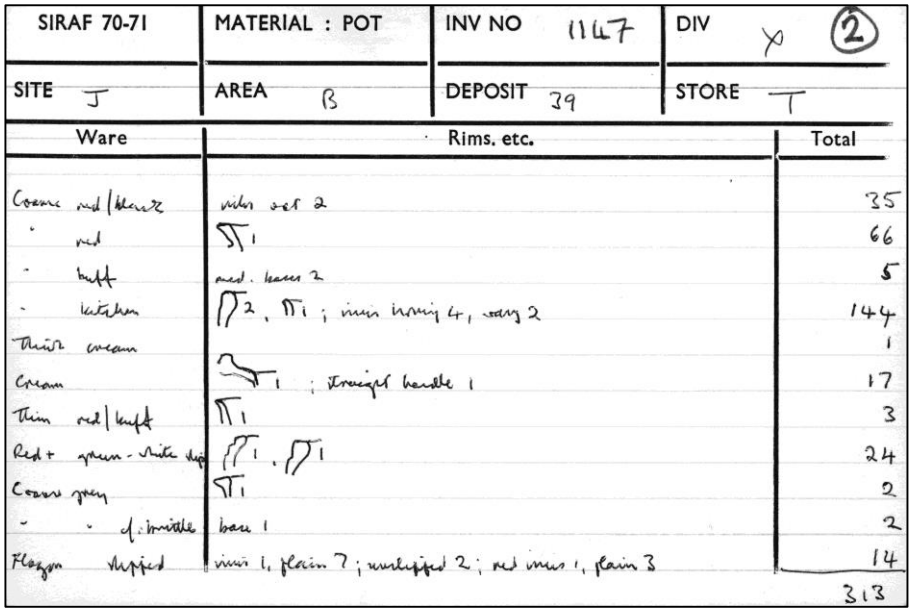
As will be outlined briefly in the following section, the origins of ceramic quantification in archaeology are inextricably linked with the development of finds seriation. Seriation was first developed as an approach in the late 19th century as a means of sequentially arranging stylistically related finds in order to establish a relative chronology in the absence of other independent dating evidence (Flinders Petrie, 1899: 296). During the mid-20th century seriation was advanced further by the inclusion of finds count data (Robison, 1951; Brainerd, 1951) and this opened up the potential of the technique to a broader range of applications, such as to infer changing patterns of ceramic use. Considerations of 'how much pottery' and comparisons of quantities of individual categories of pottery between sites or contexts brought into clearer focus the potential issues of bias surrounding counts derived from broken sherds. Much of the work that followed focused on attempts to resolve irregularities caused by variation in breakability between different categories of pottery through the use of adjusted measures, such as combined sherd surface area, aggregate sherd weight or equivalent vessel estimates (Bloice, 1971; Evans, 1973; Orton, 1975). Quantitative analysis also naturally leads onto more complex consideration of how best to measure similarity or difference and this has been explored through various statistical approaches (Orton, 1982; Orton & Tyers, 1990; 1991; 1992; Bellanger, Husi & Tomassone, 2006 and for a recent practical application within a Central Asian context, Puschnigg, 1996). At a practical level, such work has had a clear and demonstrable impact with basic quantitative recording being taken up and incorporated essentially as common practice within North American and western European archaeology and beyond since the 1970s. In the Middle East and areas of the 'developing world' that make up the Indian Ocean littoral, such ideas appear to have been much slower to catch on. However, it would be wrong to present the divide between quantitative and non-quantitative finds recording simply as a linear movement towards modern practice. The adoption of ceramic quantification in the western Indian Ocean region actually has a lengthy, albeit intermittent history (see below).

3.3.1 Early Studies (1960s – 1980s)

One of the outstanding early examples of quantification in Middle Eastern archaeology is Siraf. Excavations at the medieval port of Siraf were conducted by David Whitehouse on behalf of the British Institute of Persian Studies over seven seasons between 1966 and 1973. During this time, a series of large open-area trenches were excavated at different locations across the city (see **Chapters 4 and 5**). Many of the trenches covered entire buildings or building complexes and were dug down through several metres of stratigraphy (**Fig. 3.1**). Consequently very large quantities of artefacts were recovered. Unusually for the time, a policy of full finds recovery and recording was implemented. Finds were initially separated out by material and all ceramic sherds were washed, classified and manually recorded on paper record cards (**Fig. 3.2**) before a sizable portion of featureless pieces were discarded (Whitehouse, 2009: 8).



Fig. 3.1 *Large open-area excavation at Siraf exposing the whole of the ground plan of the Great Mosque and earlier structures below the 2m high foundation platform*.



SIRAF 70-71	MATERIAL : POT	INV NO 1147	DIV X (2)
SITE J	AREA B	DEPOSIT 39	STORE T

Ware	Rims. etc.	Total
Coarse red/black	rims var 2	35
" red	IIII 1	66
" buff	med. bases 2	5
" kitchen	III 2, II 1 ; inturn inrim 4, wavy 2	144
Thick cream		1
Cream	1 ; triangular handle 1	17
Thin red/buff	II 1	3
Red + green - white slip	III 1, III 1	24
Coarse grey	II 1	2
" " of invisible	base 1	2
Flagon stepped	inturn 1, plain 7 ; everted 2 ; red inturn 1, plain 3	14
		313

Fig. 3.2 *Example of the Find record cards from Siraf showing the itemised lists of ceramic finds recorded during the course of the excavation*.

While the essential details of the finds recording policy at Siraf are known, none of the finds data, apart from coins (Lowick, 1985) has so far been published, and no clear statement has been provided setting out the rationale behind the recording methodology and how it relates to developments taking place within the discipline of archaeology at the time. Making certain inferences about the nature of work, it seems likely that the system of finds recording that was implemented has less to do with the specific literature on ceramic quantification emerging predominantly from North America at the time and simply reflects the ambitious attempts made to achieve precision and accuracy across all aspects of a project that was well financed and visionary. Whatever the case, the mass of well recorded data from Siraf, which combines large areas of excavation with several million stratigraphically recorded finds, now provides a vast resource for quantitative analysis from one of the key Early Islamic ports in the Persian Gulf. The challenge in using this data, is how best to make use of the remaining find collections and excavation archives. These issues will be touched on again below (**Chapter 5**).

There is some evidence that the model adopted at Siraf had a broader impact within the Indian Ocean region at the time. Neville Chittick, the first Director of the British Institute of History and Archaeology in East Africa, conducted significant excavations at the coastal

settlements of Kilwa in Tanzania and Manda in Kenya. Between completing his earlier larger excavation at Kilwa in 1965 (Chittick, 1974), and starting work at Manda in 1970 (Chittick, 1984), Chittick adopted some elementary principles of ceramic quantification (for full details see **Chapter 5**). The development of his approach is illustrated to some extent by the differences between the reports from the two excavations. The publication of ceramics from Kilwa includes a traditional short narrative summary of the main varieties of imported ceramics associated with different stages in the site occupation, but with no information on quantities provided (Chittick, 1974; 302-16). The report from Manda is organisationally similar, but with a better integration between glazed and unglazed ceramics including Indian imports (Chittick, 1984: 65-105, figs. 32-55, pls. 23-42) and crucially, some figures on the quantities of different varieties of ceramics recovered (Chittick, 1984: 225). However, several aspects of the quantification from Manda remain admittedly primitive.

- Only imported categories are included
- Imported ceramics are not presented as a proportion of all ceramics recovered
- Imported ceramics are sub-divided into only 27 categories for both the Early and Middle Islamic periods
- The quantification does not include a complete breakdown of the quantities of pottery by period

What is clear then is that the quantification from Manda is important, but lacking in many fundamental details. An attempt to partially remedy some of these issues is described in further detail in Chapters 4 and 5. What caused Chittick to improve recording practices at Manda is less clear. Quite possibly he was influenced by the excavation that took place in the intervening years between Kilwa and Manda at Siraf.

Through the 1980s, two further important excavations employing quantitative finds recording took place on coastal settlements within the Indian Ocean region at Mantai in Sri Lanka and Shanga in Kenya. In Sri Lanka John Carswell completed three seasons of excavation at the port of Mantai between 1980 and 1984 before the work was

prematurely curtailed by violent ethnic conflicts that erupted in western Sri Lanka in the mid-1980s (Carswell, 1996: 514). Even though the work at Mantai was prematurely cut short (Carswell, 1996: 514), a substantial amount of excavation was achieved within the first three seasons. Unfortunately it is still difficult to summarise the nature and objectives of this work and the specific methodologies employed as none of the final results have been published[32]. What can be established from the available preliminary reports is a clear sense of the potential importance for quantitative finds recovery. For example:

> "The quantity of material recorded was enormous, and whilst it was possible to register all the small finds, imported Chinese, Islamic and other wares, the mountains of local earthenwares defeated all attempts to mark individual sherds. They were, however, bagged and labelled within and without" (Carswell, 1996: 514).

It may be that if the project had been able to continue, all of the sherd material would have been processed. Alternatively, the aim may only have been to work toward a standard of quantitative recording similar to that presented from Manda involving a basic tabulation of sherd totals for imports.

3.3.2 Recent Studies (1990s – Present)

The second site excavated in the 1980s, where very significant progress was made in establishing a quantitative recording methodology, was at Shanga within the Lamu archipelago off the coast of Kenya. The publication of this site in the 1990s essentially marks the beginning of modern quantitative recording within the Indian Ocean region (Horton, 1996b). Shanga is the site of large stone town with at least 200 partially standing buildings abandoned in the early 15th century (Horton, 1996b: 7). At its greatest extent, the settlement covered an area of 15ha including an extramural cemetery. The earliest foundation of the settlement is focused on a smaller core concentrated around the Friday Mosque, roughly in the centre of the later town. The earliest occupation in this area dates back to the late 8th century. Excavations at Shanga were conducted over six seasons

[32] In fact the results from Mantai have very recently been published (Carswell, Deraniyagala & Graham, 2013). Unfortunately they appeared too late for inclusion within this study.

between 1980 and 1987. The methodology adopted involved digging a number of larger 20 x 20m trenches (Horton, 1996b: 10, 79). Finds were recorded by stratigraphic context rather than arbitrary spit level and contexts were grouped together by phase during the course of the excavation. Local and imported ceramics were separated from one another during trench side processing. Imported ceramics were then sorted into groups and presented as a phased seriation with figures given on the basis of sherd count for the two main areas of the excavation: Trench 1 and Trenches 6-10 (Horton, 1996b: 13, tables 13-14).

Apart from providing a short account of the methodology for processing ceramics (Horton, 1996b: 13), the report from Shanga contains no discussion of the potential importance of ceramic quantification or where the specific ideas for this methodology originate. In some ways this is surprising, particularly as Shanga represents the first completed and published example of a port site in East Africa or indeed anywhere in the Indian Ocean to have produced a clear and formal classification of all varieties of ceramics represented and precise figures on the distribution of these varieties through the excavated sequence. As a result, Shanga remains a massively important site for understanding how the balance and composition of ceramic imports in East Africa shifted between the 8th and 15th centuries. Another distinct advantage of this form of presentation, which has not been mentioned until now, is that by presenting all information on the classification and occurrence of pottery 'up front', it becomes much easier to revise the chronology of that excavation as new information on the dating or definition of ceramics becomes available. In terms of where the model for quantification at Shanga comes from, it seems that Horton was influenced by his work in Mesoamerican archaeology at the time, "especially for type variety analysis of the local pottery", but also by excavation procedures that were regarded by that point as virtually standard practice within a modern European context[33].

Within the Persian Gulf region, no attempt was made to follow the example of Siraf for many decades. The next substantial use of ceramic quantification was undertaken in the

[33] Horton, pers. comm. 2012.

late 1980s by Tatsuo and Hanae Sasaki of Kanazawa University in their work at the 9th – 10th century village-scale settlement of A'Ali on the Island of Bahrain (Sasaki, 1990). This work effectively amounts to a basic tabulation of the finds, though results are used to assess the quantitative contribution of categories such as imports. A more detailed, substantial, and systematic application of quantification closer to the model established at Shanga was initiated by Derek Kennet in Ras al-Khaimah in the United Arab Emirates in the 1990s. The early fieldwork undertaken during the Jazirat al-Hulaylah survey in 1991 (Kennet, 1994), and the Sir and Jiri Plain Survey of 1994 (Kennet, 2002a: 154) followed in a mould well established in the eastern Mediterranean since the mid-1970s (discussed by Cherry, 1982: 15-16 amongst many others) but with modifications to suit the particular conditions faced within the Middle East. The primary aim was to use intensive surface collection techniques to build up evidence for long-term changes in settlement density across the region, and ultimately to extrapolate from that to consider factors such as population change and broader processes of economic or social transformation within the landscape (for some of the associated discussion see Bintliff, 1999 or Wilkinson, 1999). To conduct such work successfully, relies on having adequate control of the classification and chronology of common categories of ceramics encountered during surface survey.

The state of existing knowledge of the ceramic assemblage from Ras al-Khaimah proved to be inadequate for the aims of the investigation (Kennet, 2004: 10). Despite the useful contribution of one previous study undertaken within the area (Hansman, 1985), the general absence of information on the basic definition of ceramics, particularly for the Sasanian and early Islamic periods presented "a severe impediment to the dating of sites found by field survey and thereby to a better understanding of settlement pattern and landscape development" (Kennet, 2004: 10). In order to address some of these issues, the key settlement site of Kush was deliberately targeted for excavation in order to provide "a deep quantified [ceramic] sequence" (Kennet, 2004: 12). At Kush all ceramic finds were individually marked and recorded. Glazed pottery, imported coarse wares and all diagnostic sherds were then re-sorted according to the principles of ceramic class. This was used to generate figures for the total number of sherds, or the percentage of sherds as 'equivalent vessel estimates' (EVEs) by phase, which were seriated to provide a view of

the quantitative changes in the distribution of all varieties of pottery recorded through the excavation sequence (Kennet, 2004: table 3). This was the first time that ceramic quantification had been systematically applied and published for a Late Antique or Islamic period site within the area of the Persian Gulf. Together with Shanga in Kenya, these were the only two quantified ceramic assemblages available anywhere within the Indian Ocean area by 2004.

Within the Persian Gulf, the publication of Kush has clearly demonstrated the potential of class based classification and quantitative recording. This has had a clear and demonstrable impact within the field (see above). The stimulus for this development also clearly derives from broader sources. As we have seen, Siraf represents a pioneering example of detailed itemised recording from as early as the late 1960s and other projects such as Manda, Mantai, Shanga and A'Ali have followed with differing levels of effectiveness since. More recent efforts such as those undertaken at Hulaylah (Sasaki & Sasaki, 1996; 1998), Bilad al-Qadim (Carter, 2005), Anuradhapura (Coningham, 2006) and the as yet unpublished work from a rapidly growing number of other sites (**Table 2.1**), may be connected more generally with a growing international acceptance of the importance of quantitative recording techniques. Whatever the precise source(s) of influence, what this means in practical terms is that the 'landscape' of ceramic studies in the Indian Ocean is about to change dramatically over the next few years. What is important to appreciate within the present context is that this is an extremely recent development and therefore that the exploration of these new data sources has, as yet, hardly begun.

3.4 Methods of Quantification

The main complicating factor in recording quantities of ceramic finds represented archaeologically is the fact that the majority of ceramic vessels encountered are broken and often dispersed. The quantity of broken pieces of pottery in an assemblage is influenced first by the number of pots used and deposited and then by how broken any individual vessel has become. Establishing a correlation between broken fragments and the original number of parent vessels also has to take into consideration the fact that

fragments often become dispersed following breakage, and therefore most assemblages contain only portions of whole vessels. Estimating quantities of pottery on the basis of broken material is complicated by factors of variation, such as the different physical characteristics of vessels or the environment where they were used or subsequently deposited. Post-depositional conditions are also likely to significantly influence whether sherds stay together or becoming dispersed following breakage (Orton, 1982: 3). With regards to variation between vessels in terms of breakage, a range of obvious factors have been identified, including vessel size, form and thickness (Chase, 1985: 215) and the strength and quality of the ceramic material (Evans, 1973: 133).

3.4.1 Direct Quantitative Measures

In order to address the issues of inconsistency in breakage, various different options for measuring quantities of pottery have been considered. The most obvious and straightforward approach to ceramic quantification is based on counting numbers of sherds. Generally this has involved a 'common sense' approach in which only sherds over a certain minimum size are recorded. All early attempts to apply a quantitative recording methodology, up to around the 1950s, relied solely on sherd counts (see for example Brainerd, 1951) without giving thought to the potential problems associated with variable breakage (Orton, 1993: 170). Since that time various different options for counteracting the problems of variable vessel breakage have been considered. Another option is to record combined sherd weight. Weight has the clear advantage of providing a measure free from the influence of brokenness (Baumhoff & Heizer, 1959: 314). In addition, by combining the figures on sherd count with weight to produce a figure of part per standard unit (say 100g, 1kg), it is possible to provide an index of brokenness, which has major potential for identifying differences in deposit formation processes (Solheim, 1960: 329). An early example of the application of this approach is provided by the identification of construction levels in the Central Court at Knossos, on the basis of the smaller size of fragments noted in particular layers (Evans, 1973: 127, table IV).

Although sherd weight successfully cancels out differences in brokenness and usefully helps to highlight differences in formation processes, weight is not immune from its own

problems. Most obviously and seriously, any measure of sherd weight will be skewed in favour of large vessels, vessels with thick walls or vessels with denser fabrics. To use a couple of examples from the present corpus under consideration here: a measure of weight would lead to the virtual disappearance of light and thin fragments belonging to classes such as Frit Ware or Eggshell Ware and the major over-representation of types such as large incised storage vessels, which break into large heavy fragments. Likewise East Asian tableware such as Longquan Celadon bowls would consistently have a weight advantage over what are likely to be functionally similar categories produced in the Middle East, such as Late Sgraffiato bowls, simply because of the denser high-fired materials used.

Another direct measure that has been suggested, specifically to overcome bias caused by thickness and density, is combined surface area (Hulthèn, 1974: 1-2). This can be calculated by breaking a vessel form down into a series of regular shapes, cylinders, cones, etc. and calculating the respective surface areas (Hulthèn, 1974: 2). Alternatively, a slightly cruder though presumably infinitely faster solution has been to lay sherds out as densely as possible and calculate the combined surface area from the space that they occupy (Orton, 1993: 172). A very similar measure is volume. This can be measured on the basis of capacity of whole vessels, or from the displacement volume of the sherds themselves (Hinton, 1977: 231). Whatever the precise methods of calculation, the issues around surface area and volume remain the same. These measures overcome the problems of variable breakage, variable density and thickness, but again create their own biases with larger, thicker or more voluminous vessels taking precedence over smaller ones. This results in the seemingly meaningless example given by Hulthèn in which one grave containing a larger pot is described as containing a ‘bigger quantity of pottery’ than another tomb with a smaller pot (Hulthèn, 1974: 4, fig. 4).

What often seems to be overlooked in the not inconsiderable literature on comparative measures of broken pottery is actually what it is that is being measured. There may not necessarily be a single answer. The aim of the present study is to use a diverse range of different ceramic products to measure the changing volume and composition of ceramic exchange. At least from the consumers’ perspective, this can be most effectively and

empirically measured in terms of the consumption of individual items. The fact that one of Hulthèn's Norwegian graves had a larger pot probably did not fundamentally alter the funerary experience. Where volume and bulk do potentially become more meaningful is in terms of the consideration of materials used, expenditure in production, coast of transport and ultimately perhaps, the eventual unit cost to the consumer though even that would presumably have been influenced to a greater degree by the materials used and other qualitative factors. Similarly the value of trade ceramics often did not stem from the vessel itself, but rather from their contents. In this sense it seems inappropriate to regard greater bulk of pot (whether measured in weight, surface area or volume) as equivalent to 'more pot' in a meaningful economic sense. Faced with so many unknown factors, what we are essentially forced to fall back on is the slightly abstract but ultimately measurable construct of number of pots consumed: e.g. one lustre bowl equals one African cooking pot.

3.4.2 Indirect Quantitative Measures

If one follows quantitative recording of ceramics to its logical conclusion, the result is fairly clear. All of the directly observable quantitative measures derived from sherds – count, weight, surface area or volume – are ultimately biased (Orton, Tyers & Vince, 1993: 169-70). None provide a direct unaltered link back to the archaeological reality of 'total vessels used'. This issue was acknowledged at a far earlier stage by those involved with the study of faunal assemblages who moved away from straightforward quantitative analysis based on bone fragment counts and instead worked with a value of the minimum number of individuals represented (Egloff, 1973: 352). A similar concept has been proposed for quantification of ceramics. The technique used relies on recording the percentage of a base or rim circumferences present, and combining the totals to provide a minimum number of vessels represented (Bloice, 1971: 251; Egloff, 1973: 352). This system has since been developed by Orton as the ultimate theoretical solution to fragmentation bias (Orton, 1975; 1982; 1989; 1993). The technique has been termed 'equivalent vessel estimates' (or EVEs) and this terminology has since become widely adopted. Put simply, one can rely on the fact that a complete pot – whatever its size, weight, etc. – would originally have had 100% of a rim or base. By adding together the

total percentages of the circumference present, each 100% recorded can be regarded as at least one whole vessel or one EVE, regardless of whether the sherds come from a single or multiple vessels. The total number of whole EVEs provides a measure of the minimum number of vessels represented, which can be used to compare the proportion of one variety of pottery against another using the same standard measure.

> "By contrast [to other methods], the proportion measured by vessel-equivalent is not affected by either completeness or brokenness. Thus the vessel-equivalent is the only measure that is unbiased, both for measuring proportions within an assemblage and for comparing them between assemblages…we have found that weight and vessel-equivalents can be used to reliably (that is without bias) compare proportions of types in different assemblages, while sherd count and numbers of vessels represented cannot" (Orton, Tyers & Vince, 1993: 171).

It may seem that against such a categorical conclusion, the debate over comparative quantification methods has been definitively resolved. Certainly the theoretical argument for EVEs is powerful and incontrovertible. However, two practical issues do need to be acknowledged, the first less serious and the second far more so. First, recording the percentage of a rim or base present on a diameter estimate chart carries with it a certain degree of imprecision (Orton, 1993: 176). This is made far more difficult for pieces that have an irregular circumference and for those with only a small portion surviving (Evans, 1991: 69). Such inaccuracy is likely to be reduced as the experience of the individual recorder improves, in particular as one builds up familiarity with specific vessel forms and their likely size limits. Second, there is a much more serious problem of sample size. In a study recently undertaken by this author on a modest but not insignificant sized assemblage from northeast Iran, it was observed that out of a total assemblage of 2,125 sherds, just 6% (that is 133 sherds) were rims (Priestman, 2008a: 170, 172, fig. 19). Combined these sherds provide just 18.74 complete rim EVEs. Within this relatively straightforward single-period assemblage from a landlocked area, the assemblage breaks down into only 15 different ceramic classes. Four of these classes are not represented by any rims, and the group with the highest figures contains just over 5 whole EVEs. These figures seem too low to accurately compare the relative proportion of different varieties

of pottery even across the whole assemblage. Clearly the situation is made much worse when using EVEs to compare hundreds of different ceramic classes across a range of phases or individual periods[34].

Interestingly, the issue of minimum sample size has been addressed directly (Orton, 1982: 17). As a general guide Orton concludes that one would require at least one EVE per type or class analysed and that "if type A forms 10 per cent of our sample, we need an assemblage of 10 EVEs to estimate with reasonable precision, but if it is 25 per cent we need only 4 EVEs" (Orton, 1982: 18). The assemblage from northeast Iran that we have used as an example clearly falls far short of these standards. If we for a moment follow Orton's guidelines and think of a hypothetical example using the same assemblage to provide the required parameters, the conclusions are revealing. If the assemblage from northeast Iran is in any way typical, 133 sherds make up 18.74 EVEs. In other words, 1 EVE consists on average of 7 sherds. If one wanted to analyse the composition of an assemblage with 10 different kinds of pottery, each of which broke down into exactly the same number of pieces, we would need 70 rim sherds of each variety to provide the required 10% EVEs for each category; that is 700 rim sherds in total. If only 6% of all sherds are rim sherds (see above), then the original assemblage analysed would have to contain as many as 11,666 sherds to fulfil the criteria of one EVE per class. If the aim was to consider much larger numbers of individual types or classes and across a greater spread of sample units – for example multiple phases within an excavation – the total sample of sherds required rises exponentially.

3.5 Establishing a Suitable Methodology

The ultimate aim of ceramic quantification is to establish comparisons not only in the nature, but also in the composition of assemblages within sites, between sites or through time. For this reason and in a purely pragmatic sense, a system of quantification needs to be adopted that allows the comparison of the maximum number of assemblages possible. It is also important that the system that is used is transparent (Priestman, 2009). As has

[34] Evans makes a similar point stating: "The minimum number of rims is a very simple measure to calculate but obviously requires much larger groups of material as body sherds are ignored and it must result in a number of minor fabric types represented by body sherds alone being ignored" (Evans, 1991: 69).

been discussed in this chapter, and will be considered in more detail in Chapter 4, the number of quantified excavation sequences covering the Late Antique or Islamic periods in the western Indian Ocean is relatively limited. Where data are available, they are still often of relatively basic quality. This does not mean that the information available is not worth analysing. On the contrary, the fact that cross-regional quantitative studies of Late Antique and Islamic period ceramic exchange within the Indian Ocean has barely been attempted, means that there remains a major field of research still waiting to be explored. In order to begin this exploratory process, it is necessary to content ourselves with relatively crude quality information, while remaining mindful of the particular problems this may cause. In this case, sherd count provides the most widely applied method of sherd quantification followed by EVEs. Only in one assemblage within the potential sample has sherd weight been recorded (Anuradhapura) and this inevitably creates a discrepancy in the comparability of the data set to all of the others.

Having on the one hand acknowledged the difficulties associated with sherd count data, and on the other argued for the primacy of this method largely on the basis of pragmatic considerations, a few general comments concerning the suitability of the alternative measures can be made with particular reference to the aims of this thesis. As was discussed earlier, measures of the relative size and bulk of ceramics (i.e. weight, surface area or volume) have important potential as devices for understanding the overall volume and scale of ceramic distribution. The problem comes in trying to discern where 'more ceramic' is actually of real economic significance. Another source of information is provided by weight and sherd count combined, particularly with regards to site formation processes. Such characteristics take on most significance for understanding the development of individual site sequences, but are perhaps of less importance in understanding patterns of ceramic exchange. The key measures we are left with are sherd count and EVEs. EVEs have been rigorously tested and shown to be an ideal measure free from other sources of bias, other than recording error. For this reason, EVEs are undoubtedly of critical importance. At the same time, as has been highlighted, very large samples may be required to use EVEs to examine all variables, and the technique is likely to work best when traits within an assemblage are simplified to their maximum extent. While sherd count provides the most common point of comparison between

assemblages, this is also the measure that has been regarded as being the least dependable (Orton, Tyers & Vince, 1993: 169). This assertion needs to be explored a bit more carefully.

Several aspects relating to sherd counts seem to have been overlooked in the discussion of the comparison of quantitative measures. The first aspect to consider, which may at least explain the popularity of sherd counts, is that records that make up excavation archives or museum registers are ultimately tied to the individual objects. In the case of archaeological finds of pottery this is generally the sherd. Of course, sherds can be batch processed, but at the level of diagnosing a specific fragment, providing a drawing, etc. there is undoubtedly an advantage to being able to identify an individual fragment. This is perhaps an even more prevalent concern with Museum collections where sherds are often individually marked and described. What this means in practice, is that figures on sherd quantities are often produced simply as a by-product of the recording process, and are therefore available for use for other purposes.

The key problem with sherd counts, as has been discussed, is that they are influenced by the variable breakability of different ceramic products, or variable breakage under different conditions. To what extent variation occurs in breakage is not something that has been extensively tested, though Chase's experimental results confirm what would be expected: large vessels or particular thin vessels tend to break into more pieces (Chase, 1985: table 1). If we leave aside variation caused but different post-depositional influences for a moment, variable breakage between products could perhaps be seen as less of a problem. Obviously certain categories of pottery are likely to be more or less well represented archaeologically, depending on the extent to which they break, but such differences should remain fairly consistent across individual categories. If the aim is to understand changing degrees of usage through time, then marked increases of sherds within a particular category should be indicative of general increase in usage. The only factor that could significantly skew that result is increased level of breakage because of additional external factors. Again variation in such factors may have been overemphasised. The removal of very small fragments from the equation already introduces some level of screening. Likewise refitting exercises, where carefully

completed, should pick out most instances of joining sherds including single vessels broken into many pieces. This point would be difficult to verify, but in a study such as that recently completed on the excavated finds from Siraf in the British Museum (Priestman, forthcoming), it seems likely that non-joining sherds from different non-related vessels account for a very high proportion of pieces. In mixed urban deposits, the majority of sherds are probably orphan fragments, meaning that the total number of vessels represented should be far higher than the minimum figure provided by EVEs.

Another factor to consider is the types of sites being compared. The greatest extremes of brokenness could be anticipated between an undisturbed primary deposit, such as a tomb in which a ceramic vessel was interred, and a deposit that has undergone multiple cycles of redeposition, such as often occurs in settlement contexts. Between these extremes, there are many other possible permutations. While the sites considered as part of this study are geographically widely distributed, all are essentially similar in character: i.e. nucleated coastal settlements where trade ceramics accumulated as part of a body of urban refuse deposited through time within the settlement area. Though one might anticipate some levels of intra-site variation, or even regional contrasts caused by differing processes of deposit formation, the extent of this variation should be relatively modest compared with that represented on different site types such as settlements, graves or field scatters. The end conclusion must be that there are clearly genuine problems with the results derived from sherd counts, but that these are perhaps not as serious as has been presented by those concerned with statistical validity. The effects of bias can be minimised by at least being aware of the factors that are likely to skew the sample. In addition, none of the quantification methods designed to factor out influences of bias are themselves entirely problem free. For the purposes of this thesis, sherd counts will be used as the primary method of quantifying pottery and as a basis for generating comparison because this method is straightforward and more importantly universally applied across the different collections currently available for study within the western Indian Ocean region. Nevertheless, best practice should now include the provision of multiple volumetric measures; in particular sherd counts, weight and rim EVEs.

Chapter 4 The Sites

4.1 Introduction

From the available evidence for the nature and volume of the ceramic products in circulation within the western Indian Ocean, the aim is to infer broader patterns of ceramic consumption and exchange. The ceramic assemblages obtained from different parts of the region are themselves shaped to a large extent by the sites with which they are associated, and it is therefore important to provide an accurate assessment of the specific find contents of the individual ceramic data-sets that have been obtained. Ceramic products would have been used for a wide range of different purposes, though the majority of products are likely to have formed part of the general household equipment employed in daily life. In some cases it may be possible to identify archaeological deposits containing special instances of ceramic vessel breakage and discard, for example dumps of pottery fragments broken in transit and discarded at the point of transfer[35]. In general though, it is likely that most vessels were broken during the course of regular use and discarded alongside the clearance of other domestic refuse. It is assumed that the accumulation of ceramic fragments incorporated in the fabric of site occupation deposits then becomes emblematic of the broader ceramic consumption patterns within that settlement. Clearly there is the potential for the sample retrieved in excavation to be skewed by the concentration of particular types of activities in the areas selected for investigation, and it is important to remain mindful of potential sources of bias within the sample[36].

This chapter outlines how the site assemblages used in the thesis were chosen, before providing a description of the size and nature of settlements they are derived from the position of settlements in relation to the coastal environment or inland networks of communication. The other aspect that has a significant bearing on the nature of

[35] See for example the discussion of the possible interpretation of the high incidence of imports from the early beach deposits at Manda (Horton, 1986: 207).

[36] A relevant example includes the large-scale influx of local production waster material in the later occupation deposits at Bilad al-Qadim (Carter, 2005: 143). This appears to skew the proportions of other categories within the assemblage (see **Chapter 6**).

the ceramic finds data available is the way in which they were recovered. More specific information related to the phasing of site occupation sequences and the recording of ceramic finds will be discussed separately below (**Chapter 5**), but here it will be useful to introduce the broader aspects of the archaeological investigations that have been carried out. The final part of the chapter draws together the information provided within each of the individual site case studies and briefly considers the overall representativeness of the available samples. This includes the main factors of geographic and chronological coverage, and potential differences in site function. The nature of the find samples themselves are discussed separately below (**Section 5.2**).

4.2 Site Selection

The criteria for selecting sites for inclusion within this study are determined by three main factors: chronology, geographic location and sample suitability. As has been outlined elsewhere (**Sections 1.3-4**), the study focuses on the period from AD *c*.400 – 1275. Sites with significant evidence of occupation spanning all or part of this range have therefore been targeted for investigation. Geographically the study covers the region comprising the northern rim of the western Indian Ocean running from the extremities of Sri Lanka in the southeast, to South Africa in the southwest. Within this area evidence is drawn from coastal settlements, or sites that were closely associated with the Indian Ocean maritime exchange network. Particular emphasis is given to the Persian Gulf region and other areas of the western Indian Ocean that demonstrate connections to the Persian Gulf via ceramic exchange. Finally, the analysis is dependent on the availability of quantified ceramic finds data, preferably obtained from stratified excavation deposits. The issues related to the finds sample are discussed separately below (**Chapter 5**).

In order to identify potentially suitable sites that meet the respective criteria for inclusion, a general review has been undertaken of known prominent archaeological sites from the western Indian Ocean region (**Table 4.1**). Also included are some of the most prominent regional centres inland, which in many ways are inextricable from

the life of ports, both as major centres of consumption, and in many cases the source of political sanction for commercial outlets developed on the coast. Although this list is by no means comprehensive, it should cover the majority of relevant sites where significant archaeological investigation has taken place, and certainly all of those from which quantitative sequences have been obtained. For each site it has been noted whether the site has been excavated, whether the excavated assemblage has been quantified, and whether that quantification has been published (**Table 4.2**). Only in cases where all three of these criteria have been met, or where it has been possible to personally record unpublished quantitative data, is it possible to use that site for the detailed analysis presented within this study. A more general review of ceramic distribution evidence across these sites is beyond the remit of the present investigation.

	Name	1st				2nd				3rd				4th				5th				6th				7th				8th				9th				10th				11th				12th				13th				14th				15th			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Northern Arabia	Samarra																																																									
	Baghdad																																																									
	Ctesiphon																																																									
	Tulul al-Uhaidir																																																									
	Kufa																																																									
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	Al-Qusur																																																									
	Failaka																																																									
	Akkaz																																																									
Southern Iran	Susa																																																									
	Jundi Shapur																																																									
	Istakhr																																																									
	Bishapur																																																									
	Firuzabad																																																									
	Darabgird																																																									
	Sirjan																																																									
	Ghubayra																																																									
	T. Dasht-i Deh																																																									
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	Siraf																																																									
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	New Hormuz																																																									

	Name	1st				2nd				3rd				4th				5th				6th				7th				8th				9th				10th				11th				12th				13th				14th				15th			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Eastern Arabia	Thaj																																																										
	Jubayl																																																										
	Jabal Berri																																																										
	Murwab																																																										
	Q. al-Bahrain																																																										
	Barber Well																																																										
	Bilad al-Qadim																																	P1				P2				P3				P4				P5				P6							
	A'Ali																																					P1																				
	Sir Bani Yas																																																										
	Jumayrah																																																										
	Ed-Dur																																																										
	Mleiha																																																										
	Khatt																																																										
	J. al-Hulaylah																																																										
	Kush																Period I								Period II					Period III				Period IV								Period V				Period VI-VII											
	al-Mataf																																																									
	J. al-Ghanam																																																										
	Sohar																																																										
	Qalhat																																																										
	Ras al-Hadd																																																										
Southern Arabia	Khor Rori																																																										
	H. al-Sharqiya																																																										
	Sharma																																																										
	al-Shihr																																																										
	Qana	Lower				Middle												Upper																																											
	Shabwa																																																										
Red Sea	Zabid																																																									
	Athar																																																										
	Al Mabiyat																																																										
	Tell Qulzum																																																										
	Aqaba																																																										
	Aynuna																																																										
	Abu Shaar																																																										
	Quseir al-Qadim																																																										
	Marsa Nakari																																																										
	Berenike																																																										
	Aydhab																																																										
	Sawakin																																																										
	Badi																																																										
	Adulis																																																										
	Aksum																																																										
	Matara																																																										

	Name	1st				2nd				3rd				4th				5th				6th				7th				8th				9th				10th				11th				12th				13th				14th				15th			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3			1	2	3	4	1	2	3	4	1
East Africa	Heis																																																										
	Damo																																																									
	Ras Hafun West																																																									
	Ras Hafun Main																																																									
	Manda																																																									
	Shanga																																																									
	Pate																																																									
	Gedi																																																									
	Tumbe																																																									
	Mtambwe Mkuu																																																									
	Ras Mkumbuu																																																									
	Fukuchani																																																									
	Unguja Ukuu																																																									
	Kilwa																																																									
	Songo Mnara																																																									
	Chibuene																																																									
	Dzindani																																																									
	M'Beni																																																									
	Old Sima																																																									
	M'Bachile																																																									
	Dembeni																																																									
	Mahilaka																																																									
	KwaGandaganda																																																									
South Asia	Banbhore																																																									
	al-Mansura																																																									
	Sanjan																																																									
	Chaul																																																									
	Khambat																																																									
	Elephanta																																																									
	Alagaukulam																																																									
	Nevasa																																																									
	Pattanam																																																									
	Arikamedu																																																									
	Mantai																																																									
	Anuradhapura	Period G															Period F																Periods E-B																										
	Tissamaharama																																																									

Table 4.1 *Archaeologically documented sites from the western Indian Ocean region occupied between the 1st – 15th centuries showing periods of major occupation (highlighted in red) and reduced/declining occupation (highlighted in orange). Cells highlighted in grey show the main period covered within this study. For more information on the sites see the table below.*

	Site Name	Country	Type	Size (ha)	Excavated	Published	Quantified	Lat	Long	Source
Northern Arabia	**Samarra**	Iraq	IS		Yes	Yes	No	34°11'32.49"N	43°53'10.38"E	Northedge, 2005
	Baghdad	Iraq	IS	7000	No	n/a	n/a	33°18'51.86"N	44°23'28.96"E	Kennedy, 2011
	Ctesiphon	Iraq	IS		Yes	Yes	No	33°11'13.71"N	44°36'17.33"E	Kroger, 1998: 136
	Tulul al-Uhaidir	Iraq	IS		Yes	Yes	No	32°27'24.35"N	43°35'51.20"E	Finster & Schmidt, 1976
	Kufa	Iraq	IS		No	n/a	n/a	32°0'12.60"N	44°20'10.32"E	
	Al Hira	Iraq	IS		Yes	Yes	No	31°57'1.44"N	44°24'18.16"E	Talbot Rice, 1934
	Wasit	Iraq	IS		No	n/a	n/a	32°13'60.00"N	46°17'60.00"E	
	Ain Sha`ia	Iraq	RE		Yes	Yes	No	32°1'33.52"N	44°11'21.37"E	Okada, 1992
	Rahaliya	Iraq	RE		Yes	Yes	No			Finster & Schmidt, 1976
	al-Basra	Iraq	MP		No	n/a	n/a	30°23'59.55"N	47°44'2.67"E	Kennedy, 2011
	Mughaira	Kuwait	CAS	30	No	No	No			Blair, *et al*., 2012: 19-23
	Al-Qusur	Kuwait	RE	144	Yes	Yes	No	29°26'34.78"N	48°20'28.15"E	Kennet, 1991
	Failaka	Kuwait	RE	0.25	Yes	Yes	No			Piacentini, 1984
	Akkaz	Kuwait	RE		Yes	Yes	No	29°21'22.35"N	47°54'23.70"E	Gachet, 1998
Southern Iran	**Susa**	Iran	IS		Yes	Yes	No	32°11'22.03"N	48°14'59.62"E	Whitcomb, 1985b
	Jundi Shapur	Iran	IS	450	Yes	Yes	No			Whitcomb, 2004: 92-3
	Hajiabad (*Istakhr*)	Iran	IS		Yes	Yes	No	29°58'53.12"N	52°54'31.51"E	Whitcomb, 1979
	Anarestan (*Bishapur*)	Iran	IS		Yes	Yes	No	29°46'38.86"N	51°34'18.93"E	Salles & Ghirshman, 1956
	Firuzabad	Iran	IS		No	n/a	n/a	28°51'10.59"N	52°31'57.11"E	Huff, 1974
	Jamsi (*Darabgird*)	Iran	IS		No	n/a	n/a	28°41'28.49"N	54°28'39.26"E	Morgan, 2003
	Sirjan	Iran	IS	350	Yes	Yes	No	29°20'31.92"N	55°46'4.98"E	Morgan & Leatherby, 1987: 26
	Ghubayra	Iran	IS		Yes	Yes	No	29°41'24.62"N	57°37'58.11"E	Bivar, 2000
	Tepe Dasht-i Deh	Iran	IS		Yes	No	No			Williamson, 1971d
	Kharg	Iran	RE		Yes	Yes	No	29°16'3.96"N	50°17'16.20"E	Steve, (ed.) 2003
	Rishahr (*Rev Ardashir*)	Iran	MP	375	No	n/a	n/a	28°54'0.87"N	50°49'49.53"E	Williamson, 1971-72
	Hazar Mardom/Halileh	Iran	MP	160	No	n/a	n/a	28°50'55.92"N	50°52'13.17"E	Williamson, 1971-72
	Shif	Iran	CAS	1	No	n/a	n/a	29° 4'14.92"N	50°53'56.83"E	Carter, et al., 2006

	Site Name	Country	Type	Size (ha)	Excavated	Published	Quantified	Lat	Long	Source
S. Iran	**Deh Qa'ed**	Iran	IS	300	No	n/a	n/a	29°18'46.42"N	51°11'19.46"E	Carter, et al., 2006
	Zirah (*Tawwaj*)	Iran	IS	54+	No	n/a	n/a	29°24'31.58"N	51° 8'56.41"E	Carter, et al., 2006
	Tahiri (*Siraf*)	Iran	MP	250	Yes	No	Yes	27°40'2.43"N	52°20'6.67"E	Whitehouse, 2009
	Bibi Khatun	Iran	CAS		No	n/a	n/a			Whitehouse, 1968: 15, 17-18
	Kish	Iran	MP	50	No	n/a	n/a	26°34'6.51"N	53°58'20.76"E	Whitehouse, 1976
	Tepe Chahah (*Old Hormuz*)	Iran	MP		No	n/a	n/a			Morgan, 1991
	Jarun (*New Hormuz*)	Iran	MP		No	n/a	n/a	27°5'40.27"N	56°27'8.72"E	Morgan, 1991
Eastern Arabia	**Al-Hasa**	Saudi Arabia	IS		No	n/a	n/a			Whitcomb, 1978
	Qatif	Saudi Arabia	CAS		No	n/a	n/a			Kennet, 2007: 95
	Thaj	Saudi Arabia	IS	40	Yes	Yes	No			Kennet, 2007: 95
	Jubayl	Saudi Arabia	RE		Yes	No	No			Carter, 2008: 98
	Jabal Berri	Saudi Arabia	RE		No	n/a	n/a			Carter, 2008: 98
	Murwab	Qatar	CAS	70	Yes	Yes	Yes	25°52'18.73"N	51° 1'31.01"E	Guérin & al-Na'imi, 2009
	Qala'at al-Bahrain	Bahrain	CAS	20	Yes	Yes	No	26°14'0.07"N	50°31'11.27"E	Kennet, 2007
	Barber Well	Bahrain	CAS	n/a	Yes	Yes	No			Frifelt, 2001: 13-33
	Bilad al-Qadim	Bahrain	CAS	100?	Yes	Yes	Yes	26°12'42.00"N	50°32'54.76"E	Insoll, 2005
	A'Ali	Bahrain	CAS	1.4	Yes	Yes	Yes	26°9'19.73"N	50°31'58.84"E	Sasaki & Sasaki, 2011
	Sir Bani Yas	U.A.E.	RE	3.5	Yes	Yes	Yes	24°19'5.15"N	52°38'11.70"E	Carter, 2008
	Jumayrah	U.A.E.	CAS		No	n/a	n/a	25°12'38.31"N	55°14'53.42"E	Kennet, 2007: 97
	Ed-Dur (*Omana)*	U.A.E.	CAS	800	Yes	Yes	No	25°42'4.11"N	55°49'1.80"E	Tomber, 2008: 110-11
	Mleiha (*Ravana*?)	U.A.E.	IS	296	Yes	Yes	No	25° 4'0.43"N	55°49'15.54"E	Tomber, 2008: 112-13
	Khatt	U.A.E.	CAS	0.4	Yes	Yes	No			Kennet, 1998
	Jazirat al-Hulaylah	U.A.E.	CAS		Yes	Yes	No	25°53'9.83"N	56° 1'39.73"E	Sasaki, 1995
	Kush	U.A.E.	CAS	1.2	Yes	Yes	Yes	25°49'21.66"N	56° 0'22.01"E	Kennet, 2004
	al-Mataf	U.A.E.	CAS		Yes	Yes	Yes			Kennet, 2004
	Jazirat al-Ghanam	Oman	CAS	0.9	Yes	Yes	No	26°22'6.96"N	56°21'26.26"E	de Cardi, 1972: 305, fig. 1
	Sohar	Oman	MP	73	Yes	Yes	No	24°21'43.59"N	56°44'57.34"E	Kennet, 2007:97-99
	Qalhat	Oman	MP	59	Yes	No	Yes	22°41'45.92"N	59°22'38.24"E	Rougeulle, 2010
	Ras al-Hadd	Oman	PO	13	Yes	Yes	No	22°31'51.46"N	59°46'55.38"E	Cleuziou & Tosi, 1988

	Site Name	Country	Type	Size (ha)	Excavated	Published	Quantified	Lat	Long	Source
S. Arabia	**Khor Rori** (*Moscha Limen*)	Oman	PO		Yes	Yes	No	17°2'20.38"N	54°26'4.00"E	Tomber, 2008: 106-07
	Al-Hamr al-Sharqiya	Oman	CAS	0.5	Yes	Yes	No	17°1'43.60"N	54°26'42.59"E	Rougeulle, 2007: 654-55
	Sharma	Yemen	PO	5	Yes	No	Yes	14°49'25.98"N	50° 1'39.16"E	Rougeulle, 2005
	al-Shihr	Yemen	PO		Yes	No	No	14°45′39″N	49°36′25″E	Hardy-Guilbert, 2001
	Qana	Yemen	MP		Yes	Yes	No	14° 0'34.01"N	48°19'35.90"E	Tomber, 2008: 103-05
	Shabwa	Yemen	IS		Yes	Yes	No	14°45'14.62"N	46°31'16.63"E	Tomber, 2008: 105
	Aden	Yemen	MP		No	n/a	n/a	12°48'23.52"N	45°1'5.04"E	Margariti, 2007
Red Sea	**Zabid**	Yemen	IS		Yes	Yes	No	14°12′0″N	43°19′0″E	Power, 2008: 99
	Athar	Saudi Arabia	MP	160	Yes	Yes	No	17°8'29.91"N	42°25'48.63"E	Zarins, 1989
	Jiddah	Saudi Arabia	PO		No	n/a	n/a	21°30′0″N	39°11′0″E	Facey, 2009
	Al-Jar	Saudi Arabia	PO					23°37'54.26"N	38°32'24.99"E	Power, 2010
	Al Mabiyat	Saudi Arabia	IS	64				26°26'15.88"N	38° 8'42.39"E	Power, 2010
	al-Fustat	Egypt	PO		Yes	Yes	No	30°0′0″N	31°14′0″E	Scanlon, 1965
	Tell Qulzum (*Clysma*)	Egypt	MP					29°58′0″N	32°33′0″E	Tomber, 2008: 66
	Aqaba (*Aila*)	Jordan	MP		Yes	Yes	No	29°31′0″N	35°0′0″E	Tomber, 2008: 69-71
	Aynuna (*Lenke Kome*)	Saudi Arabia	PO					28°5′N	35°11′E	Tomber, 2008: 68
	Abu Shaar	Egypt	CAS							Tomber, 2008: 58
	Q. al-Qadim (*Myos Hormos*)	Egypt	MP	10	Yes	Yes	Yes			Peacock & Blue, 2006
	Marsa Nakari (*Nechesia*)	Egypt	MP					24°55′29″N	34°57′44″E	Tomber, 2008: 65
	Madinat al-Ḥaras (*Berenike*)	Egypt	MP		Yes	Yes	Yes	23°54′37″N	35°28′25″E	Tomber, 2008: 61-65
	Aydhab	Sudan	PO					22°19′51″N	36°29′25″E	Power, 2008
	Sawakin	Sudan	PO							Power, 2008
	Badi	Sudan	PO							Power, 2008
	Zula (*Adulis*)	Eritrea	MP		Yes	Yes				Tomber, 2008: 89-92
	Aksum	Ethiopia	IS		Yes	Yes	No	14°7'53.76"N	38°43'41.01"E	Tomber, 2008: 90-92
	Matara	Ethiopia	IS							Tomber, 2008: 92

	Site Name	Country	Type	Size (ha)	Excavated	Published	Quantified	Lat	Long	Source
East Africa	**Heis** (*Mundu*)	Somalia	CAS		No	n/a	n/a			Tomber, 2008: 95-96
	Damo	Somalia	CAS		No	n/a	n/a			Tomber, 2008: 96
	Ras Hafun West	Somalia	CAS	0.12	Yes	Yes	No	10°26'4.54"N	51°15'2.67"E	Smith & Wright, 1988: 124-25
	Ras Hafun Main	Somalia	CAS	1.3	Yes	Yes	No	10°24'43.75"N	51°16'29.44"E	Smith & Wright, 1988: 124-25
	Manda	Kenya	CAS	18	Yes	Yes	Yes	2°13'36.98"S	40°58'1.92"E	Chittick, 1984
	Shanga	Kenya	CAS	15	Yes	Yes	Yes	2°7'5918"S	41° 4'2.89"E	Horton, 1996b
	Pate	Kenya	CAS	30	No	n/a	n/a			Wilson, 1982: 201
	Gedi	Kenya	CAS	18	Yes	Yes	No	3°18'41.27"S	39°59'25.75"E	Wilson, 1982: 211
	Tumbe	Tanzania	CAS	35	Yes	No	Yes	4°56'42.71"S	39°47'30.44"E	Flexner, *et al*., 2008
	Ras Mkumbuu	Tanzania	CAS		Yes	No	Yes	5°11'39.24"S	39°39'34.25"E	Clark & Horton, 1985
	Mtambwe Mkuu	Tanzania	CAS		Yes	No	Yes	5°4'29.30"S	39°43'4.76"E	Clark & Horton, 1985
	Fukuchani	Zanzibar	CAS	10	Yes	No	Yes	5°49'16.48"S	39°17'26.86"E	Crowther, *et al*., 2013
	Unguja Ukuu	Zanzibar	CAS	16	Yes	Yes	No	6°19'2.92"S	39°22'30.81"E	Crowther, *et al*., 2013
	Kilwa	Tanzania	CAS	30	Yes	Yes	No	8°57'35.54"S	39°29'45.42"E	Chittick, 1974: 18-19
	Songo Mnara	Tanzania	CAS		Yes	No	Yes	9° 2'22.49"S	39°33'7.37"E	Wynne-Jones & Fleisher, 2010
	Chibuene	Mozambique	CAS	1	Yes	Yes	No	22°0'3.49"S	35°19'8.28"E	Sinclair, 1982
	Dzindani	Comoros	CAS	1	Yes	Yes	No			Wright, 1984
	M'Beni	Comoros	CAS	1	Yes	Yes	No			Wright, 1984
	Old Sima	Comoros	CAS	6.6	Yes	Yes	No			Wright, 1984
	M'Bachile	Comoros	CAS	4	Yes	Yes	No			Wright, 1984
	Dembeni	Comoros	CAS	5	Yes	Yes	No			Wright, 1984
	Irodo	Madagascar	CAS							
	Mahilaka	Madagascar	CAS	200	Yes	Yes	No			Radimilahy, 1998
	KwaGandaganda	South Africa	IS		Yes	Yes	No	29°41'55.13"S	30°49'39.07"E	Whitelaw, 1994

	Site Name	Country	Type	Size (ha)	Excavated	Published	Quantified	Lat	Long	Source
South Asia	**Banbhore** (*Daybul*)	Pakistan	MP	167	Yes	Yes	No	24°45'5.09"N	67°31'16.19"E	Khan, 1960
	al-Mansura (*Brahminabad*)	Pakistan	IS		Yes	Yes	No	25°52'55.32"N	68°46'35.62"E	Khan, 1990: 1-4
	Dwarka	India	PO		Yes	Yes	No	22°13'58.06"N	68°58'46.00"E	Ansari & Mate, 1966
	Khambat	India	PO		No	n/a	n/a	22°18'58.39"N	72°37'12.66"E	Nanji, 2011
	Baruch (*Barygaza*)	India	PO		No	n/a	n/a	21°41'55.47"N	72°59'22.45"E	Howell & Sinha, 1994
	Sanjan	India	PO	225	Yes	Yes	Yes	20°11'59.60"N	72°48'0.22"E	Nanji, 2011
	Elephanta	India	PO		Yes	Yes	No	18°57'58.05"N	72°56'25.81"E	Tripathi, 2004
	Chaul (*Simur*)	India	PO	180	Yes	Yes	No	18°32'53.81"N	72°55'41.43"E	Nanji, 2011
	Nevasa	India	IS		No	n/a	n/a	19°33'5.45"N	74°55'35.83"E	Tomber, 2008: 132
	Brahmapuri	India	IS		Yes	Yes	No	20°36'39.69"N	79°51'40.51"E	Sankalia & Dikshit, 1952
	Pattanam (*Muziris*)	India	MP	24	Yes	No	Yes	10°9'13.82"N	76°12'22.11"E	Tomber, 2008: 142-43
	Arikamedu (*Poduke*)	India	MP		Yes	Yes	No	11°54'10.69"N	79°49'11.90"E	Tomber, 2008: 133-37
	Mantai	Sri Lanka	MP		Yes	No	Yes	8°57'29.26"N	79°57'30.08"E	Tomber, 2008: 146
	Anuradhapura	Sri Lanka	IS	100	Yes	Yes	Yes	8°21′0″N	80°23′0″E	Coningham, 1999
	Tissamaharama	Sri Lanka	CAS		Yes	Yes	No			Tomber, 2008: 146-47

Site Type: MP = Major Port (major 'international' port)
PO = Port (significant coastal settlement with port functions)
CAS = Coastal Area Settlement (settlement on the coast or several kilometres inland with no obvious port function)
IS = Inland Centre (regional administrative and economic centre inland from the coast)
RE = Religious Centre (religious site, church, mosque, temple, funerary site, etc.)

Table 4.2 *Archaeologically documented sites from the western Indian Ocean region occupied between the 1st – 15th showing the country location, the site type (see key above) and where known, the site size, whether it has been excavated, published and quantified, the location and published source. The sources listed are those used for dating and site location purposes and are not necessarily the earliest, most recent or most significant source.*

Out of a total of 121 prominent sites (**Tables 4.1-2**) distributed throughout the western Indian Ocean, there are currently only 13 sites that have ceramic assemblages that meet the criteria for inclusion within this study (**Fig. 4.1**, **Tables 4.3-5**). One of the most significant limiting factors of this investigation is the small number of assemblages currently available from the western Indian Ocean, and the attempt made here is to extrapolate more widely from the available evidence. Clearly within such a small number of sites there are major deficiencies in the coverage provided, which are further compounded by various factors of variability within the existing sample. These factors of variability cover a wide range of different areas including geographic and chronological coverage, differences in site scale, function and status and differences in the quality of the available ceramic finds sample.

Geographically, the majority of the sites are concentrated within the area of the Persian Gulf or Eastern Arabia (62%) and the coverage provided for other areas of the western Indian Ocean is more limited (**Table 4.4**). For East Africa, the two assemblages that represent this area come from the neighbouring settlements of Manda and Shanga (**Fig. 4.1**), so the geographic focus here is particularly narrow. The attempt made to trace the long-term trajectory of economic development from the Late Antique to Islamic periods is also compromised to some extent by the chronological coverage of the available finds sample (**Table 4.3**). For the period pre-dating the mid-8th century, the data are limited and often of questionable quality (see below). In terms of site types there are also important regional and chronological differences. From the Persian Gulf area, three of the sites (Bushehr, Siraf and Sohar) appear to have been substantial ports that owed their existence and prosperity largely to the activities of maritime trade. Other settlements, particularly those along the Arabian littoral such as Bilad al-Qadim, Murwab, Sir Bani Yas and Kush appear to have derived only part of their subsistence base from wider maritime exchange networks. Similarly in East Africa, the status of coastal area settlements is still a point that is widely contested (see for example Fleisher, 2010). In South Asia, the evidence comes from a mixture of site types. Sanjan and Pattanam both appear to have served as prominent ports at different times, while Anuradhapura acted as the political and religious centre of a regional dynasty that participated to some extent with wider Indian Ocean exchange networks via an overland supply channel to

the port of Mantai (Carswell, 1991: 197). Finally in terms of the quality of the available ceramic finds sample, the assemblages vary broadly in quality from those that have been fully quantified, accurately phased and published, to those that have only been partially recorded, or cases where no phasing is available. In one case the assemblage simply consists of a large grab sample of pottery picked up off the surface of a large and widely dispersed settlement.

Some of the factors in variability within the available site and finds sample probably have a meaningful basis in archaeological reality, and will remain as durable features even following the production of further evidence. Examples include the fundamental differences in site scale and organisation between different geographic area such as South Asia, the Middle East or East Africa. Similarly, the lack of pre-7th or 8th century coastal settlements in East Africa with significant evidence of exchange contacts with the Persian Gulf may only ever be altered by exceptional cases. At the same time, as has been examined in detail earlier (**Section 2.2**), various deeply embedded factors related to the scope of research and methodological practice within the region, appear to have held back progress in providing more systematically recorded quantified finds data from key settlements within the region. This situation has only very recently changed, and the exponential growth that is likely to occur in the near future in carefully phased, dated, and quantified ceramic assemblages is going to vastly improve the ability to develop broad generalisations on the basis of the available evidence (**Table 1.3**). For now, what it is possible to achieve is a preliminary exploration of a still limited pool of data. The remainder of this chapter outlines the broad characteristics of the sites from which quantitative data has been extracted. In the following chapter, the actual ceramic finds data from these same sites is examined.

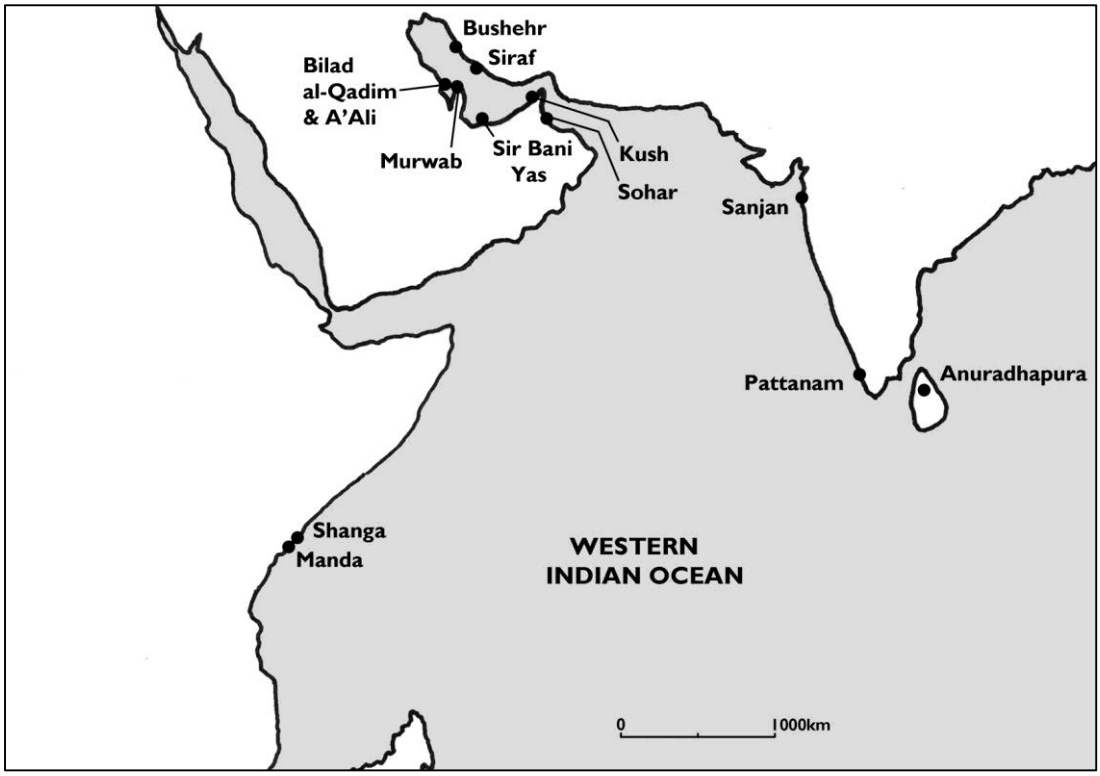


Fig. 4.1 *Map of the western Indian Ocean showing the location of sites with quantified ceramic assemblages considered within the analysis.*

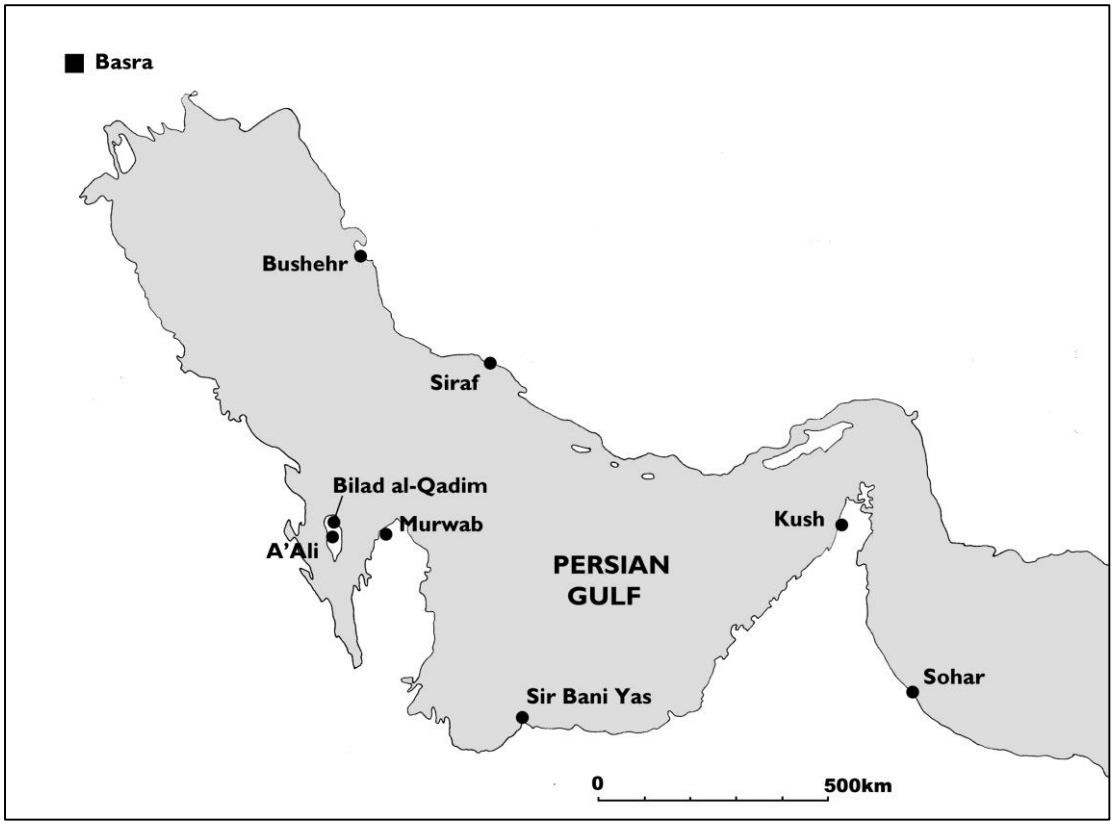


Fig. 4.2 *Map of the Persian Gulf showing the location of sites with quantified ceramic assemblages considered within the analysis (dots), together with prominent post of Basra (square).*

SITE	CP1													CP2				CP3	CP4	CP5			CP6													
	4th				5th				6th				7th				8th		9th	10th			11th			12th			13th				14th			
Siraf																		P2-3	P4-7	P8			P9										P10			P11
Bushehr	Undifferentiated																																			
Bilad al-Qadim																		P1	P2			P2	P3-4					P5				P6				
A'Ali																			L1	L1																
Murwab																			Undif.																	
Sir Bani Yas														Undif.																						
Kush					W01-E01									W04-E02				E03-04	E05	E06-07			E08-09										E10			
Sohar														L0-II				LIII-IV	LV	Contam.																
Manda																			Undifferentiated																	
Shanga																		P1	P2-5	P6-7			P8-14										P15-19			
Sanjan																		L6-5	L4-3				L2					L2				L1				
Pattanam	Undifferentiated								Undif.																											
Anuradhapura	PG				PF								PF or Void?						PE-B																	

Site	Area	Country	Site Size (ha)	Excavation Volume (m^3)	Total Sherds
Siraf	Site A	**Iran**	250	525	21787
Bushehr		**Iran**	535	n/a	1540
Bilad al-Qadim	KHA+MOS	**Bahrain**	100?		31597
A'Ali		**Bahrain**	1.4	280	3197
Murwab		**Qatar**	70		6948
Sir Bani Yas	SYB-9	**United Arab Emirates**	3.5		1194
Kush	Trench A	**United Arab Emirates**	1.2	2112	30396
Sohar	Town	**Oman**	73		1217
Manda		**Kenya**	18		250000
Shanga	Tr 6-10	**Kenya**	15	1428	135836
Sanjan	TT4	**India**	225		1078
Pattanam	Warf	**India**	24		3671443
Anuradhapura	ASW2	**Sri Lanka**	100	903	358
TOTAL					4156233

Table 4.3 *(Above) selected sites with quantified ceramic assemblages from the western Indian Ocean showing the periods of occupation and the correlation between the site phasing the ceramic periodisation (CP1-6). Red cells indicate major occupation and yellow minor or declining occupation.*

Table 4.4 *(Left) selected sites with quantified ceramic assemblages from the western Indian Ocean showing the various site details.*

Name	Recording Policy	Assemblage Treatment	Sherds Quantified	Data Source
Siraf	All excavated ceramics quantified and recorded on find record cards, none published	Small portion of larger excavated assemblage individually recorded via direct visual inspection of sherds in the British Museum + full inventory of finds recorded for one site from the find record cards	c.3,000,000 (total) 8,537 (directly recorded) 21787 (recorded from find record cards)	Sherds + find record cards
Bushehr	Large but selective sample of ceramics retained from surface survey, none previously published	Whole sample recorded via direct visual inspection of finds from the Ashmolean Museum	1,754	Sherds
Bilad al-Qadim	Majority of excavated ceramics quantified and published but only percentage figures included	Class/type groups checked from publication, sherds quantified from original finds database	31,597	Publication + finds database
A'Ali	All ceramics quantified and published but using poorly defined class groupings	Quantities and class groups recorded from publication	3,197	Publication
Murwab	Sherd totals for broad groups within the assemblage from the first season of excavation published	Quantities recorded from publication	6,948	Publication
Sir Bani Yas	Selective sample of ceramics quantified by sherd count and rim EVEs	Quantities and class groups recorded from publication	1,194	Publication
Kush	All excavated ceramics from Trench A quantified and published, though only diagnostics counted for some coarse wares	Class groups checked from publication + visual inspection of selected class categories at the Department of Antiquities in Ras al-Khaimah in 2010. Quantification generated from original finds database with some categories amended on the basis of the visual inspection	65,203 (total) 30,396 (in phased sequence)	Publication + sherds + finds database
Sohar	Small selective portion of excavated ceramics retained	Available sample from Sohar Town excavation recorded via direct visual inspection of sherds at the Ministry of Culture in Muscat in 2010	1,221	Sherds
Manda	All imports ceramics from excavation crudely quantified and published, all imports retained	Almost all imported ceramics individually recorded via direct visual inspection of sherds at the National Museums of Kenya headquarters in Lamu in 2010	250,000 (11,101 imports)	Sherds
Shanga	All excavated ceramics from Trenches 6-10 quantified, published and retained	Class groups checked from publication + via direct visual inspection of selected class categories at the National Museums of Kenya headquarters in Lamu in 2010	135,836 (7,377 imports)	Sherds
Sanjan	All diagnostic sherds from TT4 excavation quantified and published	Class groups checked from publication and amended where necessary	2,722	Publication
Pattanam	All ceramics from the first five seasons of excavation of the wharf area quantified by broad class grouping	Quantities and class groups recorded from publication	3,671,443	Publication
Anuradhapura	All excavated ceramics quantified and published from ASW2, local pottery quantified only by weight, imports by weight and count	Class groups checked from publication and amended where necessary	469,945 (total weight in grams, all periods) 358 (sherd count imports)	Publication

Table 4.5 *Sites in the western Indian Ocean from which detailed quantitative data has been extracted via direct study of find assemblages in different locations and/or archival records and publication.*

4.3 Site Case Studies

4.3.1 Siraf – Iran

Location: 27°40'02"N 52°20'07"E

Associated Names: Shahriyaj, Siraf, Shilau (historic)
Tahiri (modern)

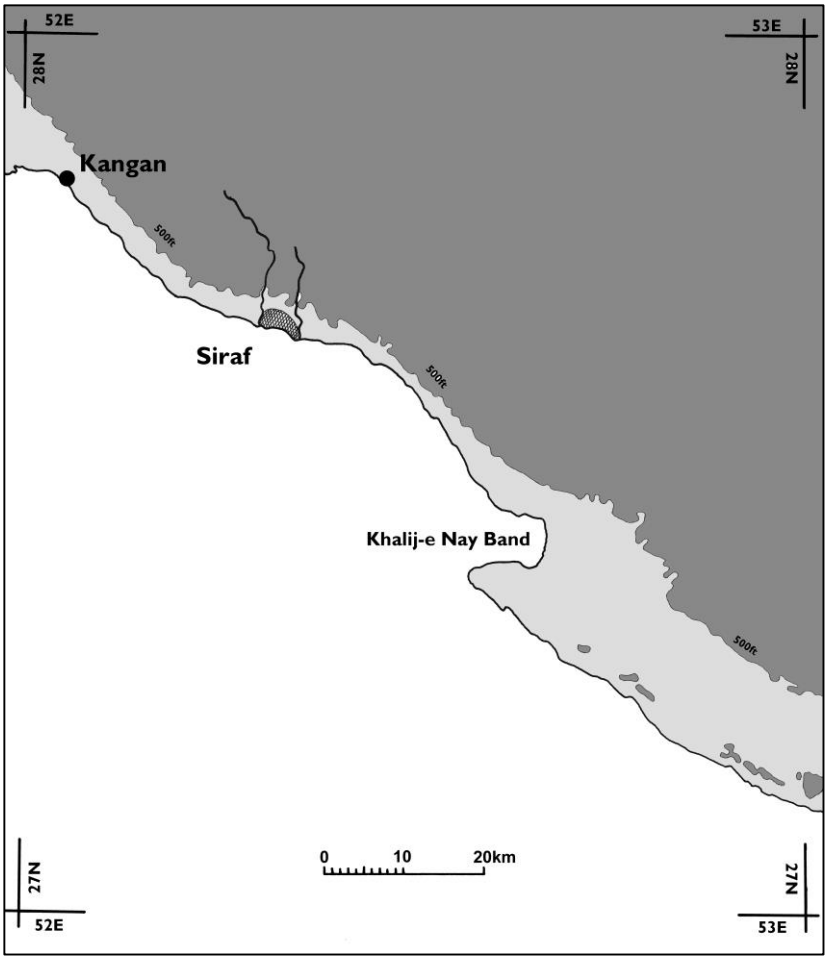


Fig. 4.3 *Map showing the location and extent of the medieval city of Siraf in relation to the surrounding coastline and ground over 500ft. The Khalij-e Nay Band represents the closest protected anchorage from on-shore winds blowing from the south*.

Site Characteristics and Setting

The medieval city of Siraf is situated adjacent to the modern village of Tahiri on a relatively isolated and inhospitable stretch of the northern shore of the Persian Gulf in southern Iran (**Fig. 4.2**) (Whitehouse, 1968: 1). The site occupies a narrow strip of land

wedged between the gently curving south facing Tahiri Bay and the precipitous flanks of the southern Zagros Mountains (**Fig. 4.3**), which rise in a series of mounting ridges starting just 500-1000m in from the shore (**Fig. 4.4**, **Fig. 4.5**, **Fig. 4.6**). The mountains go on to reach heights of over 1500m, 20km further inland (Whitehouse, 1968: 3, fig. 2). This part of Bushehr Province has a mean annual rainfall of between 120 – 400mm, and average summer temperatures of 33^{o}C (Whitehouse, 1968: 2). Consequently the surrounding landscape is desiccated with limited vegetation cover developed over poor quality lithosoils.

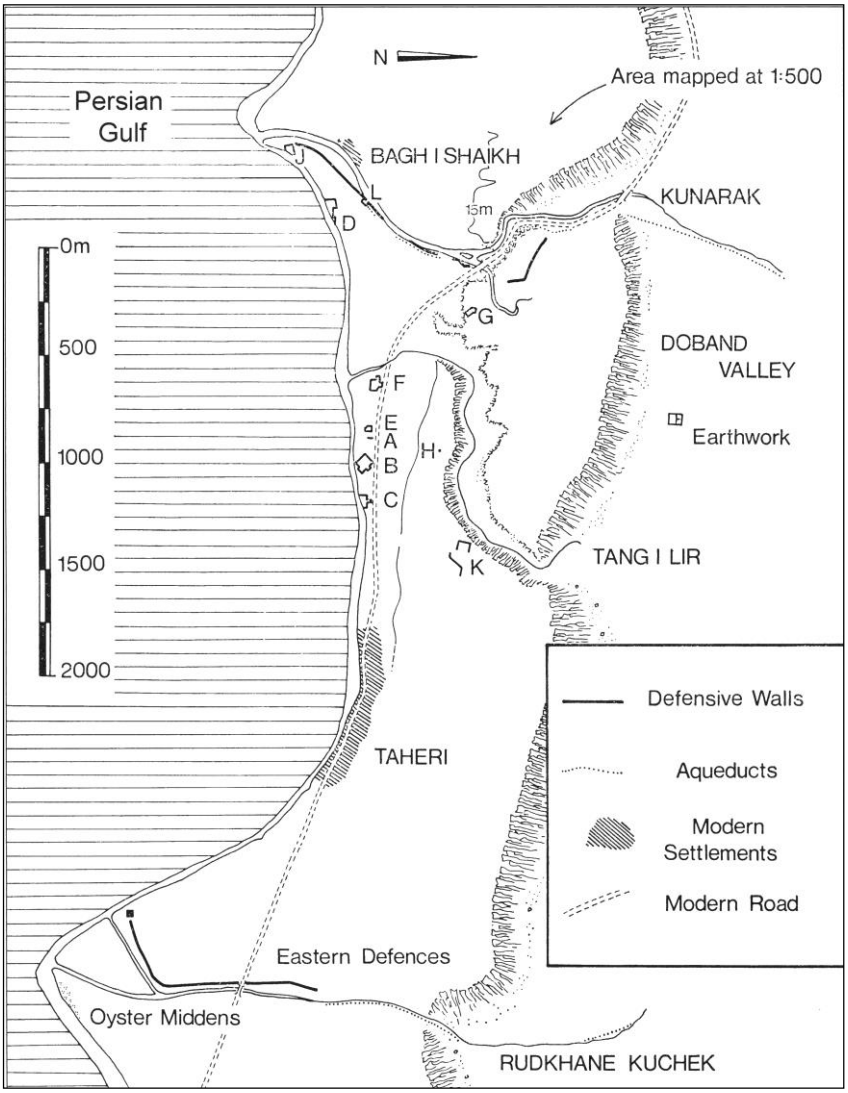


Fig. 4.4 *Location of the medieval city of Siraf facing Tahiri Bay to the south. Letters indicate the location of trenches excavated between 1966 and 1973 (after Whitehouse, 2009: fig. 9)*.



Fig. 4.5 *Aerial view of Siraf with the 'Shaikh's Fort' in the foreground and the prograding tongue of the Kunarak wadi at the western edge of the city (Siraf archive, The British Museum).*



Fig. 4.6 *View looking back across the main ruin field of Siraf from the west with remains of Site D in the foreground*.

Between the late 8th and early 11th centuries, Siraf rose to prominence as one of the most influential port cities within the Persian Gulf. Much of the trade that passed through the Persian Gulf was channelled via Siraf *en route* between the Indian Ocean and the southern Iraqi ports of Basra and al-Ubulla. The precise reason for the development of an entrepôt in this particular location is an issue worthy of consideration in its own right (see for example Ricks, 1970: 344; Priestman, 2005b; in press (a)). The function specifically ascribed to Siraf in the anonymously authored *Akhbār al-Sīn wa al-Hind* written in c. 851, was that Siraf provided suitable harbour for larger vessels to offload cargoes and take on new goods, while smaller vessels with specialised pilots were used to continue the voyage on through the complex shallow sandbar system that makes up the headwaters of the Persian Gulf (Chaudhuri, 1985: 48; Potter, 2009: 4). Siraf was also clearly of importance as a maritime gateway to southern Iran (Whitehouse, 2009: 9). Many of the merchant families who developed their fortunes through Siraf resided in Shiraz and had agents operating on their behalf stationed within the port city where living conditions were less hospitable (Piacentini, 1992: 114-16). Siraf prospered from the increasing political instability in southern Iraq from the mid-late 9th century and, with the decline of Basra, went on to assume the function of the most prominent port within the Persian Gulf region through much of the 10th century (Ricks, 1970: 345).

A wider survey of land-use within the Sirafi hinterland indicates that all available pockets of land surrounding the medieval city were brought under intensive cultivation during the peak period of habitation (**Fig. 4.7**) (Wilkinson, 1974: 129). The total area of land available for use within the vicinity is c.700ha, eight times less than the area of agricultural exploitation in the hinterland of Sohar (Whitehouse, 1979a: 873-75). Agriculture depended on irrigation, which was supplied by conduits leading down from the mountains to terraced fields (Wilkinson, 2009: 60, 62-63, figs. 58-62). Within the city, water was mostly provided in the form of surface capture facilities with storage in covered cisterns, or from deep wells cut down through the rocky substrate (Whitehouse, 2009: 34). In terms of agricultural provisioning, whatever food could be cultivated in the immediate hinterland had to be supplemented by that brought along narrow pack routes leading to the cooler inland valleys of Jam and Galadhar (Whitcomb, 2009b).

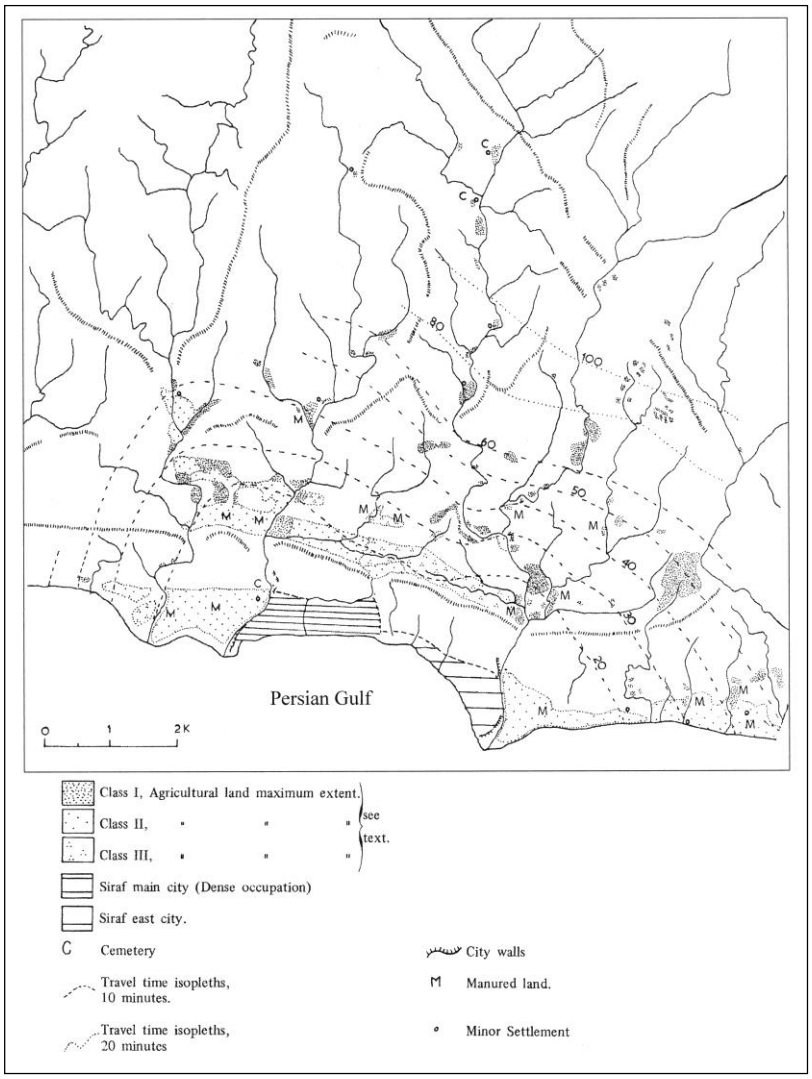


Fig. 4.7 *Land-use survey of the Siraf hinterland showing the maximum extent of land brought under intensive cultivation during the peak occupation of the city between the 9th and 11th centuries (after Wilkinson, 2009: fig. 65)*.

In terms of the suitability of Siraf as a port, certain environmental and archaeological factors appear significant. One of the first European visitors to Siraf was forced to put in to Tahiri Bay in 1835 to seek shelter from a storm (Kempthorne, 1837: 294). A number of interesting points regarding the anchorage off Siraf emerge from his account. They include: the fact that the approach could be made to within a quarter of a mile of the shore still in 2.5 fathoms of water; the sea bed is formed of a stiff clay suitable for anchorage; and the high mountains that back the site afford good protection from one of the most destructive storm patterns within the Persian Gulf that blows from the north west (Kempthorne, 1856: 125). Apart from this useful protection, Tahiri Bay is open and

exposed to strong winds from other directions, which would necessitate ships being moved a considerable distance to gain the protection of the Khalij-e Nay Band (**Fig. 4.3**) (Stein, 1937: 203, citing information from Yaqut).

Archaeologically one of the most significant features related to the site's function as a port is a 4.5m high stone and mortar built wall with regular supporting buttresses extending for over 400m along the shore adjacent to the Great Mosque within the central portion of the city, which was recorded in 1933 (Stein, 1937: 204, fig. 69, plan 17). When investigation was resumed at Siraf in 1966, all traces of the sea wall had been erased, indicating the potentially significant effects of coastal erosion along the seafront. What was initially interpreted as a "quay wall" (Stein, 1937: 204) is unlikely to have been used for mooring large ships. Instead the wall could have been constructed for land retention and to serve as a platform for goods handling. Smaller vessels capable of being dragged onto the beach may also have been moored at this point. Further geomorphological and sub-water investigation along the shore edge will be useful in assessing the potential influence of coastal erosion and in defining the active interface between the city and its main zone of commercial activity (Khakzad, 2012).

The combined results of landscape and topographic surveys and stratigraphic excavations have helped to define the main components of the medieval city. At the height of its prosperity, Siraf spread out over an area of at least 250ha (Whitehouse, 1974: 2). The city itself was densely packed into the main area of available land, delimited at its western edge by the dry Kunarak wadi and the western city wall. At the centre of the city lay a large congregational mosque surrounded by the main commercial bazaar made up of shops, small specialised workshops and other public facilities stretching for about 1km along the shore. Beyond the core of the settlement, there appear to have been extensive residential quarters consisting of large stone-built houses generally with a range of rooms split over two levels set around a central courtyard. Higher up, climbing the slopes of the first rocky escarpment were a number of palatial-scale residences with multiple structures set inside a perimeter enclosure. Just inside the western city wall was a large industrial quarter specialised in the manufacture of plain unglazed ceramics and glass. Sirafi coarse wares were used widely throughout the city and were also exported in large

quantities across the western Indian Ocean (see **Chapter 6**). Elsewhere excavation revealed a range of more specialised buildings such as smaller mosques, hammams and buildings such as the large hall at Site J and the 'basilica like building' at Site N whose function is more difficult to interpret. Beyond these immediate confines is a broader archaeological landscape, which includes areas of stone quarrying, extensive areas of rock-cut graves and tombs, outlying settlements and the traces of agricultural exploitation and communication routes leading further inland. Together these features represent a palimpsest of several centuries of occupation. Within this time span, major transformation in the form and function of the city took place. These are revealed most clearly via the results of the stratigraphic excavations.

Archaeological Investigation

Various aspects of the surface remains at Siraf were reported during the 19th and earlier 20th century (**Table 4.6**).

Year	Individual	Notes	Source
1808	James Morier	Provides the earliest description of Siraf based on an indirect account made by staff of the English East India Company conveyed to Morier during a two-month stay in Bushehr	Morier, 1812: 51
1827	Captain Brucks	Earliest description of Siraf based on direct observations made during the first naval intelligence survey of the Persian Gulf	Brucks, 1856; Stiffe, 1895: 166
1835	Captain Kempthorne	First to identify the site with the medieval city of Siraf. Also removed a carved stone grave cover which was presented to the Royal Asiatic Society in Bombay	Kempthorne, 1837, 294; Kempthorne, 1856-57
1835	Dr. Lumsdaine & Mr. Osborne	Documented evidence of collective burials within tombs situated on rock-faces within the Kunarak gorge	Kempthorne, 1856: 139
1855 or 1856	Commodore Ethersey	Made notes based on observations that were later acquired by Captain Stiffe	Stiffe, 1895: 166, note 2
1857	Captain Stiffe & Captain Constable	Spent two days at Siraf	Stiffe, 1895: 166
between 1879 - 1891	Captain Townsend & Mr Benjamin Traill Ffinch	Removed a second carved stone grave cover and stucco panel with inscription. The grave cover was presented to the British Museum	Stiffe, 1895: 167
1911	Sir Arnold Wilson		Wilson, 1942: 178
1913	Maurice Pezard	Third grave cover removed and deposited with the Louvre in Paris	Ravaisse, 1914
1933	Sir Aurel Stein	Identified the foundation of the Great Mosque, sections of the surviving sea wall, prepared the first detailed topographic plan	Stein, 1937: 202-12
1940	Karl Lindburg		Lindberg, 1955: 121
1960-61	Prof. Vanden Berghe		Vanden Berghe, 1961: 172
1962	Dr. Alastair Lamb	Visited in preparation for the BIPS fieldwork project. Small quantity of sherds removed now in the British Museum	Lamb, 1964

Table 4.6 *Documented visitors and fieldwork at Siraf prior to the British Institute of Persian Studies expedition beginning in 1966*.

The first substantial archaeological investigation at Siraf was initiated shortly after the foundation of the British Institute of Persian Studies in 1961 as a flagship project for the new institution within Iran (Stronach, 1967; 1968; 1969; 1970). Fieldwork was undertaken during seven long seasons between 1966 and 1973 under the direction of David

Whitehouse with the support of the Iranian Archaeological Services. The project consisted of several main components including detailed topographic mapping of the main area of the medieval city (Anon. 1983; Aldsworth, 2005), survey of the Sirafi hinterland (Wilkinson, 1974; 2009; Whitcomb, 2009b) and large-scale excavation (Whitehouse, 1968; 1969; 1970; 1971b; 1972; 1974). In total 15 trenches were investigated combining large areas of architectural exposure (the Great Mosque excavations covers nearly 3,600m²), with detailed single-context stratigraphic excavation and complete quantitative finds recording (**Table 4.7**).

Site	Description	Season Excavated	Sherd Qnt	Other Finds Qnt
A	Deep Sounding	1st	1598	878
B	Great Mosque and Early Palace/Fort	1st-6th	1184	2835
C	City Bazaar	1st,4th-5th	1742	1101
D	Potters' Quarter	1st,4th-5th	302	1345
E	Residential Compound (late occupation)	1st,5th	625	364
F	Residential Quarter	1st-5th	1462	3072
G	Shrine	3rd,5th	0	194
H	Imamzadeh (mausoleum)	5th	0	5
J	Military Complex & Hammam	5th-6th	2	70
K	Palatial Residence	5th-6th	158	282
L	West Gate (city wall)	5th	0	4
M	Mosques and Defensive Wall	6th	206	106
N	Basilica-like Building	6th	5	2
O	Monumental Cemetery	6th	5	163
P	Mosques and Defensive Wall	6th	209	82
?			880	327
Totals			8378	10830

Table 4.7 *Excavations completed at Siraf between 1966 and 1973 showing also when the excavation work was completed and the quantity of ceramic and non-ceramic finds in the British Museum*.

Occupation Sequence and Chronology

The conventional chronology of Siraf proposed by the excavators involves the initial development of a military outpost on the coast from "the early centuries AD" (Whitehouse, 1971a; 2009: 8). This attracted a civilian population that quickly grew in extent to cover at least 1km across with a defensive look out established on a high promontory with a vantage over the city and offshore area. Through the Sasanian period, the largely non-planned domestic architecture was periodically renewed and with time

the military nature of the site was replaced by more obvious urban qualities (Whitehouse, 2009: 12), possibly assuming, even within the Sasanian period, the status of an influential port (Hodges & Whitehouse, 1983: 135). The dating of these early levels depends on a number of different strands of evidence that are reviewed individually in detail elsewhere (Priestman, in press (a)). The revised dating proposed is for a similar but more compact series of developments with a small-scale settlement first established very close to the beginning of the Islamic era, or the earliest in the 5th or 6th centuries. Towards the middle or end of the 8th century, the status of Siraf indisputably changed from a small-scale military installation to that of a major international port (Hodges & Whitehouse, 1983: 135). Around the beginning of the 9th century major planned public building began with the construction and then enlargement of the Great Mosque and presumably many of the other significant works across the city. Through the 9th and earlier 10th centuries Siraf prospered as a major centre of maritime trade within the region.

During the later 10th century Siraf entered a phase of protracted economic decline. At some stage a defensive wall was hastily erected along the seafront blocking off streets and in places requiring the destruction of standing buildings (Whitehouse, 1974: 18). It has been suggested that this may have been erected in anticipation of a naval attack on the city from the rival port of Sohar (Whitehouse, 1974: 21), itself linked with the growing Qarmathian insurgency within the Arabian Peninsula and Persian Gulf (de Blois, 1986). A massive earthquake recorded by Muqaddasī in 977 is also likely to have wrought extensive devastation, though there is evidence of rebuilding after this event, and significant occupation of the site evidently continued beyond this date (Whitehouse, 1975: 264). From the early to mid-11th century, there was a marked episode of decline with the area of the settlement contracting and Siraf clearly losing its status as a significant port against the backdrop of competing political interests from the successor port of Kish (Whitehouse, 1975: 267-68; 1976). At the same time, some of the facilities established continued in operation. The Great Mosque was still undergoing modifications into the 12th or 13th centuries (Whitehouse, 1969: 46; Whitehouse, 1970: 6, 8; Whitehouse, 1971b: 3). In one residential area close to the centre of the city (Site E), a series of relatively large housing compounds were founded in the 12th or 13th century and continued to be occupied through to the 15th century (Whitehouse, 1969: 56-58, pl. VI: b;

Whitehouse, 1972: 84-85). Finds later than the 15th century across the city appear to be extremely scarce.

4.3.2 Bushehr – Iran

Location: 28°54'01"N; 50°49'50"E

Associated Names: Rev Ardashir (historic)
Rishahr, Hazar Mardom, Halileh (modern)

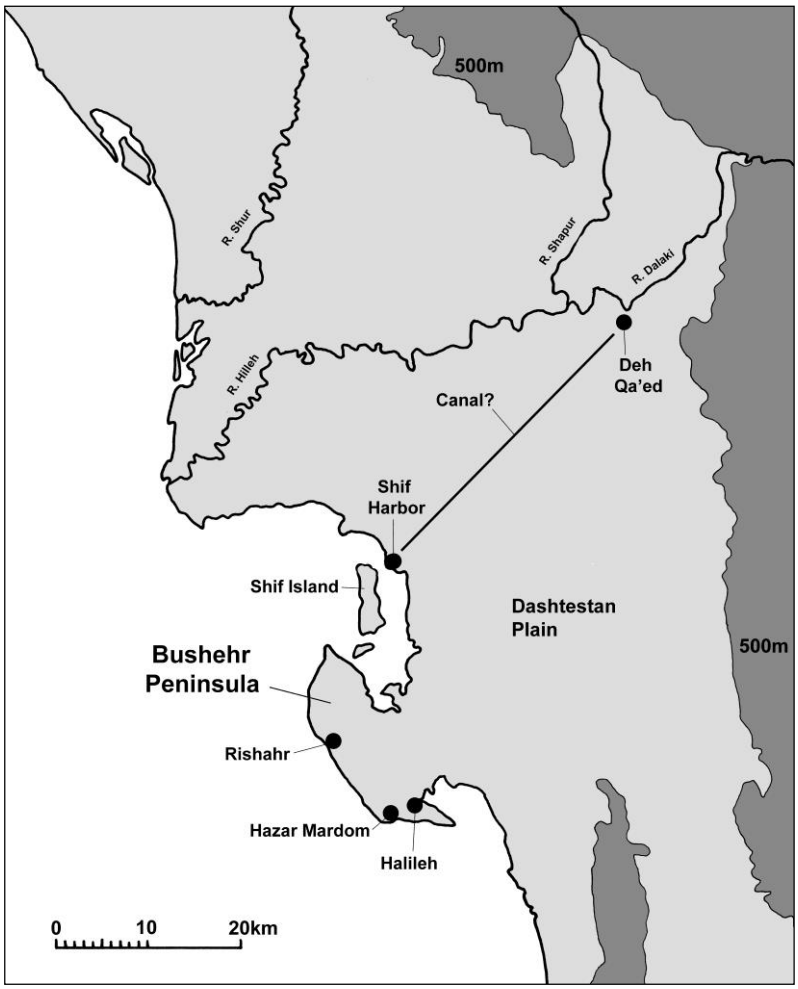


Fig. 4.8 *Map of the Bushehr Peninsula and the adjacent Dashtestan Plain showing the main sites and features mentioned in the associated discussion of the coastal settlement and port*.

Site Characteristics and Setting

The Bushehr Peninsula is situated around midway along the north shore of the Persian Gulf in southern Iran (**Fig. 4.2**). The peninsula is formed from a low-lying strip of quaternary sandstone rising to a maximum height of 35m and stretching for 21km and up to 6km wide, separated from the mainland by tidal mudflats (**Fig. 4.8**) (de Planhol 1990: 569). The whole peninsula tilts somewhat with the highest part forming a low ridge with a shelving coast along the southwest side facing the Persian Gulf. The inner side slopes

away toward a stretch of *sabkh* mudflats that separate the peninsula from the mainland (Lockhart 1960: 1341). Today the peninsula is accessed by a raised causeway, but in the past the mudflats would have been largely impassable, particularly for commercial traffic.

The site of Bushehr is made up of three main urban clusters all situated within several kilometres of one another at Rishahr, Hazar Mardom and Halileh with a spread of smaller sites and features filling much of the area between (**Fig. 4.8**). Because of the nature of the ceramic data available from Bushehr (see **Section 5.2.2**), all of these sites will be presented as part of a single larger site complex and the discussion of the sites is therefore structured with this consideration in mind. Collectively the main settlements Williamson recorded on the Bushehr Peninsula represent the largest Sasanian period settlement known within the Persian Gulf. As no substantial published excavations have been undertaken, little is currently known about occupation sequence. The ruins have been convincingly linked with the historically attested port city of Rev Ardashir (Williamson, 1971-72: 34-5), which is described in early Arab sources as one of the principal ports of the Sasanian Empire, founded early on during the reign of Ardashir I, apparently, though debatably, as part of a strategic policy of commercial expansion within the Persian Gulf (Piacentini, 1985: 60). Given the claims that have been made regarding the commercial importance of Bushehr, this is clearly a crucial site for understanding the nature of Sasanian maritime activity within the Persian Gulf.

Access to the Bushehr Peninsula from the mainland is most likely to have been restricted in the past. During the 17th – 19th centuries, when Bushehr acted at the main port within the Persian Gulf for the Dutch and British East India Companies, access was gained via a short ferry crossing from the mainland harbour of Shif (de Planhol 1990: 570). Today boats are still moored at Shif along a quayside and out in the bay in the lee of Shif Island, which is well protected from winds that prevail throughout the Persian Gulf region for *c*.9 months of the year (Anon. 2011: 271) (**Fig. 4.9**). An archaeological survey at Shif in 2004 revealed remains of a substantial settlement dating to the Sasanian and later periods, indicating that a ferry route may also have been used as the principal point of access in the more ancient past (Carter, Challis, Priestman & Tofighian, 2006: 96). Generally the approaches surrounding the peninsula are relatively shallow, and most of the deep

draught shipping belonging to the Dutch and English East India Companies had to be anchored around 2-3 miles offshore in the open sea with goods being transferred to the port by small boats (de Planhol, 1990: 569-70; Lockhart, 1960: 1341-2). In the past this may not have presented such a problem for traditional shallow draft vessels that were in use. Aside from specific docking facilities associated with Rishahr, which will be described below, the area in general offers good protected anchorages within the vicinity, especially between Shif Island and the mainland, and within the inlet at the southern end of the peninsula. This area has been specifically mentioned as providing the best anchorage for vessels in the recent past (Lorimer 1908: 331).



Fig. 4.9 *Fishing boats moored out in the lee of Shif Island in 2004*.

Habitation on the Bushehr Peninsula would have been limited to some extent by sources of irrigation and land suitable for cultivation. In general the landscape is open and arid with thin rocky soils that only support limited low scrubby vegetation. The peninsula offers no perennial water source, though dams and conduits were built to channel seasonal runoff in the past (Stein 1937: 238; Whitehouse & Williamson 1973: 40). Numerous deep wells were also excavated across the central portion of the peninsula (Whitehouse & Williamson 1973: 40; Lorimer 1908: 331; Williamson 1971-72: 35), though it is unlikely these would have been sufficient to support agriculture of the scale required

by a substantial urban population (Carter, Challis, Priestman & Tofighian, 2006: 69). An alternative solution to the issue of irrigation on the Bushehr Peninsula has been suggested by Whitcomb (**Fig. 4.10**), though the existence of this installation has more recently been called into question by ground testing in 2004 (Carter, Challis, Priestman & Tofighian, 2006: 67). Even without the supply of a major canal system, seen in more general terms Bushehr appears to be well situated as an urban scale settlement and port. The peninsula offers protected anchorages, some measure of defence, and is situated on one of the few points on the north shore of the Persian Gulf immediately adjacent to a substantial cultivable plain (**Fig. 4.11**).

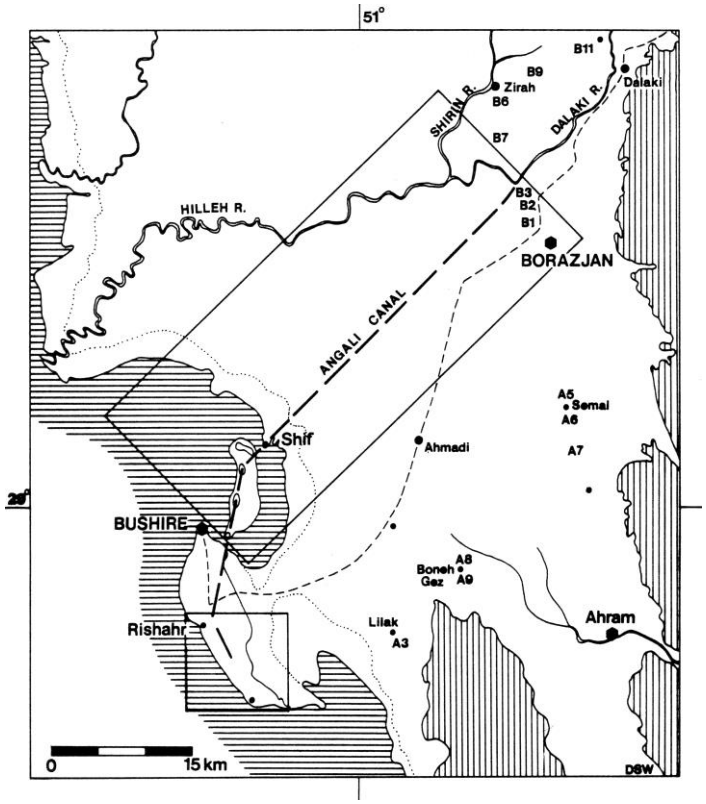


Fig. 4.10 *Map showing the course of the proposed Angali Canal running from Shif Borazjan (after Whitcomb, 1987: fig*. B).

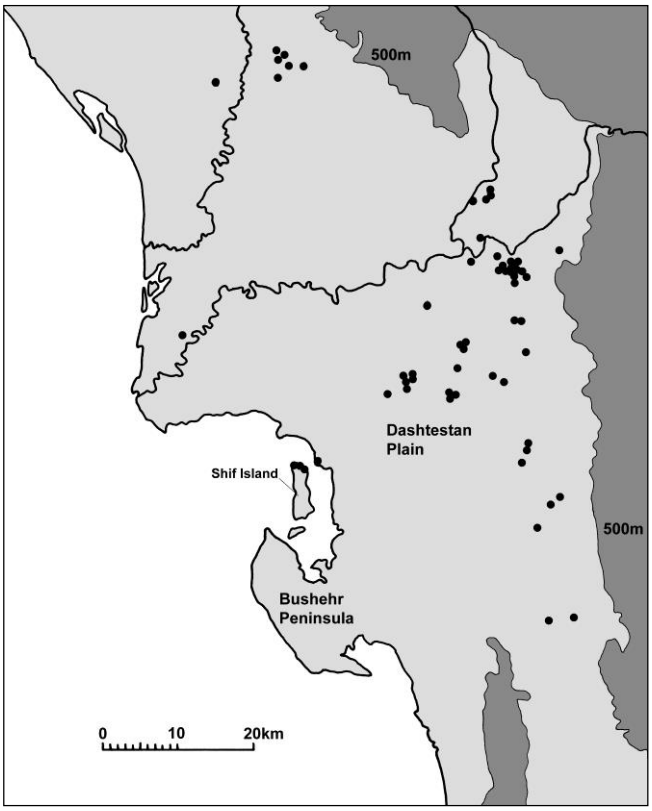


Fig. 4.11 *Map showing the distribution of sites (marked in black) surveyed and recorded during the 2004 Bushehr Hinterland Survey*.

The main areas of occupation on the Bushehr Peninsula fall into three main clusters (**Fig. 4.15**). Rishahr is situated furthest to the north. Here a steep cliff face drops down to a boulder-strewn beach. On top of the cliff are the remains of a large roughly square fortification with sides measuring 300 x 390m (Williamson, 1971-72: 34) surrounded on one side by an earth rampart and on two sides by a c.30m wide and c.3.5m deep ditch cut into the bedrock (**Fig. 4.12**). In 2005 it was possible to inspect the side of the site running along the shore and the rock-cut ditch to the southeast[37]. Here a c.6m high eroding shoreline section is exposed along the beach. Within the section, a deep accumulation of archaeological remains are exposed, including neatly constructed dressed stone walls and plastered floors (**Fig. 4.13**). Of particular significance are the remains of a c.5m wide pier formed from large roughly faced stone blocks running for c.100m straight out into the sea

[37] I wish to express my gratitude to the organisers of the Internal Congress of Siraf Port for inviting me to the conference on the 14th -16th November 2005 and for providing me with the opportunity to examine the ruins at Rishahr Halileh and Hazar Mardom before the conference began. I would also like to thank Mark Horton and Fred Aldsworth for a memorable break-away excursion to examine the impressive shoreline sections.

(**Fig. 4.14**). This same feature was highlighted by Williamson as important evidence for the use of Rishahr as a port. Evidence for the date of the pier is suggested by the presence of diagnostic Late Sasanian/Early Islamic ceramics in deposits directly overlying the pier construction where it enters the shoreline section (Williamson, 1971-72: 34-35). On the map produced by Williamson based on his more extensive survey of the area, the zone of archaeological mounding is shown to cover an area of c.375ha (**Fig. 4.15**). Given the scale of the site, its obvious military character, and apparent port infrastructure, it seems likely that Rishahr formed the main administrative centre of Sasanian Bushehr.



Fig. 4.12 *The rock-cut ditch running along the southeast side of the fort at Rishahr.*



Fig. 4.13 *Eroding shoreline section below the southwest defences at Rishahr with traces of a long section of stone wall construction exposed above older occupation deposits*.

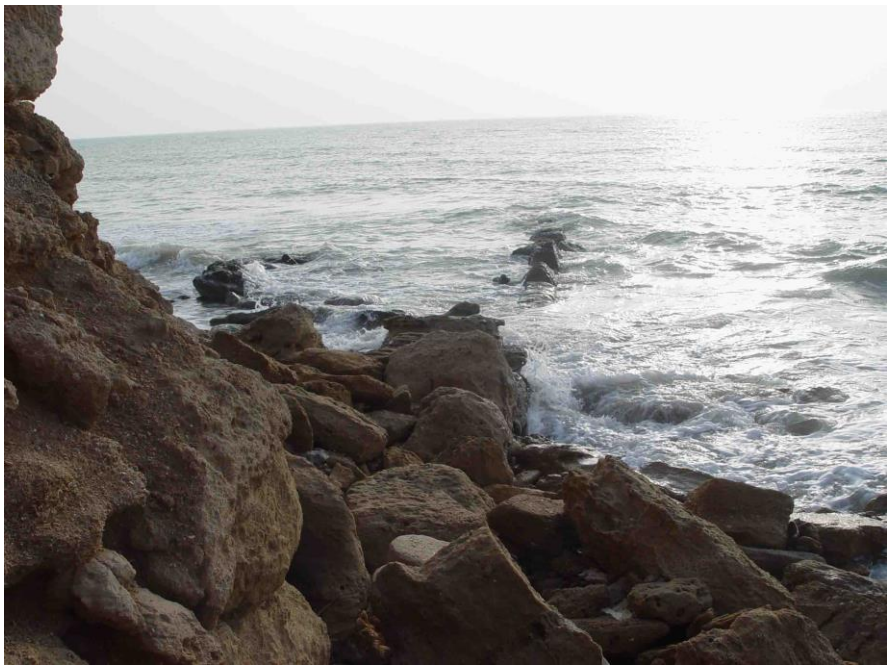


Fig. 4.14 *Remains of the stone pier at Rishahr mostly submerged at high tide*.

Towards the southern tip of the Bushehr Peninsula there are a further two main settlement concentrations at Hazar Mardom and Halileh, which virtually join to form a single large site complex of around 160h (**Fig. 4.15**). The site of Halileh has now been

erased and is inaccessible to archaeological investigation, lying as it does within the protective compound of the Bushehr nuclear power station. Slightly further to the north, different parts of Hazar Mardom cover an open stretch of land rising gently up from the shore in a series of low hummocks that represent individual structures within an extensive undulating ruin field[38]. In some places, traces of large buildings constructed from dressed stone blocks are visible on the surface. Littered across the site are blocks of masonry, fired bricks and abundant fragments of pottery. Stretching southeast of Hazar Mardom and Halileh is a low (1.5m high) narrow sandstone ridge extending for 0.8km into the sea. This feature forms the southern rim of the Khalij-e Halileh, within which a good anchorage can be taken in 5.5m of water just 0.5km from the shore (Anon. 2011: 276). The sites at the southern end of the peninsula appear to represent an undefended urban spread that developed adjacent to the main protected anchorage and potentially the best sources of subsurface water.

Archaeological Investigation

The Bushehr Peninsula has been the subject of archaeological and antiquarian investigations stretching back to the early 19th century (see Simpson, 2007 for a summary of this activity). One recurrent site type observed consists of alignments of Torpedo Jars (TORP.S) containing fragments of human bone carefully sealed with stone lids or reused potsherds. Burial sites of this nature have been reported on at least eight separate occasions (Simpson, 2007: 153). Aside from earlier investigations by Andreas in c.1876, the French Archaeological Mission to Persia in 1913, and Stein in 1933 (Simpson, 2007: 155; Pézard 1914; Potts 2003: 159; Stein, 1937: 234-241), the first detailed archaeological assessment of Bushehr was completed as part of the coastal and inland survey of southern Iran undertaken by Williamson between 1968 and 1971. Williamson spent at least one month carrying out a survey of the peninsula during three separate visits. In total he recorded 89 separate sites (Williamson, 1971a; 1971b; **Fig. 4.15**). Between the main settlement areas of Rishahr and Hazar Mardom/Halileh, he traced an almost

[38] I was able to visit parts of Hazar Mardom on two occasions in the company of Hossien Tofighian, Dr. Robert Carter, Hamed Zareh and Dr. Iraj Nabipour during the course of the Bushehr Hinterland Survey in 2004. Rishahr and Hazar Mardom were visited again in 2005. The circumstances of this visit are described above.

continuous scatter of sites strung out along the higher ground facing the shore (Whitehouse & Williamson, 1973: 37, fig. 4). Williamson estimated that across the Bushehr Peninsula there were at least 450ha of archaeological mounding simultaneously occupied during the mid to late Sasanian period (Williamson, 1971-72: 35). The areas of mounding marked on the map actually appear to be somewhat larger covering a total closer to c.535ha.

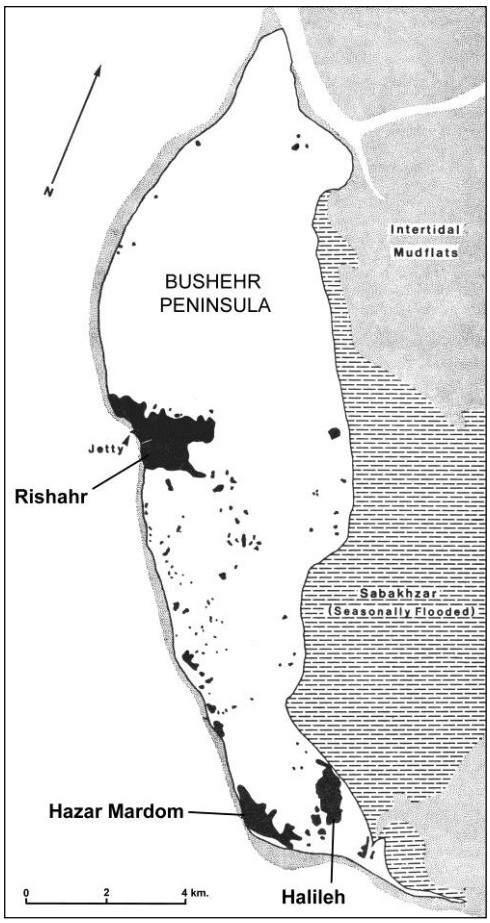


Fig. 4.15 *Map of the Bushehr Peninsula showing the distribution of mounded archaeological settlement identified by Williamson during intensive surface survey between 1968 and 1971 (after Whitehouse & Williamson, 1973: fig. 4). The scarcity of sites towards the north end reflects the extent of modern construction in this part of the peninsula at the time of the survey*.

Occupation Sequence and Chronology

The foundation date of the major coastal settlements at Bushehr is difficult to determine. In addition to the recognisable assemblage of later Sasanian pottery from Bushehr (**Section 5.2.2**), a distinctive assemblage of hard slipped coarse wares has been noted at

Hazar Mardom, which appears to date from an earlier period[39]. Precise parallels and dating for this earlier assemblage have been difficult to establish, though particular forms compare well with the early 4th century kiln assemblage from Tal-i Malyan (Alden, 1978) and the 5th – 6th century assemblage from Hājīābād (Azarnoush, 1994); both situated further inland in southern Iran. More disconcertingly, good parallels for individual types within the same assemblage also exist with pottery of Achaemenid date from Qala'at al-Bahrain and Pasargadae (Carter, Challis, Priestman & Tofighian, 2006: 94-96). This suggests either that the ceramic classification developed during the project was inherently flawed, or that ceramics changed only to a limited degree across the entire span of the Achaemenid, Hellenistic and Early Sasanian periods within the Bushehr/Dashtestan region. Potentially the coastal settlements at Bushehr could have developed any time within this long period range and further investigation would be required to clarify this point.

In terms of the major later Sasanian period occupation of Bushehr, the main evidence Williamson cites in support is the occurrence of a single type-fossil assigned to the 5th - 7th centuries, and found distributed across the full extent of the archaeological mounding. This is an Alkaline-Glazed Ware vat with an olive-green coloured glaze and a distinctive bifurcating rim (TURQ.YG/Type 64, see Priestman, 2005a: 234-38 'ALK: 29-30', pl. 91). This type was dated on the basis of its absence from 3rd - 5th century levels at Veh Ardashir in Iraq, and from the earliest levels at Siraf (Williamson, 1971-72: 10-11). Dating by absence on the basis of excavations in central Iraq does not seem particularly satisfactory. Perhaps fortuitously therefore, Williamson's dating seems to be backed by more recent and relevant evidence from Kush, where a few examples of the same type occur in Periods I-II, suggesting a similar date range between the 5th - 7th/8th centuries (Kennet, 2004: 29-31, fig. 5, table 16).

By the later Sasanian period, settlement on the Bushehr Peninsula reached its peak. This appears to have been followed sometime between the 6th - 9th centuries by an episode of

[39] The most important classes include HARGE, SLIP.HR, SLIP.HB, SMAG.B, CONG.G, CONG.RG and CONG.C. These categories are described with the Bushehr Hinterland Survey publication (see Carter, Challis, Priestman & Tofighian, 2006: 94-6).

major settlement collapse (Williamson, 1970a: 4). Williamson recognised this event having recorded just seven sites of the 9th - 14th century period with a combined area of 15ha compared with at least 450ha in the previous period (Prickett & Williamson, 1970: 1). The study recently undertaken of the Williamson Collection (Priestman & Kennet, 2002; Priestman, 2003; 2005a) also demonstrates this point. Looking at the number of settlements occupied by period, one can see a drop of over half the number of sites from the 6th - 9th to the 9th - 11th centuries (Priestman, 2005a: fig. 15). Similar results also emerge from the survey of the Bushehr hinterland in 2004, indicating that there was a regional decline in settlement parallel to that of the major port (Carter, Challis, Priestman & Tofighian, 2006: 97), mostly likely occurring within the 7th century (Priestman, in press (a)).

4.3.3 Bilad al-Qadim – Bahrain

Location: 26°12'42"N; 50°32'55"E

Associated Names: Bilad al-Qadim (historic)
Manama, Al-Khamis Mosque, Al-Hassan/Haroun Mosque, Shaikh Isa's Plantation, Abu Zaydan (modern)

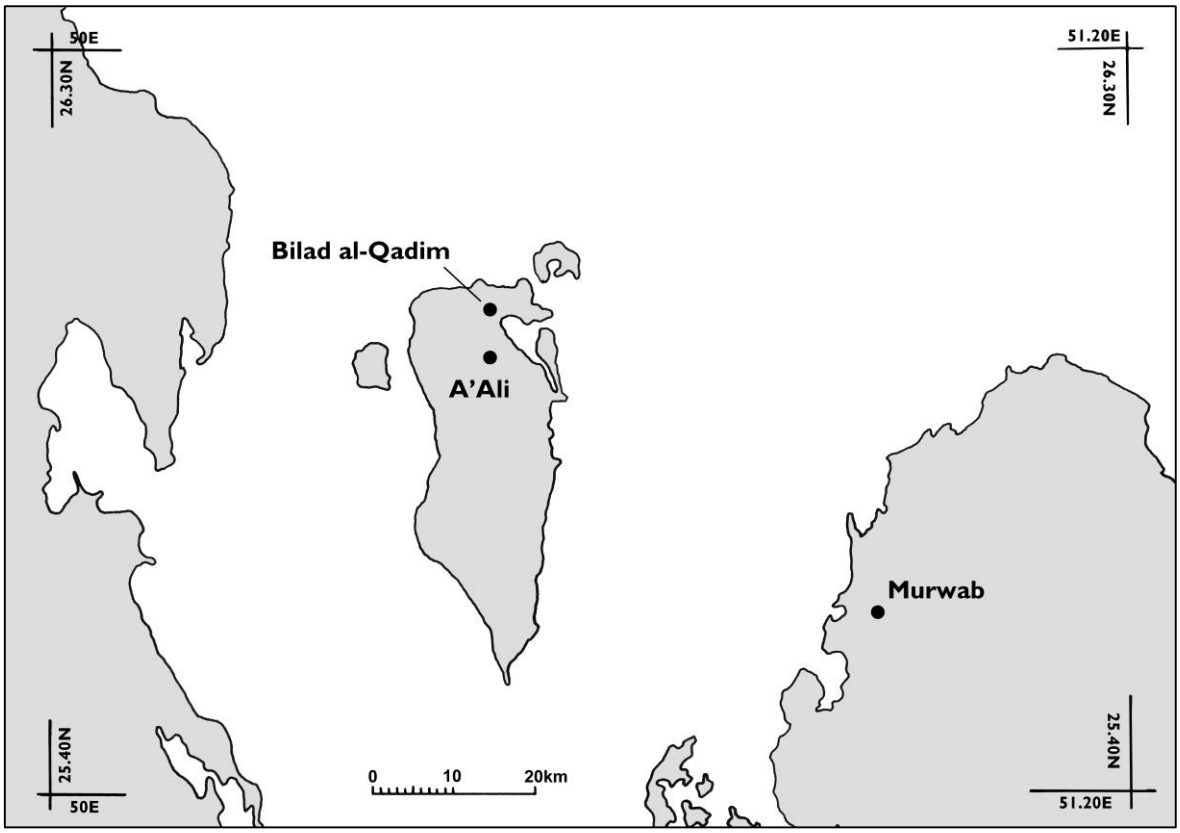


Fig. 4.16 *Map showing the location of Bilad al-Qadim and A'Ali on the island of Bahrain and Murwab in Qatar. Shaded ground all below 500ft*.

Site Characteristics and Setting

Bilad al-Qadim is situated towards the northern end of Bahrain Island, which lies just off the southern shore of the Persian Gulf (**Fig. 4.16**). The northern half of the island is the most fertile and well-irrigated section of the island and significant occupation of all periods is concentrated within this area. Bilad al-Qadim represents the principal urban centre of Bahrain between the 8th – 14th centuries (Insoll, 2005: 22). Today the core of the medieval settlement is increasingly encroached upon by the modern capital city Manama. The archaeological remains survive only as threatened pockets of better-preserved land in amongst other modern developments (**Fig. 4.19**). Because of the recent changes to the

landscape it is difficult to establish the position of the city in relation to the original coastline (Insoll, 2005: 47). The site is now separated from the shore, but may once have been sited to provide more obviously access to the sea.

Archaeological Investigation

The most substantial archaeological investigation of Bilad al-Qadim was undertaken during two long field seasons lasting for four months and three months in 2001. The work involved a combination of field survey and excavation undertaken as a rescue project in advance of the site's likely destruction through modern urban expansion (Insoll, 2005: 1). Efforts to estimate the original size of the medieval settlement were hampered by modern land-use including palm gardens, houses and roads that cover large parts of the surrounding area (Insoll, 2005: 22).



Fig. 4.17 *Excavation of structures close to the Al-Khamis Mosque (KHA) in 2001 (image reproduced with kind permission of Timothy Insoll)*.



Fig. 4.18 *Excavation in progress at the Al-Hassan Mosque site (MOS) in 2001 (image reproduced with kind permission of Timothy Insoll)*.

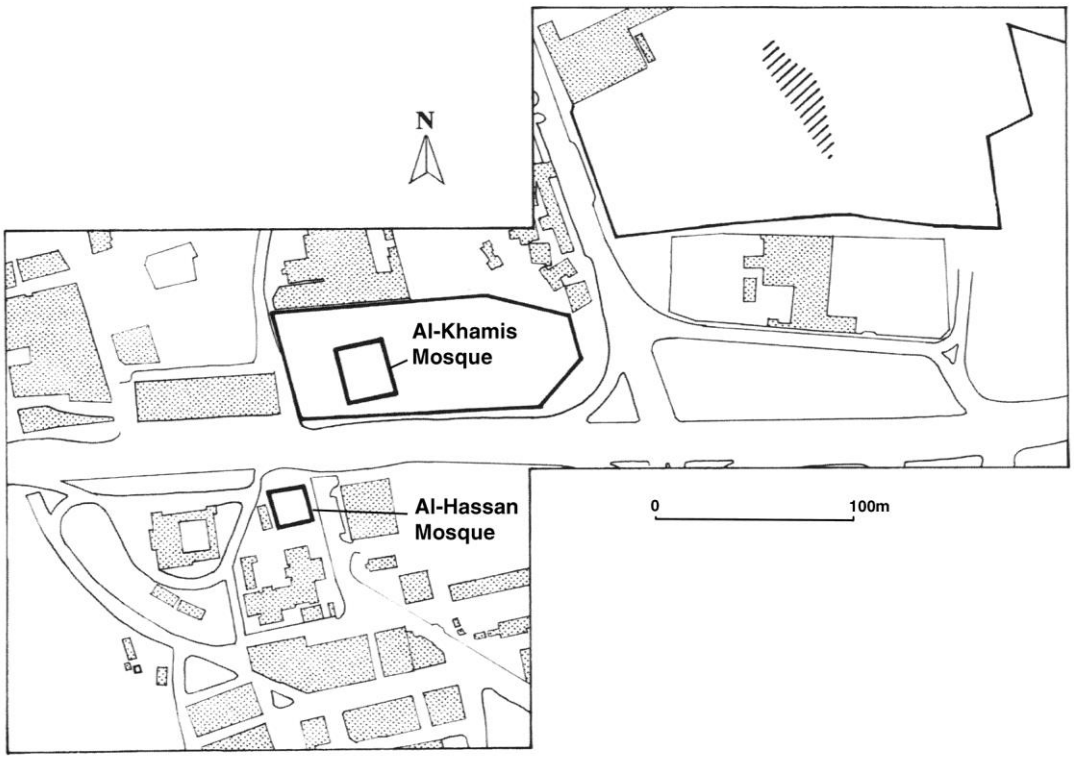


Fig. 4.19 *Map of Bilad al-Qadim showing the location of the Al-Khamis (KHA) and Al-Hassan Mosque (MOS) sites in relation to other surrounding modern developments, after Insoll, 2005: fig. 2.2.*

Occupation Sequence and Chronology

Excavation took place in two separate areas of the site (**Fig. 4.19**): one next to the main standing historic monument within the area, the Al-Khamis Mosque (**Fig. 4.17**) and the second adjacent to the smaller Al-Hassan/Haroun Mosque (**Fig. 4.18**). Within the KHA area, eight excavation areas were opened (KHA 01A-H). The first two of these (KHA 01A-B) where halted due to the discovery of recent graves. The other areas all form a contiguous block covering c.54m² (**Fig. 4.20**) (Insoll, 2005: 57-67, fig. 3.1a). The deposits encountered within this area include a complex structural sequence of superimposed building horizons reaching down to bedrock at c. 0.9-1.2m below the surface. In the Al-Hassan mosque area (MOS), seven contiguous trenches were opened over the north corner and northwest side of the recent mosque. Below the disturbed topsoil and recent mosque structure, floors, walls and other features associated with a sequence of domestic architecture were encountered again resting on natural bedrock (**Fig. 4.21**). The main part of the sequence consists of a building that was successively reused (Insoll, 2005: 67-68, fig. 3.2). Again the presence of recent graves prevented continued excavation in one area (MOS 01B).

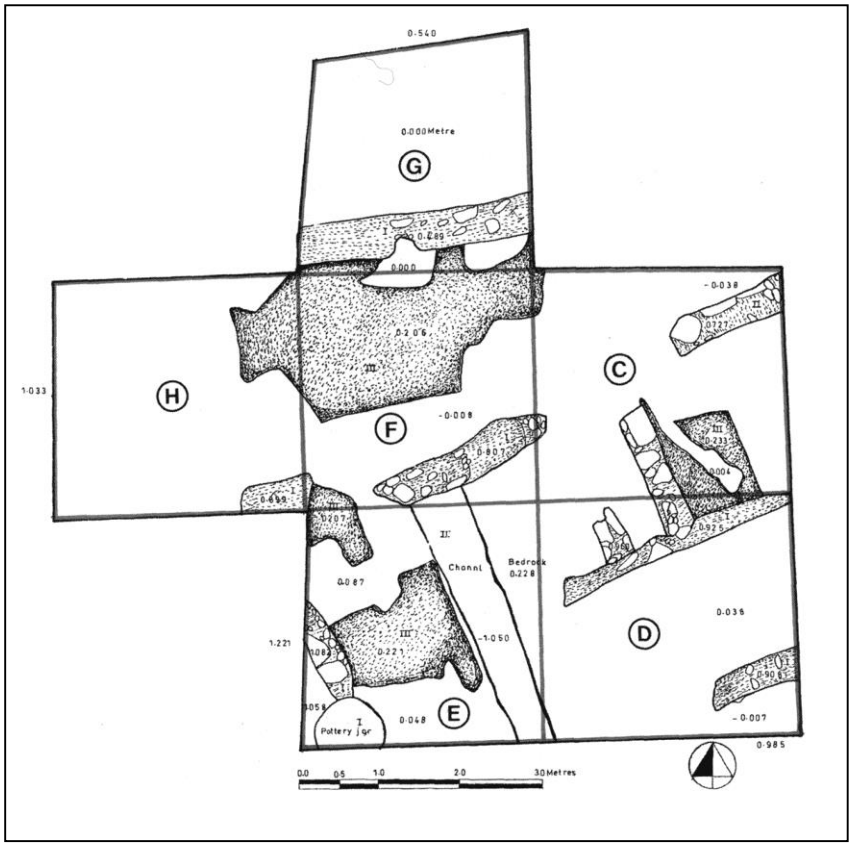


Fig. 4.20 *Plan of trenches KHA 01C-H at the Al-Khamis Mosque site, after Insoll, 2005: fig. 3.1a.*

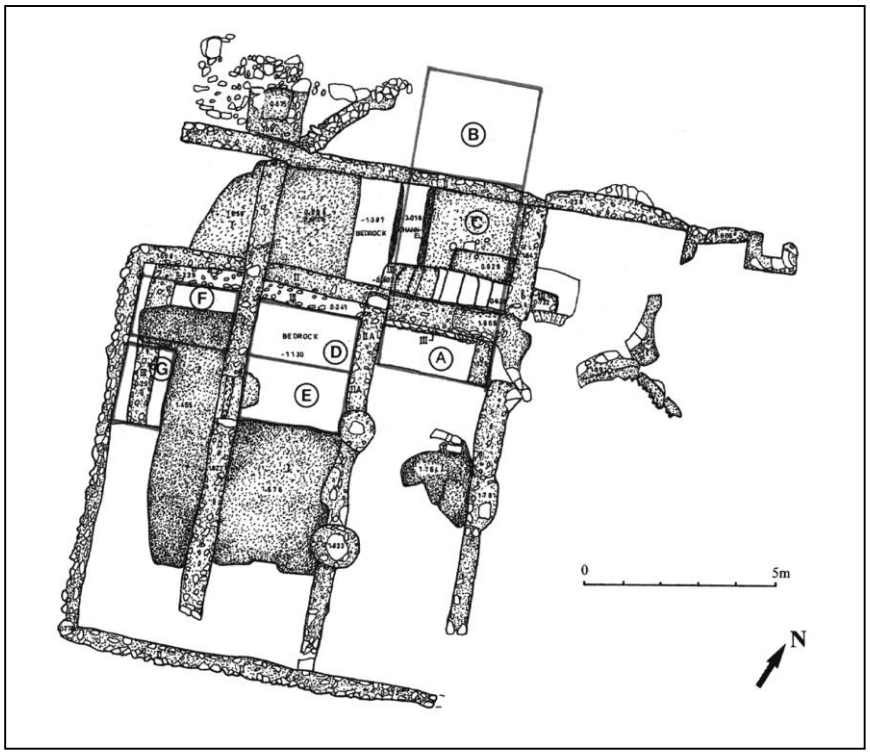


Fig. 4.21 *Plan of trenches MOS 01A-G at the Al-Hassan Mosque site, after Insoll, 2005: fig. 3.2.*

While the essential features of the structural sequences are relatively clear, neither of the excavations is described in extensive detail. The stated aim of providing a commentary on the 'social role of domestic architecture', means that far more of the report is given over to speculation regarding the possible function of the buildings and the nature of their perishable contents (Insoll, 2005: 77-100). The archaeological sequences obtained from the excavations at Bilad al-Qadim are dated entirely on the basis of ceramic sample. No absolute dates were provided as it was felt that ceramics offered a tight enough chronology for the period under consideration (Insoll, 2005: 54-55). Never-the-less, the ceramic assemblage obtained from Bilad al-Qadim remains one of the largest currently available from within the Persian Gulf (see **Section 5.2.3**) and its analysis is therefore of considerable importance. Within the publication the ceramic assemblage is sub-divided into a six part periodization covering the 8th – 14th centuries, with supporting dating provided by work completed elsewhere at sites such as Kush and Siraf (Carter, 2005: 108-192, 401-51).

4.3.4 A'Ali – Bahrain

Location: 26°09'20"N; 50°31'59"E

Site Characteristics and Setting

A'Ali is situated in the low central northern area of Bahrain a minimum of 3.7km inland from the island's eastern coast (**Fig. 4.16**). When the site was explored during the late 1980s, it was still visible as a low archaeological mound of c.160m east/west by 85m north/south situated partially within the eastern area of the modern town (Sasaki, 1990: 111). Today these remains have been largely effaced through urban expansion (Sasaki & Sasaki, 2011: 18). The area of mounding and surface finds relate to the remains of buildings and what appears to be a modest village-scale settlement. Excavation revealed a series of rectilinear buildings with long walls demarcating areas of enclosure with short partition walls separating off open spaces and covered cells (Sasaki & Sasaki, 2011: 21, figs. 7, 16-17). Buildings are constructed from large roughly dressed limestone blocks in the foundation layers, while upper courses are built from broken limestone cobbles bound with clay. Nowhere was it possible to establish any of the overall building plans (Sasaki, 1990: 112-13). Other features identified within the vicinity of the houses include date presses and bread ovens (Sasaki & Sasaki, 2011: 22-23).



Fig. 4.22 *General view looking across the low settlement at A'Ali in the 1980s (After Sasaki & Sasaki, 2011: fig. 4a, reproduced with kind permission of the authors*[40]).



Fig. 4.23 *View of the western area excavation at A'Ali close to the area of modern urban development (after Sasaki & Sasaki, 2011: 5, reproduced with kind permission of the authors)*.

[40] I am extremely grateful to Prof. Tatsuo Sasaki for helping me to obtain good quality copies of the colour images from A'Ali.

Archaeological Investigation

An initial archaeological investigation of A'Ali was undertaken by a British team in 1976 though most of this work focused on monumental burial mounds of the Dilmun period (Roaf, 2003). The work on later period structures remains unpublished. A second programme of fieldwork focusing specifically on the early Islamic occupation took place during two field seasons conducted by a joint Japanese/Bahraini project in the winter seasons of 1988-89 and 1989-90 (Sasaki, 1990; Sasaki & Sasaki, 2011). The two seasons of excavation were conducted in separate areas of the site situated about 80m from one another towards the eastern and western ends of the low settlement mound (**Fig. 4.24**). The project was undertaken with the specific aim "to study early Islamic wares traded in the Persian Gulf during the early Islamic period" (Sasaki & Sasaki, 2011: 18).

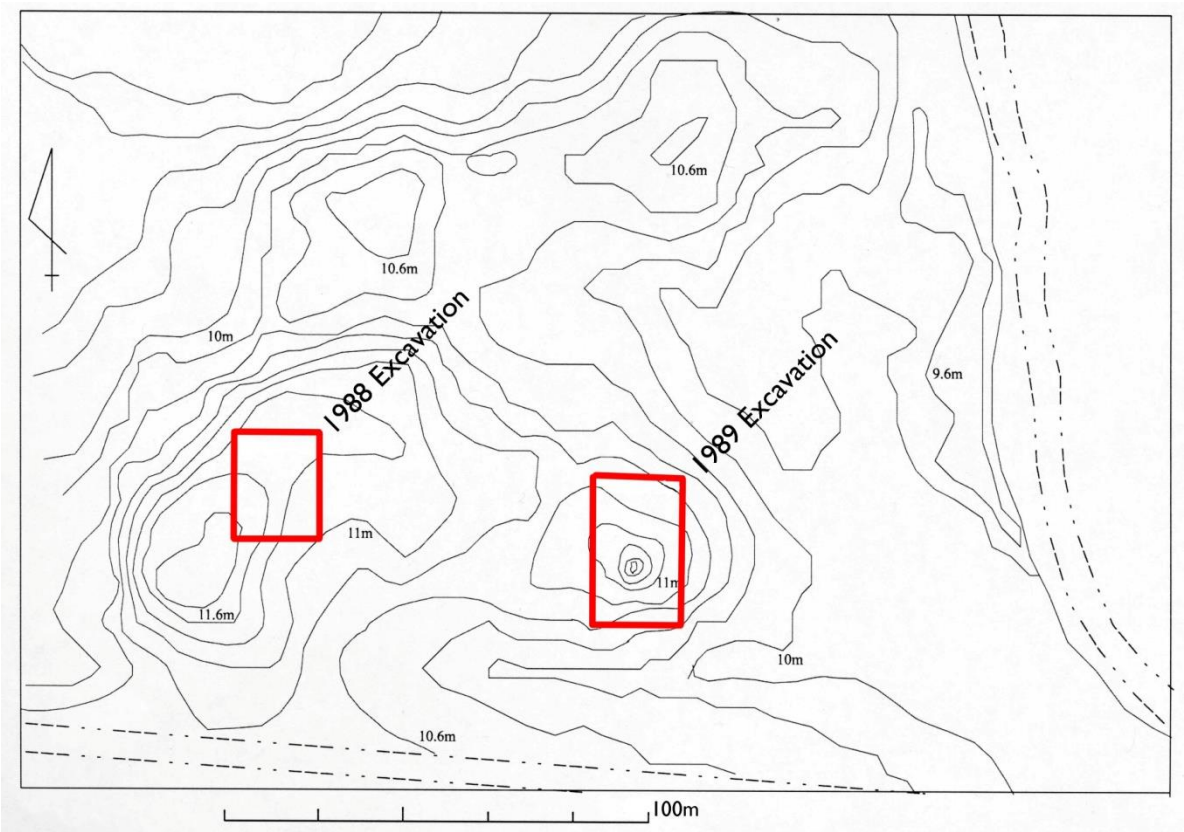


Fig. 4.24 *Contour map of A'Ali showing the location of the trenches opened during the 1988-89 and 1989-90 seasons, after Sasaki & Sasaki, 2011: fig. 3.*

Occupation Sequence and Chronology

During the first season, a 25-20m trench was opened over a gently sloping area to the western edge of the mound (**Fig. 4.25**). Below the disturbed topsoil, two separate horizons of occupation where identified (Layers 1 and 2) (Sasaki, 1990: 111). Only in limited areas was excavation continued down into Layer 2. During the second season, a second 20 x 35m trench was opened c.80m to the east of the first trench towards the eastern edge of the mound (Sasaki & Sasaki, 2011: 21, fig. 3). Again the excavation focused largely on the uppermost architectural horizon (**Fig. 4.26**). Within this deposit (Layer 1) up to seven shallow levels were distinguished. The foundations of different houses across the trench appear to have been established at various points within the Layer 1 sequence. The dating of this sequence is based entirely on the ceramic finds. The majority of these date to within the 9th and 10th centuries. A few pieces of Chinese pottery and Iranian Sgraffiatos within the same horizon suggest continued occupation of the site into the 11th – 12th centuries, perhaps on a reduced scale (Sasaki & Sasaki, 2011: 24-26).

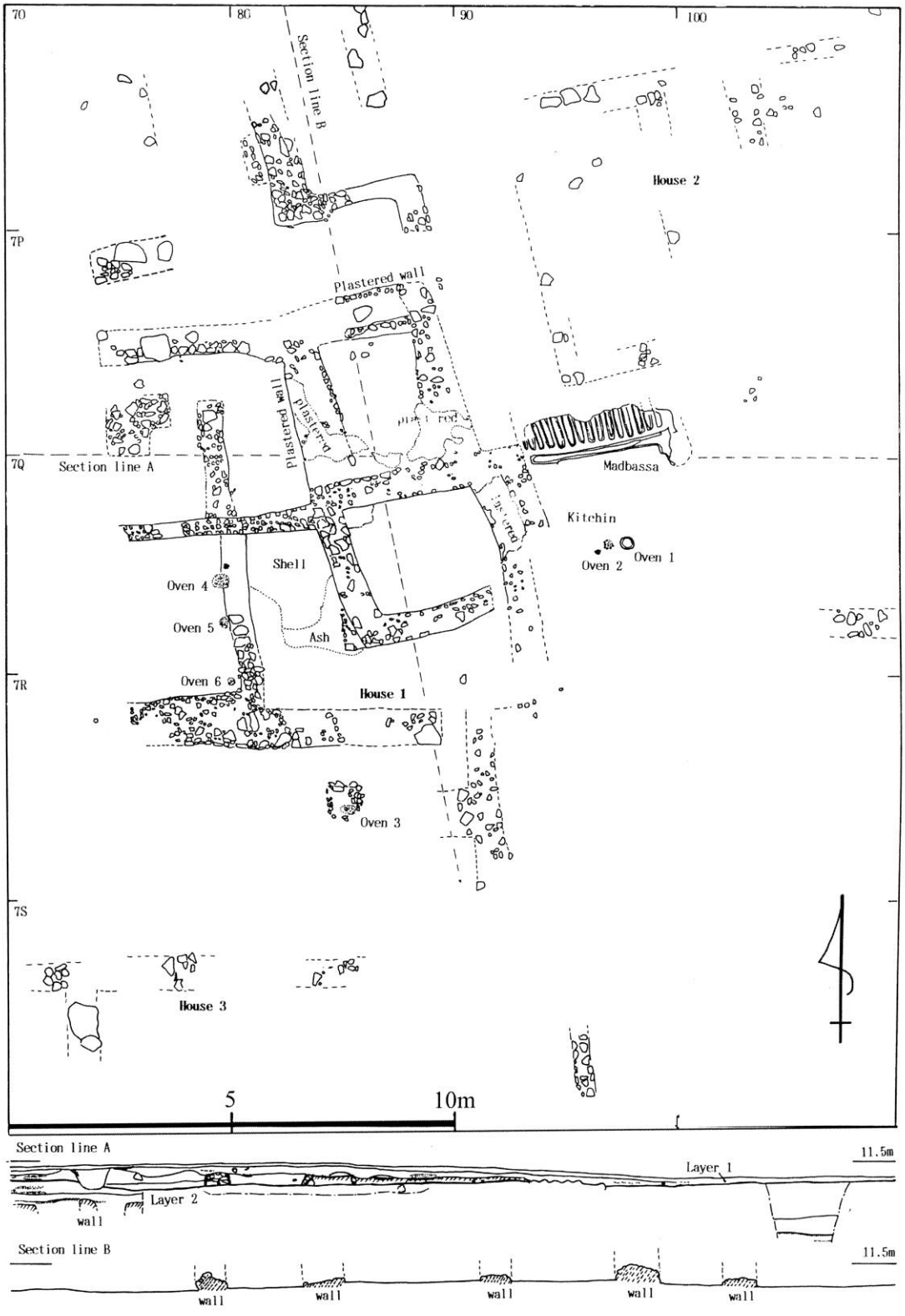


Fig. 4.25 *Plan and section of buildings excavated towards the western side of the settlement mound at A'Ali during the 1988-89 season, after Sasaki & Sasaki, 2011: fig. 7.*

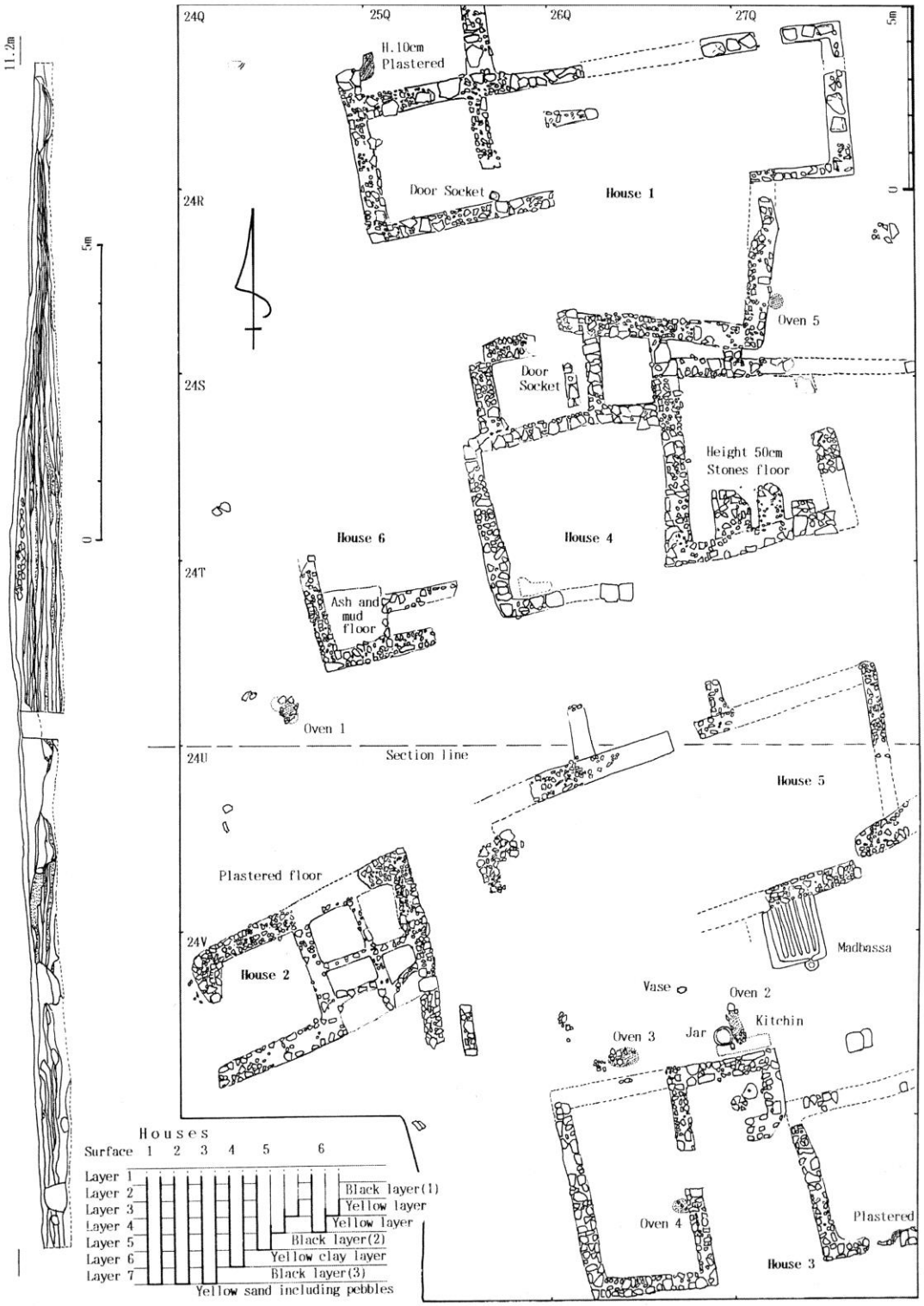


Fig. 4.26 *Plan and section of buildings excavated towards the eastern side of the settlement mound at A'Ali during the 1989-90 season, after Sasaki & Sasaki, 2011: fig. 16*.

4.3.5 Murwab – Qatar

Location: 25°52'19"N; 51°1'31"E

Site Characteristics and Setting

The site of Murwab is a village-scale settlement situated towards the northwest tip of Qatar, 5km inland from the coast (**Fig. 4.16**). The surrounding landscape is flat and arid with limited ground water or covering vegetation. Remains of a total of 220 building units including two mosques and a fort have been identified from remains visible on the surface. The whole settlement is dispersed over an area of 1.4 x 0.5km (**Fig. 4.27**) (Guérin & al-Na'imi, 2009: 183, fig. 2; 2010: 17). Excavations indicate a relatively thin, essentially single-period occupation that seems to span no more than part of the 9th century. Across the site buildings were constructed from roughly dressed limestone blocks bound with gypsum, with plaster lined floors. Within the most concentrated area of the settlement (Sector 6), buildings appear to be divided between those used for industrial purposes and those used for habitation. Masses of oyster shell were identified in some areas (Guérin & al-Na'imi, 2009: 185).

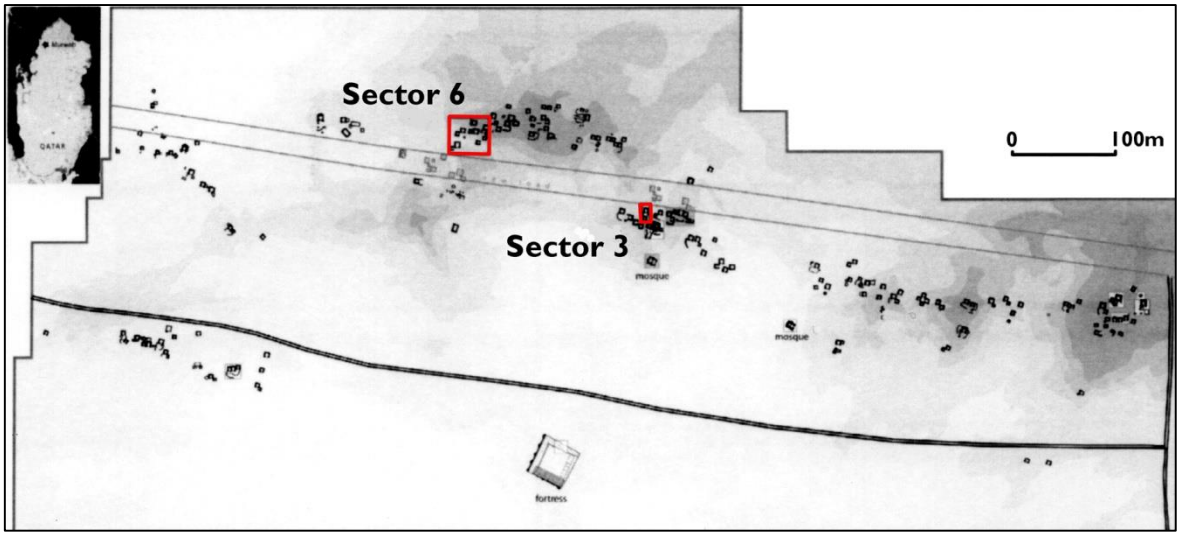


Fig. 4.27 *Site plan of Murwab showing the distribution of mapped structures and the location of the recent investigations in Sectors 3 and 6 (after Guérin & al-Na'imi, 2009: fig. 1).*

Archaeological Investigation

Murwab was first investigated by the Danish archaeological mission to Qatar in 1959, but the results of this work were never published. Subsequently work was conducted by a French mission in 1979 and 1981 (Hardy-Guilbert, 1984). Again no substantial information on the ceramics from these excavations has been made available. More recently, a programme of survey and excavations were undertaken between 2005 and 2009 (Guérin & al-Na'imi, 2009; 2010). The results of this latest investigation are still in preparation. Work during the first two seasons in 2005 and 2006 involved a broader regional settlement survey covering an area of 20 x 15km². Within the study area, five main site clusters were identified, all seemingly dated to the 9th century (Guérin & al-Na'imi, 2009: 182-83, fig. 1). Excavation at the most substantial of these site clusters, Murwab concentrating on two main areas within the settlement (**Fig. 4.27**). Sector 6 covers the area of highest building concentration (**Fig. 4.28**). A 43 x 40m area was selected for investigation and within this area the majority of deposits were cleared, revealing a total of nine individual building units (Guérin & al-Na'imi, 2009: 183, fig. 3). Sector 3 is situated within a cluster of seven building units including a small mosque (**Fig. 4.28**).

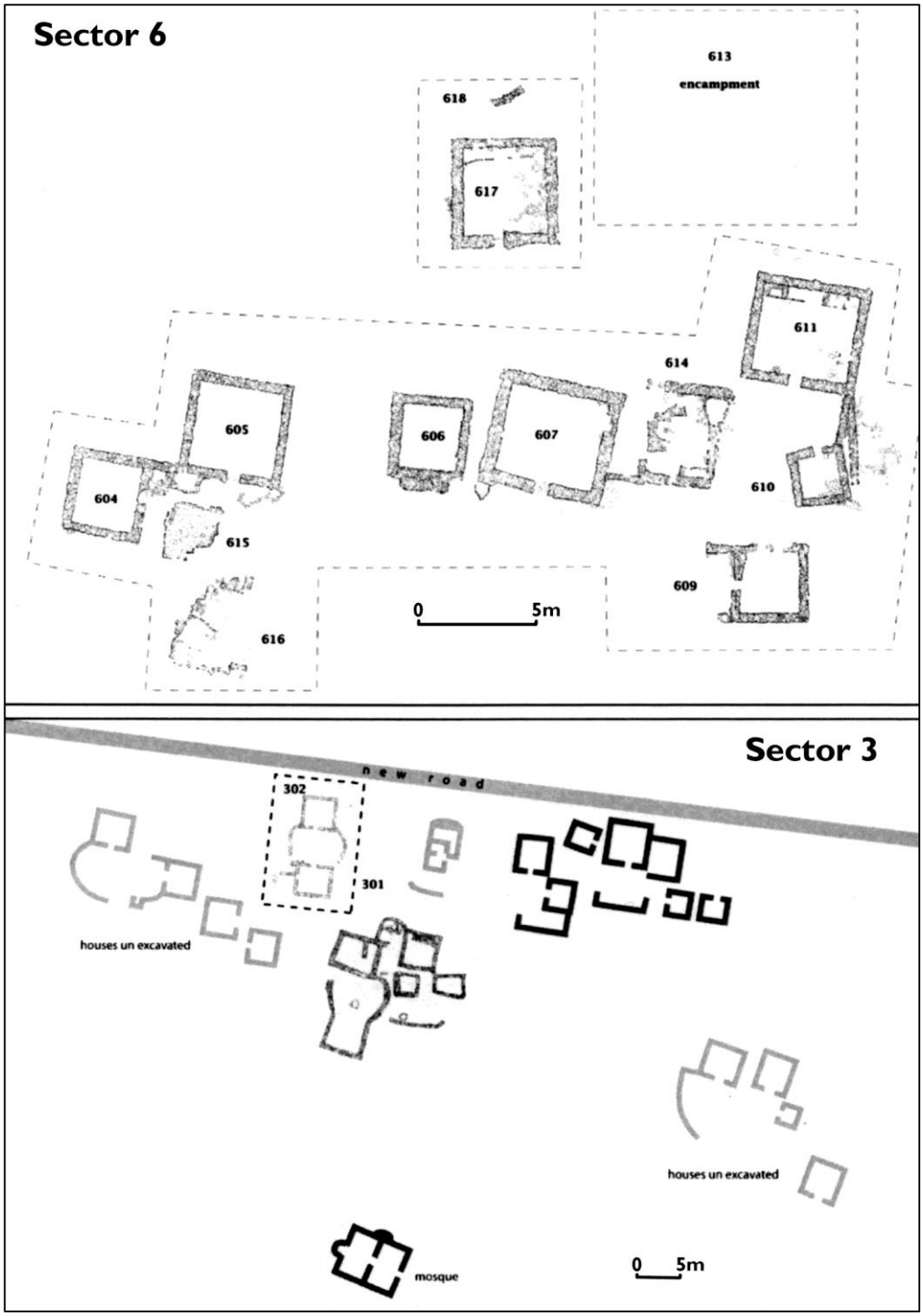


Fig. 4.28 *Plan of the buildings investigated at Murwab in Sectors 3 and 6 (after Guérin & al-Na'imi, 2009: fig. 3)*.

Occupation Sequence and Chronology

Excavation within the settlement indicates a relatively short-lived occupation with a maximum of two phases of activity (Guérin & al-Na'imi, 2010: 17). No independent or absolute chronology for the sequence has been provided, and the most significant dating evidence is provided by the ceramic finds. Opaque Glazed Wares represented from the earliest occupation levels place the foundation of the settlement within the 'Samarra horizon' phase (i.e. after the beginning of the 9th century) and the presence specifically of cobalt-decorated pieces indicates a date within the early part of the 9th century (Guérin & al-Na'imi, 2010: 21, fig. 4: K1,8-9). Other ceramics indicate continued occupation through the mid-9th century, but abandonment before the late 9th century. Perhaps somewhat speculatively, the abandonment of the settlement is seen within the historical context of the…"military rise to power of the Qarmatians" (Guérin & al-Na'imi, 2010: 18).

4.3.6 Sir Bani Yas – United Arab Emirates

Location: 24°19'05"N; 52°38'12"E

Associated Names: Mar Thomas? (historic)
Sir Bani Yas Island, al-Khawr (modern)

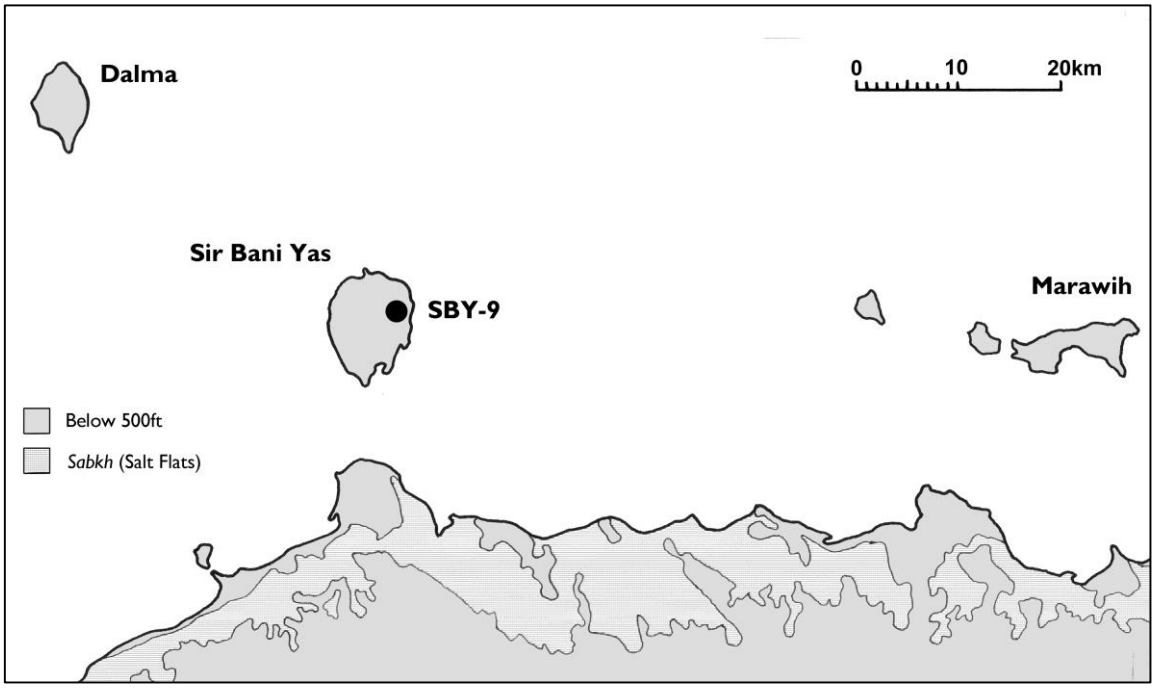


Fig. 4.29 *Map showing the location of the church site SBY-9 on the island of Sir Bani Yas off the coast of Abu Dhabi in the United Arab Emirates.*

Site Characteristics and Setting

Sir Bani Yas is a salt-plug island situated just offshore from the Emirate of Abu Dhabi within the Persian Gulf (**Fig. 4.29**). The archaeological site described specifically here, consists of a dispersed complex of structures distributed across an area of c.1.5 x 2km in the al-Khawr area on the eastern side of the island (King, 1997: 221). The site complex is sited on a coastal plain adjacent to sheltered lagoon and in an area with access to a good supply of sub-surface water (Elders, 2001: 48). Today the site is "surrounded by plantation fences" and the landscape has been significantly altered by modern agricultural development (**Fig. 4.30**) (King, 1997: 221). The main elements of the site consist of a church with surrounding precincts (**Fig. 4.31**) and a number of associated courtyard houses.



Fig. 4.30 *Aerial view of Sir Bani Yas looking southeast across the modern plantations towards the coast (image reproduced with the kind permission of Emma Thompson)*.



Fig. 4.31 *Aerial view of the Sir Bani Yas church during a recent re-excavation programme (image reproduced with the kind permission of Emma Thompson)*.

The church was first identified on the ground as a low flat mound of 220 x 160m rising to a maximum height of 1.5-2m. Excavation and magnetometer survey revealed a walled

enclosure of 90m east-west by 70m north-south, with small cells with neatly plastered floors ranged round the interior (**Fig. 4.32**). Set inside the entrance to the enclosure is the foundations of a church. This consists of a plastered floored building of 16m east-west by 11m north-south. Further to the north a total of six separated courtyard houses were identified. All appear to be of a closely comparable form and date to the church (Elders, 2001: 53).

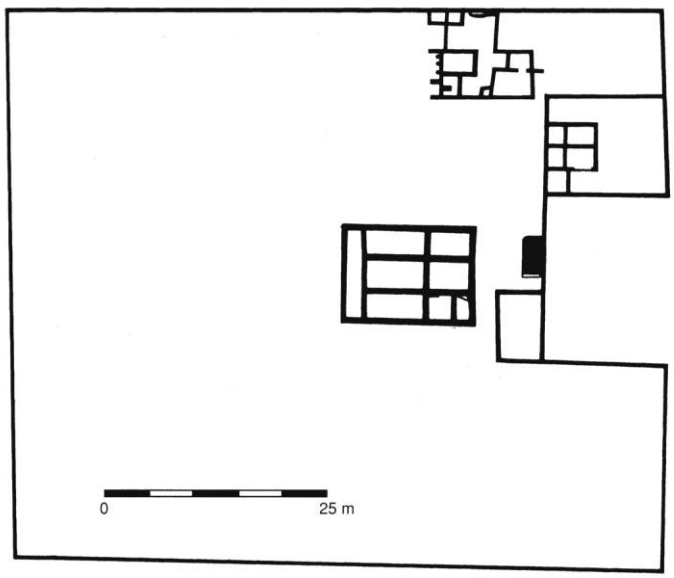


Fig. 4.32 *Simplified plan of the monastic complex at Sir Bani Yas with the church situated towards the eastern side of the enclosure (after Elders, 2003: fig. 2)*.

Archaeological Investigation

The archaeological complex in the al-Khawr area of Sir Bani Yas was first identified in 1992 during the Abu Dhabi Islands Survey (King, 1997: 221). The site was then excavated over the course of four further seasons, each lasting for about one month between 1993 and 1996. The excavation focused on the church, part of the outer enclosure and some of the associated houses that make up the dispersed site complex (Elders, 2001: 48). A final excavation report has not yet been attempted. The results of the earlier excavations are set out in preliminary reports (King, 1997; Elders, 2001) and have been reviewed or discussed in different contexts elsewhere (Elders, 2003; Kennet, 2007: 92-93; Carter, 2008; Payne, 2011; Simpson, in press (b)). A portion of the ceramic finds has also been analysed (Carter, 2008).

Occupation Sequence and Chronology

Strong similarities in the design and construction of the church and courtyard houses nearby suggest that all features are part of the same site complex dated to the same period (Elders, 2001: 53). Excavation within the church itself revealed four distinct phases associated with the building construction and occupation.

- Phase 1 – Levelling dumps and associated features related to the building's construction.
- Phase 2(a) – Smaller original church
- Phase 2(b) – Building plan enlarged and building finalised and the floors plastered
- Phase 3 – Squatter occupation represented by numerous small hearths amongst the church remains. Some evidence of deliberate vandalism of crosses associated within this phase (Elders, 2001: 49-52)

During the main period of use of the church (Phases 2(a) and (b)), the surrounding precincts and nearby courtyard houses were kept consistently clear of domestic refuse (King, 1997: 231). Most of the ceramic finds are therefore associated with the last phase of occupation (Phase 3) associated within the site's abandonment (Carter, 2008: 74).

The occupation sequence identified within the monastic complex was originally dated by its excavators to between the 6th and the mid-7th or early 8th century (King, 1997: 221; Elders, 2001: 56; 2003: 234). Abandonment of Sir Bani Yas was seen specifically within the context of the cessation of a visible episode of Late Sasanian church building activity within the Persian Gulf, brought about by the Islamic conquest (Elders, 2003: 234). Later reassessments of the available evidence, point to a slightly later dating (Kennet, 2007: 92; Carter, 2008: 89). Based on the available ceramic dating, the occupation appears unlikely to have begun earlier than the mid-7th century with abandonment most likely to have occurred by the mid-8th century (Carter, 2008: 89). The revised archaeological dating accords closely with the latest textual interpretation of the Church of the East's activity within the region (Payne, 2011). Within the context of the present study, the revised

ceramic dating for Sir Bani Yas is fully accepted and used as an important marker of the Early Islamic/pre-Abbasid chronological phase (see **Chapter 5**, Ceramic Period 2).

4.3.7 Kush – United Arab Emirates

Location: 25°49'21.66"N; 56° 0'22.01"E

Associated Names: Kush (modern)

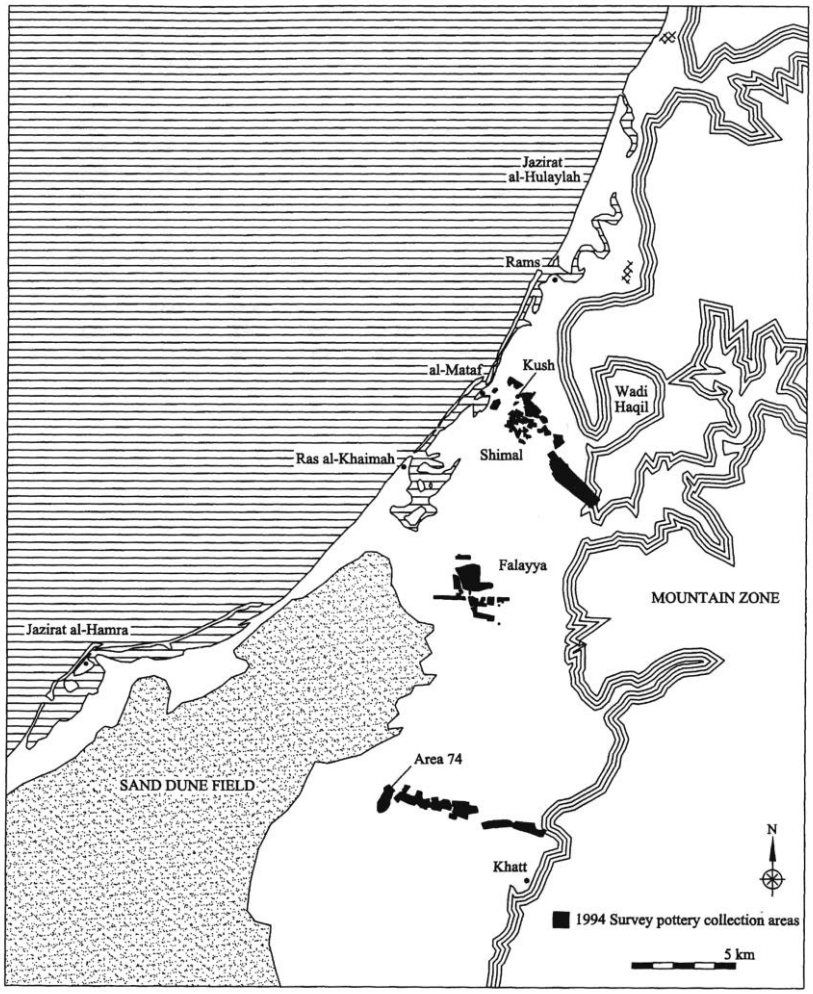


Fig. 4.33 *Location of Kush within the Shimal Oasis in the northern Emirate of Ras al-Khaimah (after Kennet, 2004: fig. 4).*

Site Characteristics and Setting

Kush is situated in northern Ras al-Khaimah in the United Arab Emirates just to the south of the Straits of Hormuz (**Fig. 4.33**). The site is a small prominent archaeological tell of 1.2ha situated c.2.5km inland from the coast and towards the northeast edge of the fertile Shimal Plain (**Fig. 4.34**). The Shimal Plain covers an area of c.15km² and is a roughly wedge shaped area delimited to the northeast by the precipitous Ru'us al-Jibal and to the south and southwest by arid dune fields (Kennet, 2004: fig. 4). The site of Kush appears to

represent the original administrative hub of a dense but non-nucleated settlement structure that developed to meet the particular demands of the extensive palm cultivation practised within the area (Velde, 2012: 215). In the past the site appears to have been connected via a creek and lagoon to the open sea (Velde, 2012: 216). Today the lagoon and creak have been in filled through siltation, and it was presumably in response to the geomorphic changes that the administrative centre of the Shimal oasis shifted toward the coast with the foundation of al-Mataf, al-Nadud and later the town of Ras al-Khaimah (Kennet, 2002a: 161).



Fig. 4.34 *General view of the settlement mound at Kush in 2010 looking east toward the Hajjar Mountains*.



Fig. 4.35 *Eroding sections left exposed through the central portion of the settlement mound at Kush in 2010*.

Archaeological Investigation

The site of Kush was first identified during field survey by de Cardi in 1977 (de Cardi 1985: 179) and was returned to for detailed investigation in 1994 (Kennet, 1997). Excavation was undertaken as part of a broader archaeological investigation in the region (Kennet, 1991; 1997; 1998; 2001; 2002a; 2003; 2004). The site of Kush was deliberately targeted for excavation in order to provide "a deep quantified [ceramic] sequence" with which to understand the long-term economic development of the site and to provide more accurate chronological control within the settlement survey (Kennet, 2004: 12). During the first season a test trench was opened, and this was followed between 1995-2001 by further seasons of large-scale excavation, which exposed over 8m of stratigraphy (Kennet, 2004: 12).

Occupation Sequence and Chronology

The main excavation at Kush is a 10 x 26.4m trench (Trench A) cut down through the highest point of the mound to provide a continuous stratigraphic sequence (**Fig. 4.35**). This has been sub-divided into 15 Phases, further grouped into 8 Periods, representing near continuous occupation from the 4th/5th century to the late 13th century, with a short

possible break around the late 8th/early 9th centuries and some minor reoccupation off to the side of the main mound during the late 16th/early 17th centuries (**Table 4.8**).

Period	Date	Nature of occupation
I	4th/5th – 6th C	Represented by at least two episodes of mudbrick construction. Little is known about the limits of the settlement at this date
II	7th/8th C	Earlier buildings levelled and replaced by a mudbrick tower, the construction of which can be assigned to the late 7th/early 8th century. Thereafter, the rest of the sequence is separated into two units on the eastern and western sides of the tower
III	Late 8th – early 9th C	The tower fell into ruin and large accumulations of collapsed mudbrick melt were deposited. The site was either abandoned or occupied on a reduced scale
IV	9th – 11thC	Limited occupation
V	Late 11th – early 12th C	From around the late 11th or early 12th centuries (Period V) new better-preserved mudbrick structures were established across the area.
VI	12th C	The quality of occupation declined with the construction of more temporary post-built structures and an increase in pit digging across the site surface.
VII	13th C	
VIII	Late 16th – early 17th C	After a lengthy period of abandonment the tell was re-occupied as a small rural settlement

Table 4.8 *Summary of the main elements of the occupation sequence and dating of Kush (Kennet, 2004: 12-13, table 2)*.

4.3.8 Sohar – Oman

Location: 24°21'44"N; 56°44'57"E

Associated Names: Sohar/Suhâr (historic and modern)

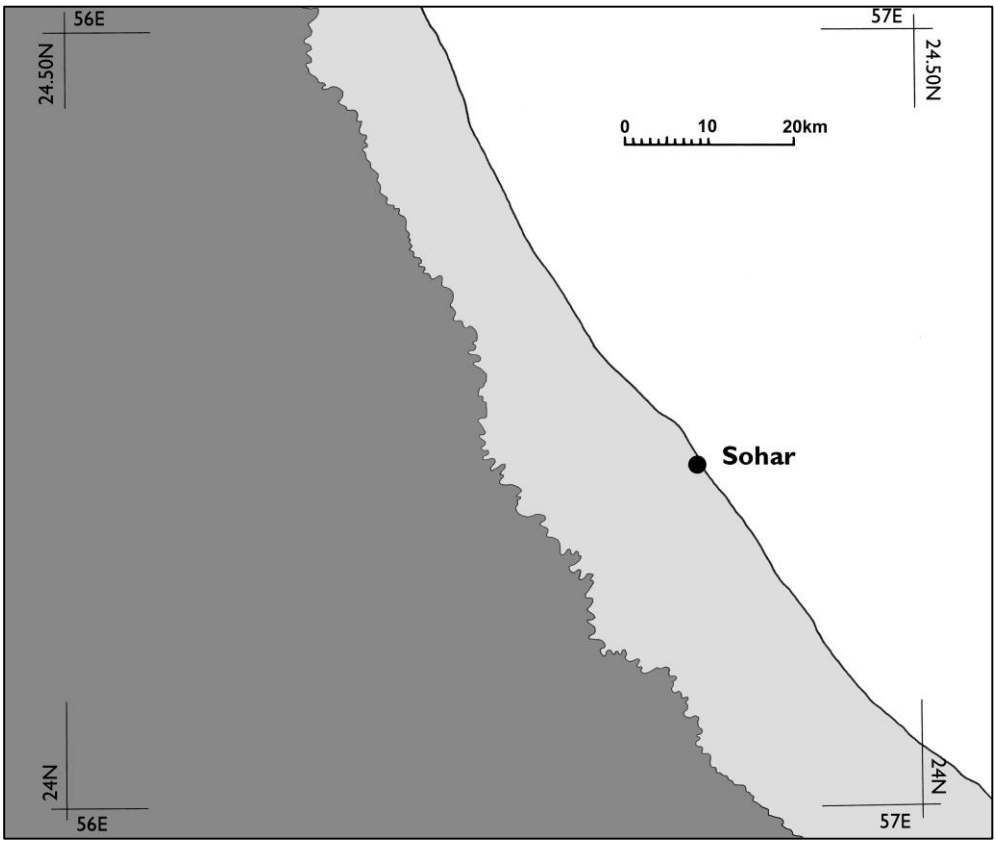


Fig. 4.36 *Map showing the location of the medieval port of Sohar on the Batinah coast of Oman. Ground shaded dark grey is above the 500ft contour.*

Site Characteristics and Setting

The port of Sohar occupies an important strategic location mid-way along the Batinah coast (**Fig. 4.36**), facing onto the Gulf of Oman with ready access both to the southwest trade routes leading towards South Arabia, the Red Sea and East Africa, and the eastern trade routes leading to India, Southeast Asia and the Far East (Anon. 1979). In general the northern Omani coast presents few significant obstacles to navigation and useful steering markers with the Hajjar Mountains rising to high peaks behind the coastal plain (Severin, 1992: 45). The Batinah coast was also the last point for taking on commodities such as food and water, and the first landfall in the open sea crossing between the Arabian Peninsula and India. More specifically, the Batinah Plain is one of the most agriculturally

productive regions of Oman, with relatively good soils and higher than average levels of precipitation. These natural conditions were exploited in medieval and earlier times with the construction of *aflaj* irrigation systems that enabled extensive cultivation across the plain (Williamson, 1973b; Costa & Wilkinson, 1987). As a port, Sohar perhaps has less obvious qualities. The depth gradient from the shore is fairly shallow and the anchorage does not appear to be particularly well protected apart from off-shore winds. Two creeks running in at either side of the medieval town may have been deeper in the past enabling small boats to be moored close to a quay (**Fig. 4.37**) (Williamson, 1973b: fig. 3a).

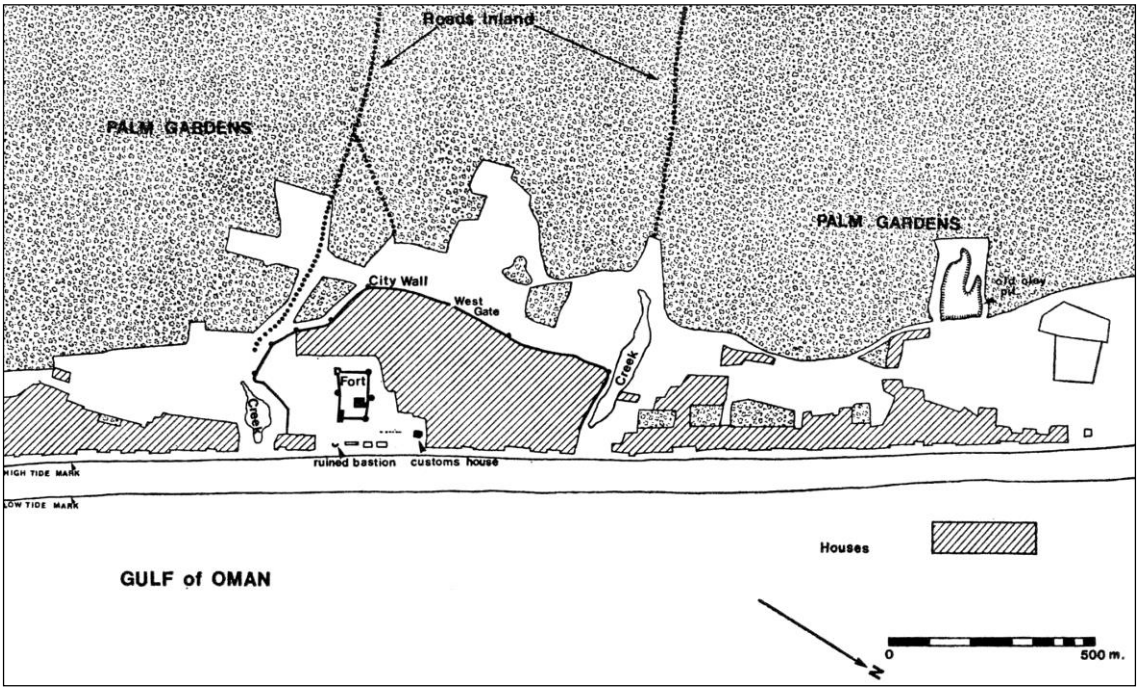


Fig. 4.37 *Location of the medieval city of Sohar (hatched) showing the area delimited within the city walls, the Late Islamic fort and the area of palm cultivation in the 1970s (after Williamson, 1973b: fig. 8).*

Today the area of the fortified medieval city of Sohar can be observed to be delimited by the seafront to the northeast and two active wadi channels separated from one another by c.800m (**Fig. 4.38**). Between the courses of these two channels, the remains of the settlement form a substantial mound. This area is almost entirely covered by relatively recent urban development. Comparison of photographs of the settlement taken during the early 1970s (Williamson, 1973b: pls. 1, 4, 6) and a plan of standing houses in the 1980s (Kervran, 2004: fig. 3), shows the rapid infilling of the area even within this

timeframe. Today the only extensive undeveloped spaces are towards the eastern edge of the settlement (**Fig. 4.38**). This area is dominated by a substantial fort first built during the 14th century (Williamson, 1973b: 30, fig. 6). The fort structure as it exists today, sits inside a rectilinear compound with sides measuring c.130 x 70m strengthened with corner and side wall bastions (**Fig. 4.39**). Beyond the wall, the area is further defended with a wide steeply angled moat, which would have cut deep down into the existing settlement mound deposits.

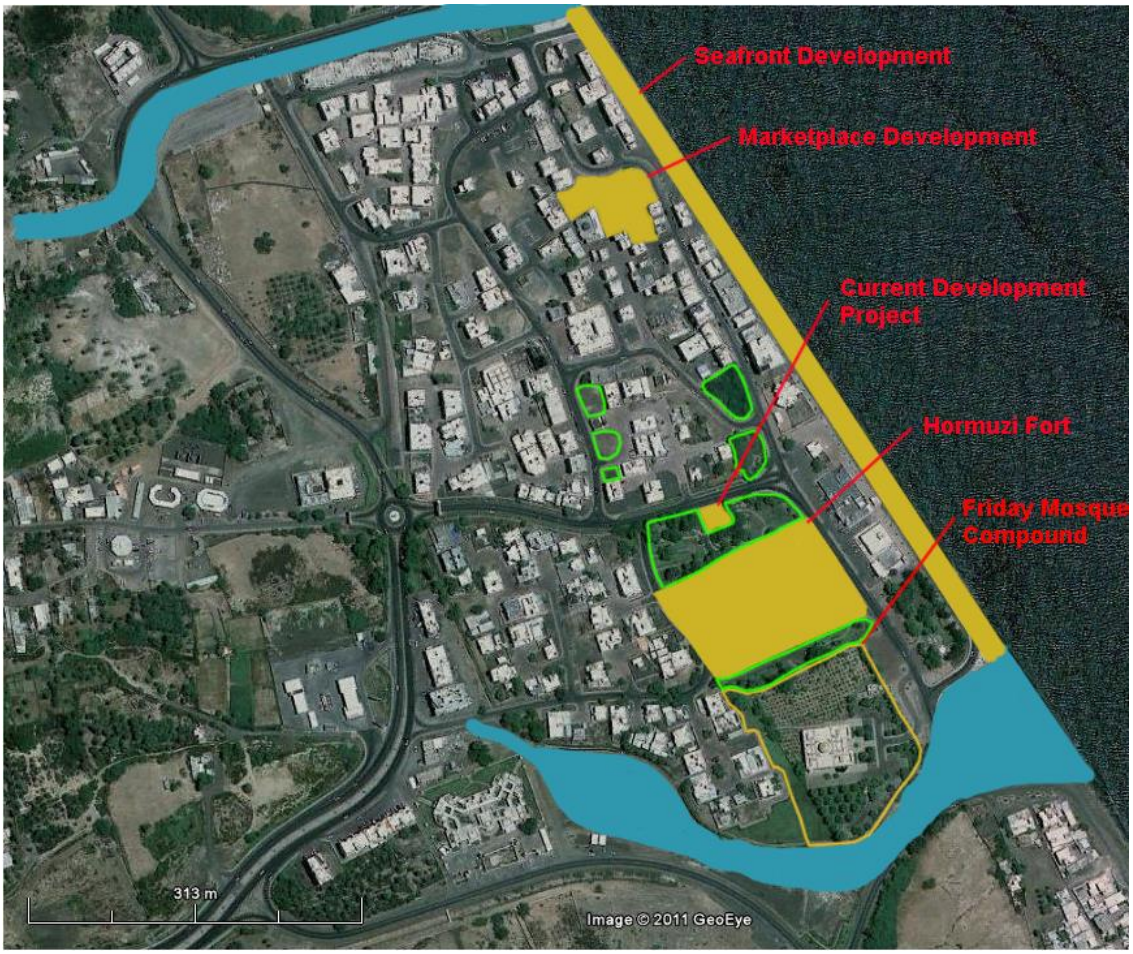


Fig. 4.38 *View of the city of Sohar showing the wadi beds that delimit the medieval city (in blue), the areas of recent development or known complete destruction (in solid yellow) and the areas on the city mound that remain potentially undisturbed by modern development (in green outline). Based on ground observations made during a site visit in 2010.*



Fig. 4.39 *The outer wall of the fort at Sohar with rounded bastions and the surrounding relatively undisturbed parkland*.

Archaeological Investigation

The first significant archaeological investigation at Sohar was conducted by the American Foundation for the Study of Man during a short two-week trial excavation in 1958 (Cleveland, 1959). The main aim of the investigation was to explore the date for the earliest occupation in the hope of identifying a potential horizon of pre-Islamic commercial activity. Several deep soundings were opened in different parts of the city, but the earliest material identified can be confidently attributed to the mid-8th century and later (Cleveland, 1959: 15, fig. 4: 1-9). From the early 1970s, with the establishment of the Department of Antiquities, a whole series of foreign directed fieldwork project were initiated within Oman including the Sohar Ancient Fields Project, which was established by the first Director of the Department, Andrew Williamson as part of the Harvard Archaeological Survey (Williamson, 1973b).

Williamson's work at Sohar continued until his untimely death in 1975 (Allan, J. 1987). Work on the Sohar Ancient Fields Project was then continued by Paolo Costa and Tony Wilkinson. Together they conducted a major programme of surface survey and

excavation in the Sohar hinterland that lasted for ten years (Wilkinson, 1975; 1976; 1977; Costa & Wilkinson, 1987). During this research, an area of 700km² was investigated from the back of Sohar to the foothills of the Hajjar Mountains, covering both the agricultural and mining resource supply zones of the medieval city. Excavations were also completed at the Arja mine complex (Costa, 1981; Costa & Wilkinson, 1987) and a small water mill in the Sohar hinterland (Wilkinson, 1980; Costa & Wilkinson, 1987). Work on the surrounding landscape archaeology was complemented by further excavation within the city by Peter Farries in 1975, the results of which were unfortunately never published. Farries' work was followed by four seasons of larger-scale excavation by a French team directed by Monik Kervran in 1980, 1982, 1984 and 1986 (Pirazzoli-t´ Serstevens, 1988; Kervran & Hiebert 1991; Kervran, 1992; 1996; 2004) (**Fig. 4.40**).

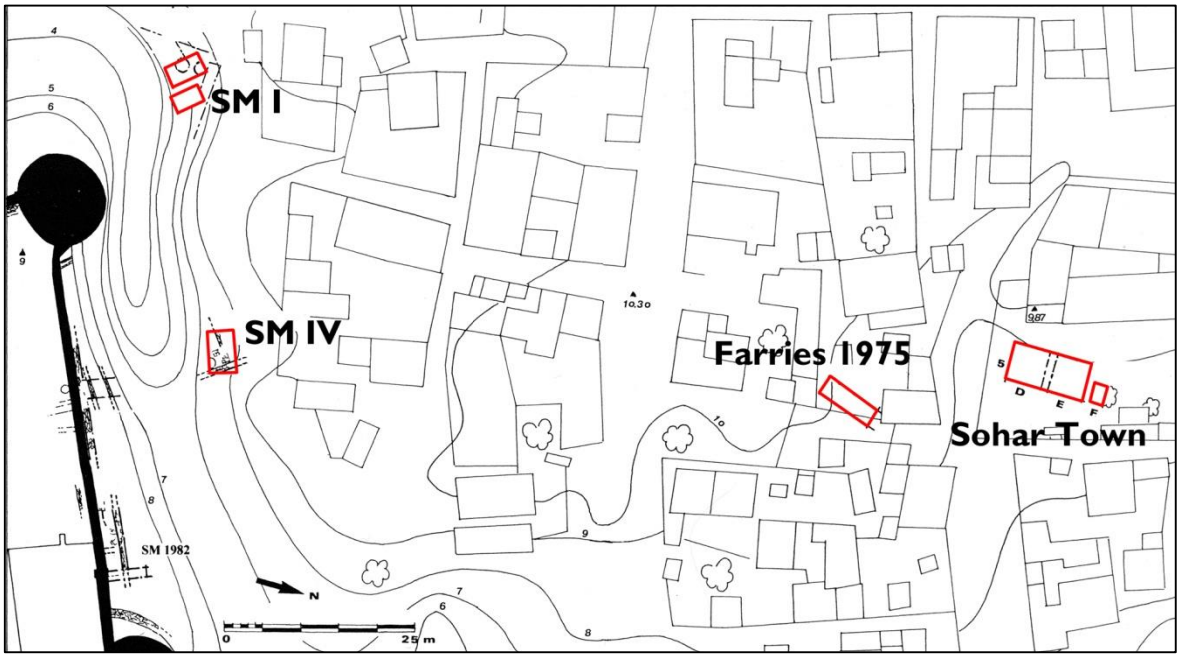


Fig. 4.40 *Detail of the settlement mound at Sohar showing the location of trenches opened by Farries in 1975 and by the French expedition between 1980 and 1986 (after Kervran, 2004: fig. 4).*

Occupation Sequence and Chronology

Based on the surface collection off the settlement mound, Williamson estimated that Sohar reached its greatest extent during the 9th – 10th centuries, when the area of archaeological mounding covered at least 73ha (Williamson, 1973b: 16). The original settlement probably covered a larger area, particularly if one factors in areas of *barasti*

architecture that would leave limited archaeological trace. In terms of dating, Williamson observed just one pre-Islamic sherd, pointing to limited activity within the area during this period (Williamson, 1973b: 14). By the early 11th century, Sohar had contracted to around 18ha, less than a third of its original size (Williamson, 1973b: 16-19). Landscape surveys conducted in the hinterland of Sohar indicate that an area of at least 6,100ha was brought under intensive cultivation during the peak phase of occupation within the city during the 9th and 10th centuries (Williamson, 1973b: 18; Costa & Wilkinson, 1987: 225-26). This also appears to have been the most intensive period of copper mining activity at the nearby mining complexes of Lasail and Arja (Whitcomb, 1975: 126; Costa & Wilkinson, 1987: 225-26).

Level	Layer	Illustrated Ceramics	Rev. Dating	Published Dating
XI	1	Not published	n/a	
	2	Not published	n/a	
	3	Not published	n/a	
X (SM)	4	Not published	n/a	
IX	5	Not published	n/a	
	6	Not published	n/a	
	7	Not published	n/a	
VIII (SM)	Gap	Not published	n/a	
VII (SM)	9	Not published	n/a	**Late 12th/Early 13th** (p.343, Table 2)
VI (SM)	Gap	**OPAQ.W1, OPAQ.C, OPAQ.TS, TURQ.T** Type JR5, **EGG, LISV, GRAF.H** (figs. 29: 12; 33: 1-3; 34: 8-13; 35: 2?; 36: 2, 7-11)	9th - 11th c.	**Mid-9th - Early 12th** (p.343. Table 2)
V	10	**GRAF.EP** (fig. 23 bis: 3, 10), first **EGG** (p301, fig. 23: 9-17), **DUSUN, WW** (p.323, fig.23 bis: 12), **CHANG** (p.319, fig. 24: 5)	10th c. (mixed layer?)	**Later 8th - Late 9th** (Table 1)
	11	**TORP** (fig. 22: 3), **BAHLA, YUE** (p.319, fig. 22: 11, pl. 30: 4), **WW** (p.323, fig. 22: 12)	10th c.	
	12	**OPAQ.W1** (p. 301, fig.21: 16), **OPAQ.TS**, first **DUSUN** (p. 318, pl. 29: 1)	9th c.	early 7th - early 9th (Table 1)
	13	**CHANG** one sherd from Layers 15-13 (p.319, fig. 26 bis: 1), Kervran interprets the Sasanian Islamic transition as occurring between Layers 15-14, in fact this is the beginning of the Samarra horizon		
	14			
IV	15	**CHANG** one sherd from Layers 15-13 (p.319, fig. 26 bis: 1), common CW of Levels 0-III disappears (p.285), possible **HARLIM?** (p.285, fig. 13: 12, 17-22), **TURQ.T** bowl (p.286, fig. 14: 1)	mid-8th - early 9th	3rd - 7th (p.293)
	16			
	17			
III	18	**TURQ.T** Kennet's Type 72 (p.296, figs. 10: 17-18; 12: 6-8), **TURQ.T** Type JR5 (p.275, pl. 25: 5), **TORP** (fig. 11: 6), **Last IRPW** (p. 316, pl. 28: 1-2), **first Stoneware Jar** (p.275, pl. 22: 2, fig. 12: 24)		
	19			
	20			
	21			
II	22	Kennet's Type 72 (p.296, figs. 10: 17-18; 12: 6-8), Ceramic continuity from Levels 0 – II (p.274)	mid-7th - mid-8th	mid 2nd/3rd (p.339, table 2)
	23			
	24			
I	25	**IRPW, TURQ.T, IRAB** & same non-diagnostic coarse ware as Level 0 (p.272)		
	26			
0	27	**IRPW, TURQ.T** & non-diagnostic coarse ware (p.271-72)		
	28			

Table 4.9 *Phasing from Sohar showing diagnostic ceramic classes and types associated with each Level together with the correlation between the published dating and a revised dating based on the associated ceramic finds. Note Levels marked "SM" are only or mostly represented by deposits from the Sohar Moat and Layers marked "Gap" are missing entirely from the Sohar Town. Page numbers, figures and tables cited refer to Kervran, 2004*.

In addition to the broader landscape study, excavations within the settlement of Sohar have provided more specific evidence for the chronology of the port. The most substantial and important evidence comes from the French excavations of the 1980s. The recent final publication of the lower part of this sequence sets out a chronology for the site sub-divided into 28 layers or 12 major levels (Kervran, 2004: 270, fig. 6). This represents a more or less continuous occupation sequence dated by the excavator to between the mid-late 2nd to mid-20th centuries AD (**Table 4.9**). None of the areas excavated provide all parts of the sequence, and it is necessary therefore to amalgamate the results from different trenches; in particular a deep sounding opened during the last season in 1986 in the highest part of the modern town (Sohar Town), and two test trenches opened towards the top of the slope of a deep moat cut through pre-existing deposits surrounding the Hormuzi period fort (Sohar Moat I and IV) (**Fig. 4.40**). For the early occupation (Levels 0-V), each level is represented in a continuous sequence within the Sohar Town excavation (**Fig. 4.41**).

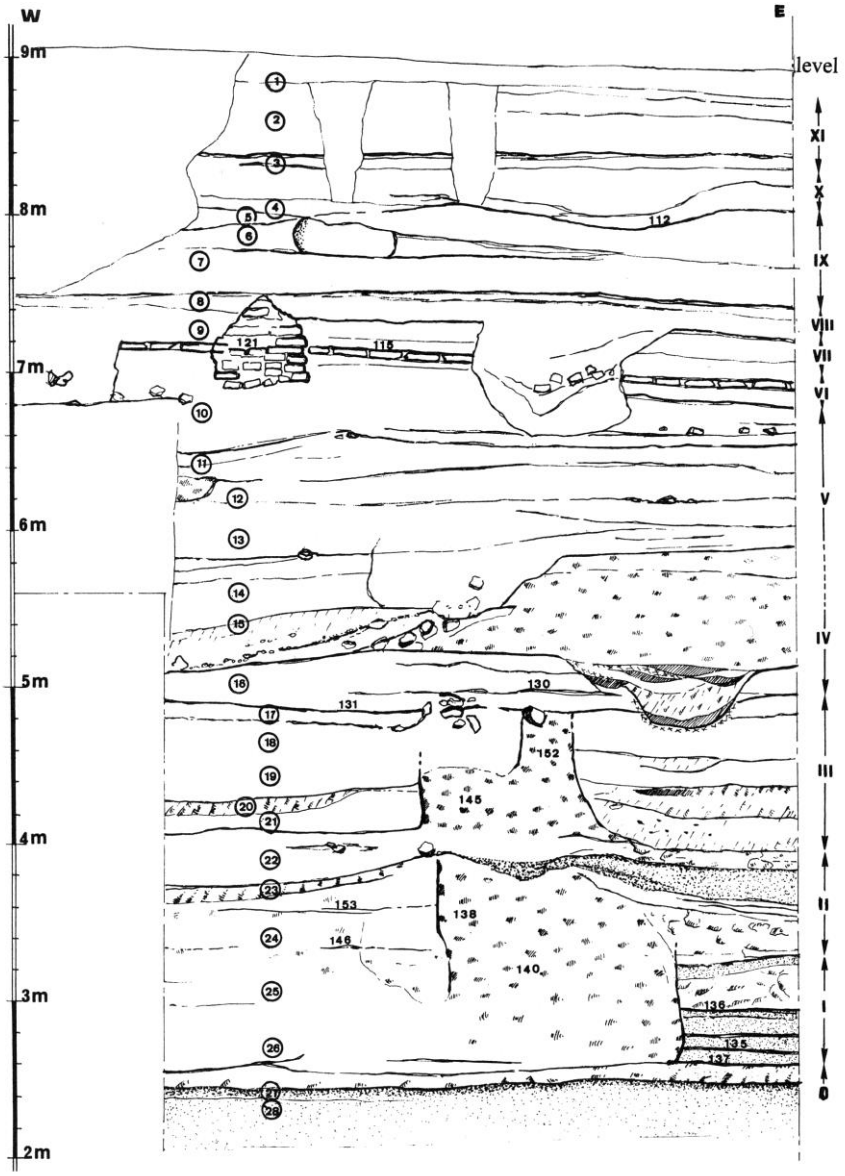


Fig. 4.41 *Section through 7m of stratigraphy in north side of the Sohar Town excavation completed in 1986. Note circled layer numbers correspond to those in the table above (after Kervran, 2004: fig. 6)*.

The dating applied to the sequence from Sohar remains contentious. No absolute dates were obtained either in the form of coin evidence or reliable radiocarbon determinations (Kervran, 2004: 339[41]). As a result, one is forced to rely largely on the ceramics and the cross dating of particular type-fossils available from other excavations with better-dated contexts. Kervran argues that a large part of the early sequence at Sohar should be

[41] The determination provided by a single radiocarbon date obtained from an oven in Level II is not included in the report as it apparently does not fit with other dating provided (Kervran, 2004: 274).

assigned to the late Parthian and Sasanian periods with Levels 0 - II dated to the mid-2nd - 3rd centuries AD, and Levels III - IV dated to between the 3rd - 7th centuries (Kervran, 2004: Tables 1 & 2). This would, if correct have major implications for our understanding of the historical development of Oman and for our view of commercial developments of the Indian Ocean during the Sasanian period. The dating of the early sequence is therefore of critical importance to a much broader set of issues. The main dating evidence for Levels 0-IV is based on the identification of four type-fossils (Kervran, 2004: 293, 296). Kennet has recently provided a detailed review of this ceramic dating evidence. In each case Kennet argues that the parallels cited are either 'wrong or problematic' or clearly assignable to the 1st – 2nd or 8th centuries (Kennet, 2007). In his opinion "the entire Sohar sequence below Level V is datable to the eighth century" possibly with some "*in situ* occupation of the first/second centuries" in Levels 0-I (Kennet, 2007: 99).

The later dating proposed for the earlier levels at Sohar has significant implications for the later parts of the sequence as well. Kervran places the transition between the Sasanian and Islamic periods between Layers 15 and 14 (Kervran, 2004: 300). On either side of this transition, there are a number of contrasts in the ceramic assemblage, as well as some points of overlap and continuity. In actual fact, this transition immediately precedes the first introduction of the 'Samarra horizon' in Layer 12, an event that securely dates that level to the early part of the 9th century. The implication must be that the Layer 15-14 transition should be placed not long before the early 9th century, most likely in the late 8th century, long after the Islamicisation of the area. This accords more closely with the available ceramic dating evidence, which includes the introduction of late 8th century markers from as early as Level III, such as single sherds of appliqué decorated TURQ.T[42] and the first East Asian stoneware (STONE.BG1) (Kervran, 2004: 275, pl. 22: 2; fig. 12: 24). The subsequent Levels IV and V, also both contain examples of CHANG bowls that are unlikely to have been manufactured and exported to the Middle East before the mid-8th century (Whitehouse, 1973; Liu Yang, 2010: 146).

[42] There is a slight confusion with the occurrence of ALK.3 in Level III as the class is named as one of the groups found in the level in the text (Kervran, 2004: 275, pl. 25: 5), however in the plate caption for the sherd that is cited, it says that this is a surface find. Numerous other inconsistencies such as this occur throughout the report.

The definition and characterisation of the crucial 'Samarra horizon' period levels, during which Sohar reached its greatest prosperity, unfortunately appear to be somewhat confused. The relevant levels are mostly missing from the deep sounding in the areas of the Sohar Town. As previously stated, the lower layers of Level V (Layers 14-12), cover the introduction of the Samarra horizon and contain an assemblage consistent with the early to middle or later 9th century. From the upper two layers of Level V (Layers 11-10), the ceramics (both published and re-catalogued (see **Chapter 5**), reveal extensive contamination with pottery from the c.9th – 15th/16th centuries mixed together in the same contexts. An attempt is made to substitute this missing component of the sequence (Level VI) with an isolated deposit sandwiched between the northwest wall of the fort and the cut of the 16th century moat (Kervran, 2004: 309-10, fig. 27). The fact that one finds both OPAQ.C of the early to mid-9th century and GRAF.H, dated from the 11th – 12th centuries in the same deposit (Kervran, 2004: fig. 29: 12-13), suggests that Level VI is also contaminated. In fact there appears to be significant chronological overlap between Level V and VI, and the ceramics from both appear equally confused. The element of the sequence that has greatest integrity remains the earlier levels from the Sohar Town.

4.3.9 Manda – Kenya

Location: 2°13'37"S; 40°58'02"E

Associated Names: Manda (modern)

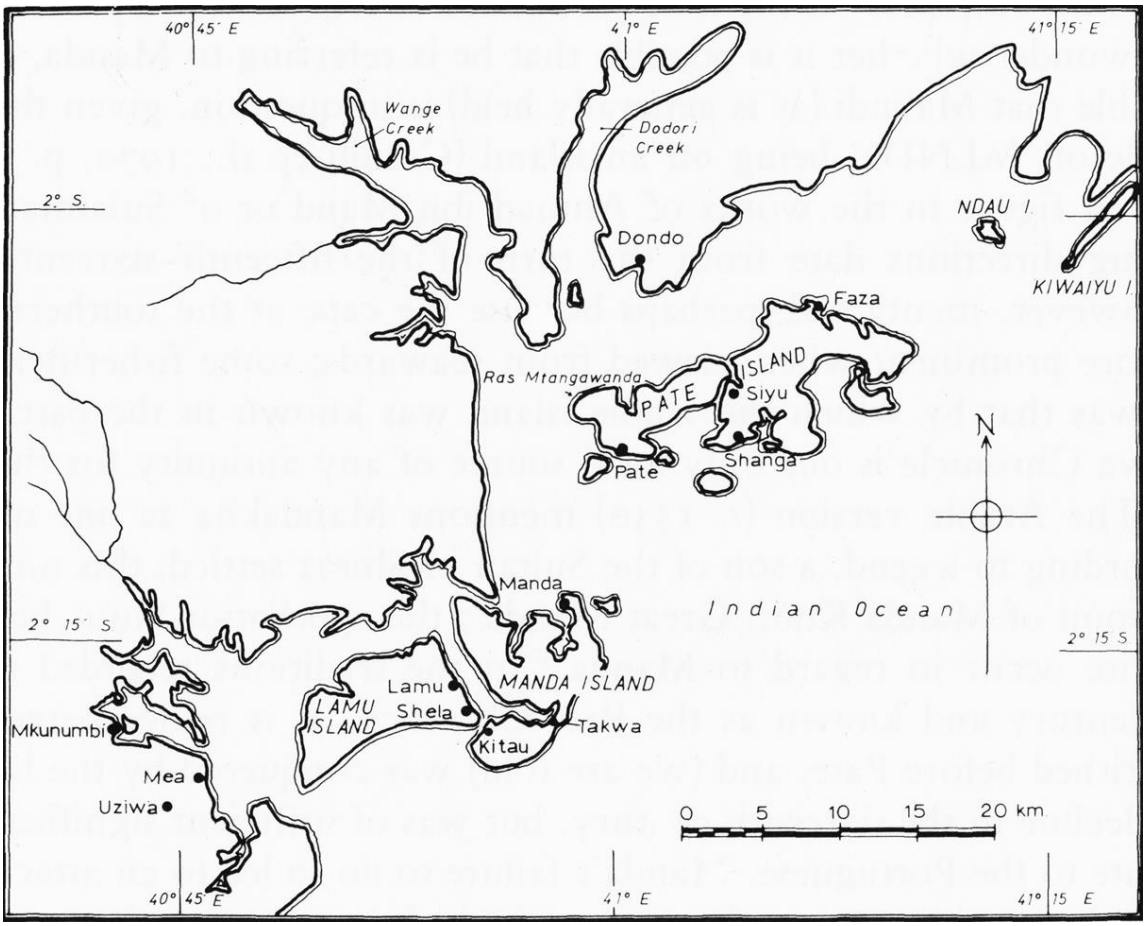


Fig. 4.42 *Location map with the settlement of Manda situated at the northern tip of Manda Island and Shanga on the south shore of Pate Island within the Lamu Archipelago off the coast of Kenya, after Chittick, 1984: fig. 1*.

Site Characteristics and Setting

The site of Manda is located on Manda Island off the coast of Kenya within the Lamu Archipelago. The site is situated towards the end of a narrow spit of land toward the northern end of the island, facing towards the East African mainland (**Fig. 4.42**). The surrounding shoreline is covered within a dense belt of mangroves (**Fig. 4.43**). Behind this, the vegetation thins out and is today dotted with tall palms, baobab trees and thorny undergrowth (**Fig. 4.44**). In terms of navigation, the peninsula is close to, but protected

from the open sea, though the approach and entrance to the archipelago are constrained by shallow reefs, winds and tides and require detailed local knowledge to approach close to the site even with a relatively small vessel.



Fig. 4.43 *The settlement mound of Manda marked by tall baobab trees behind a thicket of mangroves*.

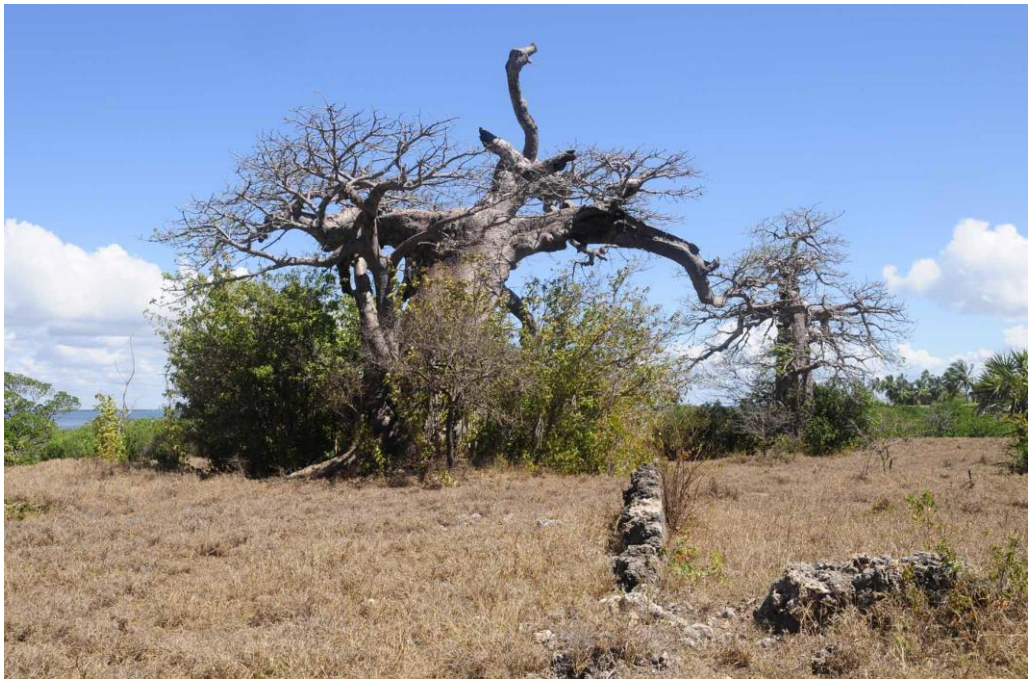


Fig. 4.44 *Open vegetation on top of the settlement mound at Manda with partially standing remains of the 'new town' wall*.

It is difficult to estimate the original size of the settlement at Manda. The area of stone buildings probably covered around 7ha (Chittick, 1984: 9), though lighter structures dated to the earlier period of occupation may have spread out over an area of as much as 20-25ha (Horton, 1986: 208) (**Fig. 4.45**). The solid architecture of Manda consists of buildings constructed from roughly dressed blocks of coral rag sometimes set in mortar together with a few fired brick buildings. The bricks were of the slop-moulded variety and are similar to those from Sohar from where they may have been imported (Chittick, 1984: 15). One of the most prominent and distinctive features of the early settlement at Manda is a series of substantial 'sea walls' running in blocks along the front of the town for around 400m (**Fig. 4.46**). Each block was back filled to form a solid terrace. The precise functions of these wall is unknown, but they may have been constructed for land retention, and as foundation platforms for houses or areas for goods handling and other activities concentrated along the sea front.

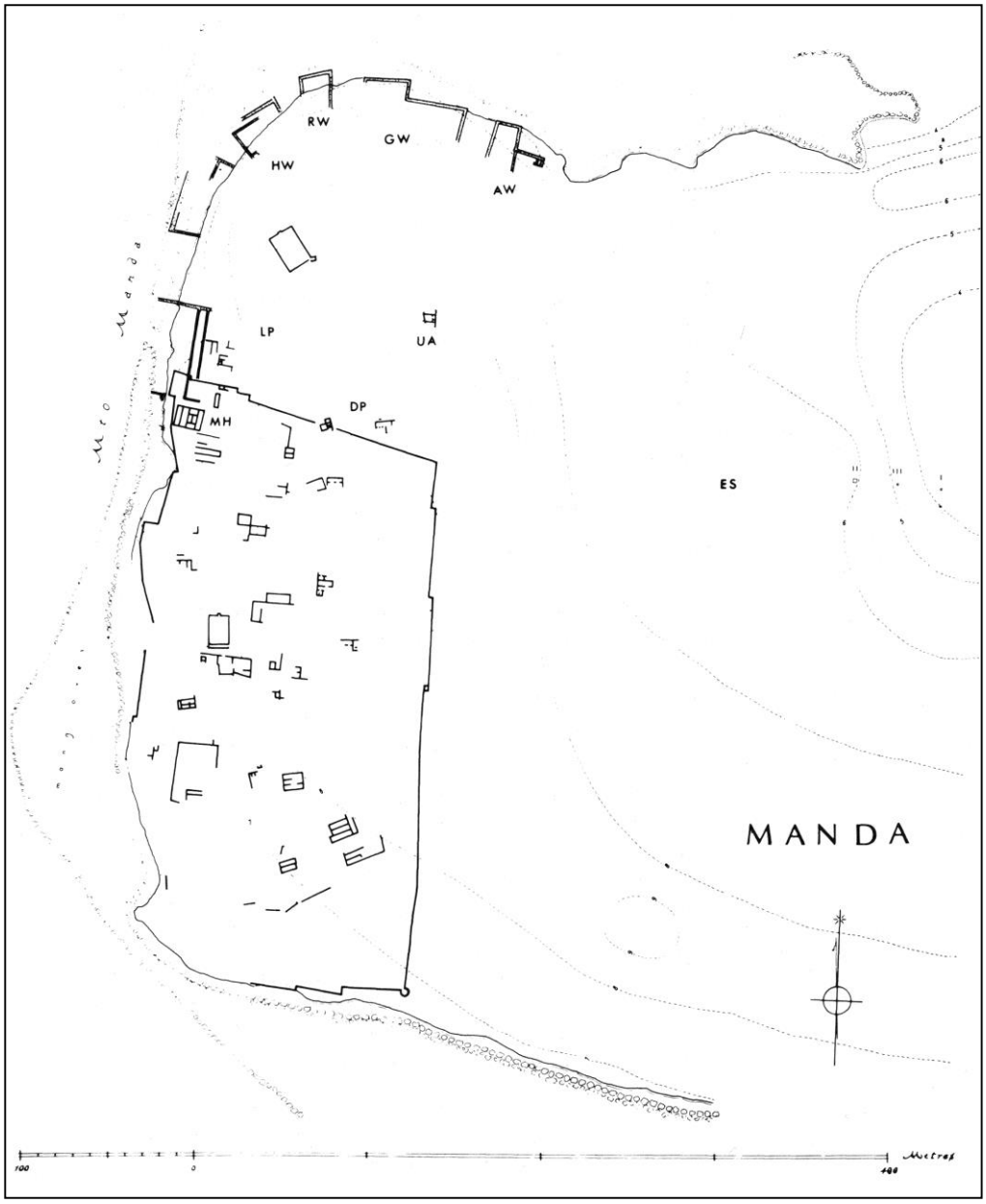


Fig. 4.45 *Plan of remaining stone structures and sea walls at Manda with the old town situated towards the north and the enclosed area of the new town to the south, after Chittick, 1984: fig. 4*.



Fig. 4.46 *Massive roughly dressed corral blocks forming one of the sea walls currently running along the high water mark*.

Archaeological Investigation

Initial trial excavation was undertaken at Manda and other sites in the Lamu archipelago on behalf of the British Institute in East Africa in 1966 (Chittick, 1967). A larger season of excavation was undertaken at the site for two-months in 1970 and for two and a half months in 1978 (Chittick, 1984: xv). At least 30 individual trenches were excavated across the settlement, mostly with the aim of tracing the spatial layout of buildings and the sea walls (Chittick, 1984: 22; Horton, 1986: 205). The publication of Manda was completed posthumously by Richard Wilding drawing extensively on the original excavation archives housed at the British Institute in East Africa in Nairobi.

Occupation Sequence and Chronology

The dating of the Manda sequence is based almost entirely on imported ceramics and the dates obtained for these in other regions, notably China and Middle East. The phasing of the site is based on a combination of stratigraphy and ceramic periods (Chittick, 1984: 11) though at least one radiocarbon date was obtained from a mangrove pole attributed to the earliest occupation. This provides a determination of 730 ±100 cal. AD, which is plausible, though doubts are raised over the feasibility of obtaining a reliable

determination from mangrove wood (Chittick, 1984: 30). The phasing of the site is sub-divided into six periods with four additional sub-periods covering the earliest occupation in Period I (**Table 4.10**).

Period	Date	Diagnostic ceramics
Ia-d	Mid-9th – early 11th C.	TURQ, OPAQ, DUSUN, CHANG, WWSL, WW
IIa	Mid-11th – late 12th C	GRAF.H, CHAMP, QING
IIb	Late 12th – late 13th C.	GRAF.LG, QING
III	Late 13th – 14th C.	YEMEN, PERSIA, LQC
IV	15th - early 16th C.	PERSIA, LQC
V	Mid-16th – 17th C.	Manganese Purple ware, PERSIA
VI	Post-17th C.	Very little material, late CBW, Islamic ”imitation stoneware”

Table 4.10 *Main periods of occupation at Manda with associated dating and typical categories of ceramic imports*.

In many areas deep excavations were hindered by the high water table and natural sediments were rarely reached (Chittick, 1984: 65, Note 1). The earliest occupation of the site (Period IA) pre-dates the construction of the sea walls. When these were constructed in Period IB, they were cut into Period IA deposits resting on the natural sand. Thereafter the sea walls continued to be used and modified up to Period IIB at the latest. The deposits overlying the sea walls contain Late Sgraffiato so all the earlier activity should pre-date the 11th – 12th century (Chittick, 1984: 28-35). In total around 250,000 sherds of local and imported ceramics were excavated. Imported pottery occurs in its greatest frequency in Period I and thereafter progressively decreases through time. Around 30% of all pottery in Period I was imported followed by 10% in Period II, 3-5% in Periods IId and III, and 1% in later levels (Chittick, 1984: 65). It has been pointed out though that the exceptionally high proportion of imports recorded from the earliest beach sand deposits, may simply be a reflection of fact that local more friable fragments have mostly been removed from these deposits through wave action (Horton, 1986: Note 7).

4.3.10 Shanga – Kenya

Location: 2°7'5918"S; 41° 4'2.89"E

Associated Names: Shangu? (historic)
Shanga (modern)

Site Characteristics and Setting

The settlement of Shanga is situated north of Manda on the neighbouring island of Pate within the Lamu archipelago. The shortest sailing route between the two sites is over a distance of c.20km (**Fig. 4.42**). Shanga is situated within a protected shallow bay on a natural promontory that can only be accessed from the sea at high tide with small boats. The surrounding coastline is formed of a low shelving bed of fossilised coral backed by a dense forest of mangrove trees. The whole site is covered with a thick tangle of thorny briers and scrub under a canopy of taller palm and baobab trees (**Fig. 4.47**). The vegetation thins somewhat further inland where the site is encircled by low dunes. These form a natural catchment for moisture, which would once have provided an abundant subsurface supply (Horton, 1996a: 78-79). The main settlement is concentrated within the centre of this natural bowl. Cemeteries extend inland beyond the perimeter of the settlement (**Fig. 4.48**). The settlement together with the cemetery covers a total of 15ha.



Fig. 4.47 *Low fossilised coral shelf with dense vegetation masking the settlement of Shanga as seen from the approach at high tide through Pate Bay*.

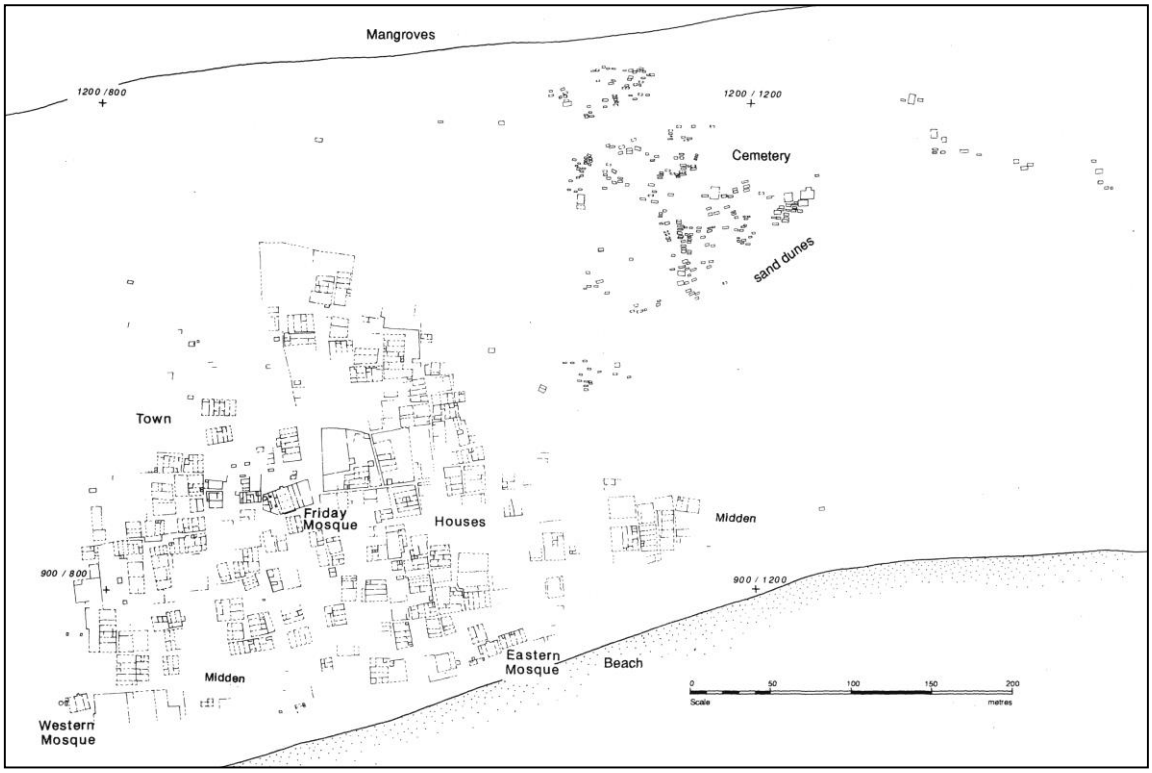


Fig. 4.48 *Plan of buildings visible on the surface at Shanga related to the latest phase of occupation together with the main cemetery area to the northeast (after Horton, 1996b: fig. 5)*.

Archaeological Investigation

The site of Shanga was first investigated intensively during six seasons of excavation between 1980 and 1988 (Horton, 1996b: xv). As part of the investigation, a plan of all visible structures and graves was completed across the settlement (**Fig. 4.48**). This was complemented by an extensive test pit survey, which showed that the deepest occupation deposits are concentrated towards the centre of the settlement. All of the main open-area excavations were targeted within this area (Horton, 1996b: 79-83, fig. 40). Ten open-area excavations where completed, each down to the natural sub-soil. Four trenches excavated to the west of the Friday Mosque form a single contiguous block covering 476m² (Tr 6-10). These provide the most useful source of information on the overall structural development of the site and the changing composition of the artefact assemblage.



Fig. 4.49 *Standing ruins of the Friday Mosque within the centre of the settlement*.

Occupation Sequence and Chronology

Today the site is dominated by well preserved coral-rag-and-lime buildings belonging to the last phase of occupation dated to the 14th and 15th centuries (**Fig. 4.49**). On the surface, more than two hundred standing houses were mapped and recorded (**Fig. 4.48**). In the centre of the site, cultural deposits extend for up to 3-4m in depth and consist of multiple episodes of building renewal covering the major transition of post built wooden architecture to monumental stone construction. The phasing within the excavation is defined on the basis of significant stratigraphic events within the sequence: a new building being constructed, a building being abandoned, a change of area function, or sometimes the appearance of a new variety of pottery. Through the occupation sequence, phases were formed through the episodic replacement of structures, which it is estimated might have occurred at intervals of around every three decades (Horton, 1996b: 11).

Limited independent dating evidence is available for individual phases within the excavations. No coins were found, a relatively small number of radiocarbon dates were obtained and information on the dating of local pottery remained limited. All of the radiocarbon dates come from Trenches 1 and 3 (Horton, 1996b: 14). In the absence of other forms of evidence, the dating of individual phases relies almost entirely on their relative stratigraphic position, and the occurrence of imported pottery; itself dated through a combination of methods, mostly cross-dating evidence from archaeological sites within the Middle East. The discussion of the primary dating evidence for imported pottery relies mostly on the treatment of this material within an East African context through the filter of earlier discussions by Kirkman (1952; 1954; 1963), Chittick (1974; 1984) and Wilding (1977). Some direct treatment of the available Middle Eastern dating evidence is also provided. The main sources utilised include Kervran's early work at Susa (1977) and Tampoe's study of pottery from Siraf (1989). Both sources have been shown to be problematic in different ways (Kennet, 2004: 31). Despite these potential pitfalls, only relatively minor adjustments to the dating appear necessary (see **Chapter 5**). The entire sequence of occupation at Shanga spans the period from the late 8th or early 9th centuries, to around the 15th century (Horton, 1996b: 5-7).

4.3.11 Sanjan – India

Location: 20°11'59.60"N; 72°48'0.22"E

Associated Names: Sindan (historic)
Sanjan Bandar, Sanjan Dakhma, Kolikhadi (modern)

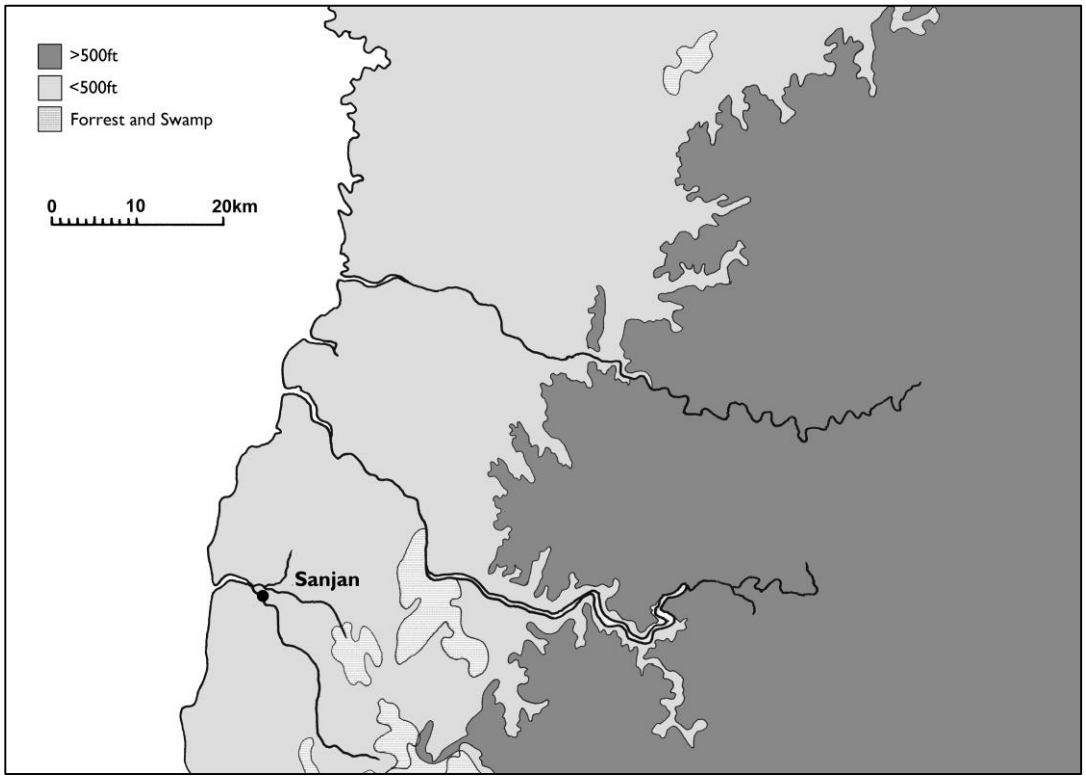


Fig. 4.50 *Map showing the location of the Sanjan a short distance inland on the north bank of the Varoli River.*

Site Characteristics and Setting

Sanjan is a sizable coastal settlement and port covering at least 225ha, situated in the Valsad District of southern Gujarat on the west coast of India (**Fig. 4.50**). The site occupies a strategic location 4-5km inland from the coast on the north bank of the Varoli River (**Fig. 4.51**). The main part of the settlement is distributed over a large mound (the Sanjan Bandar), partly cut into on one side by the river (**Fig. 4.52**). Other outlying mounds are covered with remains related to the medieval occupation, including the most famous partially standing historic structure: the Sanjan Dakhma; a circular mortuary building associated with Zoroastrian funerary practice (Nanji, 2011: 1, 8). The area surrounding Sanjan is covered with a densely forested landscape. Today much of the area of the

ancient town is covered with modern habitation and cultivation. This hinders access to archaeological remains and makes it more difficult to establish an overall outline of the site. Other important landscape changes include the siltation and partial blocking of the Varoli River delta. As recently as the late 19th century, the estuary remained navigable up to the Bandar site, even for fairly large vessels. Geomorphological investigation conducted in the area in 2004 indicates that substantial changes may also have occurred along the neighbouring coastline and delta area (Nanji, 2011: 1-2, 6).

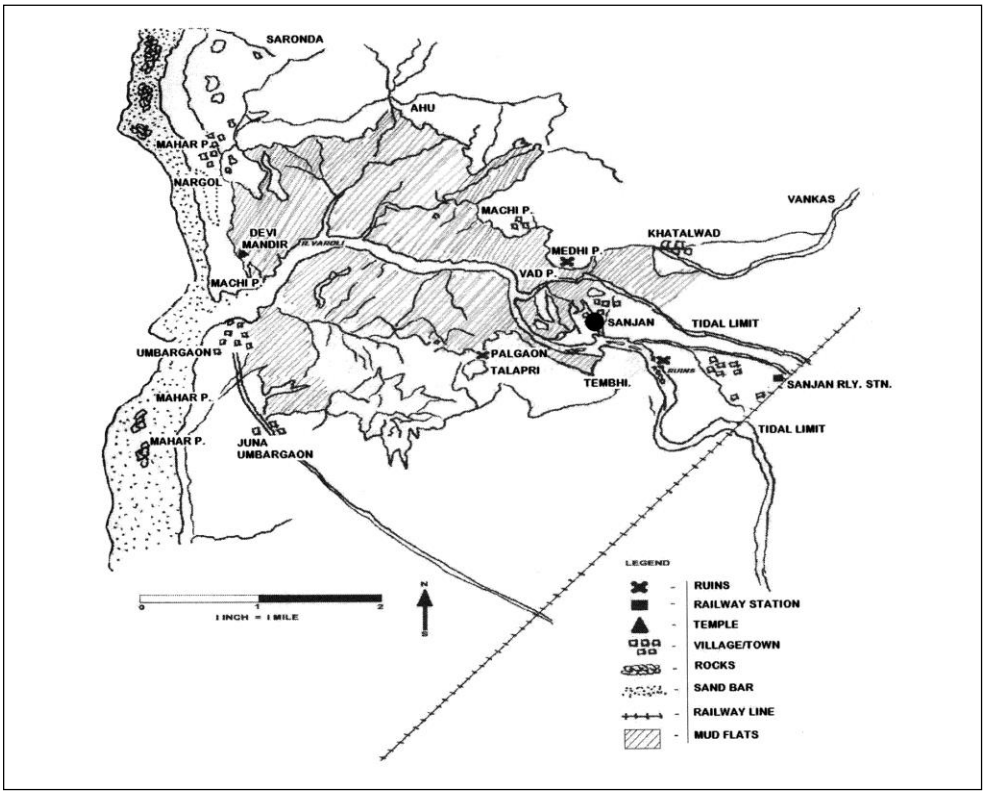


Fig. 4.51 *Location map of Sanjan within the Varoli River delta (after Nanji, 2011: fig. 4)*.



Fig. 4.52 *Sanjan Bandar site looking back towards the site from the south bank of the Varoli River (image reproduced with the kind permission of Rukshana Nanji)*.

Archaeological Investigation

The earliest archaeological investigation at Sanjan took place in 1917, when an excavation was carried out at the Sanjan Dakhma site, but the results of this were never published (Nanji, 2011: 7). Renewed investigation by the Archaeological Survey of India took place between 2002 and 2004. Excavations concentrated on three widely separated areas of the site: the Sanjan Bandar, a smaller outlying mound near the Kolikhadi Stream, and the Sanjan Dakhma. At the Sanjan Bandar site, four test trenches were opened (TT1-4). Two adjoining trenches (TT1 and TT2) were excavated during the first season on the highest available part of the settlement mound. Combined these trenches covered an area of 7.5 x 5m and were excavated to a maximum of 5.3m deep (Nanji, 2011: 8-9). During the second season, part of an eroding section along the riverbank was cleared (TT3) exposing elements of a brick built structure (Nanji, 2011: 11). Finally, in the 3rd season, a new deep 5 x 5m sounding was excavated (TT4) in order to provide additional information on the main cultural sequence and in particular to remedy certain significant problems encountered in the phasing of TT1/TT2 (see below) (Nanji, 2011: 12).

Elsewhere excavations were completed during the second season at a mound 0.5km from the Bandar site adjacent to the Kolikhadi Stream. Here a number of 5 x 5m trenches were opened revealing remains of at least three structures with rammed cobble and brick floors. The cultural sequence in this area extended down to a maximum depth of 1m (Nanji, 2011: 10-11). During the third season an excavation was also undertaken at the Sanjan Dakhma.

Occupation Sequence and Chronology

Results from the recent archaeological investigation of Sanjan have so far been presented in the form of interim reports (Gupta, *et al*., 2002; Gupta, *et al*., 2003; Gupta, *et al*., 2004; Gupta, *et al*., 2005; Nanji & Dandekar, 2005) together with a more detailed study covering the ceramic finds (Nanji, 2007; 2011). This includes the presentation of a ceramic classification based on the entire excavated assemblage, together with selected quantitative data from one of the excavations (TT4) (Nanji. 2007; 2011). TT4 is a relatively small 5 x 5m deep sounding that provided a sequence sub-divided into six layers with four main structural horizons (**Fig. 4.53**). The chronology of this excavation is based entirely on the associated dating of imported ceramics. The earliest occupation horizon has been dated to the 8th or possibly 7th century, and contains some non-glazed Middle Eastern imports, possibly Torpedo Jars (TORP.S), though this is somewhat uncertain (Nanji, 2011: 205). Typical 'Samarra horizon' glazed wares of the early 9th century appear relatively late within the stratigraphic sequence, after the formation of 2.54m of deposits. The earliest Chinese imports occur only slightly earlier. Occupation came to an end in the TT4 area, after the decline of the Samarra horizon and during the currency of Late Sgraffiatos during the late 12th or early 13th century (Nanji, 2011: 207). Occupation at the Sanjan Bandar site appears to have been continuous and to have contained some Middle Eastern imports throughout its duration.

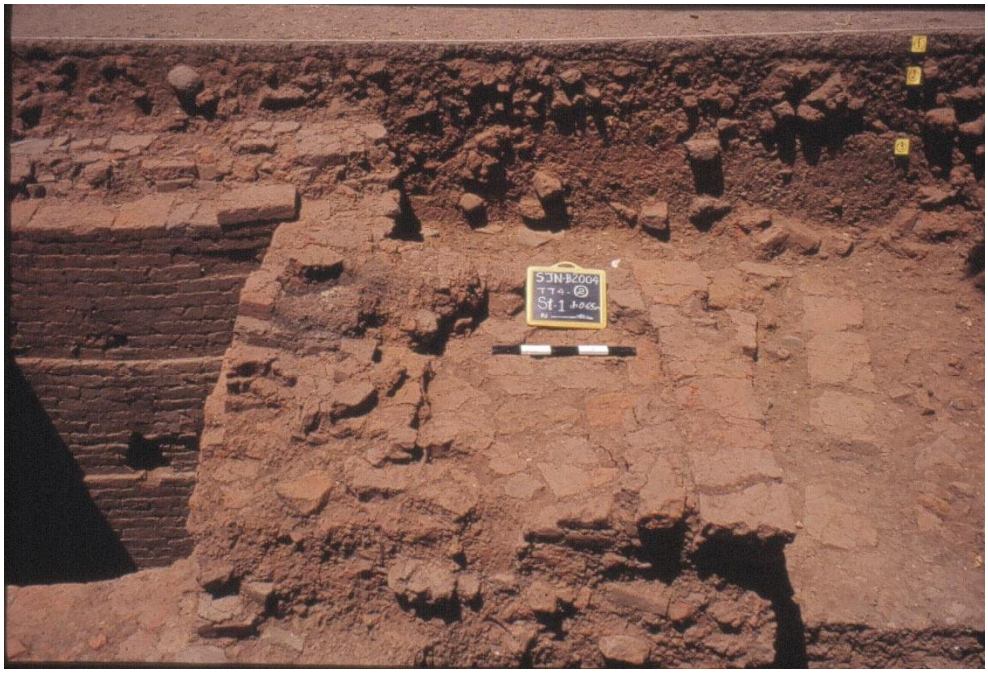


Fig. 4.53 *Excavation TT4 on the Sanjan Bandar site with the deep well visible to the left in the southwest quadrant and a solidly constructed brick structure which prevented further excavation in southwest quadrant visible to the right (image reproduced with the kind permission of Rukshana Nanji)*.

4.3.12 Pattanam – India

Location: 10°9'13.82"N; 76°12'22.11"E

Associated Names: Muziris (historic)
Pattanam (modern)

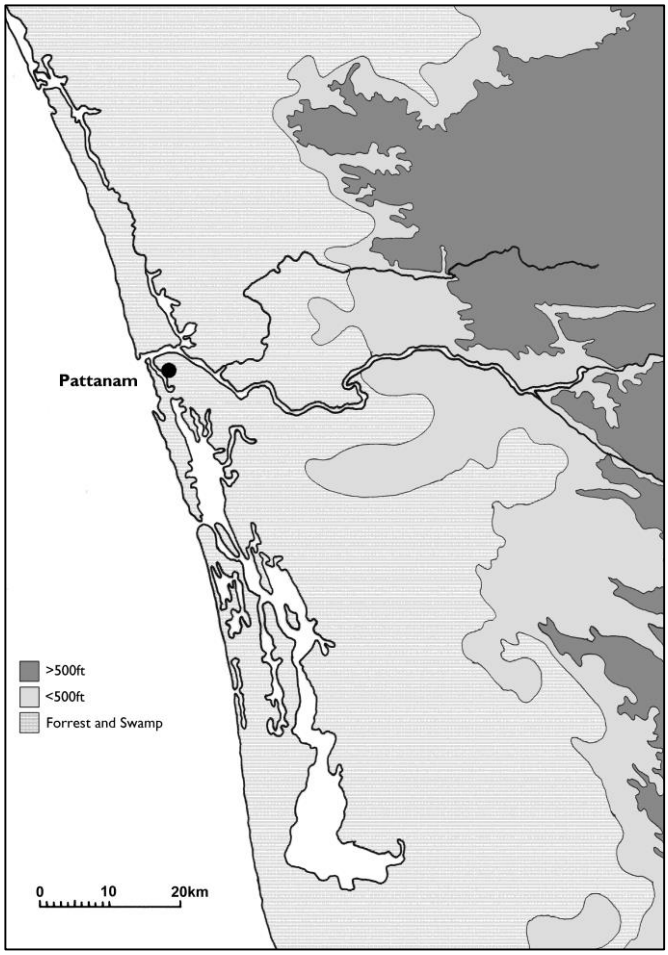


Fig. 4.54 *Map showing the location of Pattanam a short distance inland on a tributary of the Periyer River and surrounded by extensive forest and swamp.*

Site Characteristics and Setting

The site of Pattanam is located in the state of Kerala on the Malabar Coast in southwest India. The site is situated within the delta region and along a side tributary of the Periyer River about 5km inland from the present coast (**Fig. 4.54**) (Abraham, 2009: 16-18, figs. 1-2). "The delta is marked by coastal and alluvial sediments, a few marshy areas and sand deposits" (Selvakumar, Shajan & Tomber, 2009: 29) (**Fig. 4.55**). The archaeological site

was only recently identified using a combination of satellite imagery and surface survey following a protracted search to discover the well known port of *Muziris*; a major centre of Indo-Roman trade noted in the 1st century AD *Periplus Maris Erythraei* (Casson, 1989: 296). The core area of Pattanam forms a low mound of c.600 x 400m (24ha) rising to a maximum height of 2m above the surrounding area. The entire site is covered with scattered modern habitation.



Fig. 4.55 *View of the densely vegetated riverine environment surrounding the site of Pattanam in Kerala, South India (image reproduced with the kind permission of Derek Kennet).*

Archaeological Investigation

Following the discovery of the site and the completion of parts of the surface mapping program (Abraham, 2009), an initial season of trial excavation was conducted in 2006. The test trenches provided evidence for a 2.6-2.3m thick cultural sequence extending from the Iron Age/Early Historic transition to the Early Medieval periods (Selvakumar, Shajan & Tomber, 2009: 32). Since then, six further seasons of excavation have been completed as part of the Muziris Heritage Project by the Kerala Council for Historical Research together with the Archaeological Survey of India and other international

partners (Cherian, 2011: 1). During the 5th season alone, ten new trenches were opened covering a total of 250m². Large numbers of excavations have been initiated across different areas of the site. The project is still on going and most of the findings of the work are still in process (**Fig. 4.56**). One of the striking features of the deposits exposed so far, is the huge volume of finds they have generated, including quantities of imported ceramics from the Mediterranean and the Middle East that are unparalleled elsewhere in South Asia. One area of excavation that is of particular importance is situated towards the northeast area of the site and consists of:

> "a wharf and warehouse structure, a wooden canoe made of *anjili* in a waterlogged context, along with nine bollards of teak. The wharf was a platform made of a mixture of laterite, clay and lime, with an elaborate brick lining where the reclining platform touches the water" (Cherian, 2011: 1).

Preliminary results established on the basis of over 3.5 million pieces of pottery recovered from the area of the wharf, provide a basis with which to begin to explore certain essential features of ceramic consumption at Pattanam (Cherian, 2011). Clearly far more detail will become available as the publication of the large and complex multi-facetted project advances.



Fig. 4.56 *View of surrounding forested landscape and excavations being undertaken at Pattanam in 2010 (image reproduced with kind permission of Derek Kennet).*

Occupation Sequence and Chronology

The earliest occupation does not appear to be associated with any brick architecture. Ceramics from this phase are relatively sparse and indicate low intensity occupation. As at Arikamadu and Alagaukulam, occupation began before overseas contacts were first established (Tomber, 2008: 142) suggesting an indigenous foundation for such sites rather than any form of external influence. This phase has been dated on the basis of radiocarbon samples to the period covering the Iron Age/Early historic transition between the c.5th – 1st century BC. Intensive occupation at Pattanam began in Period II with the introduction of solid brick and tile constructed architecture, coinciding with the first imports of Roman amphora, Rouletted Ware and Parthian period Turquoise Alkaline-Glazed Ware from the area of the Persian Gulf. This period is roughly dated from the 1st century BC – 4th century AD. Occupation then appears to continue up to around the 9th or 10th century, though the scale and intensity of activity probably declined somewhat earlier and the overall function of the site may have changed significantly. Ceramic imports originating within the Persian Gulf region from these later layers indicate that

even though the status of the port may have declined, the site was still closely connected with a broader exchange network. Following the complete abandonment of the site during the medieval period the area was not reoccupied again until the modern period (Selvakumar, Shajan & Tomber, 2009: 34).

4.3.13 Anuradhapura – Sri Lanka

Location: 8°21’0”N; 80°23’0”E

Associated Names: Anurogrammum (historic)
Anuradhapura (modern)

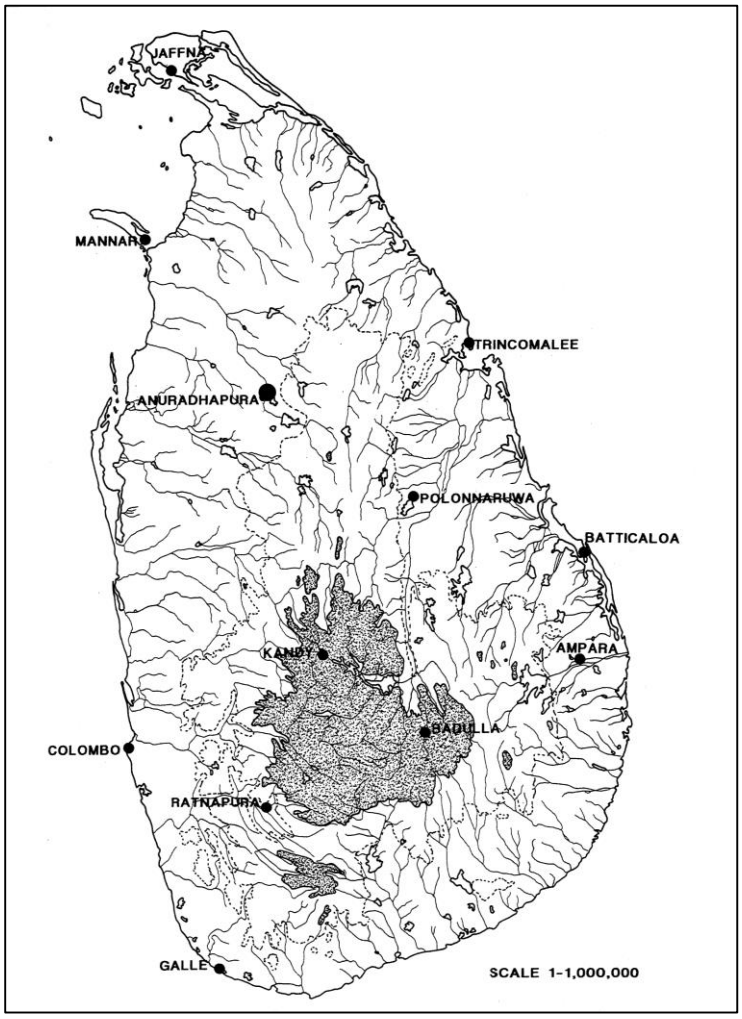


Fig. 4.57 *Map of Sri Lanka showing the location of Anuradhapura towards the north (after Coningham, 1999: fig. 4*.

Site Characteristics and Setting

Anuradhapura is the site of the ancient Sinhalese royal capital of Sri Lanka situated in the North Central Province (**Fig. 4.57**). The site is located on a low lying plain within the interior of the Island over 60km from the coast and adjacent to the Malvatu Oya River, which, although unnavigable, provides the main route of overland communication to the contemporary port of Mantai on the northern coast (Prickett-Fernando, 1990: 117). The

site and its broader environs cover an area of over 40km² (**Fig. 4.58**). At the centre of complex is the Anuradhapura citadel, which represents a roughly rectilinear enclosure of c.900m east/west by 1020m north/south surrounded by a moat and earth rampart capped by c.3.5m thick dressed stone block and brick wall (Coningham, 1999: 17) (**Fig. 4.59**). Immediately outside the Anuradhapura citadel are four large monastic complexes containing an array of specialised religious buildings mixed with residential areas and manufacturing facilities. The largest of these monasteries spreads out over an area of 1.6km². Outside the 'monastery zone' there are a number of large artificial water reservoirs or tanks. These were particularly important in supporting irrigated rice cultivation (Coningham, 1999: 22-26). These features were developed over an extended period from around the 5th century BC to the 10th or 11th century AD.

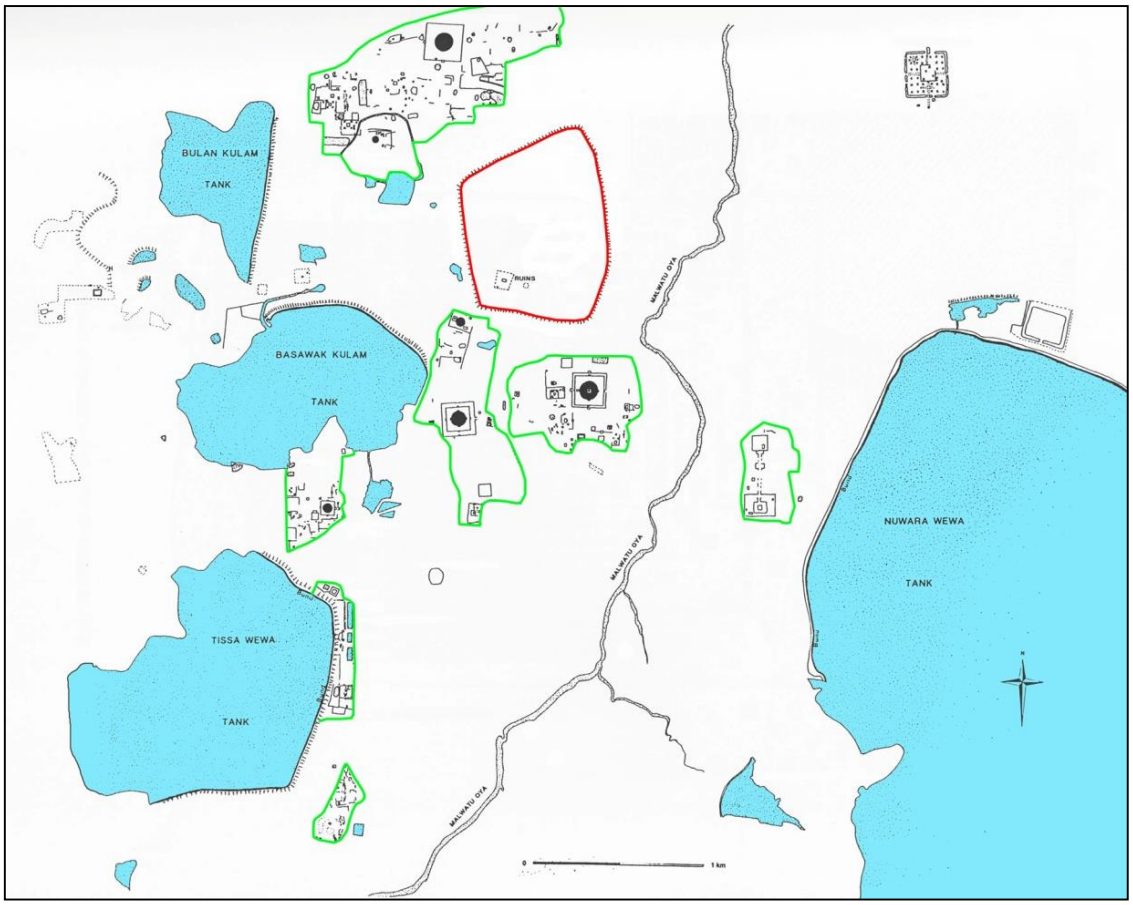


Fig. 4.58 *Simplified plan of the Anuradhapura citadel (outlined in red), with surrounding monastic complexes (outlined in green) and artificial tanks or water reservoirs (blue), after Coningham, 1999: fig. 6.*

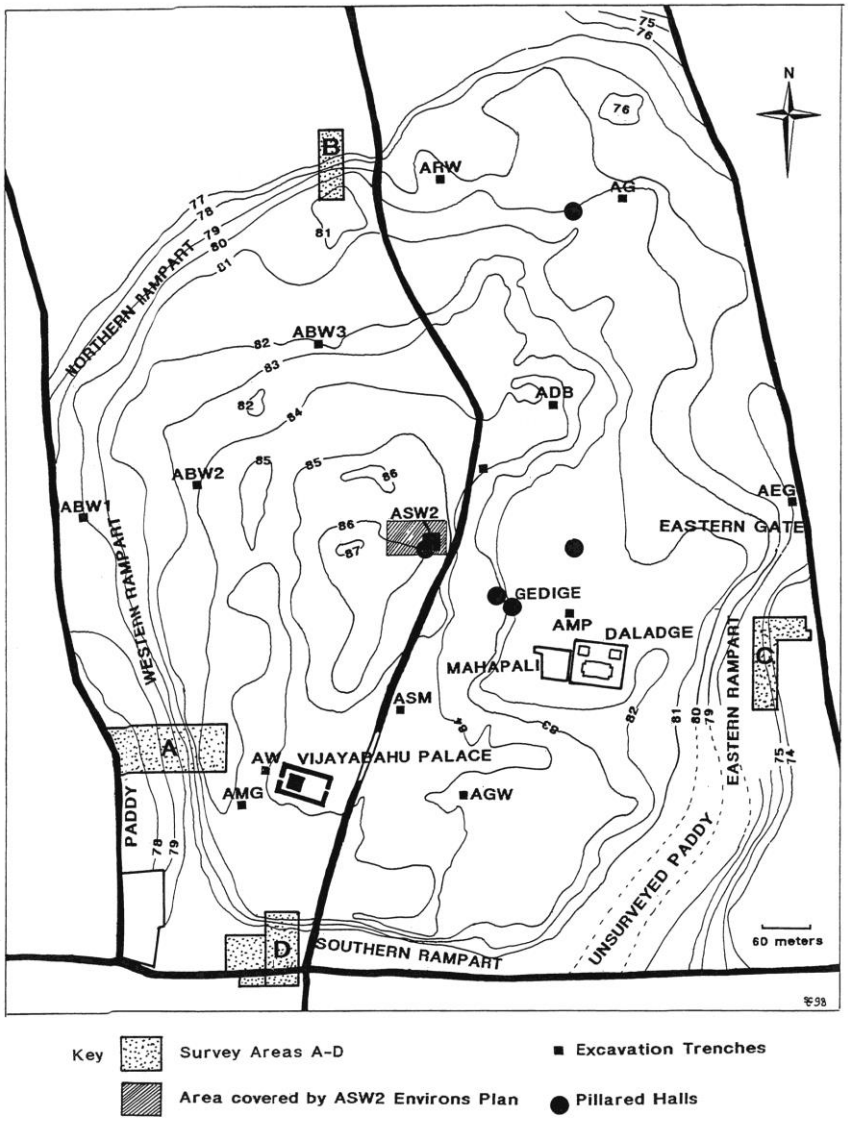


Fig. 4.59 *Detailed topographic plan of the Anuradhapura citadel showing the location of ASW2 and other previously completed excavations (after Coningham, 1999: fig. 9)*.

Archaeological Investigation

There is a long history of archaeological investigation at Anuradhapura stretching back to the later 19th century. Early excavations were mostly targeted at historically attested buildings within the urban core of the city (Coningham, 1999: 16). The first deep stratigraphic excavation aimed at determining the age of the site was undertaken in 1957. This work was continued in 1969 by cutting down deeper within the same trench to reach the natural substrate. Following further excavations, the Anuradhapura Citadel Project (ACAP) was established by the Archaeological Survey Department in 1984. The ACAP opened a further 14 sondages. More recently, the British-Sri Lankan archaeological

project set out specifically to excavate a large area within the central area of the citadel, capable of revealing a broader structural and cultural sequence and obtaining a sizable assemblage of finds and suitable samples for archaeobotanical analysis and radiometric dating.



Fig. 4.60 *Remains of buildings at Anuradhapura in the area of trench ASW2 (after Coningham, 1999: pl. IIa, reproduced with kind permission of the author)*.

Occupation Sequence and Chronology

The trench excavated by the British-Sri Lankan expedition is situated in the highest central portion of the citadel and covers a total area of 100m² (**Fig. 4.60**) (Coningham, 1999: 71). The trench (ASW2) was excavated for three seasons between 1989 and 1994 (**Fig. 4.61**). The bottom of the sequence is formed of solid bedrock and was reached at a depth of 9.5m below the surface (**Fig. 4.62**). All deposits were sieved. The sequence from ASW2 can be summarised in terms of 30 structural phases and 11 periods covering the c.5th century BC up to the 10th or 11th century AD (**Table 4.11**). The dating of the sequence is based on a combination of radiocarbon dates and a relative chronology established on the basis of the finds. In total 29 calibrated radiocarbon dates were obtained from charcoal samples distributed throughout the sequence (Coningham & Batt, 1999: 125).

The sizable assemblage of ceramic finds can be placed securely within the framework provided by the site phasing and absolute dating programme.

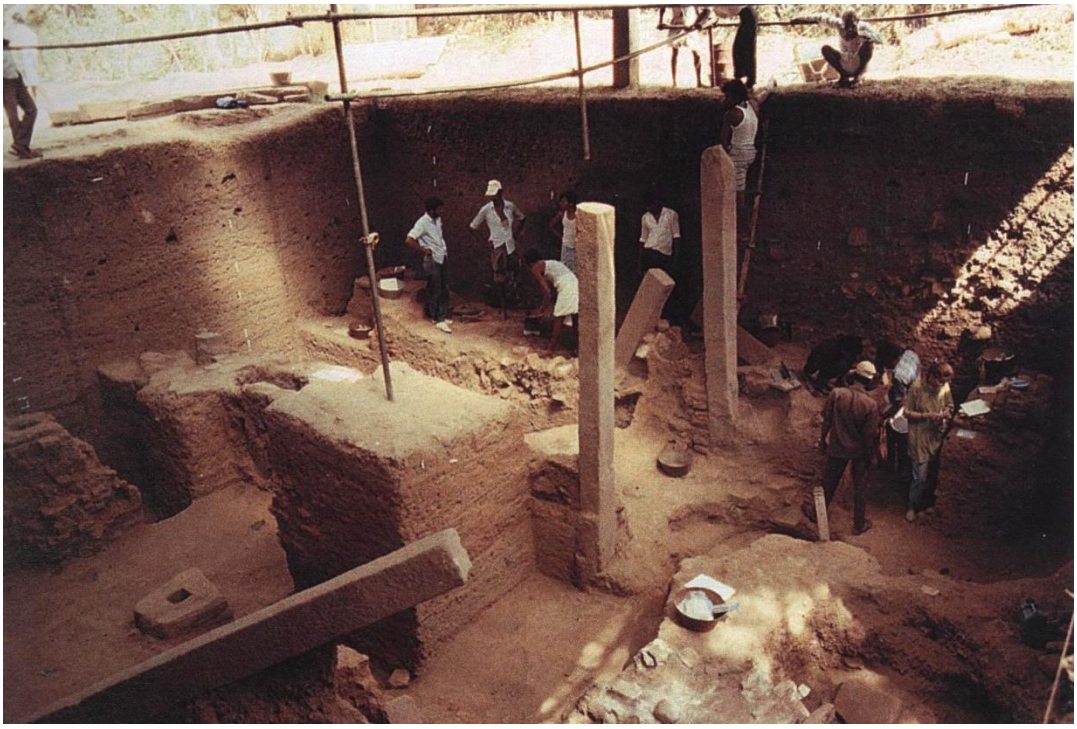


Fig. 4.61 *Excavation of the upper structural sequence at Anuradhapura ASW2, Period F (after Coningham, 1999: pl. IXb, reproduced with kind permission of the author)*.

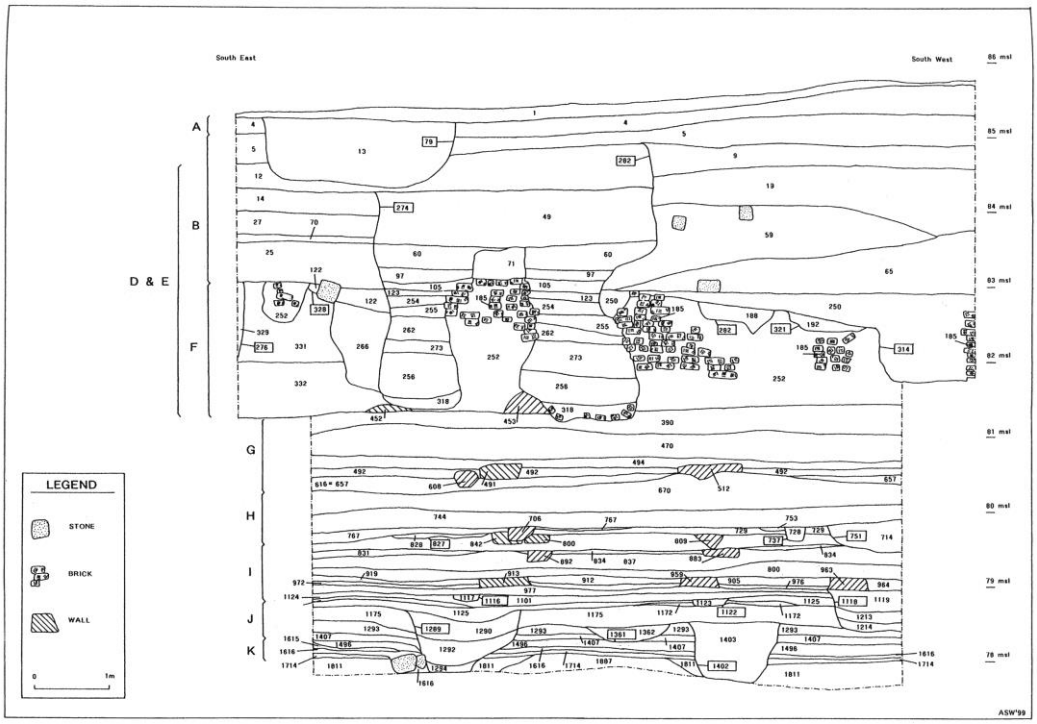


Fig. 4.62 *Section through the southern balk of ASW2 at Anuradhapura showing clearly the extensive pit digging associated with the later stages of the site development throughout Periods F-A, after Coningham, 1999: fig. 53*.

Contained within the ceramic assemblage, is a relatively modest body of material imported from areas outside South Asia (Seeley, Canby & Coningham, 2006). The earliest exotic ceramic imports include a few fragments of Turquoise Alkaline-Glazed Wares from the Persian Gulf area from Period G, dated between the 3rd century BC and the 1st century AD, contemporary with the Parthian era. A similar low density of glazed and unglazed Persian Gulf ceramic imports then continues right through to the first introduction of 9th century 'Samarra horizon' wares in Period E. It is not clear if this lengthy phase associated with the late occupation of the site represents a continuous uninterrupted sequence of developments (Seeley, Canby & Coningham, 2006: 116). As with the long-occupation sequence at Pattanam, it appears likely that the scale and nature of activity had significant changed by the medieval period.

Period	Characteristics	Dating	Revised Dating	Refs
A	Late reoccupation utilising recycled building materials from earlier occupation	**c. 1900 - 1950 AD**	**c. 1900 - 1950 AD**	Coningham, 1999: 82; Coningham & Batt, 1999: 130
B	Superimposed building horizons consisting of square post built structures with stone columns and brick walls set in foundation slots	**c. 600 - 1100 AD**	**c. 800 - 950 AD**	Coningham, 1999: 81-82; Coningham & Batt, 1999: 129-130
C	Another monumental building phase but the associated structures lie outside the area of the trench apart from a collapsed wall segment. The walling consists of dressed stone blocks and brick bound with lime mortar	**c.200 - 600 AD** - Post-monumental occupation with periods and dating somewhat disturbed but includes Samarra horizon glazed ware imports		Coningham, 1999: 80-81; Coningham & Batt, 1999: 129-130
D	A series of robber pits cut down from above for the removal of building materials, in particular the stone columns and bricks from Period F			Coningham, 1999: 80; Coningham & Batt, 1999: 129-130
E				
F	Important change in architecture represented by the introduction of monumental buildings supported on dressed stone columns with floor surfaces paved in brick	**c. 340 - 540 cal. AD –** Imports include only a few fragments of Turqu. Alkaline- Glazed Ware	**c. 340 - 540 AD**	Coningham, 1999: 79-80; Coningham & Batt, 1999: 129
G	Superimposed building horizons consisting of post built structures with brick walls, wooden columns set on limestone slab foundations and tiled roofs	**c. 275 cal. BC - 50 cal. AD** - Imports include Arikamedu Type 10, ?Parthian Turquoise Glazed Ware and some Mediterranean glass	**c. 275 BC - 50 AD**	Coningham, 1999: 77-79; Coningham & Batt, 1999: 128-29
H	Change in use of excavation area. No buildings represented. Instead a short-lived horizon comprising several oven or furnaces and long troughs filled with burnt material possibly connected with some small-scale industrial activity	**c. 290 - 190 cal. BC**	**c. 290 - 190 BC**	Coningham, 1999: 77; Coningham & Batt, 1999: 128
I	Major change in building construction with the replacement of circular shelters with substantial cardinally aligned square buildings constructed with wooden posts, wattle and daub walling and from the latest phase, roofs constructed with wooden beams and covered with ceramic tiles held in place with metal nails. Period I is also	**c. 360 - 190 cal. BC** - Imported fine grey ware and Rouletted Ware from North India. Earliest coins	**c. 360 - 190 BC**	Coningham, 1999: 74-77; Coningham & Batt, 1999: 127-28

Period	Characteristics	Dating	Revised Dating	Refs
	marked by the construction of the city wall			
J	Superimposed phases of somewhat larger and more permanent circular post-built structures of 3-6m diameter with wattle and daub walls and further ancillary features including pits, fences and furnaces	**c. 510 - 340 cal. BC** - Earliest examples of inscriptional graffiti, imported fine grey ware	**c. 510 - 340 BC**	Coningham, 1999: 72-74; Coningham & Batt, 1999: 126-27
K	Superimposed horizons of light circular post-built structures with some evidence for increasing permanence but structures are likely to have been temporary	**c. 840 - 460 cal. BC**	**c. 840 - 460 BC**	Coningham, 1999: 71-72; Coningham & Batt, 1999: 126

Table 4.11 *Summary of the site phasing of ASW2 excavated in the central portion of the Anuradhapura citadel, after Coningham, 1999*.

4.4 Representativeness of the Site Sample

So far the information that it has been possible to assemble comes from 13 different sites distributed throughout the Persian Gulf and western Indian Ocean area. Here information has been provided to establish the general characteristics of site geography, the extent and chronology of occupation, and the nature of activity represented. The level of detail provided for each site should be sufficient to establish the major features of variability related to each of these main factors. The first priority in selecting assemblages for inclusion within this study has been that they provide quantified ceramic finds data. Some additional assemblages such as Sohar and Bushehr have also been included to extend the geographic and chronological scope available. An attempt has also been made here to utilise findings generated on the basis of preliminary publication results, such as Murwab and Pattanam. Clearly much more information will become available from these sites as their respective publication programmes proceed.

In addition to various on-going excavation projects or awaited publications (**Table 1.3**), there remains substantial additional scope for further study of existing excavated assemblages. As far as possible, information has been extracted from a number of

archived collections, but much more work remains to be done on processing results from most of the sites that have been looked at. This includes work based on the excavation archives associated with Siraf, re-inputting find spot details for the imported pottery from Manda, and potential work on the unglazed ceramics from Kush that have not so far been individually categorised or analysed. Finally, some of the assemblages included within the study are of relatively low quality in terms of their size and potential representativeness. Non-systematically collected samples from Bushehr, Sohar and Sir Bani Yas are all potentially questionable, though they remain of some value in extending the breadth of evidence available.

In the chapter to follow, details related specifically to the nature and representativeness of the ceramic finds data will be described for each of these sites. Here it is useful to briefly consider the potential representativeness of the available find sample on the basis of the characteristics that have already been introduced. Chronologically, sites such as Kush and Sohar have occupation sequences that span a large part of the period under consideration. This makes them particularly useful for analysing patterns of long-term change. Other sites such as Murwab or Sir Bani Yas were only occupied for a relatively short time, and thus offer a snapshot into one stage of the longer sequence under consideration. In other examples such as Pattanam and Anuradhapura, the peak period of occupation at these sites occurred substantially earlier than the period under consideration, and what has been specifically focused on here is evidence related to the remnant activities of an established population when the function of the site may have been transformed radically, and where issues of residuality of finds may be particularly acute. Finally, there are sites such as Kush, Bilad al-Qadim and Anuradhapura where it is necessary to take into account the possibility of periods of declining activity or even complete site abandonment within a longer seemingly continuous occupation sequence.

More generally, it is clear that the chronological coverage provided by the 13 suitable site assemblages is not uniform. Very little evidence is available in most areas for the period from the 5th to mid-8th century, while sites dated from the mid-8th century onwards appear increasingly common. This clearly impacts upon the potential to systematically explore processes of transformation in broader patterns of ceramic exchange. The

reasons for these chronological imbalances may be various. The preoccupation with particular chronological periods that have dominated different branches of area studies is one potentially contributing factor. In East Africa, for example, there has been a clear tendency to focus on episode of monumental stone town construction dated mostly to the period from the 14th - 15th centuries and later, perhaps to the partial exclusion of more ephemeral archaeology from earlier periods (Wilson, 1982, Horton, 1996b: 4). Within South Asia, a different sort of period bias occurs, with medieval archaeology traditionally relegated in importance and sometimes altogether ignored on multi-period settlement sites containing Early Historic occupation (Allchin, 1995: 6-7; Mate, 2005). To some extent, the imbalances in chronological coverage within the data-set may also simply be a reflection of arbitrary factors such as which sites have been discovered and selected for investigation. At the same time, the sample available does clearly reflect genuine archaeological factors. The absence, for example, of sites in East Africa with significant evidence of long-distance exchange contacts with the Middle East and South Asia in the period before the mid-8th century, is so far broadly corroborated by all of the available evidence.

In terms of the geographic location of sites, it is again clear that there are important factors of variation within the sample. The underlying factor – the constant within the study – is the huge geographical diversity encompassed within the western Indian Ocean area (see above **Section 4.1**). At a more localised level, it is also possible to consider the position of sites and the different ways in which this may have determined their interaction with the available marine resource (see for example Petersen, 2012: 208-09). This also clearly brings us on to the issue of site functions.

While all sites would no doubt have had a mixed economic base, Siraf appears to be a particularly good example of a site with the classic attributes of a port. It is sited directly adjacent to the sea and the staple of its existence was the economic benefit derived from commercial maritime trade (Hodges & Whitehouse, 1983: 135). Bushehr, Sohar and Pattanam are sites that also fall into a similar category. Other sites may have had a more varied and less clearly defined subsistence base. The settlement of Bilad al-Qadim appears to have been an administrative hub and substantial population centre on the

island of Bahrain situated close to the coast, but largely disengaged from contemporary long-distance exchange networks. Similarly with the town/village-scale settlements of Kush, A'Ali and Murwab in Eastern Arabia, or the city-scale settlements of Anuradhapura and Sanjan in South Asia, these sites may all have benefited from aspects of the maritime economy, but in ways that were to a greater or lesser extent peripheral to their primary subsistence base and function. A recent evaluation of hagiographical sources on Christian monasticism within the Persian Gulf region around the time of the Islamic conquest exposes the complex tension that surrounded the foundation of a monastic community on an island within the Persian Gulf such as Sir Bani Yas (Payne, 2011). One the one hand, the community sought to establish a sense of worldly purity and isolation on a barren island. On the other, Sir Bani Yas remained inextricably bound to the regional economy and conspicuous public display (Elders, 2003: 233). The neighbouring settlements of Manda and Shanga in East Africa again present a complex case. The sites are strategically situated to take advantage of the extensive stands of mangrove trees that form one of the major regional exports (Horton, 1996a). At the same time the shallow waters of the Lamu Archipelago would have been largely inaccessible to ocean going vessels and the island appear somewhat isolated from the major arteries of communication with the African interior, such as the Tana River (Horton, 1996b: 18).

Looking collectively at the 13 sites with quantified ceramic assemblages that have been introduced in this chapter, what is evident is that they come from a broadly dispersed geographic area, they follow a variety of different chronological trajectories of development, and they provide evidence of communities who interacted with the coastal resource in ways that are complex and varied. All of these factors may also have been crucial in determining the range, types and volume of ceramic products imported to these sites through different agencies and exchange mechanisms. The critical question remains: can these sites be used to provide a sample of more generalised trends in ceramic consumption patterns and the trajectory of economic development within the region? Clearly the number of sites available is still relatively limited. The addition of more data-sets and improvements in standardised recording will be important to the success of the development of Indian Ocean archaeology in the future. At the same time, what has already been achieved here is the direct integration of substantially more

ceramic data-sets than has ever been attempted before, which offers distinct new potential. At the same time, and perhaps more fundamentally, the fact that such a diverse collection of sites all acted as consumers of a finite range of ceramic commodities, is the strongest evidence we have available of participation in a single integrated exchange system. To what extent we might observe evidence of standardisation or diverging consumption behaviour remains the central question to be explored below (**Chapter 6 and 7**).

Chapter 5 Ceramic Data

5.1 Quantified Assemblages

Quantified ceramic finds data have been obtained from 13 different sites distributed through the area of the Persian Gulf and wider western Indian Ocean. These sites vary widely in terms of size, status, function, chronology and location. There are also important differences in terms of the nature of the archaeological investigations that have been undertaken, and this has a significant influence on the quality of the ceramic evidence that is now available. These factors have been considered above (**Chapter 4**). The other aspect of the evidence that needs to be taken into consideration is the nature of the available ceramic finds data. Across the 13-site sample, the assemblages vary widely in quality from large, clearly stratified groups of material, where detailed ceramic recording has taken place, through to preliminary publications where only generic ceramic categories have been established, and where the stratigraphy and phasing have not yet been properly resolved. There are also assemblages where only a selection of finds has been retained, and where the basis of the selection process implemented is not obvious or apparent. Such assemblages need to be carefully evaluated to determine to what extent the selection may provide at least a rough approximation of the original assemblage composition. While the value of such information is clearly already potentially compromised, it remains an important objective to make full use of these past investigations.

This study represents an attempt to maximise the potential evidence available, and to bring together into a single unified scheme all of the data that has been recorded. In order to do so, it is important to consider the nature of the available ceramic data from the individual sites. A number of specific aspects are considered for each assemblage including:

- The size, nature, significance and representativeness of the available ceramic assemblage
- How the ceramic assemblage was recorded, quantified and phased

- Details related to ceramic categories that have been defined and how these can be incorporated within the Integrated Indian Ocean Ceramic Classification or IIOCC
- Details related to the site chronology and phasing and how this has been related to the unified ceramic periodisation (CP1-6)

5.2 Assemblage Data

5.2.1 Siraf – Iran

There are essentially two primary sources of information available on the ceramic sequence from Siraf: the archived finds and the full inventory of material recorded on finds record cards at the time of the excavation. Only a sample of the original finds was retained and these have subsequently been separated amongst widely dispersed locations (**Table 5.1**). Probably the greatest value such collections provide now is the ability to directly access and characterise the material culture assemblage. This is particularly true of the assemblage of finds from Siraf in the British Museum, which provides the largest single sample from the excavation outside Iran (Priestman, forthcoming). At the same time, it remains questionable the extent to which any of the surviving finds collections might provide an accurate reflection of either the range, or relative proportions of different finds originally encountered within the excavations. The representativeness of the extant find collections is a complex question that needs to be carefully evaluated.

Institution	Location	Description
Muze-ye Irân-e Bâstân	Tehran, Iran	Architectural features + the majority of precious metal finds and a 50% division of all diagnostic finds selected for removal from Siraf
Siraf Dig House	Tahiri, Iran	Selection of carved grave covers + a large reference collection selected for retention but never removed from the site and now presumed lost
British Museum	London, UK	Largest portion of the exported division. The collection includes 16,270 registered finds (20,383 fragments) and a cross section of all materials together with a large component of the original site documentation
Royal Ontario Museum	Toronto, Canada	Second largest portion of the exported division
Ashmolean Museum	Oxford, UK	Third largest portion of the exported division. The ceramic collection was studied by Moira Tampoe during the late 1980s
National Museum of Scotland	Edinburgh, UK	Large selection of finds, mostly of pottery
World of Glass	St Helens, UK	Small selection of glass and glass production waste deposited with the Pilkington Glass Museum. In 2000 the collection was amalgamated with another to form the new World of Glass
Corning Museum of Glass	New York, USA	Small selection of glass fragments and glass production waste together with some original documentation
Calouste Gulbenkian Foundation	Lisbon, Portugal	Not known
Institute of Palaeoanatomy, Domestication Research and History of Veterinary Medicine	Munich, Germany	*c.*300,000 fragments of animal bone packed into 25 tea chests. Appears to be the entire faunal assemblage from the site excluding a small quantity of material in the British Museum

Table 5.1 *Known storage locations of finds recovered during excavations at Siraf completed between 1966 and 1973*.

Potentially a more complete and accurate source of information comes from the full inventory of finds recorded at the time of the excavation on a series of finds record cards (**Fig. 3.2**). In total the find record cards list around three million fragments of pottery (Whitehouse, 1987: 1) with the contents of each deposit itemised under relatively broad ceramic categories assigned during on-site finds processing. It remains unclear how consistently class categories would have been applied, and in a large proportion of cases, it is difficult to ascertain which classes particular entries refer to. Small profile sketches provided under the entries for many of the unglazed categories enhance the potential for accurate identification, but much work is required to systematically decipher the classification and typology applied on the record cards. The Siraf excavation archive in the British Museum contains a xerox copy of all of the find record cards together with a significant portion of the original cards themselves. As part of the recent study of the finds

from Siraf in the British Museum, significant work was undertaken on the reorganisation of the excavation archives (Priestman, forthcoming)[43]. During this work a sample set of data were recorded from the record cards, and this information has been used as the basis for analysis of the assemblage from Siraf that is presented here. Clearly with a larger investment in time and resources to work on the Siraf excavation archives, a much more extensive body of data could be provided.

Both sources of data on the ceramic sequence from Siraf depend on the ability to phase the deposits they come from. This aspect of the work still requires substantial additional work. If we focus for a moment on the sample of finds in the British Museum, a total of 10,273 records have been assigned to ceramic finds. This figure is reduced to a total of 8,693 individual pieces once all joining fragments are excluded. This assemblage includes finds from most of the different excavations undertaken across the site (**Table 5.2**). Between the excavations there is significant variation in the number of finds represented. This variation appears to broadly reflect the differences in find yields from different parts of the site. For the purposes of quantitative analysis of the British Museum data sub-set, it is only really those sites that offer a reasonably large quantity of finds that are likely to provide potentially meaningful results. Of the 13 pottery-yielding sites, only Sites A, B, C and F provide samples of sherds in excess of 1000. These sites therefore form the key component for further study.

[43] Work on the organisation of find record cards has benefited substantially from the dedicated assistance of a number of volunteers who have carried out work at different times between 2007 and 2010. They include Mayasuni Habsberg, Grant Bryan, Meredith Grant, Angus Johnson and Talia Cohen. Angus Johnson also transcribed ceramic data from Site A used as the basis of analysis presented below. For all their efforts I am extremely grateful.

Site	Pottery	Other	Totals
A	1664	888	2552
B	1333	2875	4208
C	1743	1105	2848
D	347	1345	1692
E	630	450	1080
F	1476	3189	4665
G	0	194	194
H	0	5	5
J	2	70	72
K	158	282	440
L	0	4	4
M	207	106	313
N	5	2	7
O	6	164	170
P	209	82	291
R	1	0	1
?	912	337	1249
Totals	8693	11098	19791

Table 5.2 *Breakdown of the number of non-joining pottery and other material fragments from the different excavation sites at Siraf in the British Museum. Highlighted cells indicate assemblages containing more than 1000 pottery fragments*.

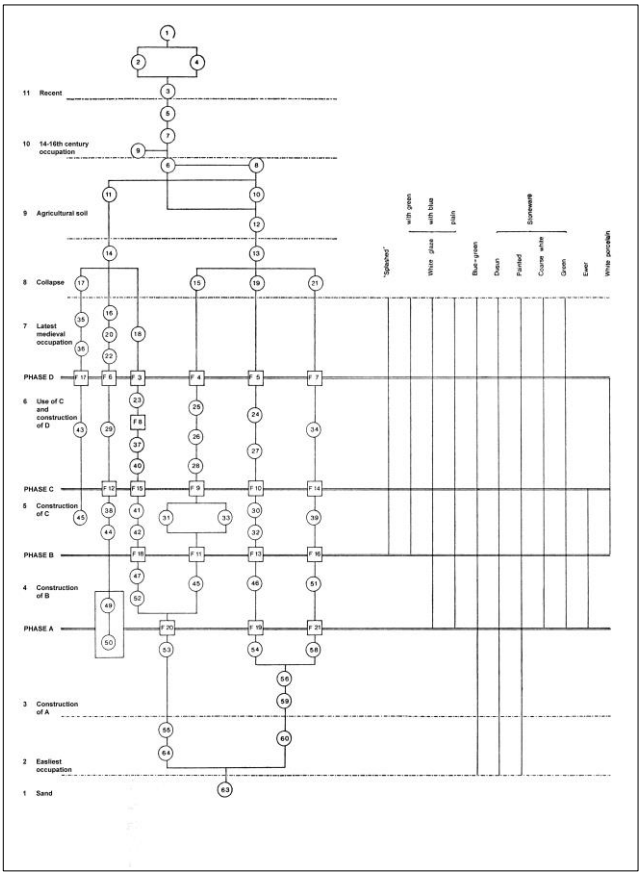


Fig. 5.1 *Chronological matrix from the deep sounding at Site A excavated in 1966 (after Whitehouse, 1979b: fig. 3)*.

The key to the stratigraphic analysis of these assemblages is a phasing summary list prepared as part of the forthcoming publication of the finds from Siraf in the British Museum (Whitehouse, forthcoming). For the deep sounding (Site A), the list is based on a single matrix that covers all of the excavated deposits (**Fig. 5.1**). Within the other larger open area excavations, deposit lists have so far only been assembled for deposits that are stratigraphically linked. What one has essentially are a number of non-connected mini-sequences within a much larger excavation. Further information is required to integrate these different sequences into a single scheme. In addition, there is substantial variation between trenches in the proportion of deposits that have actually been assigned a sequence position. If we consider for example the four site assemblages with more than 1000 sherds within the British Museum collection, two sites have such a low proportion of finds that the existing phasing is of little use (Sites B and F) (**Table 5.3**). This leaves two remaining sites. Site C also presents particular problems. Although nearly half of the finds come from deposits that can be phased, the phasing itself is broken down into seven different soundings that have no direct association and themselves contain too few finds to support meaningful analysis. In the end it is only the deep sounding from Site A that really conforms to the requirements of this study in providing a single phased sequence with a sufficient finds sample.

Site	Total Sherds	No. assigned to phase	% assigned to phase
A	1682	1482	88.1
B	1335	83	6.2
C	1743	788	45.2
F	1478	25	1.7

Table 5.3 *Siraf site assemblages with more than 1000 sherds in the British Museum collection showing the number and percentage of pieces currently assigned to a phase*.

As outlined above, the other alternative source of data from Siraf comes from the finds record cards. Given the continuing difficulties associated with the stratigraphic interpretation of the larger open area excavations, the sample from Site A again forms the most suitable element of the site data for the current analysis. In order to process the available information, the entries for find record cards listing pottery finds from Site A have

been transposed into a spreadsheet. As far as possible, individual entries have then been correlated with the class categories represented within the IIOCC and known to be represented within the sequence from the information recorded from the British Museum sub-sample. Necessarily some level of interpretation is involved in identifying the recorded class categories on the basis of short somewhat codified textual descriptions. Certain categories of pottery lend themselves to straightforward identification, particularly many of the distinctive glazed wares that are often described in more standardised terms. The coarse ware assemblage by contrast presents greater difficulties with more varied terminology applied.

In total there are 21,787 sherds from Site A listed on the find record cards. These appear under 2,044 entries, but employ a total of 1,079 different descriptions (suggesting a degree of non-standardisation to the classification applied). At the same time, using particular key words, it is possible to positively identify with a reasonable degree of confidence, a significant proportion of the classes represented. When the figures from both the British Museum sample and the full inventory are phased and seriated according to the trench matrix, it is encouraging to note that the ceramic classes appear in a credible chronological sequence (**Table 5.4**). The relative proportions of groups recorded from the record cards (discussed below) also fall within ranges that suggest a degree of integrity within the sample. The one major limitation of the evidence from the deep sounding at Site A, is the fact that occupation begins around the late 8th century (CP3), somewhat later than the earliest occupation at Siraf.

	CP3			CP4				CP5	CP6				
	m-l.8th			e.9th	m.9th	m-l.9th		10-11th	11-13th	13-14th	15-15th		
IIOCC CLASS	**A2**	**A3**	**A3/4**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**	**A11**	**?**	**Totals**
TURQ.T	20	82	10	7	63	32	26	37	39		5	24	345
DUSUN	1	5		1	17	4	2	41	23	1	4	8	107
TORP.RG	1	5			13							5	24
WHITE.PI	1	2	2		7	5		3	2	3		2	27
EGG.PI	1			1	19		27					4	52
BUFRAB	1				13	6	4	3	2			1	30
HARMIC	1				2	1			1			3	8
REBROS		9	2	2	105	13	4	9	11	5	2	49	211
BUFF.P		3	1	1	3	1			1			3	13
CW.N-ID		3		1	34	3	3	1	6		5	18	74
CHANG		2		2	23	13	1		1			6	48
HARLIM		1	2		4	4	3	2	9	6	9	2	42
INCOP		1		1	3	1						1	7
EACOP		1											1
OPAQ.W				1	9	3	13	18	19		1	4	68
WWSL				1	8	3	2		2			1	17
STONE.BG2				1			1						2
BUFF.I					15	16		7	3	1	1	5	48
CREAC					11	3	16	17	55		5	6	113
SBBW					8	4			1			1	14
STONE.GU					5	1			1			2	9
TORP.S					4							1	5
OPAQ.C					3	6	2	1	4			1	17
CHAM.N-ID					2					1		1	4
WW					1	2	2		4	2	2	1	14
EAST.N-ID					1	1	2	1	2	2		1	10
YUE.3					1		4	6	1	1	2	4	19
SPLASH.P1					1		2	1	1				5
SPLASH.P2					1			1					2
LINVES					1							7	8
EGG.M					1								1
SPORC					1								1
GW.N-ID						2	4	2	9		4	1	22
HARC						2					2		4
GLAMO.Y						1	1						2
FINLIM						1		1	1	5			8
GM						1							1
GWSG						2			1			1	4
OPAQ.PS						1		6	4				11
WHITE.M						1				1			2
YUE.1						1							1
SPLASH.GW1							21	2	1				24
OPAQ.TS							4	8	5		1	2	20
OPAQ.T							2		1				3
GRAF.EY							2		2				4
SPLASH.GW2							1		1				2
YUE.2							1				1		2
STONE.BG1							1						1
OPAQ.LR							1						1
OPAQ.BT							1						1
HAGRIT							1						1
YUE.4								2				2	4
GRAF.TL								2					2
OPAQ.B								2	1				3
OPAQ.BW								1					1
GRAF.EP2								1	1				2
GRAF.H							1		33	2		1	37
GRAF.LP									29	2	3		34
MONO.G									4		2		6
MONO.LG1									3	7	16		26

	CP3			CP4				CP5	CP6				
	m-l.8th			e.9th	m.9th	m-l.9th		10-11th	11-13th	13-14th	15-15th		
IIOCC CLASS	**A2**	**A3**	**A3/4**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**	**A11**	**?**	**Totals**
GRAF.M									3				3
JULFAR			1				1		2	9	6		19
MGPAINT.1									2		2		4
MONO.Y									2				2
HMPW.1									1		4		5
IRAB									1		3		4
GRAF.LG									1		2		3
CHAMP									1				1
GRAF.EP1									1				1
LQC						1				10	4	11	26
INC.M										2	2		4
QING					1					1	1		3
MONTUR										1			1
CHAM											6		6
HMPW.2											4		4
JULFAR.PB											3		3
UGP											3		3
JULFAR.RW											2		2
LIME											2		2
STONE.GRY											2		2
CBW.1											1		1
FRIT.B											1		1
FRIT.MIN											1		1
FRIT.UGP											1		1
FRIT.W											1		1
GRAF.EG											1		1
SPECLE.2											1		1
CBW.2												2	2
UNCLAS				1	4	1	2	1			1		10
Totals	26	114	18	20	384	136	158	176	298	62	119	181	**1692**

Table 5.4 *Phased seriation of the ceramic finds from the deep sounding at Siraf (Site A) with classification and sherd totals presented for the assemblage in the British Museum. Figures highlighted in grey occur out of their expected sequence and may be intrusive or erroneously classified*.

	CP3			CP4				CP5	CP6				
	m-l.8th			e.9th	m.9th	m-l.9th		10-11th	11-13th	13-14th	15-15th		
IIOCC CLASS	**A2**	**A3**	**A3/4**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**	**A11**	**?**	**Totals**
TURQ.T	97	167	41	43	422	277	385	234	250	132	90	66	2204
WHITE.PI	39	64	12	59	667	493	573	455	451	125	116	35	3089
CW.N-ID	38	108	22	44	1058	547	1284	1554	1798	308	778	125	7664
HARLIM	37	204	44	123	738	183	2	24	11	82		22	1470
TORP.S	31	118	19	64	95	29	1	13				21	391
SBBW	16	25	5	22	180	57	43	125	79	98	66	12	728
DUSUN	1	7		1	28	9	6	52	66	16	44	4	234
HARLIM [LISV]		14			14		6	30					64
INCOP		11	3	7	63	36	33	40	5			7	205
EGG.PI		8	7	11	137	90	371	186	176				986
CHANG		1			32	8	1	15	1		2	5	65
TURQ.YG		1											1
BUFF			32		4		23						59
IRPW			4										4
GW.N-ID			2		9	7	24	35	29	1	20	1	128
STONE.PLG			1		8								9
REBROS				11	473	62	10	25	36	2			619
CREAC		1		5	267	172	322	447	793	90	221	18	2336
OPAQ.W					30	67	229	116	134	16	43	5	640
WW					11	14	3		17	2	11	1	59
YUE					8	4	5	9	14	23	20	16	99
OPAQ.C					6		1		3				10
WWSL					3	2	1		2	3			11
GM					1								1
OPAQ.TS						5	22	23	13		1	1	65
SPLASH.P						5	1	4	23				33
GRAF.EP						2	32	26	8				68
SPLASH.GW						2		1					3
EAST.N-ID						1	1	1	1			1	5
OPAQ.BW						1		15					16
GWSG						1			2				3
OPAQ.N-ID						1				2			3
OPAQ.LG							6				2		8
OPAQ.TBS								10					10
OPAQ.B								6	3				9
MGPAINT.1								3	1				4
HMPW								1	9	19	96		125
GRAF.L							2	4	141	13	22		182
MONO.G									15				15
STONE.GRY									6		2		8
LQC									2	3	7	4	16
MONO.LG										22	31	4	57
KHUNJ										11			11
JULFAR										10	20		30
QING										3		1	4
LIME											13		13
UGP											8		8
CBW											4	5	9
GRAF.LG											4		4
FRIT.MIN											1		1
OPAQ.T											1		1
Totals	259	729	192	390	4254	2075	3387	3454	4089	981	1623	354	21787

Table 5.5 *Phased seriation of the ceramic finds from the deep sounding at Siraf (Site A) with classification and sherd totals recorded from the find record cards. Figures highlighted in grey occur out of their expected sequence and may be intrusive or erroneously classified*.

The correlation of the seriated sequences provided by the finds assemblage in the British Museum and the information recorded from the finds record cards with the ceramic periodisation is mostly straightforward. The earliest deposits from Site A contain many distinctive markers associated with the mid-8th to early 9th century occupation (CP3) including TURQ.T/JR5, EGG.PI, WHITE.PI, DUSUN and CHANG. The transition into the 9th century occupation of CP4 is also clearly delimited by the introduction of Opaque Glazed Wares (OPAQ.W etc.), Yue Ware (YUE) and White Slipped Stoneware (WWSL). The transition from the 9th century assemblage into the 10th century (CP5) is inevitably less well defined, as the ceramics themselves show less dramatic change across this horizon. The most significant markers to note include the tail off in the quantity of Torpedo Jar (TORP.S) and Changsha Ware (CHANG) sherds. The early to mid-11th century (CP6) is marked by the substantial influx of Late Sgraffiatos. On the record cards different categories of Late Sgraffiatos such as hatched (GRAF.H), or monochrome green (GRAF.LG/MONO.G), are not differentiated. In terms of dating though, Late Sgraffiatos essentially form a homogenous group. The inclusion of a few sherds of classes such as LCQ and STONE.GRY indicates that the phase probably extends in duration to the late 13th century, slightly beyond the range of CP6.

5.2.2 Bushehr – Iran

For the purposes of this study, the assemblage from Bushehr that is of most interest for analysis is dated to the latest maximum occupation of the settlement between AD *c*.500 – 650. Despite the key significance of the Sasanian settlement at Bushehr, very little archaeological evidence is available. Various excavations undertaken by the Iranian Centre for Archaeological Research and the Bushehr Cultural Heritage Organisation at the mortuary site of Shoghab and across the settlement of Hazar Mardom, have not employed quantitative recording and remain largely unpublished (Zareh, pers. comm. 2004; Tofighian, Nadooshan & Mousavi, 2011). No substantial excavations have taken place at the major settlement sites at Bushehr that would provide a potential basis for comparison with other site sequences from elsewhere within the Persian Gulf or the wider Indian Ocean. The only archaeological data that we do have available comes from the sizable body of pottery collected during surface survey conducted by Andrew Williamson between 1968 and 1971 from sites scattered across the peninsula (Williamson, 1971a; 1971b; 1971-72). The results

of this survey, although partially utilised in research reports written by those involved (Williamson, 1970b; 1972; 1973a; 1987; Whitehouse & Williamson, 1973; Prickett, 1986), have never previously been adequately published. A significant proportion of the ceramics collected during Williamson's survey are represented within a body of finds exported from Iran in the 1970s and held by the Ashmolean Museum in Oxford. This collection was transferred to the Archaeology Department at Durham University in 2001 to be reprocessed and recorded in order to further utilise the potential findings as part of the Williamson Collection Project undertaken between 2001 and 2004 (Priestman & Kennet, 2002; Priestman, 2003; 2005a; Priestman & Kennet, forthcoming).

Of all the 13 quantified ceramic assemblages available for use within this study, the information available from Bushehr is perhaps the most problematic both in the way the information was collected and subsequently processed. The ceramic finds from Bushehr represent grab samples from the surface of sites, and those finds recorded in Durham probably account for only *c*.30-50% of the original sample that was collected in the field (Priestman, forthcoming). Clearly this information is partial in nature. In addition, there are special considerations to take into consideration because the pottery was collected from the surface. In particular, surface survey provides no time depth. Pottery of all occupation periods is potentially mixed together in a single assemblage and is most likely to produce a weighting bias towards the latest phases of site use (Millett, 2000: 221). At the same time, there are two important factors that encourage the use of the surface survey collection from Bushehr within the present discussion. Firstly, Bushehr appears to have been one of the most significant centres of Sasanian commercial activity within the Persian Gulf (Williamson, 1972; Whitehouse & Williamson, 1973) and potentially the immediate predecessor of Siraf (Priestman, 2005b; in press (a)). Bushehr is therefore a crucial site for understanding whatever changes took place regarding commercial development within the region across the Sasanian/Islamic transition. Secondly, the testing that has taken place to establish the potential representativeness of the Williamson Collection material has provided results that are broadly supportive of the credibility of the data (Priestman, 2004; 2005a; Priestman & Kennet, forthcoming). As long as the differences are clearly acknowledged between the data from Bushehr and those from other sites, it may be possible to proceed with the use of the findings provided.

Within the sample available for study from the Ashmolean Museum, there are a total of 1,752 sherds from the Bushehr Peninsula. These come from 71 of the 89 different site collection areas recorded. Unfortunately there appears to be no surviving map giving the precise locations of these sites. Based on the toponyms associated with individual collection areas, it is clear that at least some of the sites form clusters around particular toponyms. Of the 71 sites represented in the collection, 41 are associated with six different toponyms (Rishahr, Tangac, Gharibou, Sabzabad, Zangina and Halileh) while the remaining 30 are unnamed. Given the uncertainties surrounding the precise location of individual sites, it may be justifiable in this instance to amalgamate the finds from all of the collection areas on the Bushehr Peninsula and consider them together here as a general sample from the whole of the scattered settlement complex (**Table 5.6**).

ORIGIN	CLASS IIOCC	CLASS Priestman, 2005a	SHERDS
India	BUFRAB	IRBS	4
Local	CHAM	CHAM.1	1
		CHAM.2	5
		CHAM.3	1
Local?	CW.N-ID	CCW.N-ID	26
		CGW.N-ID	26
		CRW.N-ID	27
		FINT	34
		FINT.LV	23
		GRIT	12
		GRIT.LV	7
		GROG	16
		GROG.LV	27
		ORG.H	1
		ORG.HS	30
		ORG.I	1
		ORG.S	1
		SWIS	5
Local	CW.N-ID [LISV]	LISV.FI	7
SE Iran	FOPW.1	FOPW.3	2
	FOPW.2	FOPW.1	4
Local?	GW.N-ID	ALK.RC	1
		GLAZ.DEG	19
		GLAZ.N-ID	2
		GREG.2	3
Local	HARLIM	SMAG.A	112
		SMAG.RC	40
Local	HARLIM [LISV]	LISV.A	38
Local	HARLIM.E	CLINKY	57

ORIGIN	CLASS IIOCC	CLASS Priestman, 2005a	SHERDS
		SMAG.B	48
		SMAG.C	47
Local	HARLIM.E [LISV]	LISV.B	30
India	HARMIC	BPCR	42
		FIRE	10
Local	HMPW	HM.N-ID	20
		HMP.N-ID	8
		PAW.CC	1
		WMP.N-ID	4
Local	HMPW.1	PAW.SCC	1
Iraq	HONEY	HONEY	27
India	INCOP	GIB	5
India	IRAB	IRAB	15
India	IRPW	IRPW	30
Local	KD.2	KD.2	1
Local	KD.4	KD.4	1
Local	REBROS	REBROS	2
India	SBBW	SBBW	3
Local	SLIP.B	SLIP.B	30
Local	SLIP.R	SLIP.R	4
Local	SLIP.TB	SLIP.TB	4
Iraq	TORP.S	TORP.1	2
		TORP.2	64
		TORP.3	8
		TORP.4	9
Iraq	TRC	TRC.1	5
		TRC.2	5
Iraq	TURQ.T	ALK.1	222
		ALK.3	39
Iraq	TURQ.YG	ALK.2	20
TOTAL			1239

Table 5.6 *Ceramics from the surface collection of the Bushehr Peninsula recorded on the basis of finds from the Ashmolean Museum showing sherd totals by class. Class codes are those recorded as part of the original study (Priestman, 2005a), and equivalent categories represented in the IIOCC*.

Looking more closely at the characteristics of the available ceramic sample, the assemblage from Bushehr was broken down into 145 different ceramic classes during the Williamson Collection study (Priestman, 2005a). When these groups are correlated with the IIOCC, they match up to form 95 different class categories. A particular area of impact that is worth highlighting is in relation to locally manufactured coarse wares. As part of the Williamson Collection study, considerable effort was made to develop a suitable coarse ware

classification based principally on the nature and sorting of coarse inclusions (Priestman, 2005a: 174-234). While the rationale behind this exercise was essentially reasonable, the classification did not ultimately result in consistently defined groups, largely because of the difficulties of combining together local coarse ware products derived from a greater part of southern Iran. As a result, many of the coarse ware classes proposed in the Williamson Collection study are unlikely to be recognised elsewhere and have been dropped from the IIOCC. All such classes from the Bushehr area, apart from the well-defined, lime-spalled categories (HALIM and HARLIM.E), have simply been recorded here are non-identified coarse wares. The bulk of the ceramic finds from Bushehr relate directly to the maximum phase of occupation contemporary with 5th to mid-7th century phase CP1. The sample also includes nine classes (with a yield of 212 sherds) that are all clearly dated substantially earlier than the Sasanian period assemblage. Likewise, following the major decline of occupation at Bushehr, probably within the 7th century (Priestman, 2005b; in press (a)), a much diminished area of the site continued to be occupied throughout the early, middle and late Islamic periods. Some of the ceramics represented from the Bushehr area amongst Williamson's surface collection also relate to these later phases of occupation. In order to more accurately assess the composition of the ceramic assemblage from Bushehr during the main phase of CP1 occupation, all of the unequivocally earlier and later dated classes have been stripped out of the sample leaving a remainder of 1,239 sherds.

5.2.3 Bilad al-Qadim – Bahrain

The ceramic sequence from Bilad al-Qadim comes from excavations undertaken in two different areas of the site: the Al-Khamis (KHA) and Al-Hassan (MOS) mosques. The two areas are located a short distance from one another but are separated by a modern road (Insoll, 2005: fig. 2.2). The sites form part of a larger medieval settlement, the full dimensions of which have not been established, due to the impact of recent urban development and landscape alteration within the area. Each excavation consists of a series of seven and eight 3 x 3m trenches often forming a progressive enlargement of the excavation area as a single contiguous block (Insoll, 2005: figs, 3.1a; 3.2). Due to pressures on time and resources, materials from three of the most finds-rich excavations were excluded (KHA 01C, KHA 01G, MOS 01B). Otherwise all deposits were sieved and all finds

quantified and analysed (Insoll, 2005: 54). The stratigraphic sequence within each of the excavations is defined on the basis of a combination of structural events and arbitrary spit levels that have been correlated with one of six periods defined on the basis of the associated ceramic finds. The whole sequence spans the period from around the 8th – 14th centuries (**Table 5.7**). Within three of the trenches that were initiated, excavation had to be halted prematurely due to the discovery of modern Islamic graves (KHA 01A, KHA 01B, MOS 01B). Other factors of disturbance combined with zonal differences in area usage through time, mean that in no trench is the complete occupation sequence represented (**Table 5.8**). In the most extreme case, Period 2 is missing across all of the KHA area excavations. In order to build up a picture of the continuous occupation of Bilad al-Qadim, the patchwork of deposits need to be combined into a single sequence (Carter, 2005: 158-159).

Period	Prop. Dating	Rev. Date	Al-Khamis Mosque (KHA)	Al-Hassan (MOS)
6	13th-14th	l.13th-14th	Superimposed building horizons, somewhat disturbed	Levelling of area in advance of the construction of the modern mosque
5	l.12th-13th	l.12th-l.13th		Continuation of Periods 3-4 but with abundant waste associated with pottery production nearby
4	m.11th-l.12th	Same	Superimposed building horizons	Superimposed building horizons with extensive reuse of earlier structures
3	l.10th-m.11th	e.11th	Elements of flooring from more substantially built structures	
2	9th-e.10th	e.9th-m.10th	Void	Remodelling and construction of high-status buildings with plastered floors and coloured plaster walls
1	8th- e.9th	Same	Earliest activity represented by a drainage channel cut into the bedrock, itself sealed by a fragmentary area of flooring	Undated drain sealed by a heavily constructed building interpreted as a possible fort

Table 5.7 *Summary of the archaeological sequences and associated dating from the Al-Khamis Mosque (KHA) and Al-Hassan (MOS) excavations after Insoll, 2005: 67-68, 76-77. Revised dates provide slight adjustments based on the available ceramic dating evidence (see Chapter 5)*.

	Ceramic Period						
Unit	**1**	**2**	**3**	**4**	**5**	**6**	**Total**
KHA 01A				1954		3570	5524
KHA 01B						482	482
KHA 01C	Finds not processed						
KHA 01D				1072	1225	98	2395
KHA 01E	24		253		2231		2508
KHA 01F			164	88	545	1096	1893
KHA 01G	Finds not processed						
KHA 01H	74		1838	780	84	338	3114
MOS 01A	419		587		1917	625	3548
MOS 01B	Finds not processed						
MOS 01C	240	339		1471	8869		10919
MOS 01D		163					163
MOS 01E	121	547					668
MOS 01E+F		87					87
MOS 01G						296	296
Total	878	1136	2842	5365	14871	6505	31597

Table 5.8 *Ceramic finds from the Al-Khamis (KHA) and Al-Hassan (MOS) excavations at Bilad al-Qadim showing the quantities of sherds from each trench and ceramic period*.

The ceramic finds from the processed elements of the KHA and MOS excavations are fully quantified by sherd count and rim EVEs and discussed according to the changing composition of the ceramic assemblage across the site within each ceramic period (Carter, 2005: 107-192). One of the most significant difficulties faced in interpreting the published findings of the Bilad al-Qadim pottery study, is the fact that only figures showing the percentages are presented for different varieties of pottery for each ceramic period. While these percentages are informative, nowhere is any indication provided of the actual number of sherds contained within the assemblage. The percentages alone do not allow one to assess potential changes in the volume of material through the sequence, or crucially the reliability of the figures provided (Kennet, 2009: 25-28). Fortunately in the preparation of this research, it has been possible to make use of the underlying sherd count figures contained within the original unpublished pottery finds database[44]. Using information contained within the database, it becomes clear that Bilad al-Qadim actually ranks amongst one of the largest quantified assemblages available from within the Persian Gulf area and that it consistently provides large and significant quantities of ceramic finds throughout its occupation sequence (**Table 5.8**).

[44] I am deeply indebted to Robert Carter for kindly making the Bilad al-Qadim pottery database available to me for the purposes of this study.

Another aspect that is crucial to the interpretation of the pottery data from Bilad al-Qadim is the issue of correlating the published pottery classification with the scheme adopted within this study (**Table 5.9**). For a number of distinctive and widely recognised classes, particularly glazed wares, correlations are often relatively straightforward to establish and this process is aided in many cases by direct cross-reference employed within the report to the pottery studies from Kush and the Williamson Collection (Kennet, 2004; Priestman, 2005a). Where a greater degree of complication does occur is in relating many of the common coarse wares represented within the study to groups encountered elsewhere. The coarse ware assemblage is broken into a range of specific classes and clustered under the general headings of White Ware, Lower Gulf Wares, Miscellaneous Wares and Common Wares (Carter, 2005: Appendix 4.1-2). Lower Gulf Wares included classes such as HARLIM that are common at Kush and thereby assumed to be local to that area. Actually the similarities in the body and firing of HARLIM and associated classes to the pottery manufactured somewhat later in the kilns at Siraf, indicate that a more likely provenance for the hard lime-spalled coarse ware assemblage is within the vicinity of Siraf/Bushehr, i.e. within the Iranian coastal area rather than southeast Arabia. Scrutiny of the published Common Coarse Ware assemblage from Bilad al-Qadim also indicates that certain specific types are more likely to belong to the Siraf area coarse ware complex, rather than being locally produced. This suggests a certain degree of inconsistency in the definition of local common coarse wares. Where possible in the least equivocal cases, particular common coarse ware types have been separated out as further examples of regional scale ceramic imports.

Using the information established from the class concordance and the sherd counts from the finds database recorded by ceramic phase, a phased seriation of the Bilad al-Qadim can be generated (**Table 5.10**). Again, it is reassuring to find a realistic chronological distribution of the classes within the seriation. The phasing can also be correlated successfully with the chronological scheme adopted here as Ceramic Periods 1-6. The only main anomaly to note is that the different classes associated at other sites with CP4 and CP5 occur mixed together within the same period rendering any division within this part of the sequence impossible. In CP6 the sequence from Bilad al-Qadim breaks down into a number of shorter stages

indicating certain important changes that occur within the period, such as the introduction of Monochrome Frit somewhat earlier than the first examples of Late Sgraffiato.

Ware/Type	BAQ Class Name	IIOCC	Notes	Ref. Carter, 2005:	Qnt
2A	Eggshell Ware	EGG.PI	Class split into 2A, 2B and 2C based on individual sherd descriptions	pp. 401-402, fig. 4.6	139
2B	White Ware	WHITE.PI	Class split into 2A, 2B and 2C based on individual sherd descriptions	pp. 401-402, fig. 4.6	901
2C	Moulded White Ware	WHITE.M	Class split into 2A, 2B and 2C based on individual sherd descriptions	pp. 401-402, fig. 4.6	1
3	Sgraffiato (general category)	GRAF.N-ID		p. 416, fig. 4.10: 5, 8-9	234
4	Lower Gulf Red Ware	HARLIM	May include some REBROS	pp. 403-404, fig. 4.7: 1-18	831
5	Cobalt Decorated White Glaze	OPAQ.TS	Coloured described as "cobalt" and mis-dated, actually turquoise	p. 412, fig. 4.9: 1-7	65
6	Fine Ware	LOCAL CW	Locally produced Eggshell Ware?	p. 407, fig. 4.8: 10-20	160
7	Hatched Sgraffiato	GRAF.H		p. 416, fig. 4.10: 1-4	53
8	Plain Turquoise Glaze	TURQ.T	Plain	p. 410, fig. 4.11: 1-2, 5-6	284
9	Cream Ware	LOCAL CW	Possibly the same as FIBIC but dating seems to different	p. 407, fig. 4.8: 5-9	6
10	Opaque White Glaze	OPAQ.W		pp 412-413, fig. 4.9: 10-11	27
11	Fine Red with Black Underglaze	SPW	Described as UGP but fabric and dating is more compatible with SPW	p. 419, fig. 4.11: 15-16	22
12	Julfar	JULFAR	Also includes some JULFAR.RW and JULFAR.PB	pp 404-405	42
13	Proto Julfar	CHAM	Possible equivalent though description states not clearly handmade	p. 405, fig. 4.7: 25-27	28
14	Brown Sgraffiato	GRAF.N-ID		pp 417-418	13
15	Lower Gulf Pale Ware	CREAC		pp 405-406, fig. 4.7: 19-24	274
16	Monochrome Green Sgraffiato	GRAF.LG		p. 418, fig. 4.10: 6-7, 10-12	19
17	Turquoise Glaze with Applique	TURQ.T	Jars with applique decoration	p. 410, fig. 4.11: 4, 7-9	52
18	Chinese Blue and White	CBW		p. 423, fig. 4.12: 4	18
19	Early Sgraffiato	GRAF.EP2	Not clear from description is this is GRAF.EP1 or 2	p. 413, fig. 4.9: 8-9	4
20	Lower Gulf Dark Ware	HARLIM	Most likely small dark grey fired vessels from same class	p. 406, fig. 4.7: 30-31	51
21	Gritty Ware	CHAM	Illustrated forms match those of Ware13	p. 406, fig. 4.7: 28-29	91
22A	Splashed Ware Green & White	SPLASH.GW1	Class split into 22A and 22B based on individual sherd descriptions	p. 413, fig. 4.9: 12-14	2
22B	Splashed Ware Polychrome	SPLASH.P1	Class split into 22A and 22B based on individual sherd descriptions	p. 413, fig. 4.9: 12-14	12
23	Miscellaneous Underglaze	UGP		p. 419	8
24	Cobalt with Black	OPAQ.TBS		p. 413, fig. 4.9: 17	33
25	Burnished Indian	SBBW		p. 425, fig. 4.12: 7	8
26	Chinese White Ware	WW		p. 423, fig. 4.12: 1-3	8
27	Blue Glaze with Vertical Ribs	GW.N-ID		p. 420	3
28	Blue Frit	FRIT.EM		p. 422, fig. 4.11: 22-23	25
29	Grey Abrasive Ware	LOCAL CW		p. 407, fig. 4.8: 1-4	24
30	White or Indeterminate Frit	FRIT.EM	Mostly early monochrome	p. 422, fig. 4.11: 19-20	17

Ware/Type	BAQ Class Name	IIOCC	Notes	Ref. Carter, 2005:	Qnt
31A	Lustre Ware (gold monochrome)	OPAQ.LG	Class split into 31A and 31B based on individual sherd descriptions	p. 414, fig. 4.9: 18-20	7
31B	Lustre Ware (ruby monochrome)	OPAQ.LR	Class split into 31A and 31B based on individual sherd descriptions	p. 414, fig. 4.9: 18-20	1
32	Carved Glazed Red Ware	GRAF.DI		p. 418, fig. 4.11: 14	4
33	Barbar	LOCAL CW		p. 407	2
34A	Yue Ware	YUE	Yue ware separated from 34 based on individual sherd description	p. 424	3
34B	Non-specific Celadon	EAST.N-ID		p. 424	3
35	Red and Green Over-glaze	OPAQ.LP	Possibly polychrome lustre	p. 420	3
36	White and Black Glaze	OPAQ.BW		p. 414, fig. 4.9: 16	2
37	Incised Turquoise Glaze	TURQ.T	With incised decoration	p. 410, fig. 4.11: 3, 10	7
38	Black Glaze	OPAQ.B		p. 414, fig. 4.9: 15	6
39	Green Glaze with Yellow Streaks	GW.N-ID		p. 420	3
40	Longquan Celadon	LQC		p. 424, fig. 4.12: 5	5
41	Manganese Purple Underglaze	MGPAINT.1		p. 419, fig. 4.11: 12	5
42	Frit Lustre Ware	FRIT.BL		p. 422, fig. 4.11: 21	2
43	Turquoise Glaze with Black	TURQ.T	Internal surfaces reduced	p. 410, fig. 4.11: 11	6
44	Khunj/ Bahla	KHUNJ		p. 420	1
45	Hard Red Sandwich Ware	LOCAL CW		p. 408	11
46	Limy Ware	LOCAL CW		p. 408	4
47	Brown Sandy Ware	TORP.S		p. 408	10
48	Dark Blue and White Glaze	OPAQ.C		p. 414	7
49	Blue and White Frit	FRIT.BW		p. 422	1
50	Unclassified Glazed Earthenware	GW.N-ID		p. 421, fig. 4.11: 24-36	585
51	Unclassified Unglazed Earthenware	CW.N-ID		p. 408	120
52	Unclassified Far Eastern	EAST.N-ID		p. 424, fig. 4.12: 6	9
53	Dusun Stoneware	DUSUN	Sherd separated out from Ware 52 based on description	p. 424	1
CW 1	Ribbed/incised medium vertical jar rim	LOCAL CW		pp 428-429, figs. 4.2: 6-7; 4.4: 1-10, 16	314
CW 1 (G)	Ribbed/incised medium vertical jar rim	LOCAL GW		pp 428-429, figs. 4.2: 6-7; 4.4: 1-10, 16	1
CW 2	Bowl or jar with horizontally extended rim	LOCAL CW		p. 429, fig. 4.4: 19-24	16
CW 2 (G)	Bowl or jar with horizontally extended rim	LOCAL GW		p. 429, fig. 4.4: 19-24	207
CW 3 (G)	Medium/large glazed bowl with simple rim (dia.>16)	LOCAL GW		p. 429, fig. 4.3: 8-9	271
CW 4	Bowl with incised hatching and column	LOCAL CW		p.429, fig. 4.3: 23-25	49
CW 4 (G)	Bowl with incised hatching and column	LOCAL GW		p.429, fig. 4.3: 23-25	82
CW 5	Large bowl with out-turned rim	LOCAL CW		p. 429, figs. 4.1: 18-20, 4.5: 19	157
CW 6 (G)	Glazed bowl with out-turned rim	LOCAL GW		p. 430, fig. 4.3: 10-11	131
CW 7	Small, simple undecorated vertical jar rim (no handle)	LOCAL CW		p. 430, figs. 4.2: 9; 4.5: 9-10	85
CW 7 (G)	Small, simple undecorated vertical jar rim (no handle)	LOCAL GW		p. 430, figs. 4.2: 9; 4.5: 9-10	1
CW 8	Vertical slipped and ribbed rim with handle	LOCAL CW		p. 430, fig. 4.2: 1-5	73
CW 9	Small unglazed bowl with simple rim	LOCAL CW		p. 430, figs. 4.2: 13; 4.3: 4	75
CW 10	Small vertical jar rim with groove (dia.<16)	LOCAL CW		pp 430-431, figs. 4.2: 10; 4.4: 14-15	42

Ware/Type	BAQ Class Name	IIOCC	Notes	Ref. Carter, 2005:	Qnt
CW 11	Jar with handle attached below rim	LOCAL CW		p. 431, fig. 4.4: 17-18	32
CW 11 (G)	Jar with handle attached below rim	LOCAL GW		p. 431, fig. 4.4: 17-18	1
CW 12	Small, simple, vertical jar rim with handle	LOCAL CW		p. 431, figs. 4.1: 22-24; 4.2: 8; 4.4: 12-13	28
CW 12 (G)	Small, simple, vertical jar rim with handle	LOCAL GW		p. 431, figs. 4.1: 22-24; 4.2: 8; 4.4: 12-13	1
CW 13	Medium/large unglazed bowl with simple rim (dia.>16)	LOCAL CW		p. 431	59
CW 14	Small everted bowl rim	LOCAL CW		p. 431, fig. 4.3: 1-2	30
CW 15	Small beaded jar rim	LOCAL CW		p. 431, fig. 4.2: 11	23
CW 15 (G)	Small beaded jar rim	LOCAL GW		p. 431, fig. 4.2: 11	2
CW 16	Large vertical jar rim with handle	LOCAL CW		pp 431-432, figs. 4.1: 21; 4.2: 22-23; 4.4: 11	24
CW 16 (G)	Large vertical jar rim with handle	LOCAL GW		pp 431-432, figs. 4.1: 21; 4.2: 22-23; 4.4: 11	3
CW 17	Bowl with groove below rim (dia. > 16)	LOCAL CW		p. 432, fig. 4.2: 16	46
CW 18	Bowl with indented rim	LOCAL CW		p. 432, fig. 4.3: 15-19	11
CW 18 (G)	Bowl with indented rim	LOCAL GW		p. 432, fig. 4.3: 15-19	20
CW 19 (G)	Small glazed bowl (dia.<16)	LOCAL GW		p. 432, fig. 4.3: 3	18
CW 20	Large/medium slipped bowl	LOCAL CW		p. 432, fig. 4.1: 7-8	16
CW 21	Large dish with straight sides	CREAC	Fabric description and form illustration match CREAC	p. 432, fig. 4.5: 4-5	20
CW 22	Bowl with thickened S-shaped rim	LOCAL CW		p. 432, figs. 4.2: 15; 4.3: 5-6	2
CW 22 (G)	Bowl with thickened S-shaped rim	LOCAL GW		p. 432, figs. 4.2: 15; 4.3: 5-6	12
CW 23	Bowl with carination below ridged rim	LOCAL CW		p. 433, fig. 4.3: 7	1
CW 23 (G)	Bowl with carination below ridged rim	LOCAL GW		p. 433, fig. 4.3: 7	6
CW 24	S-shaped rim of bottle	LOCAL CW		p. 433, fig. 4.5: 6-7	4
CW 25	Large flaring rim	CREAC	Fabric description and form illustration match CREAC	p. 433, fig. 4.2: 24	14
CW 26	Jar with beaded rim and ribbing	LOCAL CW		p. 433, fig. 4.1: 1-2	4
CW 27	Carved Common Ware bowl	LOCAL CW		p. 433, fig. 4.3: 20-22	3
CW 27 (G)	Carved Common Ware bowl	LOCAL GW		p. 433, fig. 4.3: 20-22	2
CW 28	Small collar-rim	LOCAL CW		p. 433, fig. 4.1: 3-4	4
CW 29	Tanoor (oven)	LOCAL CW		p. 433, fig. 4.5: 18	10
CW 30	Bowl with bevelled interior face	LOCAL CW		p. 434, fig. 4.2: 14	4
CW 31	Large beaded bowl rim	LOCAL CW		p. 434, fig. 4.1: 9-11	4
CW 32	Bowl with ribbed/incised flaring rim	LOCAL CW		p. 434, fig. 4.5: 1-3	4
CW 33	Shallow bowl with 2 grooves	LOCAL CW		p. 434, fig. 4.1: 5-6	3
CW 34	Thick vertical squared rim with incised line(s)	LOCAL CW		p. 434, fig. 4.2: 18-19	3
CW 35	Ribbed bowl with thick red body	LOCAL CW		p. 434, fig. 4.5: 8	3
CW 36	Large vessel with flat top, combed decoration	LOCAL CW		p. 434, fig. 4.2: 20-21	3
CW 37	Unique Common Ware form	LOCAL CW		p. 434, figs. 4.1: 12-17; 4.2: 25-30; 4.3: 12-14; 4.4: 25; 4.5: 11-17	32
CW 37 (G)	Unique Common Ware form	LOCAL GW		p. 434, figs. 4.1: 12-17; 4.2: 25-30; 4.3: 12-14; 4.4: 25; 4.5: 11-17	6
CW 38	Undefinable Common Ware rim	LOCAL CW		p. 434	102
CW 38 (G)	Undefinable Common Ware rim	LOCAL GW		p. 434	11
CWG1 (G)	Degraded Glazed Common Ware	LOCAL GW			851

Ware/Type	BAQ Class Name	IIOCC	Notes	Ref. Carter, 2005:	Qnt
CWG2 (G)	Brown/Yellow Glazed Common Ware	LOCAL GW			34
CWG3 (G)	Green/Turquoise Glazed Common Ware	LOCAL GW			49
CWU	Local Common Ware	LOCAL CW			24061
CWU (G)	Local Common Ware	LOCAL GW			6
SPIRAL HANDLE	applique spiral	LOCAL CW		p. 435, fig. 4.4: 30	8
TRIVET	trivet	LOCAL GW		p. 435	142
TWIST HANDLE	twist handle	LOCAL CW		p. 435, fig. 4.4: 29	10
WASTER	Wasters or slag	LOCAL CW		p. 435	99
					31598

Table 5.9 *Concordance of pottery classes identified at Bilad al-Qadim to the classification proposed here as the Integrated Indian Ocean Ceramic Classification (IIOCC).*

	CP3	CP4-5	CP6				
Class	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**	**Totals**
LOCAL CW	444	517	2161	4413	12785	5522	25842
HARLIM	186	178	165	137	81	135	882
WHITE.PI	104	94	130	198	108	267	901
TURQ.T	50	129	49	42	15	64	349
GW.N-ID	39	80	74	161	141	96	591
CREAC	36	41	55	72	29	75	308
CW.N-ID	11	5	13	16	46	29	120
EGG.PI	4	11	115	5	2	2	139
TORP.S	2	2	5			1	10
LOCAL GW	1	1	17	74	1516	57	1666
OPAQ.TS		25	1	27	11	1	65
CHAM		21	16	11	66	5	119
OPAQ.TBS		7	25	1			33
OPAQ.C		5	2				7
GRAF.EP2		4					4
OPAQ.W		3	7	12	1	4	27
OPAQ.LG		3	1	2	1		7
OPAQ.BW		2					2
SPLASH.P1		2		10			12
SBBW		2			6		8
SPLASH.GW1		2					2
OPAQ.B		1		4	1		6
OPAQ.LR		1					1
FRIT.EM			2	11	15	14	42
OPAQ.LP			2	1			3
EAST.N-ID			1			10	11
WW	1		1	1	1	4	8
GRAF.N-ID				118	13	116	247
GRAF.H				30	9	14	53
GRAF.LG				7	5	7	19
SPW				6	10	6	22
UGP				3	3	2	8
YUE				3			3
FRIT.BL					2		2
FRIT.BW					1		1
LQC					1	4	5
MGPAINT.1					1	4	5
WHITE.M					1		1
JULFAR						42	42
CBW						18	18
GRAF.DI						4	4
KHUNJ						1	1
DUSUN						1	1
Totals	878	1136	2842	5365	14871	6505	31597

Table 5.10 *Phased seriation of the ceramic finds from Bilad al-Qadim with classification and sherd totals recorded from the original finds database. Figures highlighted in grey occur out of their expected sequence and may be intrusive or erroneously classified*.

5.2.4 A'Ali – Bahrain

The aim of the Japanese excavations at A'Ali was to obtain a reference sequence within which to explore issues related to trade ceramics in the Persian Gulf region during the Abbasid period (Sasaki & Sasaki, 2011: 18). Towards this end, all ceramic finds obtained from the first season's excavation situated towards the western edge of the settlement mound, were categorised and quantified by fragment count (Sasaki, 1990: 113). This assemblage amounts to a total of 3,197 sherds. No additional information has so far been provided for the ceramic finds from the second season other than a gross total of 1,233 for glazed sherds (Sasaki & Sasaki, 2011: 26). If the relative proportion of glazed pottery remains consistent between the two trenches (i.e. at 14.3% see Chapter 6), then this suggests that the second season produced a far larger sample than the first with the whole assemblage falling within the region of 8,500 pieces.

For the portion of finds that have so far been published, the ceramic assemblage has been categorised into groups identified on the basis of fabric and surface treatment, and within each class, into one of nine broad vessel groups, i.e. 'bowl', 'large bowl', 'jar', etc. (Sasaki, 1990: Tables 1-2). In total, 27 glazed and 18 coarse ware classes are distinguished. In addition to the tabulation of sherd counts, each of the glazed classes is also briefly described. Although the approach adopted of quantitative recording of an Early Islamic assemblage within the Persian Gulf region was in a sense advanced for its time, a significant problem remains in the use of the information made available due to the quality of detail provided concerning the categorisation of the ceramic finds. Even for the glazed classes that are briefly described, mostly all that is provided are relatively broad attributions based on the colour of the fabric and glaze. Without a more detailed description of the nature of coarse inclusions and glaze type, it is often extremely difficult to establish reliable associations between the A'Ali classes and the categories referred to elsewhere within this study. At the same time, there are in a few cases, enough keywords provided to establish a certain or probable identification (**Table 5.11**).

Fabric	Description	IIOCC	Sherds
Creamy yellow fine	Cobalt-blue painted with copper-green splashed tin-white glaze	OPAQ.CG	3
Creamy yellow fine	Yellow glazed	?	1
Creamy yellow	White glaze	OPAQ.W	2
Creamy yellow	White glaze with copper green	OPAQ.TS	1
Creamy yellow	Manganese brown glaze	OPAQ.B?	1
Creamy yellow	Iron-yellow glaze with brown painted decoration	?	2
Creamy yellow	Iron-yellow glaze with incised decoration	GRAF.EY	1
Creamy yellow	Green glaze	?	1
Creamy yellow	Brown glaze	?	1
Creamy yellow	Blue-green glazed ware	TURQ.T	209
Greenish yellow	Blue-green glazed ware, greenish yellow fabric	TURQ.T	143
Pale rouge fine	Green glaze	?	1
Pale rouge	Polychrome glaze	SPLASH.P2	6
Pale rouge	Green glaze with paint	?	1
Pale rouge	Green glaze	?	3
Pale rouge	White glaze with dark green paint	?	2
Pale rouge	White glaze	?	12
Pale rouge	Brown glaze	?	1
Pale rouge	Yellowish brown glaze with dark painted decoration	?	1
Pale rouge	Yellow glaze	?	13
Pale rouge	Yellow painted	?	2
Pale rouge	Yellow glaze with incised decoration	GRAF.N-ID	2
Rouge	Yellow glaze	?	1
Rouge	Multi-coloured glaze with incised decoration	GRAF.N-ID	44
Dark rouge	Dark iron glaze	?	1
White fine	White glaze (11th - 12th C. Fujian)	WW	1
Grey fine	Dark greenish-brown glaze (9th - 11th C. Guangdong)	DUSUN	2
Pale grey	Coarse ware	?	102
Grey fine	Coarse ware	?	2
Grey	Coarse ware	?	107
Dark grey fine	Coarse ware	?	1
Dark grey	Coarse ware	?	90
Greenish yellow	Coarse ware	?	357
Yellowish rouge	Coarse ware	?	702
Pale rouge fine	Coarse ware	?	8
Pale rouge	Coarse ware	?	421
Rouge	Coarse ware	?	414
Dark rouge	Coarse ware	?	109
Other	Coarse ware	?	2
Pale rouge	Coarse ware with white slip	CREAC?	97
Creamy yellow fine	Coarse ware	EGG.PI?	78
Creamy yellow	Coarse ware	WHITE.PI?	171
Greenish yellow fine	Coarse ware	EGG.PI?	60
Pale rouge or rouge	Coarse ware with red polished slip	INCOP	17
Dark black	Coarse ware	SBBW	1
Total			3197

Table 5.11 *Class categories attributed to the ceramic finds from the first season of excavation at A'Ali with sherd totals and the potential correlation, where possible, to categories included in the Integrated Indian Ocean Ceramic Classification*.

Due to the difficulties related to the identification of the published ceramic categories from A'Ali, the data available are only capable of supporting certain types of analysis within the context of this study (see Chapter 6). In particular, reliable information can be extracted on the proportion of glazed and unglazed ceramics. For the most part it is also possible to separate out the major categories of exotic or regional-scale imports represented within the assemblage and to compare these against other categories that, in the absence of other information, are simply categorised as 'local'. In terms of the dating of the assemblage, excavation concentrated largely on a single undifferentiated deposit extending from below the disturbed topsoil, down to the wall foundations of the latest structures encountered (Chapter 4). The assemblage from this horizon is dominated by ceramics that date to between the 9th to 10th centuries and fit within the framework of CP4 and CP5. Some later dated categories such as Sgraffiato indicate that occupation of the site also continued on a reduced scale beyond this date. There are no means of separating out the later occupation and for the purposes of analysis, all finds are simply treated together under the narrower dating indicated for the main body of ceramic finds.

5.2.5 Murwab – Qatar

As has been outlined in Chapter 4, the archaeological excavation and study of finds from Murwab is still in progress. The information available at this time is based on an interim report outlining the main aspects of the fieldwork completed up to 2007 (Guérin & al-Na'imi, 2009) and a second report that provides an interim statement on the work on the ceramic finds, also including only the assemblage from Sectors 3 and 6 dug in 2007 (Guérin & al-Na'imi, 2010). The report on the ceramic finds assemblage presents a general outline of the system of the ceramic classification adopted, which sub-divides the assemblage in 26 broad class groupings, 22 of which are different categories of coarse wares (Guérin & al-Na'imi, 2010: 18). The four glazed ware groups all represent large 'families' of wares such as the Opaque Glazed Wares, that are likely to include more specific sub-class categories within the final publication. In general the categories of ceramics described from Murwab are familiar from other contemporary assemblages within the Persian Gulf and western Indian Ocean. However the system of class definition employed does diverge somewhat from the classification presented here (**Section 2.3.5**), and this may in the end make a thorough

integration of evidence more difficult to achieve. In particular, it is notable the strong primacy given to fabric grouping, which results in certain categories containing a mixture of glazed and unglazed ceramics, or well established categories such as Eggshell Wares being split amongst different groups (Guérin & al-Na'imi, 2010: 18-19, fig. 1). Whatever areas of incompatibility may arise, it should be possible to resolve provided adequate information is included within the final publication to further deconstruct class categories as required.

The most important information contained within the interim report on the ceramic assemblage from Murwab, at least from the perspective of this study, is an outline of the assemblage quantification. At this stage all that has been provided is a combined sherd count for the excavated assemblages from Sectors 3 and 6. It is not yet clear whether supplementary quantitative measures such as rim EVEs or weight will be included and similarly no information is provided concerning the methodology of excavation or finds retrieval. It can perhaps be reasonably assumed that as a sherd count is provided, the finds represent a full sample that has not in any way been preselected. In addition to the overall sherd count, limited additional detail is provided including the count for glazed to unglazed ceramics and figures for the local and imported components. Unfortunately this is not backed up by counts for the various different categories of pottery described within the body of the report, and at present such information cannot be obtained. The data-set currently available from Murwab is therefore limited in potential to some of the more basic characteristics interrogated as part of the analysis presented within this study in Chapter 6.

5.2.6 Sir Bani Yas – United Arab Emirates

The full assemblage of ceramic finds recovered from the excavation of Sir Bani Yas have not been recorded, analysed or published. The most detailed study of the material so far attempted is based on a selection of finds temporarily exported from the United Arab Emirates for study purposes (Carter, 2008). This included bags of pottery that appear to represent whole contexts, pre-selected bags containing only diagnostic sherds and specimens from a ware typology established during the course of the excavation (Carter, 2008: 76). In addition, the available sample was augmented by the inclusion of some pottery recorded in the form of drawings and notes. In total, the study includes 1,682 sherds, 1,335

of which come from the excavation of the church (SYB-9). In the detailed analysis, only material from "whole stratified contexts" from SBY-9 are included, reducing the assemblage further to a total of 1,164 sherds (Carter, 2008: 76, table 2). Given the manner in which the sample was selected, it remains questionable whether it can be regarded as representative of the assemblage as a whole. Some caution in the use of the data from Sir Bani Yas is therefore necessary. The finds that have been recorded are presented with the use of two different quantitative measures: sherd counts and rim EVEs (Carter, 2008: 76). While the case for the use of EVEs can be clearly made (see **Chapter 2**), within the context of the Sir Bani Yas study, the sherd count available appears to be too low to support accurate rim EVE figures. This seems to be borne out by the implausibly high proportion of Alkaline Glazed Ware in the assemblage (26%) when recorded by rim EVEs.

Based on the direct study of the available finds, the pottery from Sir Bani Yas was sub-divided into 15 different classes. Two additional classes represented by just three sherds in total – Honeycomb Ware (HONEY) and Indian Red Polished Ware (IRPW) – are discussed within the text, but not included within the analysis as they are not represented in suitable contexts from SYB-9. Of the quantified classes, most imported categories can be relatively easily identified from the description and illustrations provided (**Table 5.12**). Imports from outside the Persian Gulf are all unglazed cooking pots from India that are most likely to be Soft Black Burnished Ware (SBBW). The only category of glazed pottery is Alkaline Glazed Ware (TURQ.T). Unglazed categories from within the Persian Gulf area include three different varieties of Torpedo Jar, all grouped here under the same broad class (TORP.S). 'Hard Gritty Ware' and 'Grey Brittle Ware', although described as being somewhat different from one another, appear most likely to fall under the same heading of Hard Lime Spalled Ware (HARLIM) with both smaller and Large Incised Storage Vessel types included within the same class. Many of the other coarse ware categories are more difficult to identify on the basis of the information provided. At least some of the White Ware with no visible inclusions may be equivalent to the White Ware widely distributed within the Persian Gulf region originating from southern Iraq (i.e. WHITE.PI), but the absence of more clearly identifiable Eggshell Wares (EGG.PI) and the shape and heavily ribbed appearance of the material from Sir Bani Yas (Carter, 2008: 83-84, fig. 12) suggest these are more likely to be locally produced. Other categories of coarse wares can best be characterised as either

locally produced or non-identified categories. As is described in Chapter 4, the dating of the Sir Bani Yas assemblage is relatively tightly constrained to around the mid-7th to mid-8th centuries. The general composition of the Sir Bani Yas assemblage and many of the specific components find close parallel in a number of other contemporary assemblages. As such, Sir Bani Yas represents an important example of the typical post-Sasanian/pre-Abbasid assemblage that circulated within the Persian Gulf during CP2.

Name	IIOCC	EVE Tot	EVE %	Count	Count %
Buff	LOCAL CW	154	26	201	17
White NVI	LOCAL CW	66	11	69	6
White Inclusions	LOCAL CW	0	0	69	6
Veg (2nd Mill BC)	LOCAL CW	0	0	7	1
Red Fine Sandy	CW.N-ID	15	3	6	1
Crude Grey Brittle	CW.N-ID	0	0	36	3
Undiagnosed	CW.N-ID	0	0	7	1
Grey Brittle	HARLIM	53	9	85	7
Hard Gritty	HARLIM	35	6	359	30
Torp	TORP.S	52	9	163	14
Pebbly Torp	TORP.S	17	3	1	0
Micaceous Torp	TORP.S	0	0	6	1
Thin Torp-like	TRC	65	11	102	9
Turq	TURQ.T	136	23	75	6
Indian	SBBW	4	1	8	1
Totals		597	102	1194	100

Table 5.12 *Quantified ceramic assemblage from the church at Sir Bani Yas (SYB-9) showing correlation between published class categories and the IIOCC (after Carter, 2008: 79-89, table 2)*.

5.2.7 Kush – United Arab Emirates

A number of aspects of the site of Kush and the ceramic study undertaken there mark the site out as being particularly important within the context of the present research. Kush is in many ways a pioneering investigation that has set the agenda for work undertaken subsequently within the Persian Gulf and wider Indian Ocean area. The main features that distinguish the archaeological investigation include the following:

- The excavation represents a single relatively large trench in which stratigraphic relationships can be clearly established.

- The site of Kush provides a long potentially uninterrupted occupation sequence spanning a major phase of historical transition within the Persian Gulf region from the Sasanian era in the 4th/5th century AD up to the Middle Islamic era in the 13th/14th century (**Table 5.13**, **Fig. 5.2**).
- The ceramic classification makes a deliberate attempt to deal equally with the full range of ceramics encountered. Pottery is sub-divided into classes on the basis of attributes related to production source rather than on superficial characteristics of style. Classes are described in sufficient detail to be accurately re-identified where they occur elsewhere.
- All of the ceramic finds from Kush are fully quantified. A significant portion of the assemblage can be successfully phased and seriated.

Period	Phase	Date	Description
I	E-01	4th-5th/6th	At least two phases of mudbrick architecture
	W-03		
	W-02		
	W-01		
II	E-03	5th/6th-7th	Construction and use of mudbrick tower
	E-02		
	W-04		
III	E-05	late 7th - early 9th	Abandonment of tower, ephemeral 'squatter' occupation
	E-04		
IV	E-06	9th-11th	Limited re-occupation of the mound, possibly includes periods of abandonment
V	E-08	late 11th-early12th	New mudbrick structures across the mound
	E-07		
VI	E-09	12th	Decline in occupation, light posthole structures and abundant pits
VII	E-10	13th (early 14th?)	
VIII	E-11	late 16th-early 17th	Reoccupation of the site as a rural settlement

Table 5.13 *Archaeological phasing and summary of the occupation sequence represented within the main excavation at Kush (Kennet, 2004: 13, table 2)*.

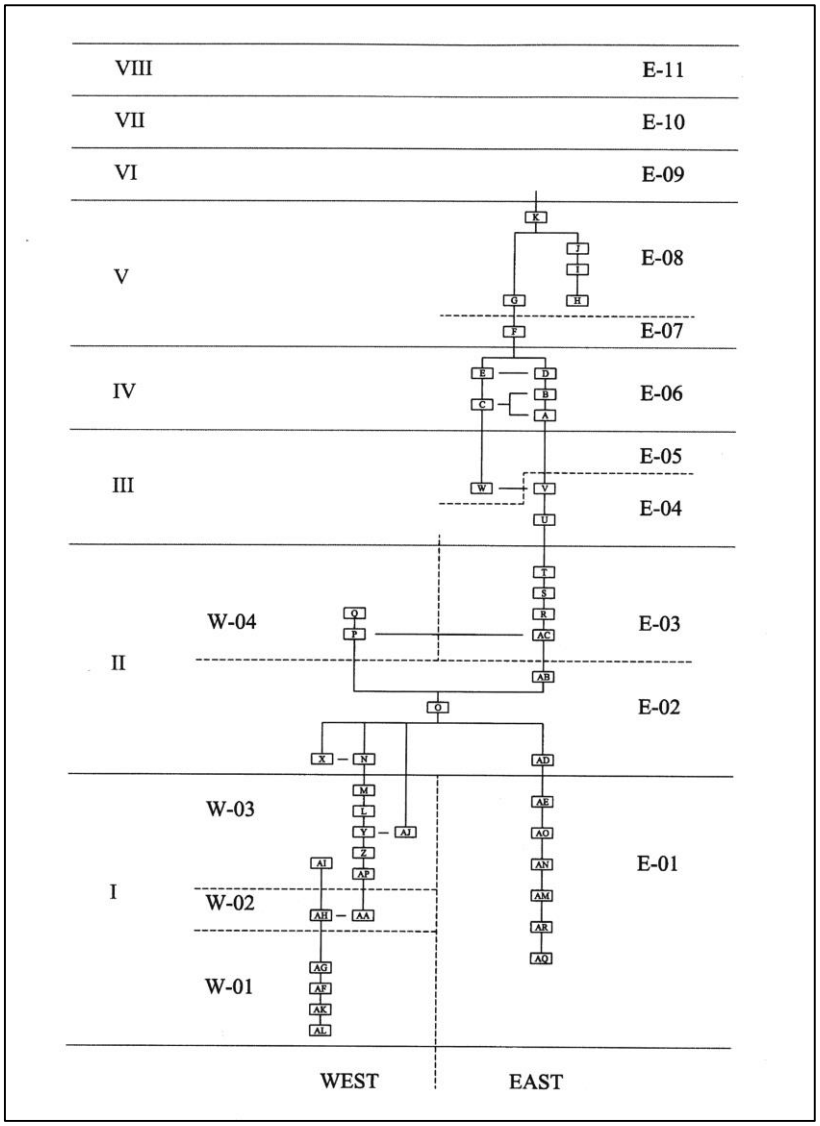


Fig. 5.2 *Stratigraphic matric showing the relationship between contexts and phases with the deep sounding at Kush, after Kennet, 2004: fig. 3*.

As part of the finds recording process, all of the pottery recovered during the excavation at Kush was marked and recorded. Glazed pottery, some imported coarse wares and all diagnostic coarse ware sherds were then re-sorted according to the principles of ceramic class. This was used to generate figures for the total number of sherds, or the percentage of sherds as 'equivalent vessel estimates' (EVEs) by phase that have been seriated to provide a view of the quantitative changes in the distribution of all varieties of pottery recorded through the excavation sequence (Kennet, 2004: table 3). In total 65,203 sherds were recorded from the excavation at Kush, of which 30,398 come from uncontaminated contexts from the main sequence in Trench A. This sub-set forms the basis of the published

ceramic quantification (Kennet, 2004: 13, table 1). The pottery within this sample is sub-divided into 78 different ceramic classes. Most classes are itemised in terms of their total sherd and rim eve yield per Phase and Period. The only exceptions are some of the most common coarse ware categories that were only specifically identified on the basis of diagnostic sherds. This has a significant impact as over two-thirds of the pottery included within the quantification is grouped together as non-classified coarse wares.

As is detailed in Chapter 2, the ceramic classification from Kush provides the initial foundation for work conducted subsequently on assemblages from the north shore of the Persian Gulf (Priestman, 2005a; Priestman & Kennet, forthcoming; Priestman, forthcoming) and for the broader attempt to integrate these classification schemes into the IIOCC. In preparation of this research, a review of the excavated ceramics from Kush was undertaken in December 2010[45]. The aim of this exercise was to return to the original 'parent' study to check on specific areas of definition and compatibility. Where new class categories have been defined since the study of Kush, it was important to be able to back-check the potential existence of such categories within the Kush assemblage, either as non-identified finds, or as groups not separated out from existing classes. Four full working days were available for the inspection of the material. In this time it was possible to look through all of the sections of the assemblage targeted for review. Although the full assemblage of material from Kush includes a total of over 65,000 sherds contained within 119 boxes, 86 of the boxes could be excluded immediately as these contain unglazed non-diagnostic body sherds. To accurately categorise this material would be feasible and would undoubtedly yield important results, but such an exercise requires an investment that is beyond the scope of the present study. In the time available, the contents of all the remaining 33 boxes were checked. Of these, 11 had blank description fields on the box contents list that was provided. These all proved to be further non-diagnostic coarse ware body sherds. The 22 remaining crates seemingly contain the entire assemblage of glazed pottery and diagnostic coarse wares (**Fig. 5.3**). These are all conveniently sorted into bags by ceramic class and labelled accordingly, making the class categories easy to identify and check.

[45] Work on the ceramics from Kush was kindly facilitated by Derek Kennet who provided permission to access the material and a box contents list for the entire collection. The other sources of assistance I received in this work are listed in the acknowledgments.



Fig. 5.3 *Crates of diagnostic pottery from Kush examined during the collection review undertaken at the Department of Antiquities in Ras al-Khaimah in 2010*.

As a result of the Kush assemblage review, it has been possible to establish an accurate concordance between the published ceramic classification from Kush (Kennet, 2004) and the IIOCC (**Table 5.14**). In addition it has been possible to propose certain significant modifications to the published ceramic classification and resulting sherd quantification. Specific details of these modification are outlined elsewhere (Priestman, 2011a) and will be incorporated where necessary within the final publication. In more general terms, the areas addressed cluster under three main categories. First, in the majority of cases existing class categories were simply checked and their overall integrity confirmed. This includes classes such as WAPO, SPOT, REDSPEC and FLAKY, which have so far only been identified at Kush. These are most likely to me locally manufactured groups that only ever achieved limited distribution beyond the local area. Nevertheless these remain consistently defined class categories. Where possible, correlations to groups already represented within the IIOCC have also been verified (**Table 5.14**). The second category of points addressed includes classes where changes are required. In some cases whole classes have simply been re-identified. The clearest example of this is a group of monochrome yellow sgraffiato (YGRAF),

which clearly falls within the early rather than late Sgraffiato tradition. Other classes appear to require more significant reworking. One important example is the generic grouping of reddish-brown Indian cooking pots (IRAB). This class can actually be separated out into a number of different components (mostly HARMIC, BUFRAB and IRAB, some SBBW). Presented as separate classes, the Indian cooking pot assemblage seems to cluster more convincingly within the phased seriation (**Table 5.15**). Finally it has been possible to reattribute certain individual sherds contained within existing classes or within a group of unique and unidentified specimens. The most significant impact of these modifications has been the identification of a number of additional sherds of early sgraffiato (GRAF.EP, GRAF.EY), splashed glazed wares (SPLASH.P, SPLASH.GW) and Sirafi coarse wares (CREAC, REBROS). Together these pieces augment the previously thinly populated 9th – 10th century occupation horizon in Phases E-06 and E-07 (Kennet, 2004: table 3).

Kush Class	IIOCC Class	Class Name	Comments
TURQ.1	TURQ.YG	Turquoise Glaze - Mustard Yellow Glaze	Mostly TURQ.YG, some TURQ.T
TURQ.2		Turquoise Glaze - White Glaze Soft Body	
TURQ.3	TURQ.T	Turquoise Glaze - White Glaze Hard Body	Large and more variable TURQ assemblage than encountered elsewhere. TURQ.4 is characteristically associated with Types BR29 (Type 72) and BR30
TURQ.4		Turquoise Glaze - Green Glaze	
TURQ.5		Turquoise Glaze - Blue Glaze	
TURQ		Turquoise Glaze	
TURQ.NRE		Turquoise Glaze - Not Re-Examined	
YBTIN	OPAQ.W	Plain opaque white glaze	
COBALT	OPAQ.TS	Cobalt-Decorated White Glaze	Includes OPAQ.TBS & OPAQ.T
BTIN	OPAQ.BW	Black Decorated Tin Glaze	
YSPLASH	SPLASH.P2	Bright Yellow Splash	
EGRAF	GRAF.EP2	Early Sgraffiato	
HGRAF	GRAF.H	Hatched Sgraffiato	
YGRAF	GRAF.EY	Yellow Sgraffiato	Includes some GRAF.EP
GGRAF	GRAF.LG	Monochrome Green Sgraffiato	
MGRAF	GRAF.M	Monochrome Mustard Sgraffiato	Includes some MONO.Y
PGRAF	GRAF.LP	Polychrome Sgraffiato	Also includes some GRAF.GYB
BGRAF	GRAF.N-ID	Two-Tone Sgraffiato	
DGRAF		Degraded Sgraffiato	
CHAMP	CHAMP	Champlevé	
FRIT.F	FRIT.EM	Fine Frit	
FRIT.W		White Frit	
FRIT.T		Turquoise Frit	
FRIT.C		Cobalt Frit	
FRIT.L	FRIT.L	Frit Lustre	
FRIT.B	FRIT.LM	Coarse Frit	
MGPAINT	MGPAINT.1	Manganese Purple Underglazed-Painted	
YEMEN	YEMEN	Yemeni Yellow	
PERSIA	SPECLE.2	Persian Blue Speckled	May include some SPECLE.1
LGJARS	MONO.G	Large Glazed Jars	
GMONO.1		Monochrome Green Glaze	
UNCLASS-G	GW.N-ID	Unclassified Glazed	
UNIQG		Unique Glazed	

Kush Class	IIOCC Class	Class Name	Comments
GWW	WW	South Chinese White Stoneware (Song)	
GGW		Yue-type Wares	
WHT		Unidentified Whiteware	
CWW	CWW	Carved White-Stoneware Lotus Bowls	
DHM	DEH	Dehua Moulded Whiteware	
DHP		Dehua Plain Whiteware	
LQC	LQC	Longquan Celadon	
GRE	EAST.N-ID	Unidentified Greenware	
CEL		Unidentified Celadon	
CHIN		Unclassified Far Eastern	
DUSUN	DUSUN	Dusun	
MTB	MTB.1	Martaban	
CBW	CBW	Chinese Blue-and-White Porcelain (Jingdezhen)	
JULFAR	JULFAR	Julfar Ware	
JULFAR.5	CHAM	Early Julfar Ware	
WHITE.C	WHITE.PI	White Ware - Coarse	Includes some WHITE.M
WHITE.F		White Ware - Fine	
WHITE.NRE		White Ware - Not Re-Examined	
BEARTH	HARLIM [LISV]	Black-Fired Earthenware	Possibly ridged LISV body sherds
LISV		Large Incised Storage Vessels	Large vessel types, Includes some HARLIM.E
SMAG	HARLIM	Small Grey Vessels	Small vessel types
HONEY	HONEY	Honeycomb	
EGG	EGG.PI	Eggshell	Includes some WHITE.PI
EGG.NRE		Eggshell - Not Re-Examined	
RED.EGG	EGG.R	Red Eggshell	
FOPW	FOPW.2	Fine Orange Painted Ware	
FOPW.2	FOPW.1	Fine Orange Painted Ware - Coarse	
CLINKY	HARLIM.E	Clinky Fired Earthenware	
FLAKEY	FLAKEY	Flaky Earthenware	Possibly similar to ORGPIN but not related
TORP	TORP.S	Torpedo Jars	
SPOT	SPOT	Spotty Ware	
SPOT.C		Spotty Ware - Coarse	
SPOT.F		Spotty Ware - Fine	
REDSPEC		Red Speckled Ware	Same as SPOT but fired to red
WAPO	WAPO	Cream Pots with Incised Wavy Decoration	
UNCLASS-U	CW.N-ID	Unglazed Unclassifiable Sherds	
UNIQU		Unique Unglazed Sherds	
SPECIAL		Special Category	Does not state in text whether glazed or u/g
IRPW	IRPW	Indian Red Polished	
SBBW	SBBW	Shiny Black Burnished Ware	
FIRE	HARMIC	Fine Indian Red	Possibly mostly body sherds of HARMIC
IRAB	IRAB	Indian Red & Black	Most material should be assigned elsewhere
PAINT	BRISAN	Painted Indian Earthenware	Also includes some HARMIC
INDIA	INCOP	Unclassified Indian Ware	

Table 5.14 *Class concordance between the published ceramic classification from Kush and the class categories represented in the IIOCC. Classes arranged in table thematically*.

For all of the adjustments to the pottery classification from Kush arising from the assemblage review, changes have been implemented by entering the proposed modifications directly into a copy of the original finds database under individual sherd entries. In addition to the various direct class correlation, access to the finds database has made it possible to introduce categories that have no direct equivalent within the published Kush classification. This data can be used to generate a modified phased seriation of the quantified ceramic assemblage (**Table 5.15**). Unlike many other quantified ceramic assemblages considered within this study, the occupation of Kush spans the entire duration of CP1 to CP6. Each stage can also be successfully recognised on the basis of new diagnostic pottery classes that first appear, or start to decline in frequency through the phased sequence. Perhaps significantly, a number of ceramic classes also appear to crosscut the published site periodisation. In particular, CP3 is marked by the introduction of applique decorated Alkaline-Glazed Ware (TURQ.T/JR5) within the last phase of Kush Period II. CP4 is marked by the introduction of the Samarra horizon (namely OPAQ.W) in the latter half of Period III. CP5 bridges Period IV and the first half of Period V. This is perhaps the most poorly resolved stage as we find mixed together typical late elements of the Samarra horizon together with outliers such as Late Sgraffiato and Early Frit more characteristically associated with CP6. CP6 itself bridges the latter half of Period V and Period VI. Here the variety of Late Sgraffiato and other associated markers increases together with the quantity of sherds as expressed most clearly by MONO.G.

IIOCC	CP1				CP2		CP3		CP4	CP5		CP6				
	I				II			III		IV	V		VI	VII	VIII	
	W01	W02	W03	E01	W04	E02	E03	E04	E05	E06	E07	E08	E09	E10	E11	Totals
TURQ.YG	237	40	24	55	6	39	22	28		20	23	2	2	5	16	519
HARLIM.E*	31	9	3	2		4	5	3	1		1				1	60
TURQ.T	17	10	36	11	6	36	99	105	5	39	40	34	34	36	92	600
FOPW.2	15	2	4	3		5	2	1					2		2	36
HARMIC	13	2	2	3		2	9	2	2	1	1	1	2		2	42
BUFRAB	4		1	1		1	1					2		1	1	12
FOPW.1	4		1			2										7
HARLIM [LISV]*	3	1		1	3	2	14	11		4	2	4	9	2	10	66
HARLIM*	2	2	1	3	5	8	18	30	1	11	13	8	4	2	7	115
INCOP	1	1	2				3	3			1				2	13
IRAB	1						1	1			3	1	2	5	4	18
JULFAR	1		1	1	1	1	2	6		6	11	104	188	131	566	1019
TORP.S*	1		1	3	1	1	5	10	1	2	1	3	3	1	2	35
WHITE.PI				1	2	7	23	40	3	210	139	221	333	187	474	1640
IRPW				1	1		19	9	1	1	2		2	2	1	39
EGG.PI					1	1			7	481	198	134	125	45	183	1175
SBBW						2	8	5		2	2		4		13	36
BRISAN						1	4					1			10	16
FLAKEY							2									2
STAMP							1									1
SPOT								1	1	138	58	9	32	18	179	436
OPAQ.W									2	29	26	7	5	6	17	92
HONEY									1							1
EGG.R										42			1			43
CREAC										31	6	1	2		2	42
OPAQ.TS										9	6	2			1	18
MONO.G										4	1	16	15	20	63	119
MGPAINT.1										2	1	1		7	100	111
SPLASH.P1										2	1				1	4
OPAQ.BW										2		1				3
GRAF.H										1	2	5	13	15	12	48
CHAM										1	2	1	7	13	38	62
FRIT.EM										1		2	5	12	18	38
GRAF.EP2										1	1		1	1	1	5
GRAF.EY2										1	1					2
OPAQ.N-ID										1						1
SPLASH.P2											2	2	5		2	11
WAPO*											1	5	8	10	26	50
WW											1	7	11	14	8	41
GRAF.EY1											1					1
GRAF.LG												5	6	9	39	59
GRAF.N-ID												4	5	2	8	19
CWW												3		1	5	9
GRAF.LP												2	2	4	14	22
QING												2	1	3	3	9
MONO.Y												3	1	3	11	18
EAST.N-ID													2		3	5
SPW													1		3	4
DUSUN													1			1
DEH														9	6	15
CHAMP														4	3	7
LQC														4	8	12
YEMEN														3	20	23
FRIT.L														3	3	6
GRAF.M														1	10	11
GRAF.LY														1	1	2

IIOCC	CP1				CP2		CP3		CP4	CP5		CP6				
	I				II		III			IV	V		VI	VII	VIII	
	W01	W02	W03	E01	W04	E02	E03	E04	E05	E06	E07	E08	E09	E10	E11	Totals
MTB.1														1		1
SPECLE.2														1		1
CBW															4	4
FRIT.LM															2	2
TRC															1	1
GW.N-ID	38	0	2	2	1	5	7	1	1	5	14	13	36	41	157	323
CW.N-ID	1231	362	314	681	268	784	2341	3491	157	1741	1510	1537	2047	1887	4918	23269
Totals	1599	429	392	768	295	901	2586	3747	183	2788	2071	2143	2917	2510	7073	30402

Table 5.15 *Phased seriation of the ceramic assemblage from Kush recalculated with modification implemented from the assemblage review. Classes highlighted in grey have no direct equivalent in the Kush publication (Kennet, 2004). Classes indicated by * have only diagnostics quantified*.

5.2.8 Sohar – Oman

The ceramic assemblage from Sohar provides the main key both to the chronology of the site, and in understanding the site's evolving commercial relationship with the Persian Gulf and the wider Indian Ocean. No information is provided within the Sohar publication on the recovery and recording methodology for ceramic finds (Kervran, 2004). From information that can be deduced from the report and through personal communication, it is clear that the project met with particular difficulties. Constraints imposed by modern development and authorisation meant that only limited areas could be excavated, and not always in localities best suited to the objectives of the research. In addition pressures on time and resources were such that it was necessary to discard most of the excavated pottery finds on the same day when they were recovered (Kervran, pers. comm. 2010). As a result, decisions had to be made on the spot about what was important to retain as a sample. However, the recent publication of the early levels from Sohar does include a fairly substantial quantity of pottery (407 pieces illustrated and described) and with sufficient description in most cases to confidently identify the major ceramic classes represented. What the report does not provide is any indication of the original quantities of each variety of pottery from the different levels within the excavation. Of course this is not unusual and the same is true for many excavations that have been completed within the Near East. Unfortunately what this means in practice is that we have no way of comparing the relative importance of different varieties of pottery and how this may have changed. Ultimately it will never be possible to acquire this information on a complete and systematic basis, as the relevant details were

simply not recorded during the excavation. At the same time, a sample of pottery was retained from the excavation and this is larger than the body of material included in the publication. Clearly this has the potential to offer further insight into the changing nature of ceramics deposited through the occupation sequence.

All the finds retained from the Sohar excavations, excluding a few pieces put on display in the Sohar Museum, are currently stored at the Ministry of Heritage and Culture in Muscat. A study visit to obtain further information on this assemblage was undertaken in 2010[46]. Five days were available in the schedule to examine the finds[47]. A review of the excavated ceramics from Sohar was designed to address two questions. The first was to help to resolve the issue of Sohar's early chronology, though much of the evidence upon which this is based has already been presented by Kervran (2004) and Mouton (1992) and reviewed by Kennet (2007). Secondly, and perhaps more importantly, the aim was to collect information that could be used to gain some indication of the relative proportion of different varieties of ceramics in circulation and any changes that may have taken place in the composition of this assemblage through the long occupation sequence.

[46] Permission to access the material was kindly facilitated by Biubwa al-Sabri and Monik Kervran. The other sources of assistance I received in this work are described in the acknowledgments.

[47] This was slightly shorter than hoped for, but had to be fitted around the 40th anniversary celebrations for H.H. Sultan Qaboos that were in full swing when I arrived in Muscat.



Fig. 5.4 *Boxes of finds from the French excavations at Sohar stored at the Ministry of Culture in Muscat*.

Finds from the excavations at Sohar can be found grouped together on open racking in one area of the Ministry of Culture store (**Fig. 5.4**). Finds specifically associated with the French excavation project are currently packed inside c.85 boxes the sit alongside finds from other projects[48]. In order to sub-sample this larger collection within the time available, it was necessary to be selective. The ultimate aim of the French archaeological mission was to "determine finally whether one or several pre-Islamic sites named in the written sources…existed" (Kervran, 2004: 270), yet the first two seasons were occupied with

[48] Finds from Sohar fully occupy two rack units, each c.2m wide x 0.6m deep with five shelves each. From the top shelves the boxes continue up to the ceiling, so that the whole stack reaches c.3m high. Across both racks it was possible to count at least 163 medium or large sized boxes. These represent all find categories from the various different archaeological investigations conducted at Sohar, including material from the *Harvard Archaeological Survey*, Peter Farries' unpublished excavations, the *Sohar Ancient Fields Project* and the French excavations. The last two projects account for the largest proportion of material. Almost the whole of one of the two racks is occupied by finds from the excavations at Arja, the water mill and surface collections associated with that project. On the other rack the significant majority of boxes belong to the French excavations.

excavations in and around the main standing monument at the heart of the town: the Hormuzi period fort. Glimpses of the earlier occupation were detected during this work (Kervran, 2004: 270) and looking through the box contents from the first three seasons, it was clear to see that there are earlier residual finds mixed up amongst material dated predominantly to the 17th – 19th century occupation. Disturbance is likely to have been particularly pronounced in the areas excavated against the massive exterior wall of the fort and the deep moat. During the final season in 1986, the focus of the project was shifted elsewhere to the Sohar Town site which offered a deep non-truncated sequence extending back through the major Early Islamic occupation of Sohar, and even to the time of its potential earliest origins and foundation. Unfortunately by ruling out material from the area of the Sohar Moat, the finds associated with the period of Sohar's decline during the 10th or 11th century are excluded. These are, as previously mentioned, only represented in the form of a seemingly contaminated context attributed to Level VI from the area of the Sohar Moat (**Section 4.3.8**).

Despite any potential shortcomings, by focusing only on finds from the 1986 season, it was possible to reduce the sample down to a manageable total of 18 boxes covering the early part of the occupation sequence extending through Levels 0-V. Importantly also, these boxes contain material from uncontaminated contexts. For each of these boxes, the contents was examined thoroughly and each sherd individually recorded in terms of its find locus, ceramic class, vessel form, part (i.e. rim, body, base or handle) and vessel category (i.e. bowl, jar, storage jar, cooking pot or lamp). For the classification and typology, all pottery was recorded according to the classification set out in the IIOCC (**Section 2.3.5**). For the typological characterisation of the Sohar pottery assemblage, it was possible to recognise and record most common vessel forms using a portable type-series printed on a series of index cards (see **Section 2.3.6**).

In total, the sub-sample of 18 boxes selected for detailed recording contained 2,566 sherds. Most of the pottery can be readily associated with class groups already represented within the IIOCC and in total 82 different ceramic classes were recognised within the Sohar sample. A significant portion of the sherds recorded can be linked to their original find locus and phase by different forms of labelling. The majority of boxes are themselves marked with

captions designating general level excavation area or period groupings. More importantly, within the boxes, the majority of finds are stored in bags labelled with the excavation area and unit number. Where finds had fallen out of their bags, the unit number was sometimes retrieved from markings on the sherds themselves. Conveniently the recent publication of the Sohar sequence includes most of the unit numbers associated with each Layer and Level within the Sohar Town excavation, so that a clear periodisation is possible (Kervran, 2004: fig. 6). Unfortunately those finds that can be successfully phased account for just under half of all the sherds recorded (**Fig. 5.5**). Pottery that has been excluded from the analysis has been left out for a number of different reasons. Excavation during the final season actually involved some additional work in the area of the Sohar Moat, and 28% of the sherds recorded from the 1986 season come from this area. A further 14% of the finds have no unit number marking on the sherds or bag labels and therefore cannot be linked back to their original find-spot. Finally, within the Sohar Town finds, 10% have unit numbers marked on the sherds or bag labels which do not appear on the published unit list (Kervran, 2004: fig. 6). Further archival research may be able to account for some of this portion. The remaining sample of 1,217 sherds includes material from 56 of the IIOCC classes.

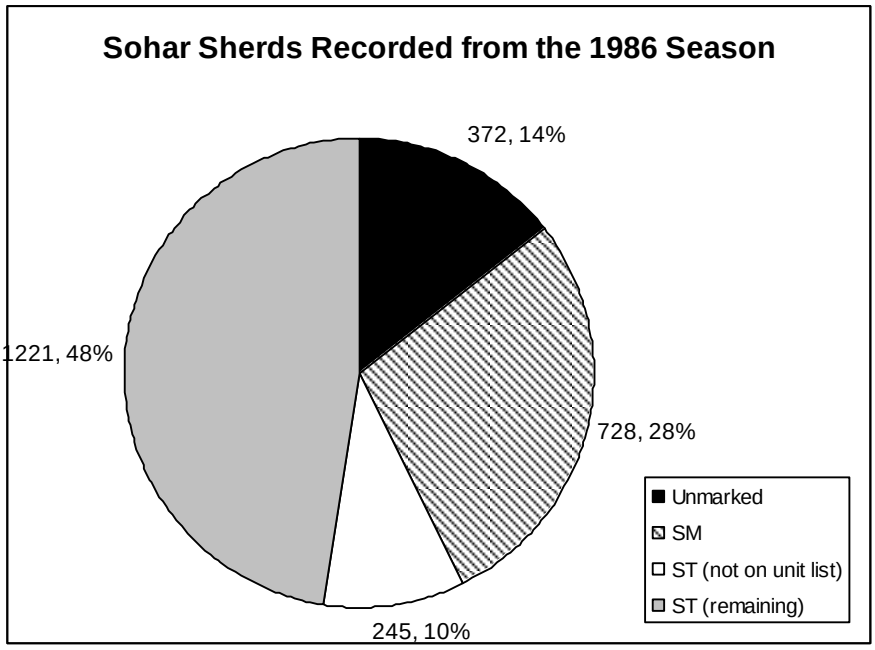


Fig. 5.5 *Breakdown of sherds recorded from the 1986 season of excavation at Sohar stored at the Ministry of Culture in Muscat showing the suitability of the data for the analysis of the Sohar Town sequence. Categories include finds that are unmarked, finds from the Sohar Moat, finds from the Sohar Town but with units not included on the published unit list (Kervran, 2004: fig. 6), and the remaining sample*.

The remaining factor to consider is whether the data recorded from Sohar provide a useful or reliable indicator of ceramic deposition at the site. The first point to make is that as with a number of other assemblages, only sherd counts have been recorded. The time available for research in Oman did not permit the recording of rim percentages for the use of EVEs. In any case, the assemblage is most likely to be too small to enable EVEs to be used effectively. More critically, as has been discussed, the majority of ceramics recovered during the Sohar excavation were immediately discarded without being recorded, and the residue of the assemblage that remains has already undergone various processes of selection. Why individual pieces were selected for retention was presumably influenced by many different and fairly spontaneous decisions. At the same time, what it might at least be possible to assume, is that pieces were selected on the basis of an informed knowledge of what appeared diagnostic, significant and some ways characteristic of each level. Although the actual analysis of the Sohar data-set will be presented and evaluated within the next chapter, it is somewhat surprising and relevant to note here that the Sohar data-set actually appears less skewed than one might anticipate. Measures such as the proportion of glazed to unglazed ceramics actually fall within a range that is potentially credible when viewed alongside better controlled results. Importantly also, the order in which classes appear within the stratified sequence when viewed as a phased seriation, generally conforms with the information available from other sites (**Table 5.16**). This suggests that despite the unsystematic process by which the assemblage was formed, it may actually provide at least a rough approximation of a sequence that is more broadly representative of the site.

The earliest occupation represented from Levels 0-II contains classes which, as has been outlined in detail elsewhere (Kennet, 2007: 97-99), conform closely to the repertoire typically associated with CP2. No obvious markers of the Parthian or Sasanian period were noted amongst the finds that were re-examined. Levels III-IV can be equated with CP3. The ceramic assemblage does not appear to change in any dramatic fashion but certain significant indicators of this late 8th century horizon do occur including most significantly the introduction of applique decorated Alkaline Glazed Ware (TURQ.T/JR5). Perhaps also significant is the declining frequency then termination of Indian Red Polished Ware (IRPW). Level V equates for the most part with CP4. As previously outlined (**Section 4.3.8**), this is clearly delimited by the introduction of Opaque Glazed Wares and other elements of the

Samarra horizon from Layer 12. Level V also witnesses an obvious increase in the quantity of Eggshell Ware and plain or incised White Wares (EGG.PI, WHITE.PI, WHITE.PI). Unfortunately starting from Layer 11 there is clear contamination through the remainder of Level V with an admixture of material associated with CP6 and even later 'Hormuzi period' occupation classes such as KHUNJ and JULFAR. All later phases are contaminated to such an extent that the data from Layer 9 upwards have been disregarded.

	CP2							CP3							CP4					Contaminated						
Level	**0**		**I**		**II**			**III**				**IV**			**V**					**VII**	**IX**			**XI**		
Layer	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	7/8	6	5	3	2	**Totals**
ORGPIN	4	14	3	2	13	1	26	7	22	8	5	22	17	20	13	7	4	10	6		1	1				206
CW.N-ID	3	6	11	1	3	2	20	7	15	2	2	11	5	7		3	7	11	9	9	12	18	12	43	10	229
IRPW	1	4	2	3	6		6		1		1	1														25
TURQ.T		7	4	1	5	1	7	2	7	8	1	9	8	7	4	3	6	15	10	2						107
BUFRAB		6		1	2		1			1			4		4		1	2	5			1				28
INCOP		4	1	2	6	1	14	8	5	2	2	4	4	14	1	4		5	3	2	6			1		89
SBBW		2		2		4	9	2	2	1		7	5	10	4	15	5	8	5		1					82
CONG.G		1	1		1			1	2																	6
LINVES		1	1		2	1	4	1		3	1	1	1	3		5	1	2	1							28
GW.N-ID		1						1									1	1	3	3	3	5	1			19
TORP.S			1	1	3		1	1	1	1			1													10
REBROS				1															1	3		3	1			9
HARMIC					1		2		1			1										1				6
BRISAN					1		1								1			3								6
WHITE.PI							1		1	2		7	4	18	10	22	21	23	2	1						112
WHITE.A							1			2				12	1		2	1								19
EGG.PI							1								1	1	1	3	5							12
IRPW.RC							1		1																	2
HARLIM									2	1		1														4
EACOP									1										1							2
BUFF.I										1		2		1		1	4		2							11
TRC										1																1
TORP.RG																2		1								3
CREAC																1			1							2
FIBIC																1						1				2
BUFF.P																	1									1
HONEY																	1									1
OPAQ.TS																	1									1
STONE.GU																	1									1
DUSUN																		2	2	4						8
CHANG																		1	1							2
CHAMP																		1								1
GRAF.H																			1	2						3
GRAF.LP																			1	1	1	1				4
YUE.3																			1	1						2

	CP2							CP3							CP4					Contaminated						
Level	**0**		**I**		**II**			**III**				**IV**			**V**					**VII**	**IX**			**XI**		
Layer	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	7/8	6	5	3	2	**Totals**
MONO.G																			1		1					2
KHUNJ																		1	8	13	14	14	3	5	2	60
JULFAR																			2	9	6		6	8	9	40
FRIT.BW																				5	2					7
REDYEL																			1	5	1	2				9
MONTUR																				5						5
CBW																				3	2	7		4	1	17
SPECLE.2																		1		1	1	1				4
MGPAINT.2																				1				1		2
FRIT.EM																				1						1
STONE.THAI																				1						1
WW																				1						1
UGP									1										3		1	1		3		9
JULFAR.PB																			1		1					2
EAST.N-ID																					1					1
FRIT.N-ID																					1					1
GRAF.LY																					1					1
STONE.BG2																					1					1
ENAM																			1			2		2		5
FRIT.UGP																		1	1			1				3
LQC																						1				1
Totals	8	46	24	14	43	10	95	30	62	33	12	66	49	92	39	65	57	92	78	73	57	60	23	67	22	1217

Table 5.16 *Phased seriation of the ceramic finds from the Sohar Town excavation with classification and sherd totals recorded from the finds held in the Ministry of Culture in Muscat. Figures highlighted in grey occur out of their expected sequence and may be intrusive or erroneously classified*.

5.2.9 Manda – Kenya

The publication of ceramic finds from Manda divides the assemblage into two broad groups of locally manufactured and imported pottery, each of which was handled with a somewhat different methodology. Local pottery is presented as a single, largely continuous ceramic tradition with a subtly shifting form repertoire and significant emphasis placed on stylistic groups defined by different forms of surface decoration (Chittick & Tobert, 1984: 108-51). Imported ceramics are presented in a logically ordered descriptive format essentially as class groupings defined on the basis of combined attributes of fabric, surface treatment and vessel forms (Chittick, 1984: 67-105, pls. 23-42). Each group is selectively illustrated with black and white photographs and fine quality line drawings in the conventional schematic format. The publication provides a useful account of the range of material represented at the site coupled with basic figures of the quantities of different varieties of ceramics recovered (**Fig. 5.6**). Unfortunately the published quantification has a number of deficiencies that limit its ultimate potential.

- No quantification is provided for locally manufactured pottery. Only a rough estimate is provided for the total number of sherds recovered (Chittick, 1984: 65). This inhibits the ability to accurately assess the overall proportion of pottery represented as imports or measure changes in the frequency of imports through the occupation sequence.
- The imported pottery covering the entire span of the late 8th/early 9th - c.15th centuries is broken down into only 27 categories and with no quantitative information provided for vessel forms. The categories employed are, as a result, fairly broadly defined, and could be significantly improved upon with further study.
- The quantitative breakdown provided showing sherd yields for the imported classes indicates the main period with which each category is associated, but does not include the actual breakdown of the number of sherds by period and class. As a result, the publication does not enable one to appreciate how the frequency of any particular category may have changed through time. In addition the periods indicated only cover the major stages of Periods I-V and

do not include the more refined chronology discussed within the text, which includes four sub-periods within Period I (Periods Ia-d). This is particularly critical to the interpretation surrounding the foundation of Manda, which contains Middle Eastern and Chinese ceramics imports in Period Ia that pre-date the early 9th century introduction of 'Samarra horizon' classes that are first represented from Period Ib (Chittick, 1984: 77).

Appendix II

COUNTS OF IMPORTED POTSHERDS AND GLASS FRAGMENTS

A. Pottery

The following list sets out the numbers of imported sherds, as recorded, together with an attempt to assess the approximate total number of vessels involved, and the proportions of the main categories. This assessment of the number of vessels is based chiefly on the number of base fragments of different vessels. It is not suggested that all or even the majority of the fragments of a given vessel are present in the soil excavated. Pottery thought to be of Indian origin is excluded.

	No: of Sherds	% of all imported sherds	Estimated no: of vessels	Estimated proportion of vessels as % of all imported
Chinese wares*				
Early ('Dusun') stoneware jars (I: 7%)	288	2.08	40	2.4
Yueh stoneware bowls (I: 3%)	57	0.41	19	1.1
Painted stoneware (I: 1.5%)	20	0.14	9	0.5
White porcelain/porcellaneous stoneware (I: 2.5%, II: 1.5%)	215	1.55	22	1.3
Ching Pai (II)	51	0.36	16	0.9
Te Hua (II)	9	0.06	9	0.5
Later stoneware jars (II-IV)	94	0.67		
Celadon	244	1.76	57	3.4
Blue-and-white (III, IV, mostly V)	40	0.28	13	0.7
Islamic glazed wares				
Sasanian-Islamic (I: 26%)	c. 3200	c. 23	145	8.6
White-glazed (I: 30%)	467	3.37	171	10.2
White-glaze + colour (I: 18%)	319	2.3	102	6.0
Lustre (I: 2%)	57	0.41	12	0.7
Mottled splashed (I: 6%)	104	0.75	32	1.9
Green-and-white (I: 1%)	5	0.03	5	0.3
'Piped Icing' (I: 1%)	6	0.03	5	0.3
Sgraffiato (II/III - at say 3:2)	c.2000	c.15	576	34.3
E. Persian (II)	68	0.49	28	1.6
Black-on-yellow (III)	375	2.79	90	5.3
Islamic monochrome (IV-V)	350	2.52	50	2.9
Manganese purple (V)	37	0.26	5	0.3
Misc. earlier Islamic (see p. 81)	12	0.1	12	0.7
Misc. later Islamic (see p. 81)	14	0.1	14	0.8
Unidentified Islamic glazed	196	1.41	20	1.2
Islamic unglazed				
Red/pink wares	c.2200	c.16	32	1.9
Buff/greenish-buff cream jars	c.2200	c.16	80	4.7
Fine cream wares (incl. 'gudulia' ware)	1122	8.10	124	7.3
Total	c.12616		c.1676	

*The period of the ware concerned is shown in parentheses, followed in the case of wares of Period I by the estimated proportion of the ware concerned to the total glazed wares of that period.

Fig. 5.6 *Published pottery quantification for the ceramic assemblage recovered during excavations at Manda (after Chittick, 1984: 225)*.

In order to address the issues with the published classification and quantification of pottery from Manda, a programme was initiated in preparation for this study to re-record the excavated assemblage. During the space of nine days, between the 18th to 28th of March 2010, it was possible to work through all of the imported ceramic

finds from the excavations stored in the National Museums of Kenya headquarters in Lamu (Priestman, 2010a). These are currently housed in a storeroom in Lamu fort in large plastic bags, which are themselves separated into two stacks: one of locally manufactured pottery and the other of imports (**Fig. 5.7**). Due to time constraints, none of the bags in the locally manufactured stack were examined. In the second stack there are 67 bags of pottery containing a total of 13,670 individual sherds. The contents of these bags indicate that the assemblage has already been subjected to different forms of sorting processes. Some represent partially sorted categories associated at a broad level, such as Alkaline Glazed Wares, Sgraffiato or imported unglazed pottery. Other bags seem to be entirely mixed and it not clear how they were formed. Each individual sherd is marked with the excavation area and level or context. In many cases these markings are still legible and could be used to locate the finds within the excavations.



Fig. 5.7 *Imported ceramic finds from Manda stacked in bags in a storeroom at the National Museums of Kenya headquarters in Lamu Fort, Kenya in 2010*.

Intermixed amongst the imported pottery are a fairly substantial number of locally manufactured sherds (2,449 pieces). These were recorded according to two categories: a generic locally manufactured group (LOCAL) and a second category of locally manufactured imitations of imports (LOCAL (IMIT)). The latter represents a group with a particularly sandy, friable fabric, often coated with a thick white slip and always closely imitating vessel forms and modes of decoration found in association with imported Siraf area coarse wares (CREAC, REBROS and HARLIM). This category of material has been discussed briefly by Horton (1996b: 258, 260, fig. 180), but warrants further consideration. The fact that locally manufactured sherds occur intermixed with those set aside as being imported, raises the very real possibility that there are further imported sherds contained within the other stack too. If there are such sherds then they are unlikely to be glazed wares. Those categories most likely to remain intermixed are Siraf area coarse wares (particularly body sherds of smaller vessels) and Indian pottery (particularly dark grey or brown firing SBBW, which does not stand out clearly from other local handmade cooking wares).

The purpose of physically checking and re-recording the imported ceramic finds from Manda, was to provide a complete sherd count of the different ceramic classes and vessel types represented across the assemblage. This can be used to provide a more detailed quantitative assessment of the assemblage composition and of the relative frequency of different categories of material at the whole assemblage level. In total 13,665 individual sherds were recorded from the bags containing predominantly imported pottery. Once one removes from this figure the 2,449 sherds of locally manufactured pottery and the 115 fragments of steatite vessels, the remaining body of imports comes to a total of 11,101 sherds. This is just 12% less than the total number of imported sherds enumerated by Chittick (**Fig. 5.6**). This reduction in the assemblage can probably be accounted for by a quantity of sherds that were transferred from Lamu to the main regional archaeological store in Mombassa, a few pieces of which can be seen on display in Fort Jesus Museum[49]. Despite not having

[49] Personal observation, 2010.

been able to record this additional component of the assemblage, the figures provided from the assemblage in Lamu suggest that at least for imports, all sherds were retained from the excavation, and that the significant majority of pieces have been covered by this review.

The relative completeness of the archived collection of ceramic finds from Manda, and the fact that it has been possible to directly record these finds on an individual sherd basis, gives Manda particular advantages over most of the other site assemblages covered within this study. In particular, the data-set includes an itemised breakdown of the numbers of sherds associated with each recognised vessel type, ceramic class and vessel portion (**Table 5.17**). The link to the IIOCC is also direct and not mediated by the vagaries of interpreting published class descriptions. Whatever loss of material has occurred appears from these figures to be relatively minimal and for imports at least, the policy appears to have been for complete retention of finds from the excavation. At the same time, it is important to note that the information obtained for the ceramics from Manda at this point is still limited in one fundamental respect. Time and resources available for the assemblage review undertaken in 2010 did not permit the recording of individual find spot markings, and instead the assemblage was simply treated as a single large batch. The time investment required to record sherds individually clearly does remain potentially worthwhile, provided adequate records are available to link the markings on sherds to particular excavation contexts and their associated phase or period. Without this information all we have is a single amorphous body of data covering the entire occupation sequence from Manda running from the late 8th to 15th centuries, though with a particular concentration of finds belonging to the major phase of activity at the site which appears to have occurred between the 9th and 10th centuries.

Class	Name	Date	Origin	Sherds
BRISAN	Brittle Sandy Painted Ware	8thC - 10thC	South Asia	7
BUFF.I	Incised Decorated Buff Coloured Ware	10thC - 12thC	Iraq	166
BUFF.S	Stamp Decorated Buff Coloured Ware	10thC - 12thC	Iraq	1
BUFRAB	Buff Red & Black Ware	9thC - 10thC	India	14
CBW	Chinese Blue and White	14thC - 19thC	China	43
CHAMP	Champlevé Ware	Mid-11thC - 13thC	Tiz	125
CHANG	Changsha Ware	Mid-8thC - Early 10thC	Changsha	1
CHIN	European China	18thC - 19thC	Europe	4
CREAC	Cream Coated Red Ware	Late 8thC - 10thC	Siraf	194
CREAC [LISV]	Cream Coated Red Ware (Large Incised Storage Vessels)	Late 8thC - 10thC	Siraf	22
CW.N-ID	Non-Identified Coarse Ware	?	?	1343
DUSUN	Green Glazed 'Dusun' Ware	Late 8thC - 11thC	Guangdong	192
EGG.PI	Plain or Incised Eggshell Ware	8thC - 10thC	Iraq	336
EAST.N-ID	Far Eastern, Non-Identified	?	East Asia	72
FIBIC	Fine Incised Buff Coloured Ware	9thC - 12thC	Iran, South	13
FRIT.BL	Blue-Glazed Frit with Gold Lustre	12thC - 13thC	Kashan	4
FRIT.EM	Early Monochrome Frit	12thC - 13thC	Iran, South	3
FRIT.N-ID	Non-Identified Frit	Mid-11thC - 16thC	Iran	1
FRIT.UGP	Underglaze-Painted Frit	14thC - 16thC	Iran, South	7
GRAF.D	Degraded Late Sgraffiato	Mid-11thC - 13thC	Iran, South	119
GRAF.DI	Deeply Incised Sgraffiato	12thC - 13thC	Iran, South	1
GRAF.EG	Early Monochrome Green-Glazed Sgraffiato	Early 10thC - Mid-11thC	Iran, South	1
GRAF.EP1	Early Polychrome-Glazed Sgraffiato, Group 1	Early 10thC - Mid-11thC	Iran, South	4
GRAF.EP2	Early Polychrome-Glazed Sgraffiato, Group 2	Early 10thC - Mid-11thC	Iran, South	9
GRAF.GW	Green and White Sgraffiato	12thC - 13thC	Iran, South	77
GRAF.GYB	Green, Yellow and Brown Polychrome Sgraffiato	12thC - 13thC	Iran, South	226
GRAF.H	Hatched Sgraffiato	Mid-11thC - 12thC	Tiz	390
GRAF.LG	Late Monochrome Green-Glazed Sgraffiato	12thC - 13thC	Iran, South	172

Class	Name	Date	Origin	Sherds
GRAF.LP	Late Polychrome-Glazed Sgraffiato	11thC - 13thC	Tiz	5
GRAF.LY	Late Monochrome Yellow-Glazed Sgraffiato	11thC - 13thC	Iran, South	93
GRAF.M	Mustard Yellow Sgraffiato	12thC - 13thC	Iran, South	31
GW.N-ID	Non-Identified Glazed Ware	?	?	737
HARLIM	Hard Lime Spalled Ware	6thC - 8thC	Iran, South	74
HARLIM [LISV]	Hard Lime Spalled Ware (Large Incised Storage Vessels)	6thC - 8thC	Iran, South	22
INCOP	Non-Identified South Asian	?	South Asia	69
KHUNJ	Khunj Ware	14thC - 17thC	Band-e Kong	16
LINVES	Large Indian Storage Vessels	8thC - 10thC	India	5
LQC	Longquan Celadon	Late 13thC - 15thC	Longquan (area)	10
MONO.G	Monochrome Green Glazed Ware	11thC - 13thC	Iran, South	212
MONO.Y	Monochrome Yellow Glazed Ware	11thC - 13thC	Iran, South	124
MTB.1	Martaban Jars	14thC - 17thC	Southeast Asia	249
OPAQ.BT	Bichrome Black on Turquoise Opaque-Glazed Ware	Mid-9thC - 10thC	Iraq	1
OPAQ.C	Cobalt Decorated Opaque-Glazed Ware	Mid-9thC - 10thC	Iraq	8
OPAQ.CP	Colour Painted Opaque Glazed Ware	Early 9thC - 10thC	Iraq	20
OPAQ.LG	Monochrome Gold Lustre Opaque Glazed Ware	Mid-9thC - 10thC	Iraq	37
OPAQ.LP	Opaque-Glazed Ware with Polychrome or Ruby Lustre	Mid-9thC - 10thC	Iraq	7
OPAQ.LR	Monochrome Ruby Lustre Opaque Glazed Ware	Mid-9thC - 10thC	Iraq	7
OPAQ.N-ID	Degraded Opaque Glazed Ware	Early 9thC - 10thC	Iraq	117
OPAQ.PS	Polychrome Splashed Opaque-Glazed Ware	Mid-9thC - 10thC	Iraq	23
OPAQ.T	Monochrome Turquoise Opaque-Glazed Ware	Mid-9thC - 10thC	Iraq	12
OPAQ.TS	Turquoise Splashed Opaque-Glazed Ware	Early - Mid 9thC	Iraq	265
OPAQ.W	Monochrome White Opaque-Glazed Ware	Early 9thC - 10thC	Iraq	492
QING	Qingbai Ware	11thC - 13thC	Jiangxi	1
REBROS	Gritted Red/Brown Slipped Ware	Late 8thC - 10thC	Siraf	802
REBROS [LISV]	Red/Brown Slipped Ware (Large Incised Storage Vessels)	Late 8thC - 10thC	Siraf	611
SBBW	Soft Black Burnished Ware	7thC - 9thC	India	24

Class	Name	Date	Origin	Sherds
SPECLE.1	Green/Blue Speckled Ware	14thC - 17thC	Iran, South	189
SPLASH.GW2	Green & White Splashed Glazed Ware, Group 2 - Oran	Mid-9thC - 10thC	Iran, South	8
SPLASH.P1	Polychrome Splashed Glazed Ware, Group 1 - Cream B	Mid-9thC - 10thC	Iraq	31
SPLASH.P2	Polychrome Splashed Glazed Ware, Group 2 - Orange	Mid-9thC - 10thC	Iran, South	89
SPW.N-ID	Slip Painted Ware	Mid-11thC - 13thC	Iran, Sistan	54
STONE.EU	European Stoneware	18thC - 19thC	Europe	3
STONE.GRY	Grey Glazed Stoneware	13thC - Mid-14thC	China	1
TORP.RG	Red Grit Tempered Torpedo Jars	Mid-8thC - 10thC	Iraq	162
TORP.S	Sandy Torpedo Jars	5thC - Mid-8thC	Iraq	10
TURQ.T	Turquoise Alkaline-Glazed Ware	Late 8thC - Late 10thC	Iraq	2740
UGP	Underglaze-Painted Ware	15thC - 17thC	Iran, South	57
WHITE.M	Moulded White Coloured Ware	12thC - 13thC	Iraq	17
WHITE.PI	Plain or Incised White Coloured Ware	Mid-8thC - 12thC	Iraq	91
WW	White Ware	10thC - 13thC	China	14
WWSL	White Slipped Ware	Mid-9thC - 10thC	Henan	2
YEMEN	Yemeni Yellow	Mid-13thC - 15thC	Yabid	8
YUE	Yue Ware	9thC - 11thC	Shanglinhu	1
YUE.3	Yue Ware, Group 3	9thC	Shanglinhu	3
Total				11101

Table 5.17 *Imported ceramic assemblage from Manda showing total number of sherds for each class recorded from the finds held in Lamu Fort in 2010*.

5.2.10 Shanga – Kenya

Shanga represents a pioneering study within the context of Indian Ocean archaeology in being the first site from anywhere across the entire region to present a full quantitative breakdown of the excavated ceramic assemblage, coupled with clear logical phasing and a systematic class-based classification (Horton, 1996b). Quantification from Shanga is based purely on sherd count. The largest and most important sample of material comes from the four contiguous trenches excavated within the centre of the town to the west of the Friday Mosque (Tr 6-10). In total Tr 6-10 covers a combined area of 476m² with a yield of 135,536 stratified sherds spread across 21 individual phases (Horton, 1996b: 116, tables 9, 14). Of this total, 5.6% of the pottery is made up of imports. The imported pottery from Tr 6-10 is sub-divided into 66 different class categories. Each class is accurately described with close attention to the main variables of fabric, surface treatment and vessel form. Enough detail is provided in most cases to reliably identify the published class groupings.

In order to check the integrity of class groupings described within the publication and precisely how they correlate with the repertoire of classes defined within the IIOCC, a review of the excavated finds from Shanga held at the National Museums of Kenya headquarters in Lamu was undertaken in preparation for this research in 2010. The process of class checking was made significantly easier by the fact that the ceramics from Shanga are stored in the class groupings in which they are published, rather than by excavation context. This makes it relatively quick and easy to check the class categories for consistency and identification. A review of all imported ceramics was completed over the duration of three days.

Group	Name	Equivalent To	Notes
1a	Sasanian-Islamic (blue/turquoise int/ext)	TURQ.T	No need to sub-divide turquoise alkaline-glazed wares based on internal and external colour or changes in tone of turquoise
1b	Sasanian-Islamic (blue ext/black int)		
1c	Sasanian-Islamic (blue ext/cream int)		
1d	Sasanian-Islamic (blue ext/green int)		
1e	Sasanian-Islamic (blue ext/reddish int)		
2a	Plain White Glaze	OPAQ.W	A significant proportion (perhaps as much as 42%) of the class may actually be EGG.PI
2b	Blue Splashed	OPAQ.TS (some OPAQ.C, OPAQ.PS)	2b contains 1 sherd of OPAQ.C but otherwise all OPAQ.TS. 2c contains a mixture of OPAQ.PS and OPAQ.TS with post-depositional brown staining
2c	Green-Brown Splashed		
2d	Yellow Splashed	OPAQ.LG (also OPAQ.LR, OPAQ.LP)	Almost all degraded gold lustre
3	Samarra Lustre		Includes monochrome gold and red and polychrome lustre
4a	Lead-Glazed Polychrome (pink fab., green glaze, brown splashed)	SPLASH.P2 (some SPLASH.P1)	4a-c sub-divided on the basis of glaze and splashed colours, all actually fall with the normal range of variation of the SPLASH tradition
4b	Lead-Glazed Polychrome (pink fab., yellow glaze, brown splashed)		
4c	Lead-Glazed Polychrome (unglazed int., blue splashed ext.)		
4d	Lead-Glazed Polychrome (buff fabric, incised lines)	GRAF.EP1	
5a	Late Sgraffiato - Hatched	GRAF.H	
5b	Late Sgraffiato - Champlevé	CHAMP	
5c	Late Sgraffiato - Brown Splashed	GRAF.GYB	5d is a type variant within the same class
5d	Late Sgraffiato - Polychrome		
5k	Late Sgraffiato - Hard Yellow	GRAF.LY	
5e	Late Sgraffiato - Hard Brown	MONO.Y	5e probably just minimally slipped
5l	Late Sgraffiato - Plain Yellow		
5f	Late Sgraffiato - Green Decoration	GRAF.LG	5g is a decorative scheme within the same class
5g	Late Sgraffiato - Green Floral		
5h	Late Sgraffiato - Plain Green	MONO.G (some GRAF.LG)	Includes some GRAF.LG
5o	Late Sgraffiato - Storage Jars		Type variant within class
5r	Late Sgraffiato - Moulded		Type variant within class
5j	Late Sgraffiato - Simple Yellow	GRAF.M (some GRAF.LY)	Group includes freckled yellow pieces (GRAF.M) and some plain golden yellow (GRAF.LY)
5p	Late Sgraffiato - Carved	GRAF.DI	
5i	Late Sgraffiato - Thin Slipped	GRAF.N-ID	5i Very poorly defined category spread across MONO.G, GRAF.LG, MONO.Y, GRAF.LY, GRAF.H, GRAF.GYB. 5m mixed category spread across GRAF.GYB, GRAF.GW, GRAF.LG, GRAF.LY. Characterised by a style of incised decoration rather than glaze colour
5m	Late Sgraffiato - Yellow Scribble		
5un	Late Sgraffiato - Non-diagnostic		
5n	Late Sgraffiato - Slip Dotted	SPW	
5q	Late Sgraffiato - Finger Impressed	GW.N-ID	Possibly Red Sea Sgraffiato
6	Green-Glazed Incised		Red Sea Sgraffiato?
7a	Black-on-yellow (wavy lines)	YEMEN	Seemingly no need to sub-divide the tradition based on decorative content as proposed
7b	Black-on-yellow (arcading lines)		
7c	Black-on-yellow (pendant triangle lines)		
8a	Underglaze painted polychrome (dark- and light-blue)	UGP	Certainly within the UGP tradition, not clear if these are necessarily Persian Gulf exports
8b	Underglaze painted polychrome (green-and-brown)		
9a	Green Monochrome	SPECLE.1	
9b	Clear Monochrome	SPECLE.2	Some of 9b may actually be SPLECLE.1, 9c is certainly all equivalent to SPECLE.2
9c	Blue Monochrome		
10	Islamic fritwares (Seljuk)	FRIT.EM	Description consistent with Early Monochrome Frit
11a	Pale green earthenware	BUFF.I	Class actually includes TORP.RG and BUFF.I
11b	White-slipped coarse pink earthenware	CREAC	11c simply described smaller vessels with correspondingly finer fabric
11c	Fine pink earthenware		

Group	Name	Equivalent To	Notes
11d	Brittle ware	HARLIM	
11e	Red-slipped earthenware	REBROS	
12	Fine creamwares	EGG.PI (some WHITE.PI)	Illustration indicates that larger (WHITE.PI) and smaller vessels (EGG.PI) are grouped together
13	Gudulia (water jars)	WHITE.M	
14	Miscellaneous unglazed wares	CW.N-ID	
15	Grass-tempered greyware	INCOP	Similar to SBBW but later dated
16	Grog-tempered maroonware		No known parallels from the Persian Gulf
17	Red-slipped orangeware		Similar to BUFRAB but later dated
18	Decorated redware		No known parallels from the Persian Gulf
19	Changsha painted stoneware	CHANG	
20	Olive-green glazed jars	DUSUN	
21	Martaban jars	MTB.1	Not certain these are the same production as those represented in the lower Persian Gulf
22	Yue stoneware	YUE	
23	Sage-green glazed greenware	LQC	23 and 25 most likely part of the LQC assemblage as acknowledged in the text
24	Longquan greenware		
25	Light-brown-glazed greenware		
26	Ding ware	WW	More likely from southern China than Ding
29	White porcelain		
27	Qingbai glazed ware	QING	
28	Moulded whiteware	DEH	
	Local pottery	EACOP	

Table 5.18 *Class concordance between the published ceramic classification from Shanga (Horton, 1996b) and the class categories represented in the IIOCC.*

Based on a combination of the published descriptions and illustrations, and the information obtained during the collection review, an attempt has been made to correlate the published class groupings from Shanga with those recognised within the IIOCC (**Table 5.18**). The best match that can be obtained results in a reduction of the range of class categories defined across the assemblage from 66 classes to 39. The reduction is caused by different sorts of factors. In some cases, classes appear to have been unnecessarily over sub-divided in the Shanga publication. For example alkaline-glazed wares are sub-divided into five sub-classes based on differences in the shade of turquoise glaze and particularly internal glaze colours. The studies of alkaline-glazed wares completed elsewhere indicate that such fluctuations are caused simply by differences in levels of glaze degradation – or particularly for internal colour – differences in the glaze reduction cycle. In other cases, there are classes that are not well represented within the existing IIOCC either because of their dating or place of origin. Examples include the four categories of relatively late dated Indian imports (Groups 15-18) or three categories of Red Sea sgraffiatos, which are not represented elsewhere within the study area (Groups 5q, 5s, 6). In cases where classes are unfamiliar, they have

been placed within the most appropriate generic non-identified groupings. Finally, there are classes defined in the Shanga study that proved upon re-inspection to be inconsistent and poorly defined. In the worst cases (for example Groups 5i and 5m), the classes have been reclassified as non-identified groups. In other cases where the blurring or contamination does not appear to be so serious, some imprecision has been noted but ignored (see for example Groups 5j or 12). Using the modified class categorisation structure that matches up the recorded and published class groupings from Shanga against the scheme developed through the broader IIOCC (**Table 5.18**), it is possible to provide an adjusted version for the phased seriation of the quantified ceramic assemblage (**Table 5.19**). These figures can be compared directly to those available from other quantified assemblages within the western Indian Ocean.

	CP3	CP4				CP5		CP6														
IIOCC Class	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**Totals**
EACOP	1371	1545	3970	3930	2527	1046	1171	1730	2801	2479	8225	14976	16334	10413	11369	9659	8093	5984	5574	8660	6395	128252
TURQ.T	24	22	46	74	49	15	20	16	32	18	54	59	68	41	28	25	13	4	5	2	3	618
EGG.PI	21	4	27	31	23	4	4	3	6	4	13	7	1			2					1	151
BUFF.I	5	18	33	23	39	17	16	10	20	24	37	21	17	6	9	1	2	4	6	4	4	316
CHANG	2		4	2	6																	14
CREAC	1	5	2	2	3	1	4	2	2	6	25	12	7	12	3	2	1	2	1	2	3	98
DUSUN	1			1			2				1		2				1				1	9
OPAQ.W		19	8	12	9	14	4	2	9	5	23	30	5	2	6			1	2	1	1	153
OPAQ.TS		9	3	4	1	2	5	1	13	4	5	15	6	2	1	1		1		1	1	75
OPAQ.LG		1	5	3	3	1	2	1	3	1	3	2	2		1	1	1					30
HARLIM		1		3		3		2	1	1	3		2									16
YUE				3		1	1		2		2	7	8	6	1							31
SPLASH.P2						1			2		2	11	5	6	12	7	8	1	4	3	2	64
REBROS								2			7	1										10
FRIT.EM								1														1
GRAF.N-ID									8	4	73	109	148	135	137	90	88	38	24	21	8	883
GRAF.LY									3	1	13	20	23	13	15	13	6	1	4	2		114
INCOP									2		3	8	50	48	35	36	49	9	17	23	19	299
GRAF.LG									1	1	28	33	53	44	42	46	44	8	20	6	6	332
WW									1		4	1	2									8
GRAF.H										3	137	255	242	170	89	37	21	11	5	6	2	978
GRAF.GYB										3	43	81	78	86	80	66	32	7	10	6	3	495
MONO.Y										2	17	69	68	40	39	28	25	14	4	2	2	310
GRAF.M										1	11	11	25	31	18	17	16	5	6	5	4	150
SPW										1	6	1			1							9
MONO.G											16	60	90	108	96	69	70	27	28	20	6	590
CHAMP											14	44	68	50	66	67	33	8	2	4	3	359
WHITE.M											5	116	27	8	2	2	2	7	2	9	7	187
CW.N-ID											5	5	5	11		1	2	1	1	1	1	33
GRAF.DI											2		4	2	2	2	2					14
MTB.1											2	4	3	3	7	2	8	2	9	15	14	69
QING											1	3	7	4	7	1	2		2	1	1	29
GW.N-ID													2	3	4	5	1	0	11	2	2	30
GRAF.EP1													1									1
SPECLE.1														1		8	5	30	55	109	149	357
DEH														1		1		1		1		4

	CP3	CP4				CP5		CP6													
IIOCC Class	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**Totals**
YEMEN															10	43	67	86	71	84	54	415
UGP																7	3	3	9	14	17	53
LQC											2	2	1			5	14	20	35	58	45	182
SPECLE.2																	2	4	11	31	49	97
Tot. Pottery	1425	1624	4098	4088	2660	1105	1229	1770	2906	2558	8782	15963	17354	11246	12080	10244	8611	6279	5918	9093	6803	135836
Tot. Imports	54	79	128	158	133	59	58	40	105	79	557	987	1020	833	711	585	518	295	344	433	408	7584
% Imports	3.8	4.9	3.1	3.9	5.0	5.3	4.7	2.3	3.6	3.1	6.3	6.2	5.9	7.4	5.9	5.7	6.0	4.7	5.8	4.8	6.0	5.6

Table 5.19 *Phased seriation of the ceramic assemblage from Shanga recalculated with class categorisation modifications implemented from the assemblage review. Values highlighted in grey appear out of expected sequence and are most likely intrusive or incorrectly classified (after Horton, 1996b: tables 9 & 14).*

As at Manda, the earliest occupation at Shanga in Phase 1 is marked by a horizon of ephemeral wooden structures and Middle Eastern and Chinese ceramic imports typical of CP3 such as TURQ.T/JR5, CHANG and DUSUN (Horton, 1996b; 1996a: 441-42). From Phase 2, the chronology is clearly delimited by the introduction of Opaque Glazed Wares marking the entry of CP4. The early chronology of Shanga then appears to flatten out and become more difficult to define. Even in Phase 2, there is no indication of the staged introduction of early and late elements of the 'Samarra horizon' as there is for many sites within the Middle East (for example Whitehouse, 1979b; Kennet, 2004: table 3). Here OPAQ.W, OPAQ.TS and OPAQ.LG all appear within the same phase (**Table 5.19**). Through the remainder of CP4, timber buildings continue to be renewed and few new categories of imported ceramics appear. CP5 is marked my dramatic architectural changes across the site with earlier timber buildings cleared and replaced by monumental construction in *porities* coral bound with red mud. However, the main components of the imported ceramic assemblage remain largely unchanged and the most obvious indication of a 10th century dating for Phases 6 and 7 is the disappearance of Changsha Ware (CHANG). The end of CP5 and beginning of CP6 is clearly marked within the ceramic sequence by the first introduction of Early Monochrome Frit (FRIT.EM). Perhaps also significant is a slight but permanent drop in the proportion of TURQ.T from 1.5 – 0.9% of the assemblage across the Phase 7/8 interface. CP6 then continues up to Phase 14 with the introduction of an increasing range and volume of Late Sgraffiatos. Phase 11 in particular is marked by a sudden jump in the volume of all varieties of ceramics recovered and total proportion of imports. The end of CP6 is marked most clearly in the following Phase 15 which sees the introduction of Yemeni Yellow (YEMEN) from the late 13th century followed not long after by a growing body of Longquan Celadon (LQC).

5.2.11 Sanjan – India

In a number of respects, the investigation at Sanjan and particularly the associated ceramic study represents a unique achievement within Indian archaeology (Nanji, 2007; 2011: 23). In general there has been a clear tendency in South Asian archaeology for the medieval period to be undervalued or neglected entirely, and often deposits containing glazed ceramics have simply been dug through and ignored in order to reach older occupation horizons (Allchin,

1995: 6-7; Mate, 2005). Sanjan is unusual in being specifically targeted as an investigation of an Islamic period site. In terms of the ceramic study, Nanji has for the first time attempted to provide a comprehensive and detailed class-based classification of the full spectrum of local and imported ceramics in South Asia, tied directly to the recent literature on ceramics from the Persian Gulf, particularly Kennet's work at Kush (2004). Sanjan also represents the first published example of a quantitative study of medieval ceramics from India. For these reasons, Sanjan opens up new possibilities for cross-regional quantitative analysis.

Unfortunately despite the important advances represented by the archaeological study at Sanjan, there are also significant problems that impede the potential use of the data. Nanji herself is explicit in stating some of the various shortcomings. Because of limitations imposed by modern land-usage, the areas opened for excavation were small, and this inhibited understanding of the structural sequence encountered (Nanji, 2011: 13). More significantly, the excavation was completed in arbitrary spit levels rather than by following stratigraphic contexts. Consequently there is some confusion in the attribution of deposits to the correct level from which they derive, particularly in areas of deep cuts such as pits and wells. These problems are so acute that the finds from the largest excavation area on the Sanjan Bandar from TT1-TT2 (Test Trenches 1 and 2) "have not been used for detailed analysis due to their disturbed stratigraphy and problematic layer identification" (Nanji, 2011: 169). Likewise material from Koli Khand, TT3 and the Sanjan Dakhma have all been excluded from the quantitative analysis because of the disturbed nature of stratigraphy from these areas.

The single deep sounding used for the purposes of analysing the ceramic sequence also contains specific problems. TT4 is a 5 x 5m sounding excavated in four separate quadrants. Of the four 2.5 x 2.5m blocks, the southwest quadrant has to be virtually excluded as the fill of a deep well was not consistently distinguished from the surrounding deposits (Nanji, 2011: 169). To get around this problem, different sets of figures are presented including or excluding the figures from the southwest quadrant (Nanji, 2011: 172, tables 4.2-7). For the other quadrants, each block was excavated down to a different depth. Both the northwest and southeast quadrants were halted early at just over 1m below the surface when solidly constructed brick structures were encountered. Only the northeast quadrant was excavated

down to sterile soil 3.86m below the surface. Added to this, the top two or three levels represented in the three remaining quadrants all occur at different elevations (Nanji, 2011: 172). Although the stratigraphic levels encountered may have sloped across the excavation area, within such a small trench, it seems unlikely that any substantial synchronous events within the sequence should be placed at a markedly different elevation. Despite clearly acknowledging this problem, the analysis presented within the ceramic study continues to use the combined figures of differently defined levels across the individual quadrants within the trench. Looking at the elevation of each of the levels across the three usable quadrants, it seems that a more meaningful way in which to interpret the results would be simply to amalgamate the finds from Levels 2 and 3 from the northwest quadrant. Once this is done the other levels match up with only relatively minor imprecision.

In addition to the issues surrounding the excavation itself, further factors related specifically to ceramic processing are also outlined by the author (Nanji, 2011). For TT4 a large sample of 22,656 sherds was retained, although an unknown quantity of material had already been discarded from this body of finds before the ceramic study took place. This includes material from “section scraping, ringwell contexts, wells and other disturbed contexts” (Nanji, 2011: 170, table 1), together with some portion of the non-diagnostic sherds. In order to overcome any potential bias introduced by preferential retention of distinctive pottery such as East Asian imports, only rim sherds have been used for the purposes of quantitative analysis. As a result certain rare classes not represented by any rim sherds are excluded from the quantitative analysis (Nanji, 2011: 169). The sample of rim sherds from TT4 amounts to 1,644 pieces.

Some additional factors concerning the ceramic quantification should also be noted. The quantitative figures provided from Sanjan include only the single measure of sherd count. As has been stated, this includes layer and class totals for rim sherds. Although rim sherds have the important advantage of being the most consistently diagnostic portion, they are clearly susceptible to the same issues of variable breakage discussed in Chapter 3. In addition there is the added factor that vessels with a larger rim circumference will provide greater numbers of rim sherds than vessels with smaller mouths. These differences are likely to be particularly marked when comparing closed and open vessels or classes that are

predominantly associated with one or other category. Such a discrepancy is noted in the case of Torpedo Jars, which are represented by a considerable number of body sherds but few rims (Nanji, 2011: 169). The possibility of using EVEs to overcome these differences was apparently considered but the "analysis could not be done in the course of this study [though] it is hoped that such an analysis will be possible in the future when the methodology for the same is available" (Nanji, 2011: 170).

Finally, in terms of the classification of pottery, Nanji follows a similar process of definition and description as that set out by Kennet in his study of Kush and al-Mataf (Kennet, 2004). Because a standardised approach is adopted and a good level of detail is provided for newly defined classes, the classification scheme from Sanjan is generally easy to correlate with the scheme adopted in this study. Naturally some differences of definition do occur, and particularly for indigenous coarse wares, it is not always possible to establish reliable associations between the class categories formulated at Sanjan and those represented elsewhere. An attempt to provide the closest possible concordance between the published classification from Sanjan and the IIOCC is presented below (**Table 5.20**). This process was aided by referring both to the published class descriptions (Nanji, 2011: 26-85) and to the web-based supplement, which contains colour photographs of a representative selection of sherds for many of the class categories[50].

[50] See http://www.rukshana-nanji.com/mainPage.php

Nanji Class	IIOCC Class	Nanji Class Name	Concordance Notes	pp. 2007	pp. 2011
TGW-1	TURQ.T	Turquoise Glazed Ware	TGW is sub-divided into six sub-classes based on glaze colour. The sub-classes appear to cover a limited range of variation and are probably better treated as a single category, though thin-section analysis revealed two distinct petro-fabrics, one belonging to a basaltic clay and the other similar but lacking bioclast	46-61	27-32
TGW-2					
TGW-3					
TGW-4					
TGW-5					
TGW-6					
WGW	OPAQ.W	White Glazed Ware		65-70	34-35
SWGW	OPAQ.TS	Splashed White Glazed Ware	Mostly OPAQ.TS but also includes at least one sherd of OPAQ.BW	70-73	35-36
CPW	OPAQ.C	Cobalt Painted Ware		73-78	37-38
LPW-1	OPAQ.LG	Lustre Painted Ware	Mostly equivalent to OPAQ.LG but also includes some OPAQ.LR and OPAQ.LP	78-88	38-42
LPW-2			LPW-2 is simply misfired OPAQ.LG and can be combined with the above		
LPW-3	OPAQ.LR				
BiGP	SPLASH.P2	Bichrome Glazed Ware	SPLASH.P and SPLASH.GW included in same class	88-91	42-43
SGPW		Splashed Glazed Pink Ware	Yellow, green and brown splashed glazed ware	119	53
None	GRAF.EP	Splashed Ware with Sgraffiato		92	43-44
HsG(P)	GRAF.H	Hatched Sgraffiato Ware	Hatched sgraffiato sub-divided into five classes based on glaze colour. The scheme is reasonable but current evidence suggests this variety of GRAF.H originated from a single production site. There remain problems also in attributing such groups from sherds as colour varies across the surface of a single vessel. Some non-hatched sherds also included which may belong to GRAF.LP	93-100	44-46
HsG(B)					
HsG(M)					
HsG(W)					
HsG(Y)					
None	GRAF.LY	Yellow Sgraffiato		100	46
CHAMP	CHAMP	Champlevé		100-101	46-48
MGP	SPECLE.2	Monochrome Glazed Pink Ware		105-108	48-49
MGB	SPECLE.1	Monochrome Glazed Buff Ware	Similar to MGP but with a buff coloured fabric and a green or blue glaze. Spur marks are present on the interior.	108-110	49-50
CSGW	GW.N-ID	Cuerda Seca Glazed Ware	Glazed ware with decoration outlined in manganese reminiscent of Fayyuni Ware from Fatimid Egypt.	110-115	50-52

Nanji Class	IIOCC Class	Nanji Class Name	Concordance Notes	pp. 2007	pp. 2011
WGPW	SPW	White Glazed Pink Ware	Glazed ware with a pink fabric, a white ground and greenish-brown painted decoration covering the interior only.	115-117	52-53
IGP	GW.N-ID	Incised Glazed Pink Ware	Slipped, incised and painted ware with a coarse pink fabric	117-118	53
None	UGP	Black & Ochre Painted Glazed Pink Ware	Slipped glazed ware with crude underglaze painted decoration.	118	53
None	UGP	Blue Glazed Pink Ware	Turquoise and black underglaze painted ware	118	53
None	UGP	Painted Glazed Pink Ware		119	53
None	YEMEN	Yemen?	Yellow glazed ware with brown or black painted decoration	119-120	54
KTGW	GW.N-ID	Khambat Glazed Pink Ware	Local glazed ware industry copying Middle Eastern imports in form	120-122	54
GRW	GW.N-ID	Glazed Red Ware	Red body with flaky white or green glaze, possibly local	122-123	54-55
FRIT	FRIT.BW	Frit Ware	Also includes FRIT.D	123-124	55
CHANGSHA	CHANG	Changsha Stoneware			80-82
STONE-1		Stoneware	Mostly CHANG, at least 1 sherd from another class is also included		82-83
STONE-2	DUSUN	Stoneware			82-83
STONE-3	YUE	Stoneware			82-83
CEL-1		Celadon Ware	Mostly YUE but class also includes at least one sherd of LQC		83-84
STONE-5	STONE.BG1	Stoneware			82-83
STONE-4	EAST.N-ID	Stoneware	Possibly non-glazed portions of DUSUN jars?		82-83
STONE-6		Stoneware			82-83
PORC-3		Porcelain			84-85
CEL-2	LQC	Celadon Ware			83-84
PORC-1	WW	Porcelain	Includes some CWW		84-85
PORC-2	WWSL	Porcelain			84-85
PORC-4	CBW.2	Porcelain	Photographs indicate late dated examples of the 17th-19th centuries		84-85
ESG(W)+FSGW	EGG.PI	Eggshell Ware (White)	Also includes one sherd off WHITE.CP		55-57
ESG(P)	EGG.IMIT	Eggshell Ware (Pink)	Two different classes. Both are most likely locally produced imitations of Eggshell Ware. Similar South Asian copies are known from Brahminabad in Pakistan		57
ESG(R)		Eggshell Ware (Red)			57
BW	WHITE.PI	Buff Ware			57-59
BW(TJ)	TORP.S	Buff Ware (Torpedo Jars)			59-60

Nanji Class	IIOCC Class	Nanji Class Name	Concordance Notes	pp. 2007	pp. 2011
WSPW-2		White Slipped Pink Ware	Class seemingly conflates different categories including Torpedo Jars and basins		62-64
BW(SV)	BUFF.I	Buff Ware (Storage Vessels)			60-61
WSPW-1	REBROS	White Slipped Pink Ware	Fabric compared to Torpedo Jars which is curious, otherwise characteristics and illustrations are consistent with REBROS, may also include some CREAC		62-64
LISV-3		Large Incised Storage Vessels	Smaller vessels in same class, not LISV		
LISV-1	REBROS (LISV)		LISV vessels, also includes some HARLIM		65-67
LISV-2			LISV vessels, also includes some HARLIM		
LISV-5	HARLIM (LISV)		Mostly HARLIM, may also include some REBROS		
LISV-4	CREAC (LISV)		Mostly CREAC, also includes some REBROS		
MISC-8	HARLIM	Miscellaneous-8	Identification uncertain		79
BW(SPOT)	CREAC	Buff Ware (Spot)	Compared to SPOT from Kush. Unlikely to be the same class. Photographs indicate closer similarity to CREAC but identification is not certain		61
UGP+UPGW	CW.N-ID	Unglazed Pink Ware	Identified as possible Siraf area coarse wares based on comparisons with Shanga. Illustrated examples from Sanjan appear do not fit this identification		61-62
WSPW-3		White Slipped Pink Ware	Description does not match any recognised Persian Gulf export classes		62-64
MISC-9		Miscellaneous-9			79-80
MISC-10		Miscellaneous-10			80
MISC-11		Miscellaneous-11			
RPW	IRPW	Red Polished Ware			68-69
SBW-1	BUFRAB	Slipped Brittle Ware - Pale Orange	Class very likely to be the same as BUFRAB. Class sub-divided on the basis of fabric and slip colour, but such variation can be observed within the same class		64-65
SBW-2		Slipped Brittle Ware - Dark Red			
SBW-3		Slipped Brittle Ware - Pale Grey			
SBW-4		Slipped Brittle Ware - Black			
SBW-5		Slipped Brittle Ware - Dark Red			

Nanji Class	IIOCC Class	Nanji Class Name	Concordance Notes	pp. 2007	pp. 2011
BSGW	SBBW	Black Slipped Grey Ware	Wider range of vessel forms represented at Sanjan than in the export assemblage, but most likely this is the same class		69-70
BSRW-1		Black Slipped Red Ware - Black Slip	Most likely a partially oxidised version of the regular SBBW class		75-77
BSRW-2		Black Slipped Red Ware - Brown Slip			
RSGW		Red Slipped Grey Ware	Most likely a partially oxidised version of the regular SBBW class		71
GW-1		Grey Ware	Most likely SBBW with no obvious slip. Even slightly degraded sherds loose their glossy burnished slipped surfaces		71-72
GW-3					
GW-2	INCOP		Rare sherds of a class with a hard fine fabric. No known parallels		
MRW-1		Mica Red Ware - Deep Red			67
MRW-2		Mica Red Ware - Pale Pink			
RSRW-1+RSPW-1		Red Slipped Red Ware - Red Slip			72-75
RSRW-2		Red Slipped Red Ware - Orange Slip			
WSRW		White Slipped Red Ware			77
RW-1		Red Ware - Semi-Coarse			77-78
RW-2		Red Ware - Extremely Coarse			
RW-3		Red Ware - Finer Body			
MISC-1		Miscellaneous-1			78
MISC-2		Miscellaneous-2			78-79
MISC-3		Miscellaneous-3			79
MISC-4		Miscellaneous-4			79
MISC-5		Miscellaneous-5			79
MISC-6		Miscellaneous-6			79
MISC-7		Miscellaneous-7			79

Table 5.20 *Class concordance between the published ceramic classification from Sanjan (Nanji, 2011) and the class categories represented in the IIOCC.*

Using the modified class categorisation structure (**Table 5.20**), it is possible to provide an adjusted version for the phased seriation spanning Layers 1-6 of TT4 with the ceramic assemblage categorised according to the classes represented in the IIOCC (Table 5.21). As this includes only the figures from three of the four quadrants within the trench, and only the counts for rim sherds, the total sherd count is relatively small and the results consequently weak and often unconvincing (see **Chapter 6**). Although there remain valid reservations regarding the integrity of the far larger, but already preselected assemblage of 22,656 sherds recorded during the ceramic study from TT4 at Sanjan (Nanji, 2011: 170-72), it seems likely that this far larger pool of data may be capable of yielding a stronger set of results. Using the information from Sanjan that is currently available, it is possible to broadly correlate the phased seriation of rim sherd counts, with the ceramic periodisation applied across other sites. The earliest occupation levels in Layers 6 and 5 appear somewhat similar to those from Manda and Shanga: they contain imports from the Persian Gulf region such Turquoise Alkaline-Glazed Wares (TURQ.T), Torpedo Jars (TORP.S) and White Wares (WHITE.PI), but none of the Samarra Horizon glazed wares apart from one sherd of OPAQ.W, which is most likely to be intrusive. The ceramic finds from Sanjan suggest a date for the earliest occupation between the mid-8th to early 9th century (CP3). Very little significant change occurs in Layers 3 and 4, though the stratigraphic position of these levels and a single sherd of White Slipped Stoneware (WWSL) could be taken as indicative of a date between the 9th and 10th centuries spanning CP4 and CP5. In Layer 2 there is clear evidence for the introduction of CP6 within the influx of Hatched Sgraffiato (GRAF.H). Other earlier dated elements such Changsha Ware (CHANG) and some Opaque Glazed Wares, also first appear within the phased sequence at this time, but this must simply reflect the overall limited data population of the seriation.

Class	CP3		CP4-5		CP6		Totals
	6	5	4	3	2	1	
SBBW	48	159	43	52	374	2	678
INCOP	20	63	20	20	151	2	276
WHITE.PI	2	2		1	1		6
REBROS	2						2
BUFRAB	1	3			14	1	19
TORP.S		2	1				3
TURQ.T		3			18		21
CW.N-ID		1			2		3
WWSL			1		1		2
EAST.N-ID				1			1
GRAF.H					23	2	25
OPAQ.W	1				12		13
OPAQ.TS					5		5
WW					4		4
EGG.PI					4		4
CHANG					3		3
SPW					3		3
OPAQ.LG					3		3
SPLASH.P2					2	1	3
CREAC					1		1
CREAC [LISV]					1		1
HARLIM					1		1
CBW						1	1
Totals	74	233	65	74	623	9	1078

Table 5.21 *Phased seriation of rim sherd counts from TT4 at Sanjan recalculated using the class categorisation structure applied within the IIOCC after Nanji, 2011. Values highlighted in grey appear out of expected sequence and are most likely to be intrusive or incorrectly classified.*

5.2.12 Pattanam – India

The recent discovery and current excavations underway at the port of ancient Muziris at Pattanam on the coast of Kerala in south India promise to transform our understanding of the development of Indian Ocean trade in South Asia and the broader nature of interaction taking place across the Indian Ocean during the South Asia Iron Age and Early Historic periods. A number of factors give Pattanam a particularly elevated significance:

- Muziris is one of the most prominent ports of the region mentioned in the important 1st century AD Classical source the *Periplus Maris Erythraei* (Casson, 1989) and went on to be occupied through into the early medieval period.
- The occupation sequence spans the transition from the classic 'Indo-Roman trade period' of the c.1st century BC – 3rd century AD through to the lesser known period of Indian Ocean trade activity of Late Antiquity and the early medieval period.

- Waterlogged deposits discovered around the area of a wharf provide exceptional preservation of perishable materials and will yield an important archaeobotanical sequence extending back into the Indian Iron Age (c.1st century BC) containing detailed evidence for the trade of varied food stuffs (Cherian, 2011: 8).
- The massive volume and accurate quantitative recording of the finds assemblage. Already in the space of five seasons of excavation completed between 2007 to 2011, over 3.5 million pieces of pottery have been individually recorded, a figure that surpasses the quantity of pottery recorded from seven seasons of large-scale open area excavation from Siraf (Cherian, 2011: Tables 1-2).

When the pottery publication of Pattanam excavations is completed, we can expect a mass of new evidence for the changing composition of ceramic trade across the two millennia from c.1000 BC – 1000 AD. At the time of writing this information is not available. What we do have are a few general figures on the overall composition of the finds assemblage showing object counts for different materials and finds categories (Cherian, 2011: tables 1-2). These figures are worth considering within the context of the present study accepting the fact that they are only preliminary and do have inherent limitations (**Table 5.22**).

Name	Class/IIOCC Code	Origin	Sherds
Amphora	Roman Amphora	Mediterranean	6029
Terra Sigillata	Terra Sigillata	Mediterranean	122
TGP	TURQ	Iraq/SW Iran	1527
Torpedo	TORP.S	Iraq/SW Iran	3098
Chinese	EAST.N-ID	China	239
Rouletted	Rouletted Ware	Bengal	8534
Unidentified distinct pottery	INCOP?	South Asia?	94776
Local Ceramics	LOCAL CW	Kerala	3557118
TOTAL			3671443

Table 5.22 *Total number of sherds recovered from the first five seasons of excavation at Pattanam after Cherian, 2011: Table 2*.

For the pottery assemblage, the published figures are sub-divided into eight broad categories. These include two groups imported from the Mediterranean area, two categories from the Persian Gulf, one category from the Far East, two categories that

probably represent regional level trade within South Asia, and the remainder of the pottery that is local. Although all of the individual classes and types are not yet itemised, the categorisation provided does allow one to distinguish between 'exotic' and 'regional' imports and local pottery and broadly between imported 'tablewares' and 'container' vessels. These aspects allow the figures from Pattanam to be integrated within the framework of the analysis presented below and to fill in a significant lacuna in the available evidence covering the period of western Indian Ocean trade in the pre or very early Islamic period. However, the information that has so far been made available does differ from many of the other data-sets considered within the study in two important respects. Firstly, we do not yet have the information to separate out the finds from different stratigraphic levels. The Turquoise Alkaline-Glazed Ware assemblage from the latest occupation levels suggest contemporaneity with Ceramic Period 1. Markers of CP2 such as Type 72 are significant in their absence (Kennet, pers. comm. 2010). Therefore for present purposes, all of the published figures from Pattanam will be treated as belonging to CP1, when in actual fact this conflates mostly earlier period finds, and in the case of the Chinese imports, pottery that is most likely to be later dated too. The second factor that is important to note, is the impressively large total of local pottery recovered currently includes "architectural materials such as bricks, tiles and ring wells" (Cherian, 2011: 6). In all of the other assemblages considered, such finds have been quantified separately. If the number of architectural fragments proves in time to be large, then this will impact on the analysis of vessel fragment proportions considered below.

5.2.13 Anuradhapura – Sri Lanka

Quantitative data on the ceramic sequence from Anuradhapura can be obtained from the publication of the British-Sri Lankan excavation of ASW2 completed between 1989 and 1994 and situated within the centre of the citadel (Coningham, 1999: 2006). The excavation covers an area of 100m² and was excavated down to a depth of 9.5m. In total 903m³ of deposits were extracted and sieved. The sequence can be broken down into 11 main structural periods, which cover occupation on the citadel mound extending from the around the 5th century BC up to the 10th or 11th century AD (**Table 4.11**). The ceramic assemblage represented throughout this sequence is massively dominated by locally manufactured

pottery and the products of regional scale exchange within South Asia (Coningham, Ford, Cheshire & Yong, 2006: 127-330, tables 6.1-5). These have been classified and recorded according to the measure of aggregate sherd weight. A relatively small selection of imported ceramics also occur within the later part of the sequence, starting with West Asian products dating from the 1st century AD and extending right though to European china from the 19th century found within the topsoil. These finds – which amount to a total of just 358 pieces – are separately categorised and recorded both by sherd count and weight (Seely, Canby & Coningham, 2006: 91-126, tables 5.1-4). Because other categories of ceramics are not recorded by sherd count, it is not possible to use these figures as a basis for comparative quantification of the whole assemblage. The only standard measure provided for all ceramic finds is sherd weight. While sherd weight is probably of equal value as a method of quantification to sherd counts (**Chapter 3**), it does mean that the basis of quantification at Anuradhapura is different to that provided for the other available quantified assemblages from contemporary sites within the western Indian Ocean region. This inconsistency means that there are potential difficulties relating to the compatibility of the results from Anuradhapura with those obtained from other sites.

The imported ceramics represented through the later part of the Anuradhapura ASW2 sequence are subdivided and on the basis of clearly outlined class categories grouped under twelve headings (Seely, Canby & Coningham, 2006: 91-113). Each sherd is also individually described within the catalogue. Most of the class categories identified within the assemblage can be clearly linked to the same ceramic classification structure applied to the other assemblages represented within this study (the IIOCC). In addition, individual sherd descriptions make it possible to further refine the classification of some groups such as ‘Lustre Ware’ or ‘White Tin-Glazed Ware’, by recognising groups recognised on the basis of the stylistic attributes such as the format or colour scheme of the decoration (**Table 5.23**).

No	Name	IIOCC Class	Notes	Frags.	Grams
5.2.1	Lustre ware	OPAQ.LG	Fragments described as 'brown, amber and yellow'. Probably all gold monochrome	29	72.4
		OPAQ.LP		3	9
		OPAQ.LR		2	4
5.2.2	Imitation lustre ware	SPW?	Specific category of glazed pottery known from Nishapur, possibly SPW or category not covered within the IIOCC	1	1
5.2.3	White tin-glazed ware	OPAQ.W		77	528.1
		OPAQ.C		1	1
		OPAQ.TS		1	4
5.2.4	Lead-glazed wares	SPLASH.P1	Sherd with monochrome green and yellow glaze on different sides but no splashes, could be another glazed ware but assigned to category following published attribution	1	1
		SPLASH.P2		10	161.53
5.2.5	Sasanian-Islamic wares	TURQ.T		116	769.46
5.2.6	Undiagnostic	CW.N-ID		7	117.3
		GW.N-ID		4	28
5.2.7	Buff ware	TORP.S	Fragments only counted where lined with bitumen or badly worn, others classified with CW.N-ID	56	2136
5.3.1	Changsha painted stoneware	CHANG		3	8
5.3.2	Xing & Ding white wares	WW	Although the fragments have been identified by a Chinese ceramics expert (Rose Kerr), the pieces are extremely small and non-diagnostic. Given the fact that white wares from other regions of China are far more common amongst the export assemblage, it seems likely that these fragments are not from the specific high-status kilns proposed	11	39.1
5.3.3	Yue green ware	YUE		6	18.94
5.3.4	Coarse grey stoneware	DUSUN		2	58
5.4	European ceramics	CHIN		2	36
TOTALS				332	3992.8

Table 5.23 *Class concordance between the published ceramic classification from Anuradhapura (Seely, Canby & Coningham, 2006: 91-113) and the class categories represented in the IIOCC.*

Using the information established from the class concordance and the sherd count and weight values provided within the publication, it is possible to generate a phased seriation showing the combined figures of local and imported pottery within the Anuradhapura sequence from ASW2 (**Table 5.24**). The late part of the occupation sequence from Structural Period F to B covers the chronological horizon that is of relevance within the context of this study. Unfortunately the dating of these periods is somewhat problematic. Period F represents the last monumental building horizon (Coningham & Batt, 1999: 129). A radiocarbon sample from the foundation level of a pillared stone structure placed the occupation within the range of AD cal. 340 – 540, suggesting a date within the Sasanian period, though ceramic imports amount to just four sherds of Turquoise Alkaline-Glazed Ware. Other archaeological indicators of contact with the Sasanian world are limited. Following Period F, Anuradhapura entered a 'post-monumental', phase with further horizons of building construction, but with heavy robbing of earlier construction materials, causing substantial disturbance. In terms of imported ceramic finds, Period F, which might be correlated with CP1 is followed immediately through Periods E and D by the introduction of 9th or 10th century markers such as Opaque Glazed Ware that are associated with CP4. In addition, there is no evidence on the basis of the ceramic finds for the chronological succession of Periods E and D; late 9th century Monochrome Gold Lustre (OPAQ.LG) appears earlier within the sequence than ceramics that first appear in the early 9th century such as White Opaque Glazed Ware (OPAQ.W) or Changsha Ware (CHANG). The late levels represented at Anuradhapura are interpreted as a continuous occupation sequence extending through the first millennium AD and are dated accordingly. The evidence provided by the relatively small assemblage of imported ceramic, could be taken as an indication that the site was either abandoned from somewhere between the 4th – 6th century occupation of Period F and the possibly late 9th and 10th century occupation of Periods E to B, or that Period F represents a very long and stable horizon of occupation spanning the period from at least the 5th to 8th centuries (CP1-CP3), during which the site had only very minimal contact within the Indian Ocean ceramic distribution network.

												CP1		CP4									
		K		J		I		H		G		F		E		D		C		B		A	
CLASS	**Glaz/NG**	**Wgt**	**No**	**Wgt**	**No**	**Wgt**	**No**	**Wgt**	**No**	**Wgt**	**No**	**Wgt**	**No**	**Wgt**	**No**	**Wgt**	**No**	**Wgt**	**No**	**Wgt**	**No**	**Wgt**	**No**
TURQ.T	G									8	4	36	4	9	2	453	76			227	29	37	7
OPAQ.LG	G													4	1	43	23			25	5		
TORP.S	NG													54	1	1394	39			278	13	410	8
OPAQ.W	G															311	50			199	27	18	2
CW.N-ID	NG															17	14			96	3	4	1
WW	G															29	10			10	3		
SPLASH.P2	G															96	5			38	4	28	1
YUE	G															15	5			4	1		
CHANG	G															8	3						
GW.N-ID	G															18	3			10	1		
OPAQ.LR	G															4	2						
DUSUN	G															13	1			45	1		
OPAQ.LP	G															4	1			5	2		
OPAQ.TS	G															4	1						
SPLASH.P1	G															1	1						
OPAQ.C	G																			1	1		
SPW?	G																			1	1		
CHIN	G																					36	2
Total Sherds			0		0		0		0		4		4		4		234		0		91		21
Weight Imports		**0**		**0**		**0**		**0**		**8**		**36**		**2477**						**939**		**533**	
Weight Local		**1863**		**19895**		**91368**		**910**		**17904**		**19080**		**137758**						**86515**		**90659**	
Imports %		**0.00**		**0.00**		**0.00**		**0.00**		**0.05**		**0.19**		**0.00**						**1.09**		**0.59**	

Table 5.24 *Phased seriation of the entire assemblage from ASW2 at Anuradhapura showing aggregate sherd weights in grams together with sherd counts for the later imported categories. Ceramic classes are based on groups defined within the IIOCC, after Seely, Canby & Coningham, 2006: tables 5.2-4 and Coningham, Ford, Cheshire & Yong, 2006: tables 6.1, 6.3)*.

5.3 Factors of Variability within the Sample

In addition to the substantial differences in the nature, geography and chronology of the sites covered within the sample (**Section 4.4**), there are significant differences in the quality of the ceramic data available, and this no doubt impacts in various ways upon any analysis to be undertaken (**Chapters 6 & 7**). Factors of variability within the sample range across many areas. At the stage of finds recovery, retrieval practices range in intensity from complete sieving of deposits and full retention of finds at Anuradhapura, to partial and selective retention of finds at Sohar, or grab samples of diagnostic sherds from the surface at Bushehr. Finds retrieval and retention policy are also closely tied to the strategies devised for finds quantification and publication, with again selective illustration of diagnostic ceramics from Sohar (Kervran, 2004), contrasted against the seriated quantification of sherd counts from the deep sounding at Kush (Kennet, 2004: table 3). Approaches to the categorisation of ceramic also vary and this impacts directly on the ability to generate accurate comparisons of the same ceramic products represented on different sites. At one extreme one could highlight the simplified categorisation of imports from Manda (Chittick, 1984: 225) or the description based largely on glaze colour characteristics from A'Ali (Sasaki, 1990), against the much more detailed and easily utilised descriptions covering fabric, surface treatment and vessel forms provided for the assemblages from Kush (Kennet, 2004) and Sanjan (Nanji, 2011).

Factors related to the storage and availability of finds are also significant. In the cases of Shanga and Kush, the fact that ceramics are sorted and stored in the groups in which they are published, and the fact that the assemblages continue to be curated and are accessible, makes it relatively quick and straightforward to reinterpret these assemblages. Similarly the fact that imported finds from Manda have been preserved and not too heavily dispersed, creates the potential to conduct further more detailed research on the finds assemblage. By contrast, the extensive dispersal of finds from Siraf, together with the inaccessibility of finds in some locations and even the permanent loss of parts of the collection, meant that working from the excavation archives remains the only dependable source of full quantitative data. Finally the treatment and recording of finds assemblages as part of this study has been shaped and determined by different conditions. Direct access to finds and recording on an individual sherd basis provides the most detailed and

accurate source of information. Access to the original unpublished finds databases for Bilad al-Qadim and Kush also significantly enhanced the ability to reinterpret the excavated data-sets from these sites. At the other end of the spectrum, partially published data, such as that available from Murwab (Guérin & al-Na'imi, 2010), or minimal class descriptions like those from A'Ali (Sasaki, 1990), mean that only certain generalised analysis of these assemblages can be undertaken at this point. All of these factors influence the ability to analyse and interpret the ceramic finds data. This chapter set out to detail these factors for each site so that the differing nature and quality of the ceramics finds data can be properly assessed as part of the broader analysis and interpretation pursued through the remaining chapter of this thesis.

Chapter 6 Quantitative Analysis of Ceramic Exchange

6.1 Introduction

Previous chapters have set out the core source material upon which this study is based, which includes quantified ceramic finds data from 13 sites distributed widely within the area of the Persian Gulf and western Indian Ocean. The aim of this chapter is to compare the available ceramic data-sets in order to provide a quantitative assessment of the actual volume of imported ceramics represented, and how this may have varied chronologically or spatially across different regions or types of site.

A useful starting point in the analysis of broad ceramic consumption patterns is to consider differences in the relative balance between glazed and unglazed material. The majority of glazed wares encountered within the study area, represent imports on the sites on which they occur. Similarly, glazed pottery covers the majority of products traded as a commodity in their own right and those situated towards the upper end of any potential value spectrum. At the same time, these generalisations are by no means exclusive, and the glazed/unglazed distinction can only be taken as a crude indicator of these general factors.

In order to develop a deeper, more nuanced appreciation of ceramic exchange activity, further analysis looks specifically at ceramic imports. In order to isolate imported categories and measure their overall contribution to the ceramic record, a distinction first needs to be established between ‘local’ and ‘imported’ categories. As little of the information available at this point can be supported on the basis of known production sources, or scientific provenance studies, relatively crude distinctions have to be drawn. These are supported via a combination of specific evidence, together with a more general knowledge of the most common (and therefore more likely local) groups within an assemblage. Within the portion of a ceramic assemblage identified as being non-local, further distinctions can be drawn between pottery derived from long-distance exchange, and those products that circulated at a local or regional level. By distinguishing, where possible, between these two alternative scales of ceramic exchange, it becomes clear

that the dynamics affecting their operation and long-term development were fundamentally different.

In order to generate direct, cross-assemblage quantitative analysis, certain practical procedures have been adopted, the nature of which has been outlined earlier. The foundation of this study is the provision of a single Integrated Indian Ocean Ceramic Classification (IIOCC, see **Section 2.3.5**). The dating associated with classes represented within the IIOCC, has been grouped into six chronological stages based on moments of obvious change within the ceramic record (**Section 2.4**). The identification of these same six chronological stages (Ceramic Periods 1-6 or CP1-6) within the 13 quantified ceramic assemblages enables the phasing of individual site occupation sequences to be aligned (**Chapter 2, Table 1**). This effectively provides a means of synchronising the phasing from different sites into a single chronological scheme (**Table 6.1**). Within this framework, overall figures can be provided indicating the total number of sherds recorded by site and period (**Table 6.2**). Further more detailed breakdowns of the ceramic finds data incorporating ceramic class and type data are presented in the analysis below.

Period	Date	Period	Associated Site and Phase(s)
CP1	400-650	Sasanian	Bushehr
			Kush (Phases W-01-E-01)
			Anuradhapura (Period F)
			Pattanam (undifferentiated)
CP2	650-750	Early Islamic	Sir Bani Yas
			Kush (Phases W04-E02)
			Sohar (Levels 0-II)
			Sanjan (Levels 5-6)
CP3	750-825	Early Abbasid	Siraf (Periods 2-3)
			Bilad al-Qadim (Period 1)
			Kush (Phases E-03-E04)
			Sohar (Levels III-IV)
			Shanga (Phase 1)
			Sanjan (Levels 3-4)
CP4	825-900	Early Abbasid	Siraf (Periods 4-7)
			Kush (Phases E-05)
			Sohar (Level V)
			Shanga (Phases 2-5)
CP4-5	825-1025	Early Abbasid/ Late Abbasid	A'Ali (Level 1)
			Bilad al-Qadim (Period 2)
			Murwab
			Sanjan (Level 2)
CP5	900-1025	Late Abbasid	Siraf (Period 8)
			Kush (Phases E-06-E-07)
			Shanga (Phases 6-7)
CP6	1025-1250	Late Abbasid	Siraf (Period 9)
			Bilad al-Qadim (Periods 3-5)
			Kush (Phases E-08-E-09)
			Shanga (Phases 8-14)
			Sanjan (Level 1)

Table 6.1 *Ceramic periodisation stages CP1-6 with dating, period and associated phase of site occupation. For period terminology see above* (**Table 1.1**).

SITE	AREA	CP1 (400-650)	CP2 (650-750)	CP3 (750-825)	CP4 (825-900)	CP5 (900-1025)	CP6 (1025-1250)	
		No	No	No	No	No	No	TOTALS
Kush	**Eastern Arabia**	3195	1205	6331	183	4857	5057	20828
Bushehr*1	Southern Iran	1240						1240
Sir Bani Yas	Eastern Arabia		1196					1196
Siraf (BM Sherds)	Southern Iran			140	708	175	298	1321
Siraf (FRCs)	**Southern Iran**			988	10298	3454	4089	18829
Bilad al-Qadim	**Eastern Arabia**			878	1136		23078	25092
A'Ali	**Eastern Arabia**				3197			3197
Murwab	**Eastern Arabia**				6968			6968
Sohar	Eastern Arabia		240	344	331			915
Pattanam	**South Asia**	3671443						3671443
Anuradhapura*2	**South Asia**	[19115]			[227688]			0
Sanjan	South Asia			307	139		623	1069
Shanga	**East Africa**			1425	12470	2334	49333	65562
Manda	**East Africa**			250000				250000
TOTALS		3675878	2641	260413	35430	10820	82478	4067660

Table 6.2 *Ceramic assemblages from the Persian Gulf and western Indian Ocean showing the total number of sherds recorded by ceramic period. Sites indicated in bold are fully quantified. Exceptions within the data-set include (*1): counts based on finds collected during surface survey and (*2): counts based on sherd weight (grams)*.

Figures for the total number of sherds by period (**Table 6.2**) have been generated by combining information from published sources, original excavation archives, and in some cases, the physical re-cataloguing of sherd assemblages. The full details related to the acquisition and integration of data sources is set out in Chapter 5 above. The figures for total sherd yields are used for all subsequent discussions within this chapter and should be referred to where calculations are made elsewhere quoted as percentages. Before proceeding with the analysis, it is important to reiterate the caveats raised in the conclusions of Chapters 4 and 5. Whatever results are generated from the analysis, they are themselves constrained by the many significant variables in terms of the nature and geography of sites and the quality and integrity of the available ceramic data that have been recorded. Where relevant, specific factors detailed in the previous two chapters are highlighted again within the discussion presented below.

6.2 Glazed vs. Unglazed Pottery

In contrast to certain more detailed characteristics considered below, reliable figures on the proportion of glazed to unglazed pottery can be extracted from all of the quantified assemblages included within this study. Besides the general ease of distinguishing between glazed and unglazed pottery in many of the available sources, glazed pottery forms an important category in its own right. Although the technology, use and availability of glazed pottery may have varied to a significant extent though time, the addition of glaze would in general have added to the unit cost of production and thus the use of glazed ceramics is seen as an indicator of higher status consumption (Watson, 2012: 338-39). At the same time, in most cases, glazed ceramics represent imports, and in this sense they can be regarded as a "crude proxy for the volume of overseas trade" (Kennet, 2004: 71). In most cases, figures on the proportion of glazed to unglazed ceramics in an assemblage can be represented according to the chronological framework of CP1-6. This means that we now for the first time have the ability to systematically examine this factor across a reasonably large sample of sites (**Table 6.3**).

A useful reference point for considering long-term changes in the proportions of glazed to unglazed ceramics is the assemblage from Kush. This is because: 1) Kush is the only data-set that covers the entire chronological range under consideration; 2) figures can be attributed to each of the six ceramic periods; and 3) the changing proportion of glazed ceramics within the assemblage has already been the subject of some consideration (Kennet, 2004: 71, figs. 46-48, table 31). In his commentary, Kennet laments the fact that "were the volume of glazed ceramic trade in the western Indian Ocean throughout this time known, it would be possible simply to compare the Kush/al-Mataf sequences and identify points where they diverge from the norm" (Kennet, 2004: 71). Less than a decade on, the figures presented here make it possible to begin this process.

SITE	AREA	CAT.	CP1 (400-650)	CP2 (650-750)	CP3 (750-825)	CP4 (825-900)	CP5 (900-1025)	CP6 (1025-1250)
			%	%	%	%	%	%
Kush	**Eastern Arabia**	Glaz	14.7	7.7	4.1	4.4	4.8	5.0
		Unlaz	85.3	92.3	95.9	95.6	95.2	95.0
Bushehr*1	Southern Iran	Glaz	24.9					
		Unlaz	75.1					
Sir Bani Yas	Eastern Arabia	Glaz		6.0				
		Unlaz		94.0				
Siraf (BM Sherds)	Southern Iran	Glaz			78.6	46.3	75.4	67.8
		Unlaz			21.4	53.7	24.6	32.2
Siraf (Record Cards)	**Southern Iran**	Glaz			27.7	17.2	16.0	17.8
		Unlaz			72.3	82.8	84.0	82.2
Bilad al-Qadim	**Eastern Arabia**	Glaz			10.4	23.3		10.6
		Unlaz			89.6	76.7		89.4
A'Ali	**Eastern Arabia**	Glaz				14.3		
		Unlaz				85.7		
Murwab	**Eastern Arabia**	Glaz				26.0		
		Unlaz				74.0		
Sohar	Eastern Arabia	Glaz		10.8	12.8	22.1		
		Unlaz		89.2	87.2	77.9		
Pattanam	**South Asia**	Glaz	0.05					
		Unlaz	99.95					
Anuradhapura*2	**South Asia**	Glaz	0.2			0.7		
		Unlaz	99.8			99.3		
Sanjan	South Asia	Glaz			1.3	1.4		11.9
		Unlaz			98.7	98.6		88.1
Shanga	**East Africa**	Glaz			1.9	2.3	2.9	4.7
		Unlaz			98.1	97.7	97.1	95.3
Manda	**East Africa**	Glaz			2.8			
		Unlaz			97.2			

Table 6.3 *Quantified ceramic assemblages from the Persian Gulf and western Indian Ocean showing the proportion of glazed and unglazed ceramic sherds for CP1 to CP6. Sites indicated in bold are fully quantified. Exceptions within the data-set include (*1): counts based on finds collected during surface survey and (*2): counts based on sherd weight (grams).*

As previously noted (Kennet, 2004: 96), it is striking that the proportion of glazed pottery at Kush is at its highest during the Sasanian period and that it then drops away significantly reaching its lowest ebb in the mid-8th to early 9th century occupation of CP3 (**Table 6.3**). While these results are of considerable interest, they might simply be connected with site-specific factors, in particular the possible abandonment of the settlement during the 9th century (Kennet, 2004: 15). The only other assemblage within the Persian Gulf from which some form of quantitative data can currently be extracted

from levels contemporary with the early occupation of Kush, is Bushehr. Here the proportion of glazed wares is even higher. This may be a reflection of sampling bias with preferential selection and retention of glazed ceramics within a non-systematic surface collection. On the other hand, seen within the context of the Persian Gulf area as a whole, the figure of 25% of glazed wares from CP1 at Bushehr seems potentially plausible and could be indicative of the difference in status and location of Bushehr as a major port close to the main source of production of glazed wares in this period; namely, Alkaline-Glazed Ware (TURQ.T or TURQ.YG) originating in southern Iraq/southwest Iran.

Looking at the Persian Gulf area more widely and across a broader chronological range, other quantified assemblages generally indicate a very different trajectory to the development to Kush. Only the figures from the mid-7th to mid-8th century (CP2) at Sir Bani Yas and Sohar seem to corroborate the evidence from Kush with a relatively low proportion of glazed ceramics, in the region of 6-10%. As one moves into the late 8th century and beyond, the proportion of glazed ceramics tends to climb dramatically from anywhere between 10% to over 30%, though the picture varies somewhat between individual sites. At Siraf, the figures generated from the sub-sample of the assemblage recorded from the finds in the British Museum are, as expected, clearly heavily skewed by selection bias. Figures of nearly 80% glazed pottery in CP3, for example, are simply implausible and suggest that the British Museum assemblage cannot be relied on as a representative sample for quantitative purposes. Figures recorded for the same assemblage from the find record cards provide much more plausible results. Throughout the occupation sequence of Site A at Siraf, the proportion of glazed wares remains higher than at any point during the occupation of Kush, though after the mid-8th to early 9th (CP3), that proportion does drop away sharply by around one-third. The evidence from Bilad al-Qadim indicates that the spike in the proportion of glazed wares in CP3 at Siraf is not necessarily part of a region wide trend. Here glazed wares follow an inverse trajectory to Siraf, with the proportion showing an increase from CP3 up to levels of over 20% in the early 9th to early 11th century (CP4 and CP5).

The two relatively small village or town scale settlements of A'Ali and Murwab, both on the southern side of the Persian Gulf, tie in with the emerging picture of a relatively high

proportion of glazed wares in circulation during the 9th – 10th centuries, though they also reflect the substantial scope for regional variation. Almost one-third of the ceramics from Murwab are glazed, twice as high a proportion as that represented at A'Ali. Finally Sohar, facing onto the Arabian Sea, but essentially within the Persian Gulf maritime orbit, sees a progressive growth in the proportion of glazed wares in use up to a peak in the 9th century (CP4). While the data-set from Sohar is potentially problematic (see **Section 5.2.8**), the figures fall within the parameters suggested by other sites, perhaps indicating that the retained finds sample is relatively representative. On the whole, it appears that a reasonably high proportion of ceramics in common circulation within the Persian Gulf were glazed and that figures of anywhere between 10-30% are typical. Chronologically this proportion may not have varied significantly. Instead site-type, location and site status may all have been more significant factors in determining access to glazed ceramics. Certainly there is little evidence to suggest that the drop in proportion of glazed ceramics from the Sasanian occupation of Kush is a feature represented across the region as a whole. More generally, Kush appears to be atypical in the low proportion of glazed ceramics it received, particularly in comparison to other similar scale settlements in the Arabian Peninsula such as Murwab or A'Ali.

In discussing the long-term profile in the changing proportions of glazed ceramics from Kush in comparison to Shanga in East Africa, the suggestion has been made that there is close harmonisation across both sequences (Kennet, 2004: 71). This is used to support the potentially significant argument that "…there was indeed a general pattern of development of trade in the western Indian Ocean into which the two sites were linked" (Kennet, 2004: 71). Seen from the perspective of a broader evidence base, we can now see that Kush does indeed falls in broadly with the pattern of ceramic consumption witnessed through CP3 to CP6 on sites in East Africa (see below). What is also clear is that far from being indicative of a region-wide pattern of conformity, this actually marks Kush out as something of an exception within the area of the Persian Gulf.

One of the most striking and significant contrasts that emerges from the analysis, is the radically different proportion of glazed wares encountered when contrasting those figures from the Persian Gulf to sites in East Africa and South Asia. It is important to bear

in mind here the fact that glazed ceramics were not produced indigenously in East Africa or South Asia in the periods with which we are concerned and therefore glazed ceramics are by definition exotic imports when occurring in these areas. At Shanga in East Africa, only 2-3% of the assemblage from the mid-8th to early 11th century levels (CP3-CP5) is glazed. This figure rises very gradually through the sequence and eventually peaks at above 4% during the early 11th to mid-13th century (CP6). Although the data from Manda cannot currently be sub-divided by phase, the overall proportion of glazed wares in the assemblage recorded from the body of finds held at the National Museum of Kenya store in Lamu, is remarkably close to the published figures from Shanga. This suggests a strong degree of synchronisation in patterns of ceramic consumption between these two neighbouring sites. In South Asia, the evidence from Pattanam, Anuradhapura and Sanjan, indicates that glazed pottery may have had an even more marginal presence, particularly through CP1-CP3 (5th – 8th centuries). At Sanjan this trend is altered by the available figures from the early 11th to mid-13th century (CP6), where the proportion of glazed wares jumps to over 10%. While these figures are potentially important, the sample size for these levels is particularly low and these figures may well not be reliable (see **Section 5.2.11**).

In itself, it is not immediately clear what these varying patterns of glazed ceramic consumption tell us. Although the common tendency is to directly equate levels of glazed ware usage to factors such as site status and practices of luxury consumption (see for example MacLean & Insoll, 2003 and many others), the example from the late levels of a site such as Bilad al-Qadim indicate that certain glazed wares were at times locally mass-produced and very prevalent. What is clearly significant about the results is the capacity of glazed wares, taken as a proportion of the assemblage, to highlight potential areas of weakness in the data. The results also suggest at times markedly different patterns of ceramic consumption between different types of site within a similar geographic area and more fundamentally, between different sectors of the western Indian Ocean. The fact that such large differences exist in glazed ware usage between the Persian Gulf region and areas such as East Africa and South Asia, provides an important foundation upon which to consider ceramic usage in these different areas.

6.3 Local vs. Non-Local Production

The clear advantage of analysing regional or chronological variation in the proportion of glazed to unglazed ceramics, is the ease with which both categories can be defined. A more interpretive distinction, but one that is perhaps less tangential to the central issue under consideration, is between locally produced and imported ceramics. Further consideration of different potential factors governing the use, circulation and consumption of imported ceramics is given in Chapter 7. Here it is important simply to note that in order to assess any potential changes in the volume and composition of ceramic exchange, what one is essentially considering, is the balance between locally produced and imported material. The problem comes in determining where specific classes of pottery were produced, and what parameters to set in defining boundaries between 'local' and 'imported' categories.

To date, very few major pottery production centres have been positively identified within the western Indian Ocean region, and the amount of work undertaken on the petrographic and chemical characterisation and provenance of different ceramic products is still limited. In the absence of exact information on the provenance of most categories of ceramics commonly encountered within the western Indian Ocean region, and in the light of the massive range of products in circulation from different sources, this study adopts a relatively crude approach to ceramic provenance. Broad and often generic attributes allow one to distinguish between clusters of loosely related classes from East Asia, South Asia, the Middle East or East Africa. Within certain areas, particularly the Persian Gulf, further information is available but of variable quality. At the most specific level, there are well defined industries with a known source, such as the 9th – 10th century coarse wares manufactured within the vicinity of Siraf (Whitehouse, 1971b: 15; Priestman, forthcoming), or the later products of the Julfar kilns in Ras al-Khaimah (Stocks, 1996; Mitsuishi & Kennet, forthcoming). At a more general level, there are broad regional characteristics such the fine pale cream coloured fabrics often associated with products from the alluvial plains of central and southern Iraq or southwest Iran. In other cases, the provisional assumption is simply made that the most common coarse ware classes represented in an assemblage, are those that are most likely to be 'locally' made. For

each individual class, the rational for attributing provenance is outlined within the class and fabric descriptions (**Appendix I**).

The other factor to consider is how to decide what material to include within the definition of 'local'. Perhaps the most obvious definition would include pottery manufactured at or within the immediate vicinity of the site where that category of pottery is found. The question then becomes what constitutes the maximum distance from the site of consumption to still be classed as 'local' and how should this be measured? Early research into the patterns of medieval ceramic circulation in southern Iran have already highlighted the marked differences that occur in the distribution of both glazed and unglazed ceramics in landlocked inland areas compared to the circulation of material manufactured on the coast (Williamson, 1987: 14). The case of the medieval port of Siraf seems particularly informative.

At Siraf a large-scale workshop was established next to the sea shore on the outskirts of city, but still just within the western city wall (Whitehouse, 1968: 12). Excavation revealed that the pottery is set within a regularly gridded street plan. The main block investigated covers an area of 45 x 42m and contains a large workshop building accessed from the street surrounded by four enclosed courtyards densely packed with wells, water tanks, preparation surfaces, pits, kilns and further light covered structures (Whitehouse, 1971b: 12-15, fig. 6). Further investigation of the surrounding area indicated that the next block to the north contained another walled compound containing at least three more pottery workshops with a similar arrangement of kilns, wheel installations and wells (Whitehouse, 1972: 84). A wide range of utilitarian coarse wares were produced at the pottery and these constitute the most common category of ceramic finds through all areas of the medieval city. Sirafi coarse wares were also exported on a large scale and have been found on sites throughout the Persian Gulf and western Indian Ocean. In addition to the pottery from Site D, further large-scale production centres have been identified during surface survey a few kilometres to the west of Siraf adjacent to the large contemporary settlement of Chah-kaur (Stein 1937: 201, pl. XXVI: 7-9), immediately to the east of Siraf outside the eastern city wall (Whitehouse, 1968: 5), and as part of a cluster of three production sites situated within 2.5km of one another a further 50km east of Siraf close

to Shirinu (Stein, 1937: 201; Whitehouse, 1968: 16, note 48). The important feature of these kiln sites is that they were all involved with the mass-production of vessel types that in many or perhaps all cases were the same. As such, the Siraf area kilns represent what is best seen as a manufacturing region and one covering a relatively large geographic extent.

The Siraf model highlights the need for a fairly flexible approach to the definition of 'local' or 'imported' categories based on the recognition of production regions rather than necessarily specific kiln sites. Even working within this relatively loose framework, significant discrepancies occur in the quality of information available from different parts of the western Indian Ocean. Within the Persian Gulf, it is possible to differentiate between products originating from a number of different sectors of the region. If we consider the example of Siraf, the information available makes it possible to define a set of coarse wares manufactured within the broad vicinity of the site (in this case up to c.50km in either direction along the coast), which could be termed 'local'. Beyond that range, significant quantities of ceramics were imported via medium distance exchange. This includes glazed wares and large container vessels exported from the alluvial plains and waterways of Iraq/southwest Iran, particularly in the period up to the later 10th century. From around the mid-11th century, the source of many glazed ware imports to Siraf appears to have switched to sgraffiato production centres such as Tiz on the Makran coast and frit production centres, perhaps situated further inland (Priestman, 2005a: 123-25). Beyond these medium distance exchanges, one encounters a small fraction of the ceramic finds that originate from much more distant sources such as China. In other areas of the western Indian Ocean, this tripartite breakdown cannot necessarily be sustained. In areas such as East Africa or South Asia, products not identified as exotic imports have simply been grouped together and recorded as 'local', regardless of the possibility that some at least may derive from regional sources. This difference in the quality of information available for the Persian Gulf and other areas of the western Indian Ocean can be attributed to several factors.

- The ceramic classification applied within this study has been developed primarily on the basis of studies undertaken within the Persian Gulf region. The products of

this region are, therefore, by default the best represented and most closely studied.

- To some extent the localised, small-scale production and long-lived nature of indigenous ceramic traditions characteristic of South Asia and East Africa, make these industries less amenable to clear characterisation and provenance attribution. Although there is a growing literature on the distribution of different stylistic groups of handmade pottery along, for example the East African coast (e.g. Forslund, 2003; Wynne-Jones & Mapunda, 2008; Fleisher & Wynne-Jones, 2011), information on the absolute quantity of pottery from local as opposed to regional sources, is generally not available within the publications of relevant coastal sites such as Shanga or Sanjan.
- The volume of ceramics in circulation via regional exchange within the Persian Gulf may potentially be higher than in other areas of the Indian Ocean.

Whatever the precise causes for the lack of differentiation between local and regional products within East Africa and South Asia, the effect is to create an imbalance in any potential comparison in the volume of imports between these areas and the Persian Gulf.

6.4 Exotic Ceramic Imports

One solution to the discrepancy in the quality of information currently available on regional-scale exchange within all parts of the study area, is simply to amalgamate the categories of locally made and regional-scale imports for assemblages from the Persian Gulf. By amalgamating these categories, an equal comparison can be established with other areas such as East Africa or South Asia, where products of regional scale exchange have not been differentiated. What is being compared then for each area is the balance between ceramic products derived from local or regional sources against those derived from long-distance exchange. For the purpose of this discussion, products derived from long-distance exchange will be referred to as ‘exotic’. This is meant purely in the literal sense of being from elsewhere, as opposed to any potential connotations the term may have with the value or perception associated with such material. It is also important to stress the fact that the component of exotic ceramics has to be defined somewhat

differently within each sector of the Indian Ocean. Within the Persian Gulf, South Asia ceramics are classed as exotic, while in South Asia the position of South Asian and Persian Gulf products is clearly reversed. In this way exotic exchange constitutes a comparable category defined on the basis of different components of the ceramic assemblage in each area (**Table 6.4**).

SITE	**ORIGIN**	**CP1** (400-650)	**CP2** (650-750)	**CP3** (750-825)	**CP4** (825-900)	**CP5** (900-1025)	**CP6** (1025-1250)
		%	%	%	%	%	%
Kush	Exotic	1.0	0.6	1.0	1.6	0.3	0.8
	Local	99.0	99.4	99.0	98.4	99.7	99.2
Bushehr*1	Exotic	13.2					
	Local	86.8					
Sir Bani Yas	Exotic		0.7				
	Local		99.3				
Sohar	Exotic		38.3	25.6	25.7		
	Local		61.7	74.4	74.3		
Siraf	Exotic			6.3	5.8	7.0	4.8
	Local			93.7	94.2	93.0	95.2
Bilad al-Qadim	Exotic			0.1	0.2		0.1
	Local			99.9	99.8		99.9
A'Ali	Exotic				0.7		
	Local				99.3		
Pattanam	Exotic	0.3					
	Local	99.7					
Anuradhapura*2	Exotic	0.2			1.5		
	Local	99.8			98.5		
Sanjan	Exotic			4.2	2.9		13.5
	Local			95.8	97.1		86.5
Manda	Exotic			4.4			
	Local			95.6			
Shanga	Exotic			3.8	4.0	5.0	5.7
	Local			96.2	96.0	95.0	94.3

Table 6.4 *Quantified ceramic assemblages from the Persian Gulf and western Indian Ocean showing the proportion of 'local' and 'exotic' ceramics through chronological stages CP1 to CP6. Sites indicated in bold are fully quantified. Exceptions within the data-set include (*1): counts based finds collected during surface survey and (*2): counts based on sherd weight (grams).*

The figures above group the ceramics from each site according to the chronological stages of CP1 to CP6 and compare the proportion of the total for each period represented

by exotic imports against local and regionally manufactured ceramics combined (**Table 6.3**). Data on the quantity of ceramics from different sources in the assemblage from Murwab have not yet been made available (Guérin & al-Na'imi, 2009; 2010) and therefore this assemblage has been dropped from the analysis. For the site of Kush, which covers the full chronological spectrum under consideration, it is striking to note that exotic ceramics consistently provide a very low proportion of the overall ceramic assemblage. What is also clear is that the proportion of exotic ceramics remains essentially stable, with only a minor degree of fluctuation between 0.3 to 1.6%. If this pattern is compared to the data from other sites, it seems that the sites cluster essentially into one of two groups. All of the sites on the Arabian shore of the Persian Gulf (Kush, Sir Bani Yas, Bilad al-Qadim, A'Ali) provide very similar figures with rarely more than 1% of the assemblage made up of exotic imports. No significant change occurs in the overall proportion of exotic imports across the full span of activity represented from the 5th to 13th centuries. The second cluster of sites is represented most clearly by the results obtained from Siraf. Again exotic imports remain at a relatively consistent level throughout the occupation sequence only fluctuating between c.5 to 7%. The major difference here is that exotic imports account for a small but consistently higher overall proportion of the assemblage. The other two sites that register similarly high percentages of exotic imports are Bushehr and Sohar. All three were major ports. However, the data-sets from Bushehr and Sohar are small, unsystematically collected and potentially problematic, and it has to be acknowledged that the frequency of exotic imports from both these sites may well be inflated through processes of pre-selection.

Outside the Persian Gulf area, the data available are still relatively limited. Again though, as far as any patterning might be evident, the sites appear to follow one or other of the two main behaviours identified already on the basis of the evidence from the Persian Gulf. At the same time, site-specific factors seem to play an important part. At Pattanam, despite this being the most productive site known for imported ceramics in South Asia (Cherian, 2011), imports still make up only a tiny fraction of the assemblage against the backdrop of the exceptional volume of locally manufactured material. Whether Pattanam or sites in South Asia in general have a higher overall ceramic yield than certain other areas of the western Indian Ocean such as the Middle East, is one factor that potentially

needs to be taken into consideration. Anuradhapura similarly provides a low proportion of exotic imports through the late part of the occupation sequence. This is perhaps explainable by the geographic location of the site, situated, as it is a relatively long distance inland from the coast. Sanjan, Manda and Shanga all potentially tie in more closely with the pattern suggested by the results from Siraf. Manda and Shanga in particular provide a consistent picture with exotic imports making up close to 5%. Where the sequence can be chronologically sub-divided at Shanga, the picture again is relatively stable and unchanging. The only potential trend that one can observe is a slight increase in the proportion of exotic imports that continues through the site's development. At Sanjan, the early phases provide a roughly comparable picture. Through the mid-8th to 10th century (CP3 to CP5), the proportion of exotic imports sits between c.3 to 4%. The situation then changes between the early 11th to mid-13th century (CP6). However, as noted above, the unusually high proportion of exotic imports within this later phase of occupation is based on a fairly limited number of sherds.

The presentation of the data focusing on the proportion of exotic imports highlights certain significant differences between individual sites. Of particular interest are the contemporary assemblages from Siraf and Bilad al-Qadim on opposite shores of the Persian Gulf. Bilad al-Qadim represents the major centre of urban life on the island of Bahrain during the Early Islamic period (Insoll, 2005). The site is situated just under 240km across the Persian Gulf from the port of Siraf. Despite the significant status of Bilad al-Qadim, and the relatively short distance between the two sites, the assemblage from Bilad al-Qadim contains almost none of the exotic imports that make up a sizable component of the finds from Siraf. At Bilad al-Qadim, exotic imports constitute no more than 0.1 to 0.2% of the assemblage, and in ceramic terms, the site appears to be virtually locked out of the broader Indian Ocean distribution network. The comparison between Bilad al-Qadim and Siraf is all the more significant as both sets of results are supported by substantial quantities of finds data. What this evidence indicates, is that exotic imports were in no sense uniformly distributed amongst contemporary littoral sites within the region.

6.5 Regional Ceramic Exchange

As has been previously detailed, for sites within the Persian Gulf, the available information on the general provenance of ceramic classes lends itself to a broad grouping of the assemblage differentiated by three levels of circulation behaviour:

- Local - ceramics manufactured at the site of consumption or potentially within a broader geologically similar 'production region'.
- Regional - ceramics from outside the local production area, but from other sources within the general regional block, for example the area surrounding the Persian Gulf.
- Exotic - ceramics derived from outside the regional block, for example within the context of the Persian Gulf, ceramics from South Asia or East Africa.

Where figures can be provided that enable regional and exotic exchange patterns to be differentiated, a more nuanced view of ceramic circulation emerges (**Table 6.5**). Kush again provides a benchmark against which to compare the evidence from other sites. Unlike the data on exotic imports, the proportion of ceramics represented by products of regional scale exchange fluctuates to a significant degree through the occupation sequence. Like the figures for the glazed component, regional ceramic imports make up a relatively high proportion of the assemblage during the earliest occupation of CP1 (16.4%). They then drop by over half to reach an assemblage low in the mid-8th to early 9th century (CP3). That proportion then rises again reaching a peak of between 20-30% in the 10th to later 13th century (CP5 and CP6). This fluctuation in the proportion of regional ceramic imports is clearly important in understanding the changing degree of integration of the site of Kush in different aspects of the ceramic exchange network. At the same time the results may be partly influenced by the fact that no attempt has been made to classify non-diagnostic coarse ware body sherds (see **Chapter 5**). Further work on the coarse ware assemblage from Kush is likely to have a particular impact on the recognition of further regional-scale imports within the assemblage such as Sirafi coarse wares of the 9th to 10th century period. Working for now on the basis of the results provided, regional imports make up only a relatively small proportion of the ceramics assemblage from Kush. Seen from the perspective of other sites within the Persian Gulf, this pattern is atypical.

As with the data on the proportion of glazed wares in the assemblage (**Table 6.3**), Kush appears to represent an exception not the norm.

SITE	AREA	CP1 (400-650)	CP2 (650-750)	CP3 (750-825)	CP4 (825-900)	CP5 (900-1025)	CP6 (1025-1250)
Kush	Exotic	1.0	0.6	1.0	1.6	0.3	0.8
	Regional	16.4	10.8	6.6	11.5	27.9	20.5
	Local	82.6	88.6	92.4	86.9	71.8	78.7
Bushehr*1	Exotic	8.8					
	Regional	32.4					
	Local	58.8					
Sir Bani Yas	Exotic		0.7				
	Regional		66.2				
	Local		33.1				
Sohar	Exotic		38.3	25.6	26.0		
	Regional		15.8	30.2	49.5		
	Local		45.8	44.2	24.5		
Siraf	Exotic			6.3	5.8	7.0	4.8
	Regional			53.9	41.1	31.7	29.8
	Local			39.8	53.0	61.3	65.4
Bilad al-Qadim	Exotic			0.1	0.2		0.1
	Regional			43.5	46.7		7.1
	Local			56.4	53.1		92.8
A'Ali	Exotic				0.7		
	Regional				25.6		
	Local				73.7		

Table 6.5 *Quantified ceramic assemblages from the Persian Gulf showing the proportion of ceramic derived from exotic, regional and local sources through chronological stages CP1 to CP6. Sites indicated in bold are fully quantified. Exceptions include *1: counts based on finds collected during surface survey and *2: counts based on sherd weight (grams).*

The comparison of the data from the contemporary occupation sequences from Siraf and Bilad al-Qadim is again particularly informative given the fact that both sites provide information based on large find samples with good integrity (**Table 6.5**). Both sites provide a high proportion of regional ceramic imports mostly falling within the top half of the range from c.30-50%. The one significant anomaly is the 11th to later 13th century (CP6) at Bilad al-Qadim, where regional imports drop down to 7.1%. This can almost certainly be explained by the fact that very large quantities of pottery were introduced

into this horizon as waster material from a nearby manufacturing site, thereby skewing the figures for the proportion of local ceramics, which elsewhere appear to reflect 'regular use' (see **Section 5.2.3**). The results from Siraf and the main part of the sequence from Bilad al-Qadim appear to be broadly reflected elsewhere within the Persian Gulf with around 30-50% of the ceramics from most sites made up of material imported from regional sources. Only in a few instances do the values provided fall outside this range. At Sir Bani Yas, two-thirds of the assemblage are regional imports. This may be a reflection of the site's particular status situated in relative isolation on an island and to a significant extent dependent on external sources of provisioning and supply (Elders, 2003: 233). Alternatively the figures may simply be inflated by the non-systematic selection process for the available finds sample (see **Section 5.2.6**). At Sohar, the proportion of regional imports starts relatively low at 15% in the 7th to mid-8th century (CP2). This figure then doubles in the mid- 8th to early 9th century (CP3). This may represent an important transformation within the commercial history of the site, although as in a number of other cases, the non-systematic nature of finds retention from Sohar makes it difficult to have full confidence in the results. Finally at the site of A'Ali, the frequency of regional imports appears somewhat low and closer to the levels represented at Kush. In this case, there is a real problem in accurately identifying all pottery classes within the assemblage based on the short descriptions provided, and not all of the regional imports may have been picked up within the current calculation exercise (see **Section 5.2.4**).

6.6 Conclusion

The information currently available on the sources of ceramics supplied to a variety of different types of coastal settlement within the Persian Gulf region, indicate that in most cases, a relatively high proportion of ceramics were derived from sources beyond the immediate local area. Clearly this is a radically different situation to that encountered in contemporary landlocked areas, for example the Sasanian period occupation of sites on the Gorgan Plain in northeast Iran (Priestman, 2013). To what extent the Persian Gulf may be seen to be either typical or exceptional in this regard compared with other littoral areas within the Indian Ocean such as East Africa or South Asia, is a significant point that remains to be established in the future. In terms of any potential change in the balance

between locally produced ceramics and those circulating via regional or long-distance exchange systems, very little consistent patterning is evident across the available assemblage data. Although there are certain marked differences in the consumption levels of exotic ceramic imports between certain strategic port sites such as Siraf and other sites situated along the southern shore of the Persian Gulf such as Bilad al-Qadim and Kush, the actual proportion of such imports seems to vary very little through time. Likewise with regional ceramic imports, there is little consistent chronological patterning between sites. At Siraf, for example, the proportion of regional ceramic imports drops progressively through the occupation sequence. This trend runs in the reverse at Sohar and, in the levels not distorted by the introduction of local production debris, at Bilad al-Qadim (CP3-CP5). The evidence available indicates that site function and geographic location exerted a greater degree of influence over the consumption of ceramics, than broader chronological changes in the overall volume and composition of ceramic exchange. The Abbasid 'trade boom' if it existed, does not manifest itself uniformly or without qualification.

Chapter 7 Composition of Ceramic Exchange

7.1 Introduction

Up to this point the analysis presented has dealt only with generalised characteristics: the varying proportions of glazed to unglazed ceramics, and distinctions based on non-local/local, or local, regional and exotic imports (**Chapter 6**). In order to understand how the dynamics of ceramic circulation and consumption behaviours developed and varied across the western Indian Ocean region, it is necessary to look more closely at precisely what sorts of ceramics were involved; that is, from where the ceramics originate, how they might be characterised and the types of vessels that were involved. As we have already seen, what does not appear to change significantly, perhaps surprisingly, is the overall proportion of exotic ceramics in circulation. At the same time, the qualitative impression one derives from looking at the changing nature of the ceramic assemblage, is of an increase in the range and variety of ceramic products, the number of production sources and the geographic spread of these sources, particularly as one moves from the Sasanian and Early Islamic periods, into the early Abbasid period. This is clearly represented, for example, by the introduction of East Asian ceramic imports into the western Indian Ocean area starting from around the mid-8th century (Rougeulle, 1996), or the development in the early 9th century of innovative brightly decorated glazed ceramics within the Middle East, which themselves became a significant export commodity (Northedge & Kennet, 1994; Priestman, 2011b). The challenge remains: how best to document such developments within an empirical and quantitative framework?

Two main aspects of the ceramic assemblage can be considered. The first is an analysis based on the range of material defined according to the framework of the ceramic production tradition or class. Within the scheme applied within this study, a broad range of ceramic classes are distinguished on the basis of general macroscopic characteristics. It is assumed that each class represents a set of products originating from a similar place of manufacture and the same time period (see **Section 2.3.5**). What needs to be addressed are

the changes in the overall range of classes in circulation, and the specific varieties of material represented.

An alternative approach to the assemblage is to consider the composition of ceramic finds in terms of the range of vessel forms represented. Vessel forms have the added advantage of being particularly closely associated with the factor of vessel use (see **Section 2.3.6**). For many of the categories of material represented within the study, a broad spectrum of vessel types occurs as part of the same class. In such cases, information on specific vessel forms is required to distinguish between different functional categories. At the same time there are difficulties associated with the developing analysis on the basis of typological information. The recording of specific vessel types used for the purposes of formal typological identification relies on the presence of diagnostic sherds, which make up only a small proportion of the overall sherd assemblage. There is also the broader problem of establishing a reliable basis with which to correlate specific vessel forms with particular functions (e.g. Rice, 1987: 210-11; Juhl, 1995: 8). In the end, the most obvious and immediate value of typological information is in connection with ceramic chronology and for broader matching and classification purposes. For a general functional analysis of the assemblage, generic vessel shape/functional groups can be considered. Different approaches to the ceramic assemblage reveal certain key underlying trends in the composition of Indian Ocean ceramic exchange, but also highlight aspects of the evidence that remain limited and require additional attention as part of the routine recording of assemblages in the future.

7.2 Class Numbers

At the most simplified level, ceramic diversity can be measured by the total number of classes recorded through successive periods of site occupation (**Table 7.1**). Insufficient information is available in publication at this time for the sites of Murwab and Pattanam to estimate the full range of classes represented, and these sites have therefore been excluded from the analysis. For the assemblage from Siraf, most of the analysis presented above relies on the full and representative sherd count data recorded from copies of the find record cards held within the excavation archive at the British Museum (see **Section 5.2.1**). The difficulty of deciphering the brief and abbreviated class descriptions given on the find

record cards, means that only a relatively generic classification of the classes has been attempted. For the purposes of recording the full range of different classes represented, more accurate information can be obtained from the direct study of a large sample of the ceramic finds from Siraf in the British Museum (Priestman, forthcoming). Although certain rare categories of material may potentially fail to be represented within this sample, the assemblage available appears to be broadly representative of the typical range of material encountered within the excavation.

With only a few exceptions, the figures provided for the number of classes recorded across the 11 suitable assemblages shows a pattern of general increase through the period under consideration, potentially confirming the impression of increasing overall diversity within the assemblage alluded to earlier (**Table 7.1**). At the same time, there are several factors that may influence these results. At sites with longer occupation sequences, there is clearly a progressive accumulation affect. Later dated phases generally include classes that are new to that period together with classes from earlier periods, including those that may already have gone out of circulation. In addition to the issue of residuality, the figures provided are influenced by the somewhat arbitrary factor of how the ceramic assemblage has been classified. That is, whether a group is relatively broadly defined or more extensively subdivided. By way of example, the long-lived Alkaline Glazed Ware assemblage, which shows significant diachronic change in terms of the repertoire of vessel forms, but little obvious variation in terms of glaze colour and fabric, has all been categorised here under two broad classes (TURQ.T and TURQ.YG). Opaque Glazed Wares, by contrast, display relatively uniform characteristics in terms of glaze and fabric, but have been separated out into many different sub-class categories on the basis of specific decoration techniques or colour schemes (for example OPAQ.W, OPAQ.C, OPAQ.LG, etc.). Class categorisation is undoubtedly influenced by the presence of obvious visual traits, and this creates a bias in terms of the number of classes likely to be recorded for certain categories such as the distinctive coloured glazed wares introduced during the Abbasid period.

A final factor to consider is the quality of information available for recognising different ceramic classes. As has been detailed for each site in Chapter 5, a range of different sources have been utilised to identify the class categories, and the classes themselves have been

subjected to a further process of standardisation in order to generate cross-site comparisons (see **Section 2.3**). The most detailed and accurate source of information comes from those assemblages – like the Siraf assemblage in the British Museum – where it has been possible to personally record information on the basis of a physical examination and recording of individual sherds. For these assemblages, the maximum range of classes is likely to be recognised. By contrast, for assemblages recorded only on the basis of published information, the identification of classes is very much dependent on the quality of information provided. Working from published class groups, standardisation of class categories across assemblages can generally only be achieved by amalgamating categories. Unless individual sherd catalogue or database entries are provided – such as for the assemblages from Anuradhapura and Bilad al-Qadim – published class categories are by their nature non-divisible. In cases where minimal description is provided, such as in the publication of ceramics from A'Ali (Sasaki, 1990), many of the glazed categories have simply been grouped together under the generic heading of Non-Identified Glazed Wares (GW.N-ID, see **Section 5.2.4**). Where ceramic classes are described in greater detail, such as for the assemblage from Kush (Kennet, 2004), more detailed correlations can be established. In this example, the process has also been aided by physically reviewing the class categories and where necessary reattributing class assignations within the original finds database (see **Section 5.2.7**).

SITE	CP1 (400-650)	CP2 (650-750)	CP3 (750-825)	CP4 (825-900)	CP5 (900-1025)	CP6 (1025-1250)
Kush	**17**	**18**	**21**	**13**	**34**	**41**
Bushehr	**29**					
Sir Bani Yas		7				
Siraf (BM)			**14**	**54**	**25**	**45**
Bilad al-Qadim			11	23		34
A'Ali				20		
Sohar		**18**	**20**	**37**		
Anuradhapura	1			17		
Sanjan			8	10		22
Shanga			**7**	**12**	**12**	**34**
Manda			**72**			
AVERAGE	16	14	9	20	17	32

Table 7.1 *Total number of IIOCC classes recorded by period for each site. Figures highlighted in bold indicate those established on the basis of the physical examination of associated sherd assemblages. The last row provides the average number of classes recorded per-period.*

Based on the figures provided (**Table 7.1**), it is clear that there are also notable differences in overall numbers of classes recorded for the same period between different sites. As is detailed above, this is influenced to a significant extent by the quality of source information available for the categorisation of class groups. Those cells with figures highlighted in bold represent assemblages where it has been possible to establish class groupings on the basis of the physical examination of sherds. Focusing specifically on this group, it is clear that there is generally close agreement in the broad trajectory of progressive growth in the number of classes recorded. Where exceptions occur, these appear to be closely connected to specific local factors. At Kush, the temporary dip in class numbers in the 9th century (CP4), corresponds to a period of limited activity on the settlement mound, possibly including an episode of abandonment during the 9th century (Kennet, 2004: 15). This same phase is characterised by the most intensive activity at the medieval port of Siraf. This corresponds to the maximum range of classes represented at Siraf. The drop in the range of classes recorded for the 10th to early 11th century (CP5), may not be characteristic of the Siraf occupation sequence as a whole, but rather be related to the relatively early abandonment

of the building sequence represented in the area of Site A from where the data-set is drawn (Whitehouse, 1968: 7-8[51]).

For the assemblage from Shanga in East Africa, it is striking to note the same general trajectory of increasing class numbers, but with only around half the number of classes represented to those generally expected for the 9th to early 11th century (CP4 and CP5) on sites within the Persian Gulf. This is likely to be related to the cruder methodology adopted for recording class groups in the assemblage from Shanga (see **Section 5.2.10**), but may also partially reflect the circulation of a more limited range of ceramic imports within the East African littoral area further from their source of origin within the Persian Gulf (for a related point see Priestman, 2011b: 110). A similar figure is provided for the same period from the assemblages from Sanjan and Anuradhapura in South Asia, both of which provide figures based on relatively detailed recording of class categories within the available publications (Nanji, 2011; Seely, Canby & Coningham, 2006: 91-126). For the assemblage from Manda, a large majority of the imported sherds have been physically examined and the classification provided is therefore well populated. At the same time, no information on the phasing of the sherds has been obtained, and therefore classes from all periods are presented as a single undifferentiated block. The comments made here in connection with the crude measure of overall class numbers, apply equally to the more detailed consideration of the range of actual classes recorded that are presented below.

7.3 Class Categories

Information on changes in the overall quantity and verity of classes represented on sites can be unpacked further by considering the specific categories of regional and exotic class categories recorded. Again it is appropriate to concentrate on those assemblages highlighted above where class groupings have been established on the basis of the physical examination of sherds and where a wider and more accurate range of classes are therefore recorded (**Table 7.1**). Like the figures for the overall number of classes, the individual

[51] Note in particular the evidence for what appears to be a substantial break between the long building sequence that ends in 'Period 2D' and the more ephemeral occupation that begins c.1.5m higher up within the sequence in the next phase; 'Period 3'. Finds from Period 2D include material characteristic of the 10th such as incised decorated Yue Ware (YUE.4), while material from Period 3 includes Longquan Celadon (LQC) and Julfar Ware (JULFAR), suggested that these levels may date as late as the 13 or 14th century.

categories represented are influenced by similar factors, namely: residuality, the process of class definition, and the quality of source evidence upon which class divisions are based. The individual classes listed and discussed below, as elsewhere in this study, are referred to by class codes. A key to these codes appears at the beginning of Appendix I followed by a full catalogue of the class and fabric descriptions.

There are two alternative ways of presenting what is in effect the same set of results, both of which help to highlight different aspects of the information. The first is a breakdown of the range of classes recorded in each assemblage presented by ceramic period (**Tables 7-12**). The second is a presentation of the results across periods by site (**Tables 13-18**). Both configurations provide information on basic presence/absence associations. Clearly this does not take into account the relative frequencies of the different classes represented, though as has already been indicated above, the regional and exotic imports considered within this section, make up only a relatively small proportion of ceramics recovered. Particularly for exotic imports, many of the classes are only represented by a few sherds and it is their recorded presence rather than their quantitative contribution that is considered here. The results provided for the changing range and nature of classes recorded points to certain widespread shifts in the make-up of ceramic exchange through the period under consideration.

REGION	Bushehr	Kush	Siraf	Sohar	Shanga
CERAMIC PERIOD 1 (400-650)					
East Asia					
South Asia	BUFRAB	BUFRAB			
	HARMIC	HARMIC			
	INCOP	INCOP			
	IRAB	IRAB			
	IRPW	IRPW			
	SBBW				
East Africa					
Iraq	HONEY				
	TORP.S	TORP.S			
	TRC				
	TURQ.T	TURQ.T			
	TURQ.YG	TURQ.YG			
		WHITE.PI			
Eastern Arabia					
Southern Iran (non-local)	CHAM				
	FOPW.1-2	FOPW.1-2			
		HARLIM			
		HARLIM.E			
	SLIP.B				
	SLIP.R				
	SLIP.TB				

Table 7.2 *Ceramic classes recorded on sites occupied during Ceramic Period 1 (AD c.400-650)*.

REGION	Bushehr	Kush	Siraf	Sohar	Shanga
CERAMIC PERIOD 2 (650-750)					
East Asia					
South Asia		BRISAN		BRISAN	
		BUFRAB		BUFRAB	
		HARMIC		HARMIC	
				INCOP	
		IRPW		IRPW	
				IRPW.RC	
				LINVES	
		SBBW		SBBW	
East Africa					
Iraq		EGG.PI		EGG.PI	
		TORP.S		TORP.S	
		TURQ.T		TURQ.T	
		TURQ.YG			
				WHITE.A	
		WHITE.PI		WHITE.PI	
Eastern Arabia					
Southern Iran (non-local)		FOPW.1-2			
		HARLIM			
		HARLIM.E			
				CONG.G	
				REBROS	

Table 7.3 *Ceramic classes recorded on sites occupied during Ceramic Period 2 (AD c.650-750)*.

REGION	Bushehr	Kush	Siraf	Sohar	Shanga
CERAMIC PERIOD 3 (750-825)					
East Asia			CHANG		CHANG
			DUSUN		DUSUN
South Asia		BRISAN			
		BUFRAB	BUFRAB	BUFRAB	
		HARMIC	HARMIC	HARMIC	
		INCOP	INCOP	INCOP	
		IRAB		IRPW	
		IRPW		IRPW.RC	
				LINVES	
		SBBW		SBBW	
East Africa			EACOP	EACOP	EACOP
Iraq				BUFF.I	BUFF.I
					EGG.PI
			BUFF.P		
		STAMP			
			TORP.RG		
		TORP.S		TORP.S	
				TRC	
		TURQ.T	TURQ.T	TURQ.T	TURQ.T
		TURQ.YG			
				WHITE.A	
		WHITE.PI	WHITE.PI	WHITE.PI	
Eastern Arabia					
Southern Iran (non-local)				CONG.G	
					CREAC
		FOPW.2			
		HARLIM		HARLIM	
		HARLIM.E			

Table 7.4 *Ceramic classes recorded on sites occupied during Ceramic Period 3 (AD c.750-825)*.

REGION	Bushehr	Kush	Siraf	Sohar	Shanga
CERAMIC PERIOD 4 (825-900)					
East Asia			CHANG	CHANG	CHANG
			DUSUN	DUSUN	DUSUN
				ENAM	
			EAST.N-ID		
			GM		
			GWSG		
			LQC		
			QING		
			STONE.BG1		
			STONE.BG2		
			STONE.GU	STONE.GU	
			WW		
			WWSL		
			YUE	YUE	YUE
South Asia				BRISAN	
			BUFRAB	BUFRAB	
		HARMIC	HARMIC		
		IRPW			
			INCOP	INCOP	
			LINVES	LINVES	
			SBBW	SBBW	
East Africa				EACOP	
Iraq			BUFF.I	BUFF.I	BUFF.I
			BUFF.P	BUFF.P	EGG.PI
		EGG.PI	EGG.PI	EGG.PI	OPAQ.LG
		HONEY		HONEY	
			OPAQ.C		
			OPAQ.T		
			OPAQ.TS	OPAQ.TS	OPAQ.TS
		OPAQ.W	OPAQ.W		OPAQ.W
				REDYEL	TURQ.T
			SPLASH.GW1		
			SPLASH.P1		
			TORP.RG	TORP.RG	
		TORP.S	TORP.S		
		TURQ.T	TURQ.T	TURQ.T	
				WHITE.A	
		WHITE.PI	WHITE.PI	WHITE.PI	
Eastern Arabia			JULFAR	JULFAR	
				JULFAR.PB	

REGION	Bushehr	Kush	Siraf	Sohar	Shanga
CERAMIC PERIOD 4 (825-900)					
Southern Iran (non-local)			CHAM.N-ID		
				CHAMP	
				CREAC	CREAC
				FIBIC	
				FRIT.UGP	
			GLAMO.Y		
			GRAF.EY		
				GRAF.H	
				GRAF.LP	
		HARLIM			HARLIM
		HARLIM.E			
				KHUNJ	
				MONO.G	
				REBROS	
South Arabia				SPECLE.2	

Table 7.5 *Ceramic classes recorded on sites occupied during Ceramic Period 4 (AD c.825-900)*.

REGION	Bushehr	Kush	Siraf	Sohar	Shanga
CERAMIC PERIOD 5 (900-1025)					
East Asia			DUSUN		DUSUN
			EAST.N-ID		
			YUE		YUE
		WW			
South Asia			BUFRAB		
		HARMIC			
		INCOP			
		IRAB			
		IRPW			
		SBBW			
East Africa					
Iraq			BUFF.I		BUFF.I
		EGG.PI			EGG.PI
			GRAF.TL		
			OPAQ.B		OPAQ.LG
		OPAQ.BW			
			OPAQ.PS		
		OPAQ.TS	OPAQ.TS		OPAQ.TS
		OPAQ.W	OPAQ.W		OPAQ.W
			SPLASH.GW1		
		SPLASH.P1			
		TORP.S			
		TURQ.T	TURQ.T		TURQ.T
		TURQ.YG			
		WHITE.PI	WHITE.PI		
Eastern Arabia					
Southern Iran (non-local)		CHAM			
		CREAC			CREAC
		EGG.R			
		FRIT.EM			
		GRAF.EP2			
		GRAF.EY			
		GRAF.H			
		HARLIM			HARLIM
		HARLIM.E			
		MONO.G			
		SPLASH.P2			SPLASH.P2

Table 7.6 *Ceramic classes recorded on sites occupied during Ceramic Period 5 (AD c.900-1025)*.

REGION	Bushehr	Kush	Siraf	Sohar	Shanga
CERAMIC PERIOD 6 (1025-1250)					
East Asia			CHANG		WW
		CWW			
		DUSUN	DUSUN		DUSUN
		EAST.N-ID	EAST.N-ID		
			GWSG		
					LQC
					MTB.1
		QING			QING
			STONE.GU		
		WW	WW		
			WWSL		
			YUE		YUE
South Asia		BRISAN			
		BUFRAB	BUFRAB		
		HARMIC	HARMIC		
					INCOP
		IRAB	IRAB		
		IRPW			
		SBBW	SBBW		
East Africa					
Iraq			BUFF.I		BUFF.I
		EGG.PI			EGG.PI
					GRAF.EP1
		OPAQ.BW			
			OPAQ.C		
					OPAQ.LG
			OPAQ.PS		
		OPAQ.TS	OPAQ.TS		OPAQ.TS
		OPAQ.W	OPAQ.W		OPAQ.W
		TORP.S			
		TURQ.T	TURQ.T		TURQ.T
		TURQ.YG			
					WHITE.M
		WHITE.PI	WHITE.PI		
Eastern Arabia			JULFAR		
			MGPAINT.1		

REGION	Bushehr	Kush	Siraf	Sohar	Shanga
CERAMIC PERIOD 6 (1025-1250)					
Southern Iran (non-local)		CHAM			
					CHAMP
		CREAC			CREAC
		EGG.R			
		FOPW.2			
		FRIT.EM			FRIT.EM
					GRAF.DI
		GRAF.EP2			
			GRAF.EY		
					GRAF.GYB
		GRAF.H	GRAF.H		GRAF.H
		GRAF.LG			GRAF.LG
		GRAF.LP	GRAF.LP		
					GRAF.LY
			GRAF.M		GRAF.M
		HARLIM			HARLIM
		MONO.G	MONO.G		MONO.G
		MONO.Y	MONO.Y		MONO.Y
					REBROS
		SPLASH.P2			SPLASH.P2
		SPW			SPW

Table 7.7 *Ceramic classes recorded on sites occupied during Ceramic Period 6 (AD c.1025-1250)*.

REGION	CP1 (400-650)	CP2 (650-750)	CP3 (750-825)	CP4 (825-900)	CP5 (900-1025)	CP6 (1025-1250)
East Asia					WW	CWW
						DUSUN
						EAST.N-ID
						QING
						WW
South Asia	BUFRAB	BRISAN	BRISAN	HARMIC	HARMIC	BRISAN
	HARMIC	BUFRAB	BUFRAB	IRPW	INCOP	BUFRAB
	INCOP	HARMIC	HARMIC		IRAB	HARMIC
	IRAB	IRPW	INCOP		IRPW	IRAB
	IRPW	SBBW	IRAB		SBBW	IRPW
			IRPW			SBBW
			SBBW			
Iraq	TORP.S	EGG.PI	STAMP	EGG.PI	EGG.PI	EGG.PI
	TURQ.T	TORP.S	TORP.S	HONEY	OPAQ.BW	OPAQ.BW
	TURQ.YG	TURQ.T	TURQ.T	OPAQ.W	OPAQ.N-ID	OPAQ.TS
	WHITE.PI	TURQ.YG	TURQ.YG	TORP.S	OPAQ.TS	OPAQ.W
		WHITE.PI	WHITE.PI	TURQ.T	OPAQ.W	TORP.S
				WHITE.PI	SPLASH.P1	TURQ.T
					TORP.S	TURQ.YG
					TURQ.T	WHITE.PI
					TURQ.YG	
					WHITE.PI	
Southern Iran	FOPW.1-2	FOPW.1-2	FOPW.2	HARLIM	CHAM	CHAM
	HARLIM	HARLIM	HARLIM	HARLIM.E	CREAC	CREAC
	HARLIM.E	HARLIM.E	HARLIM.E		EGG.R	EGG.R
					FRIT.EM	FOPW.2
					GRAF.EP2	FRIT.EM
					GRAF.EY	GRAF.EP2
					GRAF.H	GRAF.H
					HARLIM	GRAF.LG
					HARLIM.E	GRAF.LP
					MONO.G	GRAF.N-ID
					SPLASH.P2	HARLIM
						MONO.G
						MONO.Y
						SPLASH.P2
						SPW

Table 7.8 *Regional and exotic imports recorded through the occupation sequence at Kush. Class groups defined on the basis of categories presented in publication (Kennet, 2004). Groups checked and amended where necessary in the original finds database following a review of the collection at the Department of Antiquities in Ras al-Khaimah.*

REGION	CP1 (400-650)	CP2 (650-750)	CP3 (750-825)	CP4 (825-900)	CP5 (900-1025)	CP6 (1025-1250)
South Asia	BUFRAB					
	HARMIC					
	INCOP					
	IRAB					
	IRPW					
	SBBW					
Iraq	HONEY					
	TURQ.T					
	TRC					
	TORP.S					
	TURQ.YG					
Southern Iran (non-local)	CHAM					
	FOPW.1					
	FOPW.2					
	SLIP.B					
	SLIP.R					
	SLIP.TB					

Table 7.9 *Regional and exotic imports from Bushehr. Class groups defined on the basis of the study of surface finds collected by Andrew Williamson in the Ashmolean Museum, Oxford.*

REGION	CP1 (400-650)	CP2 (650-750)	CP3 (750-825)	CP4 (825-900)	CP5 (900-1025)	CP6 (1025-1250)
East Asia			CHANG	CHANG	DUSUN	CHANG
			DUSUN	DUSUN	EAST.N-ID	DUSUN
				EAST.N-ID	YUE	EAST.N-ID
				GM		GWSG
				GWSG		STONE.GU
				LQC		WW
				QING		WWSL
				STONE.BG1		YUE
				STONE.BG2		
				STONE.GU		
				WW		
				WWSL		
				YUE		
South Asia			BUFRAB	BUFRAB	BUFRAB	BUFRAB
			INCOP	HARMIC		HARMIC
			HARMIC	INCOP		IRAB
				LINVES		SBBW
				SBBW		
East Africa			EACOP			
Iraq			BUFF.P	BUFF.I	BUFF.I	BUFF.I
			TORP.RG	BUFF.P	GRAF.TL	OPAQ.C
			TURQ.T	EGG.PI	OPAQ.B	OPAQ.PS
			WHITE.PI	OPAQ.C	OPAQ.PS	OPAQ.TS
				OPAQ.T	OPAQ.TS	OPAQ.W
				OPAQ.TS	OPAQ.W	TURQ.T
				OPAQ.W	SPLASH.GW1	WHITE.PI
				SPLASH.GW1	TURQ.T	
				SPLASH.P1	WHITE.PI	
				TORP.RG		
				TORP.S		
				TURQ.T		
				WHITE.PI		
Eastern Arabia				JULFAR		JULFAR
						MGPAINT.1
Southern Iran (non-local)				CHAM.N-ID		GRAF.EY
				GLAMO.Y		GRAF.H
				GRAF.EY		GRAF.LP
						GRAF.M
						MONO.G
						MONO.Y

Table 7.10 *Regional and exotic imports recorded through the occupation sequence of Site A at Siraf. Class groups defined on the basis of categories presented in publication (Kennet, 2004). Class groups defined on the basis of the study of the study of a sample of finds in the British Museum*.

REGION	CP1 (400-650)	CP2 (650-750)	CP3 (750-825)	CP4 (825-900)	CP5 (900-1025)	CP6 (1025-1250)
East Asia				CHANG		
				DUSUN		
				ENAM		
				STONE.GU		
				YUE.3		
South Asia		BRISAN	BUFRAB	BRISAN		
		BUFRAB	HARMIC	BUFRAB		
		HARMIC	INCOP	INCOP		
		INCOP	IRPW	LINVES		
		IRPW	IRPW.RC	SBBW		
		IRPW.RC	LINVES			
		LINVES	SBBW			
		SBBW				
East Africa			EACOP	EACOP		
South Arabia				SPECLE.2		
Iraq		EGG.PI	BUFF.I	BUFF.I		
		TORP.S	TORP.S	BUFF.P		
		TURQ.T	TRC	EGG.PI		
		WHITE.A	TURQ.T	HONEY		
		WHITE.PI	WHITE.A	OPAQ.TS		
			WHITE.PI	REDYEL		
				TORP.RG		
				TURQ.T		
				WHITE.A		
				WHITE.PI		
Southern Iran		CONG.G	CONG.G	CHAMP		
		REBROS	HARLIM	CREAC		
				FIBIC		
				FRIT.UGP		
				GRAF.H		
				GRAF.LP		
				KHUNJ		
				MONO.G		
				REBROS		
Eastern Arabia				JULFAR.PB		
				JULFAR		

Table 7.11 *Regional and exotic imports recorded through the occupation sequence at Sohar. Class groups defined on the basis of the study of a sample of finds at Ministry of Culture in Muscat.*

REGION	CP1 (400-650)	CP2 (650-750)	CP3 (750-825)	CP4 (825-900)	CP5 (900-1025)	CP6 (1025-1250)
East Asia			CHANG	CHANG	DUSUN	WW
			DUSUN	DUSUN	YUE	DUSUN
				YUE		QING
						YUE
						LQC
						MTB.1
South Asia						INCOP
Iraq			BUFF.I	BUFF.I	BUFF.I	BUFF.I
			EGG.PI	EGG.PI	EGG.PI	EGG.PI
			TURQ.T	OPAQ.LG	OPAQ.LG	GRAF.EP1
				OPAQ.TS	OPAQ.TS	OPAQ.LG
				OPAQ.W	OPAQ.W	OPAQ.TS
				TURQ.T	TURQ.T	OPAQ.W
						TURQ.T
						WHITE.M
Southern Iran			CREAC	CREAC	CREAC	FRIT.EM
				HARLIM	HARLIM	GRAF.DI
					SPLASH.P2	GRAF.GYB
						GRAF.LG
						GRAF.LY
						GRAF.M
						GRAF.N-ID
						HARLIM
						MONO.G
						MONO.Y
						SPLASH.P2
						SPW
						CREAC
						REBROS
						CHAMP
						GRAF.H

Table 7.12 *Regional and exotic imports recorded through the occupation sequence at Shanga. Class groups defined on the basis of categories presented in publication (Horton, 1996b). Groups checked and amended where necessary based on a review of the collection at the National Museums of Kenya store in Lamu.*

REGION	CP1 (400-650)	CP2 (650-750)	CP3 (750-825)	CP4 (825-900)	CP5 (900-1025)	CP6 (1025-1250)
East Asia			CBW	→	→	→
			CHANG	→	→	→
			DUSUN	→	→	→
			EAST.N-ID	→	→	→
			LQC	→	→	→
			MTB.1	→	→	→
			QING	→	→	→
			STONE.GRY	→	→	→
			WW	→	→	→
			WWSL	→	→	→
			YUE	→	→	→
South Asia			BRISAN	→	→	→
			BUFRAB	→	→	→
			LINVES	→	→	→
			SBBW	→	→	→
Iraq			BUFF.I	→	→	→
			BUFF.S	→	→	→
			EGG.PI	→	→	→
			GRAF.EP1	→	→	→
			OPAQ.BT	→	→	→
			OPAQ.C	→	→	→
			OPAQ.CP	→	→	→
			OPAQ.LG	→	→	→
			OPAQ.LP	→	→	→
			OPAQ.LR	→	→	→
			OPAQ.N-ID	→	→	→
			OPAQ.PS	→	→	→
			OPAQ.T	→	→	→
			OPAQ.TS	→	→	→
			OPAQ.W	→	→	→
			SPLASH.P1	→	→	→
			TORP.RG	→	→	→
			TORP.S	→	→	→
			TURQ.T	→	→	→
			WHITE.M	→	→	→
			WHITE.PI	→	→	→

REGION	CP1 (400-650)	CP2 (650-750)	CP3 (750-825)	CP4 (825-900)	CP5 (900-1025)	CP6 (1025-1250)
Southern Iran			CHAMP	→	→	→
			CREAC	→	→	→
			FIBIC	→	→	→
			FRIT.BL	→	→	→
			FRIT.EM	→	→	→
			FRIT.N-ID	→	→	→
			FRIT.UGP	→	→	→
			GRAF.DI	→	→	→
			GRAF.EG	→	→	→
			GRAF.EP2	→	→	→
			GRAF.GW	→	→	→
			GRAF.GYB	→	→	→
			GRAF.H	→	→	→
			GRAF.LG	→	→	→
			GRAF.LP	→	→	→
			GRAF.LY	→	→	→
			GRAF.M	→	→	→
			GRAF.N-ID	→	→	→
			HARLIM	→	→	→
			INCOP	→	→	→
			KHUNJ	→	→	→
			MONO.G	→	→	→
			MONO.Y	→	→	→
			REBROS	→	→	→
			SPLASH.GW2	→	→	→
			SPLASH.P2	→	→	→
			SPW	→	→	→
South Arabia			SPECLE.1	→	→	→
			YEMEN	→	→	→
Europe			CHIN	→	→	→
			STONE.EU	→	→	→

Table 7.13 *Regional and exotic imports from Manda. Class groups defined on the basis of the study of finds in the National Museum of Kenya store in Lamu.*

7.3.1 South Asian Exports

In terms of exotic imports, South Asian classes are marked out by their presence in every assemblage and the relative stability in the range of classes represented through the period under consideration. South Asian imports onto sites within the Persian Gulf and East Africa consist largely of two broad categories of material: hard impermeable and highly finished jars such as Indian Red Polished Ware (IRPW), or slightly larger and coarser versions of a similar vessel often with simple black painted decoration (HARMIC), and low-fired, coarse tempered cooking pots (such as SBBW, BUFRAB, IRAB) (Kervran, 1996). Both groups are distinct in the fact that they represent what are essentially utilitarian products but with a

very extensive geographic distribution beyond their area of production. A similar range and composition of classes are represented at many of the sites and the classes themselves appear to change only gradually during the period under consideration. The most significant diachronic change appears to be the decline of more highly finished jars such as IRPW and the switch to an assemblage consisting almost entirely of cooking pots. Within this picture certain notable exceptions occur.

The 9th century occupation at Kush (CP4), the 10th to early 11th century occupation at Siraf (CP5), and the assemblage from Shanga are all marked out by the comparatively low range of South Asian classes recorded. In each case, these results may be explained by particular local factors. At Kush, the dip in class numbers in CP4 coincides with a period of overall reduced class variety and an episode of interrupted settlement activity on the mound (Kennet, 2004: 15). Similarly at Siraf, the range of South Asian and other exotic imports dips in CP5 and thereafter many of the classes represented across all categories appear to be residual. While many areas of the port city witnessed continued intensive activity in this period, there are indications of localised and relatively early abandonment of structures in the area of the deep sounding at Site A (Whitehouse, 1968: 7-8). At Shanga the low range and frequency of South Asian imports recorded would, if genuine, be highly significant as the picture is clearly different to that recorded for sites within the area of the Persian Gulf. However, the potential difficulty that exists in distinguishing South Asian imports from locally manufactured products means that South Asian imports may have simply been overlooked during recording. This suspicion appears to be confirmed by the presence of a more typical range of South Asian imports similar to those from sites within the Persian Gulf amongst the assemblage from the neighbouring settlement of Manda.

The presence of low-fired, coarse-tempered cooking pots from South Asia on sites in East Africa appears somewhat surprising given the ready availability of closely comparable products as part of the indigenous assemblage. More careful recording is likely to be required to consistently distinguish the two similar cooking pot traditions. Already the evidence from Manda provides an indication that the main driver for the widespread export of South Asian pottery was not simply a functional demand. While simplistic correlations between the origin of cooking pots and the ethnicity of their users are probably of little

value in their own right (see for example Hansman, 1985: 48; Frifelt, 2001: 91), the evidence from East Africa may be the strongest indication yet that the use of such material was governed by specific cultural concerns associated with the demands either of diaspora communities, or more indirectly with the spread of a South Asian culinary tradition.

7.3.2 East African Exports

The other significant source of ceramic cooking pots in the period with which we are concerned, as has just been alluded to, is East Africa. Like their South Asian counterparts, these too were exchanged beyond their local area of production, though the overall volume of material and the geographic extent of their distribution within the western Indian Ocean appear to be more limited. Due to the small quantities of East African cooking pots encountered within the quantified assemblages included within this study (apart from those in East Africa), no attempt has been made at this stage to further subdivide the assemblage into regional groups, and the material is simply included under the single generic class of East African Cooking Pots (EACOP). No doubt more detailed study of the East African assemblage will – and to some extent already does – allow its constituent components to be distinguished and provenanced (e.g. Fleisher & Wynne-Jones, 2011). At the same time, there are significant underlying differences of approach taken in relation to the definition of the products of small-scale localised production traditions within the East African littoral area and the industrial-scale output of many of the products emanating from the Middle East or East Asia. This is likely to present certain challenges in terms of a broader process of methodological integration.

In terms of the distribution of East African cooking pots within the western Indian Ocean, none are so far attested within a South Asian context but this again may simply reflect the potential difficulties of separating out superficially similar East African and South Asian cooking pot traditions. Within the Middle East, the frequency of East African cooking pot finds appears to drop off progressively as one moves from South Arabia to the east and north through Oman and into the Persian Gulf. However, the temporal aspect of this distribution still remains poorly resolved. At the late 10th to mid-12th century entrepôt site of Sharma in the Hadramawt region of Yemen, excavations completed between 2001 and 2005 produced an assemblage containing as much as c.15% East African pottery (Rougeulle, 2005:

223). Further to the northeast in Oman, East African cooking pots also appear to be relatively common. Examples have been noted amongst the surface finds at the extensive 9th – 15th century settlement of Ras al-Hadd (Priestman, 2011a: 22, fig. 5) and also amongst the excavated finds from the Arja mine complex and Sohar (pers. obs. 2010 and 2013). At Sohar, examples are represented in levels dated to between the 8th and 9th centuries within the quantified assemblage presented here from the Sohar Town excavation. Within the Persian Gulf, East African pottery appears to be much more scarce and the only examples that are currently known are a small number of pieces amongst the finds from Siraf in the British Museum (Priestman, forthcoming) and a single fragment from Sirjan in inland Fars (Priestman & Kennet, forthcoming). Within the Site A sequence at Siraf, these are only represented in the mid-8th to early 9th century occupation of CP3, though somewhat later examples more likely dated within the 9th and 11th to 12th century (Horton, pers. comm. 2008) are represented amongst the larger sample from other trenches. Compared with South Asian exports, East African cooking pots appear to have a more limited distribution within the western Indian Ocean. At the same time, an improving recognition of this material is likely to lead to further examples being recorded from an increasing range of sites.

7.3.3 East Asian Exports

One of the most dramatic changes to occur in the make-up of the exotic ceramic imports within the western Indian Ocean during the period under consideration occurs with the introduction of East Asian imports. The arrival of East Asian pottery marks a significant increase both in the overall diversity of imports and in the geographic extent of the sources from which they are derived. Broadly East Asian ceramics can be divided into two categories: container vessels used to transport other sorts of commodities, and 'tablewares' that were traded as a commodity in their own right. Both categories are clearly represented for example within the cargo of the Belitung wreck recovered off the coast of Indonesia in the form of large green glazed 'Dusun' jars and standardised mass-produced bowls and ewers from Changsha in Hunan (Krahl, 2010b: 52). The Belitung cargo presents a clear example of ceramic mass-production and structured directional exchange within a 9th century context. The question of whether this lone cargo represents an exception or the norm is critical to the interpretation of the broader structure of ceramic exchange within the Indian Ocean region and will be returned to again in Chapter 8.

The results obtained from the excavation of Siraf in southern Iran are particularly informative in tracing the arrival of East Asian imports into the western Indian Ocean region. Within the element of the sequence covered by the deep sounding at Site A, a substantial extension occurs in the range and variety of East Asian imports between the mid-8th to early 9th, and the 9th century occupation horizons (CP3 and CP4). The earlier assemblage of painted Changsha bowls (CHANG) and simple green-glazed 'Dusun' storage jars (DUSUN), is augmented in CP4 by the addition of a range of refined tablewares such as green glazed Yue Ware (YUE), white porcelain (WW), plain white or bright green splashed Slipped White Ware (WWSL, GWSL) and fine ornately decorated moulded vessels with green splashes (GM). Large handmade, black glazed storage jars (STONE.BG1-2) are also first represented in CP4, though evidence from elsewhere within the excavation indicates that these are amongst the earliest East Asian imports to occur at the site in CP2 or CP3 (Whitehouse, 1973: 246-47). Following the growth in the range of East Asian imports witnessed in the 9th century (CP4), the variety of classes then contracts significantly during the 10th to early 11th century (CP5). This same trend is reflected across all classes from CP5, and is most likely to be related to the same factors highlighted above concerning the localised abandonment of structures in the area of Site A. Many of the classes represented from this point on are residual from earlier periods.

The developments charted through the Site A sequence at Siraf are played out with points of similarity but also significant differences at other sites. During the mid-8th to early 9th century (CP3), the same limited range of East Asian classes to those from Siraf are represented from the beginning of the sequence at Shanga in East Africa. If the recorded assemblage from Manda was chronologically differentiated, it too would be likely to yield comparable finds for this stage[52]. The absence of East Asian imports amongst the assemblage from Sohar from this same stage is difficult to accept, and indeed similar classes are represented within the publication from Level III contemporary with CP3 (Kervran, 2004: 275). Why this material has not come to light during the review of the assemblage is not certain, though the presence of one box containing only East Asian imports indicates that many of the sherds were separated out for specialist study. Unfortunately the labelling of

[52] See the published description of ceramics from the earliest occupation of Manda Period 1a (Chittick. 1984: 65).

these particular pieces does not allow them to be linked to a particular context within the excavation. Moving onto the 9th century (CP4), all three sites – Siraf, Shanga and Sohar – share some of the most prevalent groups of East Asian exports such as 'Dusun' jars (DUSUN), Changsha (CHANG) and the new category of tableware, Yue Ware (YUE). At the same time, Siraf appears to contain a more diverse assemblage than the other sites including examples of fine white porcelain (WW). During the periods covering the 10th to early 11th century and 11th to 13th century stages (CP5 and CP6), the picture revealed by the comparison of classes becomes increasingly confused. A variety of factors may be responsible such as increased residuality, the localised decline in activity in the area of the deep sounding at Siraf, and contamination of the sequence at Sohar. The most important features to observe through this period is the particularly late arrival of East Asian imports at the site of Kush. Across all sites, certain changes in the assemblage also occur with a growing incidence of fine white porcelains (WW), Carved White Ware (CWW) and Qingbai (QING).

7.3.4 Iraqi Exports

The alluvial plains of central and southern Iraq and southwest Iran provide a major source of ceramic exports to the rest of the Persian Gulf and the wider area of the western Indian Ocean. Long-term changes to the economic fortunes of this area are to some extent played out in the changing composition of ceramic exports from Iraq[53]. In general, exports from Iraq during the period from the 5th to 8th century (CP1 to CP3) are dominated by heavy unglazed amphora and jars such as Torpedo Jars (TORP.S), Stamp Marked Jars (STAMP) and Honeycomb Ware (HONEY), fine, creamy-white, unglazed jars and jarlets probably used as water cooling and drinking vessels (Watson, 2012) such as White Ware (WHITE.PI) and Eggshell Ware (EGG.PI), and a wide variety of turquoise-blue or olive-green Alkaline-Glazed Ware vessels (TURQ.T and TURQ.YG). During the 9th century (CP4) the character of this assemblage shifts decisively. Some components of the assemblage continue in circulation. At the same time the range of products is augmented by the addition of new varieties of plain white or coloured glazed wares, most of which represent dishes and bowls best characterised as tablewares. These classes fall within two general traditions of Opaque Glazed Wares (OPAQ#) and clear Splashed Glazed Wares (SPLASH#). Both can be further sub-divided on the basis of decoration techniques or stylistic attributes defined on the basis of standardised overall colour schemes. In truth, these groups mask a situation of considerable potential complexity, with different 'product ranges' being manufactured along-side one another as part of the same broader industry, or products with a similar superficial appearance replicated in different workshops (Priestman, 2011b). As far as possible, production-related groups have been differentiated, but much additional work is still required to accurately identify the likely range of different production sources. It is potentially significant to note that towards the end of the period considered here, the overall number of 'Iraqi' classes starts to decline. Again, these broader generalisations are played out with certain points of variation between assemblages from different sites.

The assemblages of Iraqi imports for the 5th to mid-7th century (CP1) at Bushehr and Kush are closely aligned; both being dominated by Torpedo jars (TORP.S) and Alkaline Glazed Wares (TURQ.T). The character of the assemblage shifts somewhat during the period from

[53] Here and elsewhere in the following pages 'Iraq' will be used as shorthand for the general region of central and southern Iraq and Southwest Iran that makes up the area of the Tigris/Euphrates lower alluvial basin and delta region.

the mid-7th to mid-8th centuries (CP2) with these earlier, long-lived ceramic traditions supplemented by an increasing range of fine white Eggshell Wares (EGG.PI) and larger creamy white porous vessels (WHITE.PI, WHITE.A). These changes are similarly reflected in the assemblages of this period from Kush and Sohar. During the mid-8th to early 9th century (CP3), the range of Iraqi classes continues to increase, though with seemingly far less harmonisation across the four assemblages represented. In some cases, groups such as Stamp Marked Jars (STAMP) or Appliqué Decorated White Ware (WHITE.A) appear to be relatively scarce and thus result in a more sporadic distribution. In other cases, the discrepancies in the occurrence of classes between sites are difficult to interpret. The absence of Eggshell Wares (EGG.PI), for example, from all but one of the quantified assemblages, may be liked with factors such as the preservation and recording of these generally small and fragile sherds. During the 9th and 10th centuries (CP4 and CP5), the range of Iraqi imports increases with the addition of a variety of coloured glazed wares. In general there is a reasonable level of agreement in the classes represented on different sites for the most common categories. The most notable factor of variation, particularly in CP4, is the narrower range of classes represented within the assemblages from Kush and Shanga compared with those from Siraf and Sohar. For Shanga this is partially connected with the somewhat simplified recording of class categories (see **Chapter 5**), but may also partially reflect a genuine dynamic in which a greater diversity of Iraqi exports are represented on larger sites situated close to the source of origin, compared with smaller more peripheral settlements such as Kush or sites situated at a greater geographic remove (Priestman, 2011b: 110). Finally during the 11th to 13th century (CP6), the population of classes across the three assemblages of Kush, Siraf and Shanga appears similar. What the tabulated results do not reveal is the fact that most, if not all of the Iraqi exports represented in CP6 are residual. In fact this period is characterised by a significant decline in the circulation of Iraqi exports within the western Indian Ocean.

7.3.5 Iranian Exports

Another significant source of ceramic exports into the Persian Gulf and the broader Indian Ocean is southern Iran. Although there are again notable points of variation in the occurrence of individual classes on different sites, it is possible to discern what could be characterised as three main stages in the long-term transformation of ceramic exports from

the region. Right up to the early 9th century (CP1 to CP3), southern Iranian exports break down essentially into two main groups: fine slipped wares or slipped and painted wares predominantly from southeast Iran, and hard, lime-spalled coarse wares from the mid-north Persian Gulf region. The first group includes a distinctive class of refined, thin-walled, painted drinking beakers manufactured in the Minab and Halil Rud areas of southeast Iran (FOPW), which achieved widespread circulation within the Persian Gulf area during the Sasanian period, though always it appears in small quantities (see for example de Cardi, 1975: 55, fig. 8: 36; Kennet, 2004: 63, table 3, fig. 36; Bénoist, Mouton & Schiettecatte, 2003: 71, fig. 9, 2,3). Also included within the CP1 assemblage, but only at Bushehr, are a range of fine red, brown or black slipped wares (SLIP.R, SLIP.TB, SLIP.B). A wider programme of surface collection from sites in southern Iran indicates that these classes are particularly well represented on sites in the southeast, suggesting potential manufacture within that area (Prickett, 1986; Priestman, 2005a: 234). Equally though, similar material has been recorded from the Sasanian sequence at Qasr-i Abu Nasr in Fars (e.g. Whitcomb, 1985a: fig. 51: g-h), so additional production sources further west and closer to Bushehr may also be possible.

The other important, and numerically more significant group within the early assemblage is robust, largely undecorated utilitarian Hard Lime Spalled Coarse Wares (HARLIM, HARLIM.E[54]) including some very large vessels that might have been used either for transport or static storage (i.e. LISV vessel types). Although the exact source of these products has not yet been established, the close similarity of inclusions and general quality of the fabric associated with HARLIM and the slightly later dated 9th – 10th century products such as Cream Coated Ware (CREAC) and Red or Brown Slipped Ware (REBROS) from the kilns at Siraf, indicates that all are likely to come from a similar geographic area and indeed form part of the longer-term evolution and development of closely related production tradition. What is not yet properly resolved is the precise chronology and relationship between these classes, and this complicates the process of consistently recording these groups from different sites. A further factor that complicates the issue is the observation

[54] Note HARLIM and HARLIM.E are widely referred to elsewhere under the class names CLINKY, SMAG and LISV (Kennet, 2002b; 2004, etc.). The categories defined by Kennet have been renamed here in order to reflect the fact that these three groups – defined originally by vessel size and type – are in the opinion of this author, part of a single production tradition.

that the vessel types associated within the HARLIM complex were copied at different times in other areas of the western Indian Ocean. The impact of this is particularly evident for example with the results for the mid-7th to mid-8th century (CP2), where HARLIM is entirely absent from the recorded assemblage from Sohar. In its place, the predominant coarse ware represented is Pink Organic Tempered Ware (ORGPIN). This has the same vessel forms as HARLIM (e.g. Kervran, 2004: fig. 10: 6-7), but in a completely different and presumably local pinkish-buff coloured fabric with organic inclusions. Similarly in East Africa, a component of the finds from Shanga (Horton, 1996b: 258, 260, fig. 180) and Manda (pers. obs.) consists of a group with a sandy, friable fabric, often coated with a thick white slip that always closely imitates vessel forms and modes of decoration found in association with imported Siraf area coarse wares (particularly CREAC). In this case, the friable nature of the East African imitations would have meant that they were in no way functionally equivalent to their robust Iranian counterpart, and it is a point of real interest to consider in what context this imitation industry was produced.

Within the period from the 9th to 10th centuries (CP4 and CP5), certain changes occur in the character of Iranian exports within the Persian Gulf and western Indian Ocean, though admittedly these remain only partially understood. Hard Lime Spalled Wares seem to remain in circulation possibly for some time into the 9th century (HARLIM) (Kennet, 2004: table 3). At the same time, one of the notable developments is the increasing prevalence of Sirafi coarse wares (CREAC, REBROS). In addition, various coloured glazed ware traditions that originated in Iraq, such as Opaque Glazed Wares (OPAQ#), clear Splashed Glazed Wares (SPLASH#) and Early Sgraffiato (GRAF.E#), started to be manufactured in Iran, and these groups appear in the different assemblages, albeit sporadically. At this point our knowledge of the translocation of ceramic traditions from Iraq to southern Iran remains somewhat limited. The main petrographic study to be undertaken so far on Splashed Glazed Wares (SPLASH#), indicates that there were a wide variety of different fabric groups in use amongst samples analysed from Siraf, some of which appear to be local while others match those associated with fabrics from Iraq (Mason & Keall, 1991: 62-63). Extensive sampling of these industries will probably be required to unravel the full complexities of the situation. In addition to these broader considerations, there are factors of archaeological disturbance and sample variability that interfere with the class occurrence results. This is evident, for

example with some of the much later dated classes represented within CP4 at Sohar (see ENAM, SPECLE.2, REDYEL, FRIT.UGP, KHUNJ, JULFAR). Finds from CP5 onwards are so badly contaminated by intrusive finds that they are of little use and have been excluded from the review entirely. Likewise there is a virtual reversal in the assemblage profiles during CP4 and CP5 between Siraf and Kush. In CP4, a wide variety of Iranian origin coloured glazed ware is represented in the assemblage from Siraf, while few of these corresponding groups appear in the assemblage from Siraf. In CP5, these profiles are reversed. One suspects that this has more to do with the specific occupation histories represented in the areas of excavation, rather than any more meaningful regional or chronological changes in the composition of ceramic exchange. From Shanga in East Africa, the 9th and 10th century (CP4 and CP5) the assemblage of Iranian imports is dominated by Sirafi coarse wares (CREAC, REBROS), but none of the glazed wares associated with other sites of this period.

Finally, the period from the early 11th to mid-13th century (CP6), heralds a point of major change in the nature of the southern Iranian export assemblage and the composition of exports from the Persian Gulf area as a whole. Once one strips out a range of classes recorded within the CP6 assemblage that are evidently residual within this period, the assemblages from Kush, Siraf and Shanga all appear reasonably closely aligned. They are dominated by coloured glazed tablewares within the Late Sgraffiato and Slip Glazed Ware traditions (GRAF#, SPW#). At least one substantial production site for Hatched Sgraffiato (GRAF.H) and Champlevé (CHAMP), is attested from close to the port of Tiz on the Makran coast (Stein, 1937: 90-91) and a further kiln site producing Monochrome Green Glazed Ware (MONO.G) and Monochrome Green Sgraffiato (GRAF.G) is known from close to the coast on the Minab Plain (Priestman & Kennet, forthcoming). Again, accurate petrographic and chemical characterisation of the Late Sgraffiato fabric would probably reveal additional production sources. It appears that there were a number of different manufacturing sites for these wares, including some situated on the coast where output was presumably directed towards a maritime export market. The other side of this distribution is reflected particularly clearly along much of the coast of East Africa, where there is a notable proliferation of sites receiving southern Iranian glazed ware imports during the 11th – 13th century period (e.g. Wilding, 1977; Horton, 1996b; Priestman, 2010b). The other significant aspect of the rise of these Iranian glazed ware export industries, is that this occurs in a

period when earlier common Iraqi glazed wares went fully out of circulation. What began as perhaps a more limited translocation in the production of Iraqi origin glazed ware industries such as Early Sgraffiato (GRAF.E#) and Splashed Glazed Ware (SPLASH#) to Iran in the 9th and particularly the 10th century, progressed to a state of full eclipse by the early 11th century.

7.3.6 Exports from the Arabian Peninsula

The one remaining area to consider is the contribution of ceramic exports from the Arabian Peninsula. These are largely absent throughout the period under consideration for sites outside of the region itself. One potential anomaly occurs during the 9th century (CP4), where handmade Julfar cooking pots from Ras al-Khaimah are recorded in the assemblages from Siraf and Sohar (JULFAR, JULFAR.PB). Black Julfar Ware with purple painted decoration (JULFAR.PB) is reliably dated elsewhere to the 14th to 16th centuries (Kennet, 2004: 53, table 7) and the finds from Sohar in this period are clearly intrusive. The same may also be true of the rest of the Julfar ware recorded from Sohar in this period. At Siraf a fairly consistent and sizable assemblage occurs in CP4 of a plain grey cooking pot class with a fabric with abundant platelet inclusions that is visually similar to that from Julfar, but with forms that differ somewhat in detail to currently known examples from the Julfar area (Mitsuishi & Kennet, forthcoming). These have been provisionally assigned to the Julfar class and recorded as such, though the precise origin of the material may turn out to be different. More dependable evidence for the input of Arabian imports occurs much later during the 11th to mid-13th century (CP6) at Siraf with finds of characteristic Julfar Ware (JULFAR), together with early Manganese and Purple Underglaze Painted Ware (MGPAINT.1). Again we do not yet have precise evidence for the source of MGPAINT.1, but the class is attested elsewhere from a number of 11th – 13th century contexts within the Persian Gulf including at Kish, Kush and Qala'at al-Bahrain (Whitehouse, 1976: 147; Kennet, 2004: 40-41, table 3; Frifelt, 2001: fig. 226: e-d), and the closest analogies for its distinctive fabric are later dated products such as Lime Tempered Ware (LIME) most likely originating in Bahrain (Frifelt, 2001: fig. 90; Carter, 2005: 153).

These finds of proven or possible Arabian imports during the 11th to mid-13th century occupation (CP6) at Siraf, herald the beginning of a much more widespread and complex trend involving the spread and proliferation of glaze ware technology from Iraq and Iran

further east into Pakistan (Mughal 1967; Kennet, Petrie & Priestman, 2007) and India (Bhan, 2006), and south into the Arabian Peninsula during the 13th and 14th centuries[55]. The impact of this is seen particularly clearly in East Africa where Persian Gulf glazed wares are almost entirely displaced from the late 13th century by products such as Yemeni Yellow (YEMEN), crude locally made Sgraffiato and what appears to be a related and even more widespread set of products, Speckled Glaze Ware (SPECLE.1-2). Again the origin of SPECLE.1-2 has not yet been seriously investigated. Originally it was thought to come from Iran (Hansman, 1985: 52; Kennet, 2004: 53-4) but the fact that the pottery is present in dramatically higher quantities in assemblages from East Africa such as Manda (Chittick, 1984), Shanga (Horton, 1996b: 293) and Gedi (Kirkman, 1954), than on sites within the Persian Gulf, and the similarities of the fabric to other contemporary products from Southern Arabia such as YEMEN, indicates that this important class is more likely to originate in that area. Increasingly one sees a pattern in which both coarse ware and glazed ware industries in Arabia grew in scale, organisational sophistication and volume of output (Priestman, 2008b). They also contributed increasingly to the range of ceramic products in circulation within the western Indian Ocean. The most notable examples include the Julfar kilns in Ras al-Khaimah (Mitsuishi & Kennet, forthcoming) and the Bahla kilns in Oman (Whitcomb, 1975: 129). These developments briefly summarised here fall largely beyond the chronological remit of the present study.

7.4 Vessel Forms

The various categories of ceramics in circulation within the western Indian Ocean region have been presented according to the class categories recorded (**Section 7.3**). The key factor that emerges is the way in which the main areas of ceramic production and ceramic input into the Indian Ocean basin shifted over time, and how the character or essential nature of ceramics in circulation underwent a process of long-term transformation. An additional factor to consider is the specific varieties of vessels that were exchanged. Across the Indian Ocean area, a broad mix of vessel types were circulated, ranging from large transport amphorae, storage jars and cooking pots to more decorative tablewares. The reasons for importing various vessel categories were probably very different, and it is important to try

[55] See for example the recently discovered monochrome glazed ware products of Qalhat in Oman (Rougeulle, 2010) or the glazed wares industry that mostly likely started at this time at Bahla (Whitcomb, 1975: 129).

to disentangle some of this variation in order to begin to understand the primary factors that governed different forms of ceramic exchange, i.e. pots used as containers, as packaging or pots exchanged as a commodity in their own right. The different types of pots exported from various areas within the western Indian Ocean and their overall volume and geographic spread, also help to explain the contrasting roles of different regional sectors to the broader structure and operation of the Indian Ocean maritime economy.

7.4.1 Typological Information

The immediate difficulty one faces in developing an interpretation of an assemblage based on its functional characteristics, is in meaningfully ascribing function to the material encountered. Up till now, the analysis presented has focused on ceramic classes, which can be defined on the basis of the combined variables of vessel form, fabric properties and surface treatment. Often the combination of these various characteristics enables even small featureless fragments to be reliably attributed to a class. This is important as generally well over 90% of the sherds encountered are body sherds (Priestman, 2008a: fig. 19), and a system of classification based on class categories allows this mass of data to be utilised. To interpret an assemblage in terms of its functional characteristics requires somewhat different information. Features such as fabric quality or surface finish need to be taken into consideration, but the most significant variable for determining usage is vessel form. Forms are reconstructed as far as possible on the basis of surviving vessel profiles, but one is always faced with the difficulty that most material encountered archaeologically is presented in a fragmentary state and often whole forms can only be partially reconstructed. The solution adopted is to record vessel forms only in terms of a small portion of the overall vessel profile, such as the rim, handle or base within the framework of a formalised vessel typology (Orton, Tyers & Vince, 1993: 78; see Appendix I).

The close definition of vessel forms in terms of specific variations in one portion of a vessel, such as the rim profile, represents an important stage in the descriptive process, but the information it yields is not necessarily well suited to more generalised functional interpretation, at least within the context of the present study. Three somewhat different factors have a bearing on this assessment. First, specific vessel types can generally only be identified on the basis of diagnostic vessel portions, and as has been stated, these make up

only a small proportion of the overall sherd yield. In most cases, the sherd assemblages available are simply not large enough to develop reliable quantitative analysis on the basis of rim sherds alone.

Secondly, very little full or accurate typological data is available. The only assemblages within this study where sherd counts for vessel types are available are those cases where it has been possible to physically record individual sherds on the basis of archived sherd collections. This includes the finds from Siraf in the British Museum, the finds collected from the surface at Bushehr in the Williamson Collection, the imported finds from Manda and the selection of finds from the Sohar Town excavation. In different ways (set out in detail in **Chapter 5**), these assemblages are all somewhat problematic. For the various other assemblages that have been utilised, the quality of typological data available is somewhat variable. Most of the published quantified assemblages include only selective illustration of vessel forms, with the main results presented according to class group. This applies for example with current publications available for Shanga (Horton, 1996b), Kush (Kennet, 2004), Bilad al-Qadim (Carter, 2005), Anuradhapura (Seely, Canby & Coningham, 2006; Coningham, Ford, Cheshire & Yong, 2006) and Sanjan (Nanji, 2007). One could also include within this group the preliminary publications available for Murwab (Guérin & al-Na'imi, 2009; 2010) and Pattanam (Cherian, 2011), in which the sherd quantification is presented in terms of generic class groups. In many of these cases a more detailed level of recording including counts for vessel types has been undertaken, but such information still requires extraction from individual fragment records such as the find databases for Kush, Bilad al-Qadim, Sanjan and Pattanam, small sketches of rim profiles on the find record cards in the excavation archives for Siraf, or drawings in notebooks in the excavation archives for Shanga (Horton, pers. comm. 2012). Where full sherd counts for individual forms could be provided, a further level of information assimilation is still required. In a similar manner to the integrated ceramic classification that has been presented (the IIOCC), significant additional work is still required in order to standardise the recording of vessel types across different assemblages. An attempt to begin this process is described above (**Section 2.3.6**) and elsewhere (Priestman, 2011b). More detailed work on this aspect remains beyond the scope and the needs of the current study.

The third issue relating to the potential use of typological data is that types, by definition, describe specific variations in form that can be used for the purposes of matching related ceramic products where these are mass-produced and standardised. The form itself though may or may not have direct relevance to the vessel's intended use (Rice, 1987: 211). Some variations, for example, are probably related simply to factors of style and design. The correlation between form and function remains problematic. While the potential exists to develop a sophisticated understanding of the way in which specific variation in vessel form may have impacted upon vessel use, this field of research depends to a significant extent on the ability to draw on further supplementary evidence including techniques such as organic residue analysis, use-wear analysis, information from ethnographic sources, experimental trial, occasional historical references to the use of the ceramic vessels, or archaeological find contexts (Orton, Tyers & Vince, 1993: 217-26). At this stage, it seems more appropriate to consider simply a means of establishing a basic functional categorisation scheme based on the data available.

7.4.2 Determining a Functional Classification

One broad system of functional grouping that appears to effectively subsume the myriad of different uses of ceramic vessels, partitions the assemblage into three main categories: "storage, transformation or processing, and transfer or transport" (Rice, 1987: 208). Within each sphere of activity, additional morphological or technical characteristics may be used to differentiate more specific functional categories. A similar system proposes a subdivision into the categories of 'storage vessels', 'transport vessels', 'serving vessels' and 'processing vessels' with further sub-divisions that take account of factors such as the accessibility of the contents and whether the vessel was intended to hold a dry or liquid contents (Juhl, 1995: 28-35). The benefit of this type of framework is its inclusivity and simplicity and therefore the potential it holds for practical application. The systems set out above by Rice and Juhl summarise in essence the known range of functions of ceramic vessels informed to a significant extent by ethnographic observation. The problem remains of establishing reliable correlates for these categories within the actual material encountered. These systems were not developed from the perspective of practical feasibility considerations. In addition, they do not necessarily take into consideration the particular interests of understanding ceramic exchange. Certain categories of material may be incorporated into

these systems without any difficulty, such as the identification of cooking pots as processing vessels. In other cases the distinctions appear to be more difficult to maintain. In the case of storage jars, for example, it will not necessarily be clear whether a vessel was intended for on-site storage or storage and transport. The ability to make effective distinctions based on vessel functions depends on the way in which vessel forms are categorised and recorded at an individual sherd level.

One critical distinction that needs to be drawn within the current context of investigating ceramic exchange is between vessels that were used for storage, and thus circulated as packaging for other sorts of commodities, and vessels that would have been transported empty and were thus exchanged as a commodity in their own right. Some crossover or blurring in this distinction is likely. On the whole though, the dynamics affecting the exchange of these different types of ceramic products would have been very different. The sub-division of container vessels and vessels circulated as an exchange commodity is represented in terms of first order 'Level 1' distinctions below (**Table 7.14**).

Within the broad group of products exchanged as a commodity in their own right, a further important distinction needs to be drawn between vessels used primarily in connection with the serving, consumption and display of food or other related areas of presentation, and vessels that were used for different forms of processing activity, both of a culinary or non-culinary nature. Finding a correct terminology to describe this distinction is admittedly problematic (Rice, 1987: 210). Coarse ware/fine ware, common/luxury, utilitarian ware/tableware; none are entirely satisfactory. The important factor in terms of identification is that ceramics used in connection with consumption and display generally have a surface finish such as burnishing, slip or glaze and may have more sophisticated decoration. The construction of the entire vessel is often also more carefully worked. Vessels intended for more robust utilitarian use are generally, by contrast, less well finished and the design features that occur often have a more direct and obvious practical application. Such a distinction is of course fraught with all kinds of difficulty. Some cooking pots or jars used for processing or storage can be elaborately decorated or carefully finished with a surface preparation such as slip or burnishing, and some vessels used for consumption and display can be left unadorned. The distinction also potentially brings one

back full circle to something close to the sorts of value-judgments applied widely within the field of Islamic art history, that were criticised earlier (**Chapter 2**). While acknowledging this, the principal difference here is that the division proposed between vessels used for serving and display and other more 'utilitarian' functions, is not one based solely on aesthetic judgment, or one that attempts to isolate a portion of the assemblage for special attention. Rather it is one that contrasts elements of the assemblage on the basis of functional considerations.

7.4.3 Implementation

The subdivision of ceramics exchanged as a commodity into 'tablewares' and 'utility' wares is represented according to what can be considered as a second level of categorisation below (**Table 7.14**). Beyond this, further more specific form/function categories might be identified such as those listed as Level 3 (**Table 7.14**). As has previously been outlined, the most detailed level of information on form groups is likely to come from the study of specific type variation on the basis of diagnostic sherds. Here a practical factor needs to be taken into consideration. For the basic bi or tri-part sub-division of the assemblage offered by Levels 1 and 2, most of the pottery recorded can be assigned *en masse* to one of the categories on the basis of attributes defined at the scale of the ceramic class (**Table 7.15**). Only in two cases is there a really significant problem encountered. The first is with a group of large storage jar types (Types LISV#), that were produced as part of a broader repertoire of vessels within the classes such as Hard Lime Spalled Ware (HARLIM), Red or Brown Slipped Coarse Ware (REBROS) or Cream Coated Ware (CREAC), but which are functionally distinct from a range of smaller vessels that occur within those classes. Similarly in the case of Turquoise Alkaline Glazed Wares (TURQ.T), amongst a class made up predominantly of tablewares, is a medium to large sized, appliqué decorated jar better classified as a storage jar or transport vessel (Type JR5). In both cases, the distinctive vessels can mostly be differentiated within the various data-sets by referring to additional recorded information that allow one to pick out these pieces as separate groups (**Table 7.15**). For the categorisation suggested in Level 3, or more sensitive form/function classifications that could be instated beyond that, one is forced to rely increasingly on specific typological information. As has previously been explained, there are two main problems with the use or availability of such information within the current context. Namely the more limited pool of

information provided by diagnostic sherds, and the fact that for most of the data-sets available at this time, there is simply insufficient detail provided to generate quantitative analysis on the basis of vessel forms. For these reasons and necessary limitations in the scope of this research, only the basic tripartite division of vessel functions offered by Level 2 will be examined further at this stage.

Level 1	Level 2	Level 3
Container	Container	Storage vessel
		Amphora
Commodity	Utility	Cooking pot
		Kitchenware - bowl
		Kitchenware - jar
	Tableware	Drinking
		Serving - bowl
		Serving - other

Table 7.14 *Progressively refined scheme of vessel form/functional sub-division defined on the basis of practical feasibility considerations and the particular interests of understanding ceramic exchange*.

IIOCC	Level 1	Level 2	Level 3
BRISAN	Commodity	Utility	Kitchen - jar
BUFF.I	Container	Container	Storage vessel
BUFF.P	Commodity	Utility	Kitchen - bowl
BUFF.S	Container	Container	Storage vessel
BUFRAB	Commodity	Utility	Cooking pot
CBW	Commodity	Tableware	Serving - bowl
			Serving - other
CBW.1	Commodity	Tableware	Serving - bowl
			Serving - other
CBW.2	Commodity	Tableware	Serving - bowl
			Serving - other
CHAM	Commodity	Utility	Cooking pot
CHAM.N-ID	Commodity	Utility	Cooking pot
CHAMP	Commodity	Tableware	Serving - bowl
CHANG	Commodity	Tableware	Serving - bowl
			Serving - other
CHIN	Commodity	Tableware	Serving - bowl
CIZHOU	Commodity	Tableware	Serving - other
CHOC	Commodity	Utility	Kitchen - jar
CONG.G	Commodity	Utility	Kitchen - bowl
			Kitchen - jar
CREAC	Commodity	Utility	Kitchen - bowl

IIOCC	Level 1	Level 2	Level 3
			Kitchen - jar
CREAC [LISV]	Container	Container	Storage vessel
CREAM	Commodity	Tableware	Serving - bowl
CW.N-ID	Commodity	Utility	Kitchen - bowl
			Kitchen - jar
CW.N-ID [LISV]	Container	Container	Storage vessel
CWW	Commodity	Tableware	Serving - bowl
DEH	Commodity	Tableware	Serving - bowl
DUSUN	Container	Container	Storage vessel
EACOP	Commodity	Utility	Cooking pot
EGG.R	Commodity	Tableware	Drinking
EGG.PI	Commodity	Tableware	Drinking
EGG.M	Commodity	Tableware	Drinking
ENAM	Commodity	Tableware	Serving - bowl
EAST.N-ID	Commodity	Tableware	Serving - bowl
			Serving - other
FIBIC	Commodity	Utility	Kitchen - jar
FINLIM	Container	Container	Storage vessel
FLAKEY	Commodity	Utility	Kitchen - bowl
			Kitchen - jar
FOPW.1	Commodity	Tableware	Drinking
FOPW.2	Commodity	Tableware	Drinking
FRIT.BL	Commodity	Tableware	Serving - bowl
FRIT.BW	Commodity	Tableware	Serving - bowl
FRIT.EI	Commodity	Tableware	Serving - bowl
FRIT.EM	Commodity	Tableware	Serving - bowl
FRIT.GW	Commodity	Tableware	Serving - bowl
FRIT.I	Commodity	Tableware	Serving - bowl
FRIT.L	Commodity	Tableware	Serving - bowl
FRIT.LM	Commodity	Tableware	Serving - bowl
FRIT.M	Commodity	Tableware	Serving - bowl
FRIT.MIN	Commodity	Tableware	Serving - bowl
FRIT.N-ID	Commodity	Tableware	Serving - bowl
FRIT.TB	Commodity	Tableware	Serving - bowl
FRIT.UGP	Commodity	Tableware	Serving - bowl
GDC.1	Commodity	Tableware	Serving - bowl
GDC.2	Commodity	Tableware	Serving - bowl
GLAMO.Y	Commodity	Tableware	Serving - bowl
			Serving - other
GM	Commodity	Tableware	Serving - bowl
GRAF.DI	Commodity	Tableware	Serving - bowl
GRAF.EG	Commodity	Tableware	Serving - bowl
			Serving - other
GRAF.EP1	Commodity	Tableware	Serving - bowl

IIOCC	Level 1	Level 2	Level 3
GRAF.EP2	Commodity	Tableware	Serving - bowl
GRAF.EY	Commodity	Tableware	Serving - bowl
			Serving - other
GRAF.GYB	Commodity	Tableware	Serving - bowl
GRAF.GW	Commodity	Tableware	Serving - bowl
GRAF.H	Commodity	Tableware	Serving - bowl
			Serving - other
GRAF.LG	Commodity	Tableware	Serving - bowl
GRAF.LP	Commodity	Tableware	Serving - bowl
GRAF.LY	Commodity	Tableware	Serving - bowl
GRAF.M	Commodity	Tableware	Serving - bowl
GRAF.N-ID	Commodity	Tableware	Serving - bowl
GRAF.S	Commodity	Tableware	Serving - bowl
GRAF.TL	Commodity	Tableware	Serving - bowl
GT	n/a	n/a	n/a
GW.N-ID	Commodity	Tableware	Serving - bowl
			Serving - other
GWSG	Commodity	Tableware	Serving - bowl
GYSG	Commodity	Tableware	Serving - bowl
HAGRIT	Commodity	Utility	Kitchen - jar
HARC	Commodity	Utility	Kitchen - jar
HARLIM.E	Commodity	Utility	Kitchen - bowl
			Kitchen - jar
HARLIM.E [LISV]	Container	Container	Storage vessel
HARLIM	Commodity	Utility	Kitchen - bowl
			Kitchen - jar
HARLIM [LISV]	Container	Container	Storage vessel
HARMIC	Commodity	Utility	Kitchen - jar
HONEY	Container	Container	Storage vessel
HMPW	Commodity	Utility	Cooking pot
HMPW.1	Commodity	Utility	Cooking pot
HMPW.2	Commodity	Utility	Cooking pot
HMPW.BST	Commodity	Utility	Cooking pot
HMPW.CC	Commodity	Utility	Cooking pot
HMPW.ORG	Commodity	Utility	Cooking pot
HMPW.RB	Commodity	Utility	Cooking pot
HMPW.SA	Commodity	Utility	Cooking pot
INC.M	Commodity	Tableware	Drinking
INCIMP	Commodity	Tableware	Serving - bowl
INCOP	Commodity	Utility	Cooking pot
IRAB	Commodity	Utility	Cooking pot
IRPW	Commodity	Tableware	Serving - other
IRPW.RC	Commodity	Tableware	Serving - other
JDC	Commodity	Tableware	Serving - bowl

IIOCC	Level 1	Level 2	Level 3
JULFAR	Commodity	Utility	Cooking pot
JULFAR.PB	Commodity	Utility	Cooking pot
JULFAR.RW	Commodity	Utility	Cooking pot
KD.1	n/a	n/a	n/a
KD.2	n/a	n/a	n/a
KD.3	n/a	n/a	n/a
KD.4	n/a	n/a	n/a
KHUNJ	Commodity	Tableware	Serving - bowl
			Serving - other
LIME	Container	Container	Storage vessel
LINVES	Container	Container	Storage vessel
LOCAL CW	Commodity	Utility	Kitchen - bowl
			Kitchen - jar
LOCAL GW	Commodity	Tableware	Serving - bowl
			Serving - other
LQC	Commodity	Tableware	Serving - bowl
			Serving - other
MEW	Commodity	Tableware	Drinking
MEW.MO	Commodity	Tableware	Drinking
MGPAINT.1	Commodity	Tableware	Serving - bowl
MGPAINT.2	Commodity	Tableware	Serving - bowl
MONO.G	Commodity	Tableware	Serving - bowl
			Serving - other
MONO.LG1	Commodity	Tableware	Serving - bowl
			Serving - other
MONO.LG2	Commodity	Tableware	Serving - bowl
			Serving - other
MONO.Y	Commodity	Tableware	Serving - bowl
			Serving - other
MONTUR	Commodity	Tableware	Serving - bowl
MTB.1	Container	Container	Storage vessel
MTB.2	Container	Container	Storage vessel
OPAQ.B	Commodity	Tableware	Serving - bowl
			Serving - other
OPAQ.BT	Commodity	Tableware	Serving - bowl
			Serving - other
OPAQ.BW	Commodity	Tableware	Serving - bowl
			Serving - other
OPAQ.C	Commodity	Tableware	Serving - bowl
			Serving - other
OPAQ.CP	Commodity	Tableware	Drinking
OPAQ.LG	Commodity	Tableware	Serving - bowl
			Serving - other
OPAQ.LP	Commodity	Tableware	Serving - bowl

IIOCC	Level 1	Level 2	Level 3
			Serving - other
OPAQ.LR	Commodity	Tableware	Serving - bowl
			Serving - other
OPAQ.N-ID	Commodity	Tableware	Serving - bowl
			Serving - other
OPAQ.PS	Commodity	Tableware	Serving - bowl
			Serving - other
OPAQ.T	Commodity	Tableware	Serving - bowl
			Serving - other
OPAQ.TBS	Commodity	Tableware	Serving - bowl
			Serving - other
OPAQ.TS	Commodity	Tableware	Serving - bowl
			Serving - other
OPAQ.W	Commodity	Tableware	Serving - bowl
			Serving - other
OPAQ.WC	Commodity	Tableware	Serving - bowl
			Serving - other
ORGPIN	Commodity	Utility	Kitchen - bowl
			Kitchen - jar
QING	Commodity	Tableware	Serving - bowl
			Serving - other
REBROS	Commodity	Utility	Kitchen - bowl
			Kitchen - jar
REDYEL	Commodity	Tableware	Serving - bowl
REGTEC	Commodity	Utility	Kitchen - jar
RUST	Container	Container	Storage vessel
SBBW	Commodity	Utility	Cooking pot
SLIP.B	Commodity	Tableware	Serving - bowl
			Serving - other
SLIP.PBR	Commodity	Tableware	Serving - bowl
			Serving - other
SLIP.R	Commodity	Tableware	Serving - bowl
			Serving - other
SLIP.TB	Commodity	Tableware	Serving - bowl
			Serving - other
SPECLE.1	Commodity	Tableware	Serving - bowl
			Serving - other
SPECLE.2	Commodity	Tableware	Serving - bowl
			Serving - other
SPLASH.GW1	Commodity	Tableware	Serving - bowl
			Serving - other
SPLASH.GW2	Commodity	Tableware	Serving - bowl
			Serving - other
SPLASH.P1	Commodity	Tableware	Serving - bowl

IIOCC	Level 1	Level 2	Level 3
			Serving - other
SPLASH.P2	Commodity	Tableware	Serving - bowl
			Serving - other
SPORC	Container	Container	Storage vessel
SPOT	Commodity	Utility	Kitchen - bowl
			Kitchen - jar
SPW	Commodity	Tableware	Serving - bowl
SPW.BG	Commodity	Tableware	Serving - bowl
SPW.BW	Commodity	Tableware	Serving - bowl
SPW.YB	Commodity	Tableware	Serving - bowl
STAMP	Container	Container	Storage vessel
STONE.BG1	Container	Container	Storage vessel
STONE.BG2	Container	Container	Storage vessel
STONE.BLU	Container	Container	Storage vessel
STONE.BUR	Commodity	Tableware	Serving - bowl
STONE.EU	Container	Container	Storage jar
STONE.GRY	Commodity	Tableware	Serving - bowl
STONE.GU	Commodity	Tableware	Serving - bowl
STONE.PLG	Commodity	Tableware	Serving - bowl
STONE.THAI	Commodity	Tableware	Serving - bowl
TORP.RG	Container	Container	Amphora
TORP.S	Container	Container	Amphora
TRC	Container	Container	Storage vessel
TURQ.T	Commodity	Tableware	Serving - bowl
			Serving - other
TURQ.T [Type JR5]	Container	Container	Storage vessel
TURQ.YG	Commodity	Tableware	Serving - bowl
			Serving - other
UGP	Commodity	Tableware	Serving - bowl
UGP.CB	Commodity	Tableware	Serving - bowl
UGP.BG	Commodity	Tableware	Serving - bowl
UGP.BW	Commodity	Tableware	Serving - bowl
UGP.TB	Commodity	Tableware	Serving - bowl
VBW	Commodity	Tableware	Serving - bowl
WAPO	Commodity	Utility	Kitchen - bowl
			Kitchen - jar
WHITE.PI	Commodity	Tableware	Drinking
WHITE.M	Commodity	Tableware	Drinking
WHITE.A	Commodity	Tableware	Drinking
WW	Commodity	Tableware	Serving - bowl
WWSL	Commodity	Tableware	Serving - bowl
			Serving - other
XING	Commodity	Tableware	Serving - bowl
YAOZ	Commodity	Tableware	Serving - bowl

IIOCC	Level 1	Level 2	Level 3
YEMEN	Commodity	Tableware	Serving - bowl
YUE.1	Commodity	Tableware	Serving - bowl
			Serving - other
YUE.2	Commodity	Tableware	Serving - bowl
			Serving - other
YUE.3	Commodity	Tableware	Serving - bowl
			Serving - other
YUE.4	Commodity	Tableware	Serving - bowl
			Serving - other
YUE	Commodity	Tableware	Serving - bowl
			Serving - other

Table 7.15 *Correlation between the Integrated Indian Ocean Ceramic Classification classes (IIOCC) and the three levels of functional categorisation outlined above*.

7.4.4 Functional Analysis

Most of the quantified assemblages included within this study, can be presented according to the basic functional categorisation outlined above of transport 'containers', 'tablewares' and 'utility' wares. Only in the three cases of A'Ali, Murwab and Pattanam is the published information on class categories too partial to effectively differentiate these different groups. In the two latter cases, this is because only preliminary information on the quantification of these on-going investigations has so far been made available (Guérin & al-Na'imi, 2009; 2010; Cherian, 2011). Added to this is the assemblage from Anuradhapura where the very small sample of imported material precludes meaningful analysis of the proposed categories (Seely, Canby & Coningham, 2006: 99-106). For the remaining assemblages, most of the classes recorded can be correlated directly with one of the three functional groups. The most significant anomaly occurs with the differentiation of transport container vessels within classes that include a broader repertoire of vessel types. By drawing on additional information recorded in publication or directly from archived sherd collections, it is possible in most cases to separate out these groups. In three cases there are specific limitations with the available information that make this process more difficult. For Sir Bani Yas, one cannot determine what proportion of the Hard Gritty Ware are LISV vessel types. Some illustrated examples are clearly LISV types (Carter, 2008: fig. 14: 2-7), while others belong to smaller vessels within the same production tradition. For Shanga, insufficient information is provided within the publication to determine the quantities of sherds associated with

Alkaline-Glazed Ware (TURQ.T) or LISV (various classes) storage jar types (Horton, 1996b). Notebooks containing sketches of diagnostic sherds held within the site archive would be likely to contain sufficient information to determine the identification of many pieces (Horton, pers. comm. 2012), but these have not been consulted as part of this study. For Sanjan TURQ.T storage jars cannot be separated out from the rest of the class (Nanji, 2011: 27-32). In all three cases, the results are presented from these sites without necessarily having achieved a full and reliable separation of the transport container vessels. This point needs to be taken into consideration in the interpretation of the results (**Table 7.16**, **Table 7.17**).

Site	Function	CP1 (400-650)	CP2 (650-750)	CP3 (750-825)	CP4 (825-900)	CP5 (900-1025)	CP6 (1025-1250)
		No	No	No	No	No	No
Kush	Container	10	7	48	2	19	25
	Tableware	503	112	349	19	1300	1069
	Utility	2675	1077	5936	162	3540	3966
	Totals	3188	1196	6333	183	4859	5060
Bushehr	Container	195					
	Tableware	380					
	Utility	662					
	Totals	1237					
Sir Bani Yas	Container		272				
	Tableware		75				
	Utility		847				
	Totals		1194				
Siraf	Container			248	430	128	144
	Tableware			414	3911	1096	1233
	Utility			514	5746	2216	2725
	Totals			1176	10087	3440	4102
Bilad al-Qadim	Container			7	20		15
	Tableware			194	352		2991
	Utility			677	764		20072
	Totals			878	1136		23078
Sohar	Container			15	19	34	
	Tableware			52	94	153	
	Utility			173	231	144	
	Totals			240	344	331	
Shanga	Container			6	114	35	141
	Tableware			47	368	74	2496
	Utility			1372	11988	2225	46696
	Totals			1425	12470	2334	49333
Manda	Container			1579			
	Tableware			6327			
	Utility			242094			
	Totals			250000			
Sanjan	Container			2	1		1
	Tableware			8	3		79
	Utility			297	135		543
	Totals			307	139		623

Table 7.16 *Quantified assemblages showing the number of sherds recorded by period according to the functional categories of transport 'container', 'tableware' and 'utility' vessels.*

Site	Function	CP1 (400-650)	CP2 (650-750)	CP3 (750-825)	CP4 (825-900)	CP5 (900-1025)	CP6 (1025-1250)
		%	%	%	%	%	%
Kush	Container	0.3	0.6	0.8	1.1	0.4	0.5
	Tableware	15.8	9.4	5.5	10.4	26.8	21.1
	Utility	83.9	90.1	93.7	88.5	72.9	78.4
Bushehr	Container	15.8					
	Tableware	30.7					
	Utility	53.5					
Sir Bani Yas	Container		22.8				
	Tableware		6.3				
	Utility		70.9				
Siraf	Container			21.1	4.3	3.7	3.5
	Tableware			35.2	38.8	31.9	30.1
	Utility			43.7	57.0	64.4	66.4
Bilad al-Qadim	Container			0.8	1.8		0.1
	Tableware			22.1	31.0		13.0
	Utility			77.1	67.3		87.0
Sohar	Container		6.3	5.5	10.3		
	Tableware		21.7	27.3	46.2		
	Utility		72.1	67.2	43.5		
Shanga	Container			0.4	0.9	1.5	0.3
	Tableware			3.3	3.0	3.2	5.1
	Utility			96.3	96.1	95.3	94.7
Manda	Container			0.6			
	Tableware			2.5			
	Utility			96.8			
Sanjan	Container			0.7	0.7		0.2
	Tableware			2.6	2.2		12.7
	Utility			96.7	97.1		87.2

Table 7.17 *Quantified assemblages showing the proportion of sherds by period according to the functional categories of transport 'container', 'tableware' and 'utility' vessels.*

In general the three functional categories that have been identified follow a consistent trend with transport containers being the least common category followed by tablewares followed by utility wares as the most common category (**Table 7.17**). This in itself is of some interest as it can be shown that only a relatively small proportion of the ceramics in circulation could be classed as having a distribution wholly determined by the circulation behaviour of other non-ceramic commodities. Of course, ceramics would have been distributed within the Indian Ocean alongside a wide range of other – in many cases – more

economically significant products, so all were in effect inextricably bound up with a larger organisation process. What is perhaps more significant to note within the current context, is a number of points of clear variation in the proportion of the different categories between sites and through individual site occupation sequences.

Seen in isolation, the higher proportion of transport container vessels represented during the mid-8th to early 9th century (CP3) at Siraf, compared with the rest of the sequence, appears as a notable anomaly. Actually the figure of over 20% transport containers in CP3 at Siraf compares well with the earlier sequences covering the 5th to mid-8th centuries (CP1 and CP2) from Bushehr and Sir Bani Yas, suggesting a potential chronological dimension to this aspect. At all three sites, these results are influenced by the incidence of categories such as Torpedo Jars (TORP.S, TORP.RG) and Large Incised Storage Vessels (various classes). Seen from a long-term perspective, the subsequent drop in the proportion of transport container vessels during the 9th century at Siraf (CP4) and through the remainder of that sequence, ties in with evidence for the decline of amphora and other categories of large ceramic transport vessels during this period (Kennet, 2004: table 3). The picture, however, is not uniform and the ceramics from other sites such as Kush, Bilad al-Qadim and the sites outside the Persian Gulf only ever produced very low proportions of transport container vessels. The other factor that is significant to note in connection with the use of transport container vessels, is the fact that even after their proportion dropped down to a lower level from the 9th century (CP4) at Siraf, the assemblages from Siraf and Sohar are still both marked out by providing a noticeably higher proportion of transport container vessels (c.4-6%) than any of the other contemporary assemblages. The status of the sites of Siraf and Sohar as major ports may be partially reflected in these figures.

The incidence of tablewares also shows some significant patterning. Tablewares remain as a relatively stable proportion of the assemblage throughout the sequence at Siraf (between c.30-39%), despite the fluctuation in the proportion of transport container vessels. Tablewares also make up a relatively high proportion of the assemblage from Siraf compared with other sites. Again this may be linked with the site's specific role in commodity handling and transhipment. Alternatively, the incidence of tablewares could be taken as a more general indicator of site status with Siraf benefiting from its role as a

relatively prosperous urban establishment. Other assemblages that provide broadly comparable results are Bushehr, Sohar and the main mid-8th to early 11th century occupation (CP3-CP5) horizon at Bilad al-Qadim. For CP6 at Bilad al-Qadim, the results appear to be skewed – as elsewhere within the analysis – by the massive influx of coarse ware waster material derived presumably from a nearby source (Carter, 2005: 143). Similarly the significant rise in proportion on tablewares at Sohar during the 10th to early 11th century (CP5) seems likely to be influenced by external factors, in this case the increasing levels of contamination mostly of later dated glazed tablewares in this level (see **Chapter 5**).

Elsewhere it is striking to note that tablewares represent an unusually small proportion of the assemblage from Sir Bani Yas. This could potentially be linked to factors such as the particular ascetic concerns of the monastery's inhabitants (Payne, 2011). At Kush, tablewares generally make up a lower proportion of the assemblage than at other sites in Persian Gulf. The proportion also fluctuates through the occupation sequence, broadly mirroring the information considered earlier, on the contribution of regional imports (**Chapter 6**). The proportion of tablewares within the assemblage starts at a relative high during the 5th to mid-7th century (CP1). It then declines to reach an assemblage low during the mid-8th to early 9th century (CP3) and rises again to a new assemblage peak during the 10th century (CP5). Outside the Persian Gulf, the data from Manda and Shanga – as elsewhere in the analysis – appear closely aligned. Tablewares make up only a relatively small proportion of these assemblages and where the figures can be chronologically differentiated at Shanga, their proportion hardly fluctuates apart from a small increase during the 11th to 13th centuries (CP6). The figures from Manda and Shanga are also largely similar to those from Sanjan. Again it is striking to note the extent to which the consumption of the same ceramic products varied to such a large degree between the Persian Gulf and other areas of the western Indian Ocean. There is one important caveat that does need to be raised here though. Within the current context, 'tablewares' have been defined from an admittedly crude Middle Eastern perspective. No doubt within the low-fired local ceramic traditions of East Africa and South Asia, there are a similarly broad range of functional types, including vessels used for serving and display. If these were differentiated within the assemblage, then it may be that the breakdown between utilitarian and tableware

categories within an East African or South Asian context would actually appear similar to those presented from the Persian Gulf. Such a comparison is clearly necessary and valid, but lies beyond the remit of the current investigation. What the results presented here do confirm, is what one might expect: a drop off in the occurrence of Middle Eastern tablewares away from their production source.

7.4.5 Sources of Functional Categories

A final factor that is important to consider is the sources of origin of different functional categories. Some of this information has been touched on within the discussion of the changing composition of ceramic exchange in terms of the specific classes represented (**Section 7.3**). It is clear from this that there were important regional shifts in terms of the major areas of input of ceramic products entering the Indian Ocean circulation pool, and that the nature of the products themselves also underwent a process of significant transformation during the period under consideration. Certain important functional types have also been mentioned such as Torpedo Jar (TORP.S) transport containers from Iraq, or the mix of characteristic transport containers and tableware vessels represented by 'Dusun' (DUSUN) and Changsha (CHANG) vessels amongst the cargo of the Belitung wreck. What is important to consider from a quantitative perspective, is how the composition of the assemblage circulating at different scales of distribution may have been constituted in terms of the main functional categories represented. Particularly for regional and exotic imports, do they consist predominantly of particular functional categories and did the mix of categories vary or change? This question can be accessed by combining the variables previously discussed of local, regional and exotic origin, and the functional categories of transport containers, tablewares and utilitarian vessels (**Tables 18-35**).

This final aspect of the analysis provides a rich array of results with notable points of diachronic and synchronic variation that potentially justify further detailed commentary. For the purposes of this study though, it is sufficient to pick out just a few salient aspects that highlight certain broad principles affecting the operation of ceramic exchange. As we have already seen, exotic imports generally make up only a small proportion of the ceramics encountered archaeologically, and therefore figures related to this component of the assemblage are only ever expressed as minor value changes. Nevertheless, a consistent

feature across all the assemblages sampled, is that for sites within the Persian Gulf, exotic imports consist of a higher proportion of utilitarian coarse wares than fine tablewares. On sites in East Africa and South Asia this trend is reversed. This is largely influenced by the differing status of South Asian cooking pots in these different parts of the study area. Another even more striking feature for sites within the Persian Gulf area – where the products of regional scale exchange can be differentiated – is the fact that tablewares and transport container vessels are derived almost exclusively from regional-scale exchange. By contrast, locally manufactured products consist mostly of utilitarian coarse wares. This division is not unexpected; however, the consistency shown in the results establishes an important benchmark in understanding the structure of provisioning for different functional categories within the Persian Gulf region.

Source	Function	CP1	CP2	CP3	CP4	CP5	CP6
		No	No	No	No	No	No
Exotic	Container	0	0	0	0	0	1
	Tableware	1	1	28	1	4	28
	Utility	31	6	37	2	10	13
Regional	Container	10	7	48	2	19	24
	Tableware	460	105	313	17	1274	991
	Utility	53	17	56	2	65	23
Local	Container	0	0	0	0	0	0
	Tableware	42	6	8	1	22	50
	Utility	2591	1054	5843	158	3465	3930
Totals		3188	1196	6333	183	4859	5060

Table 7.18 *Kush, sources of functional types, sherd count*.

Source	Function	CP1	CP2	CP3	CP4	CP5	CP6
		%	%	%	%	%	%
Exotic	Container	0.0	0.0	0.0	0.0	0.0	0.0
	Tableware	0.0	0.1	0.4	0.5	0.1	0.6
	Utility	1.0	0.5	0.6	1.1	0.2	0.3
Regional	Container	0.3	0.6	0.8	1.1	0.4	0.5
	Tableware	14.4	8.8	4.9	9.3	26.2	19.6
	Utility	1.7	1.4	0.9	1.1	1.3	0.5
Local	Container	0.0	0.0	0.0	0.0	0.0	0.0
	Tableware	1.3	0.5	0.1	0.5	0.5	1.0
	Utility	81.3	88.1	92.3	86.3	71.3	77.7

Table 7.19 *Kush, sources of functional types, period percentage*.

Source	Function	CP1	CP2	CP3	CP4	CP5	CP6
		No	No	No	No	No	No
Exotic	Container	0					
	Tableware	30					
	Utility	79					
Regional	Container	120					
	Tableware	325					
	Utility	7					
Local	Container	75					
	Tableware	25					
	Utility	576					
Totals		1237					

Table 7.20 *Bushehr, sources of functional types, sherd count*.

Source	Function	CP1	CP2	CP3	CP4	CP5	CP6
		%	No	No	No	No	No
Exotic	Container	0.0					
	Tableware	2.4					
	Utility	6.4					
Regional	Container	9.7					
	Tableware	26.3					
	Utility	0.6					
Local	Container	6.1					
	Tableware	2.0					
	Utility	46.6					

Table 7.21 *Bushehr, sources of functional types, period percentage*.

Source	Function	CP1	CP2	CP3	CP4	CP5	CP6
		No	No	No	No	No	No
Exotic	Container			8	44	52	66
	Tableware			6	105	25	45
	Utility			60	448	165	84
Regional	Container			226	366	46	78
	Tableware			406	3761	1036	1159
	Utility			0	0	0	0
Local	Container			14	20	30	0
	Tableware			2	45	35	29
	Utility			454	5298	2051	2641
Totals				1176	10087	3440	4102

Table 7.22 *Siraf, sources of functional types, sherd count*.

Source	Function	CP1	CP2	CP3	CP4	CP5	CP6
		%	%	%	%	%	%
Exotic	Container			0.7	0.4	1.5	1.6
	Tableware			0.5	1.0	0.7	1.1
	Utility			5.1	4.4	4.8	2.0
Regional	Container			19.2	3.6	1.3	1.9
	Tableware			34.5	37.3	30.1	28.3
	Utility			0.0	0.0	0.0	0.0
Local	Container			1.2	0.2	0.9	0.0
	Tableware			0.2	0.4	1.0	0.7
	Utility			38.6	52.5	59.6	64.4

Table 7.23 *Siraf, sources of functional types, period percentage*.

Source	Function	CP1	CP2	CP3	CP4	CP5	CP6
		No	No	No	No	No	No
Exotic	Container		9	10	13		
	Tableware		23	4	5		
	Utility		60	74	67		
Regional	Container		6	9	21		
	Tableware		34	97	161		
	Utility		4	7	7		
Local	Container		0	0	0		
	Tableware		1	2	8		
	Utility		109	150	70		
Totals			246	353	352		

Table 7.24 *Sohar sources of functional types, sherd count*.

Source	Function	CP1	CP2	CP3	CP4	CP5	CP6
		No	No	No	No	No	No
Exotic	Container		3.7	2.8	3.7		
	Tableware		9.3	1.1	1.4		
	Utility		24.4	21.0	19.0		
Regional	Container		2.4	2.5	6.0		
	Tableware		13.8	27.5	45.7		
	Utility		1.6	2.0	2.0		
Local	Container		0.0	0.0	0.0		
	Tableware		0.4	0.6	2.3		
	Utility		44.3	42.5	19.9		

Table 7.25 *Sohar, sources of functional types, period percentage*.

Source	Function	CP1	CP2	CP3	CP4	CP5	CP6
		No	No	No	No	No	No
Exotic	Container		0				
	Tableware		0				
	Utility		8				
Regional	Container		272				
	Tableware		75				
	Utility		444				
Local	Container		0				
	Tableware		0				
	Utility		395				
Totals			1194				

Table 7.26 *Sir Bani Yas, sources of functional types, sherd count*.

Source	Function	CP1	CP2	CP3	CP4	CP5	CP6
		%	%	%	%	%	%
Exotic	Container		0.0				
	Tableware		0.0				
	Utility		0.7				
Regional	Container		22.8				
	Tableware		6.3				
	Utility		37.2				
Local	Container		0.0				
	Tableware		0.0				
	Utility		33.1				

Table 7.27 *Sir Bani Yas, sources of functional types, period percentage*.

Source	Function	CP1	CP2	CP3	CP4-CP5	CP6
		No	No	No	No	No
Exotic	Container			0	0	0
	Tableware			1	0	8
	Utility			0	2	6
Regional	Container			7	20	15
	Tableware			160	291	1008
	Utility			222	240	632
Local	Container			0	0	0
	Tableware			40	81	1990
	Utility			455	522	19434
Totals				885	1156	23093

Table 7.28 *Bilad al-Qadim, sources of functional types, sherd count*.

Source	Function	CP1	CP2	CP3	CP4-CP5	CP6
		%	%	%	%	%
Exotic	Container			0.0	0.0	0.0
	Tableware			0.1	0.0	0.0
	Utility			0.0	0.2	0.0
Regional	Container			0.8	1.7	0.1
	Tableware			18.1	25.2	4.4
	Utility			25.1	20.8	2.7
Local	Container			0.0	0.0	0.0
	Tableware			4.5	7.0	8.6
	Utility			51.4	45.2	84.2

Table 7.29 *Bilad al-Qadim, sources of functional types, period percentage*.

Source	Function	CP1	CP2	CP3	CP4	CP5	CP6
		No	No	No	No	No	No
Exotic	Container	[redacted]		6	114	35	141
	Tableware			47	368	74	2494
	Utility			1	16	8	136
Regional	Container			0	0	0	0
	Tableware			0	0	0	0
	Utility			0	0	0	0
Local	Container			0	0	0	0
	Tableware			0	0	0	2
	Utility			1371	11972	2217	46560
Totals				1425	12470	2334	49333

Table 7.30 *Shanga, sources of functional types, sherd count*.

Source	Function	CP1	CP2	CP3	CP4	CP5	CP6
		%	%	%	%	%	%
Exotic	Container	[redacted]		0.4	0.9	1.5	0.3
	Tableware			3.3	3.0	3.2	5.1
	Utility			0.1	0.1	0.3	0.3
Regional	Container			0.0	0.0	0.0	0.0
	Tableware			0.0	0.0	0.0	0.0
	Utility			0.0	0.0	0.0	0.0
Local	Container			0.0	0.0	0.0	0.0
	Tableware			0.0	0.0	0.0	0.0
	Utility			96.2	96.0	95.0	94.4

Table 7.31 *Shanga, sources of functional types, period percentage*.

Source	Function	CP1	CP2	CP3	CP4	CP5	CP6
		No	No	No	No	No	No
Exotic	Container	[redacted]		1579			
	Tableware			6327			
	Utility			3195			
Regional	Container			0			
	Tableware			0			
	Utility			0			
Local	Container			0			
	Tableware			0			
	Utility			238899			
Totals				250000			

Table 7.32 *Manda, sources of functional types, sherd count*.

Source	Function	CP1	CP2	CP3	CP4	CP5	CP6
		%	%	%	%	%	%
Exotic	Container	[redacted]		0.6			
	Tableware			2.5			
	Utility			1.3			
Regional	Container			0.0			
	Tableware			0.0			
	Utility			0.0			
Local	Container			0.0			
	Tableware			0.0			
	Utility			95.6			

Table 7.33 *Manda, sources of functional types, period percentage*.

Source	Function	CP1	CP2	CP3	CP4	CP5	CP6
		No	No	No	No	No	No
Exotic	Container			2	1		1
	Tableware			8	3		79
	Utility			2	0		2
Regional	Container			0	0		0
	Tableware			0	0		0
	Utility			0	0		0
Local	Container			0	0		0
	Tableware			0	0		0
	Utility			295	135		541
Totals				307	139		623

Table 7.34 *Sanjan, sources of functional types, sherd count*.

Source	Function	CP1	CP2	CP3	CP4	CP5	CP6
		%	%	%	%	%	%
Exotic	Container			0.7	0.7		0.2
	Tableware			2.6	2.2		12.7
	Utility			0.7	0.0		0.3
Regional	Container			0.0	0.0		0.0
	Tableware			0.0	0.0		0.0
	Utility			0.0	0.0		0.0
Local	Container			0.0	0.0		0.0
	Tableware			0.0	0.0		0.0
	Utility			96.1	97.1		86.8

Table 7.35 *Sanjan, sources of functional types, period percentage*.

7.5 Broader Implications

Seen more generally, the results presented throughout this chapter highlight some of the same underlying problems and challenges for research in the future. Particularly for sites outside the Persian Gulf area, the absence of information on regional-scale exchange and the differentiation of various functional categories inhibits detailed comparison with the assemblages from the Persian Gulf. No doubt much of the information required is already being actively worked on as part of the area studies taking place on indigenous ceramics in East Africa and South Asia (e.g. Fleisher & Wynne-Jones, 2011). The point that needs to be emphasised here is not that there is any significant gulf in the level of progress made in the study of Middle Eastern ceramic traditions and those from allied fields in East Africa and South Asia. Rather, the challenge remains that having identified some of the

broad features that are of central significance in developing an interregional analysis of the comparison on ceramic exchange, efforts now need to be directed towards achieving a better degree of integration in recording practices to provide directly comparable data.

Chapter 8 Ceramics and the Maritime Economy of the Western Indian Ocean

8.1 Introduction

Having considered the available quantitative ceramic data for the western Indian Ocean covering the period from the 5th to later 13th century, the purpose of the discussion here is to review the conclusions resulting from the analysis and then to explore some of the broader implications that follow. Before doing so, it will be useful to briefly re-examine the main aspects of this study including:

- The context of the research and the principal questions that this study aims to address (**Section 8.2**)
- The approach that has been adopted in order to answer the underlying research questions (**Sections 8.3 & 8.4**)
- The key findings of the analysis (**Section 8.5**)

In the presentation of the analysis so far, the available information has been considered largely from the perspective of individual site assemblages (**Chapters 6 and 7**). This has provided the context for a relatively detailed discussion in which the characteristics of sites have been factored into the analysis. In order to provide a broader level synthesis and to better isolate certain key features within the results, further analysis is presented below in which several key variables are combined. This final summative analysis will inevitably introduce new factors and highlight additional conclusions that may only have been partially identified up to this point. The aim of this chapter will be to relate some of the principal findings generated from the available quantified ceramic finds data to broader questions regarding the trajectory of development, the organisation, and the broader significance of Indian Ocean maritime exchange (**Section 8.6**).

8.2 Models of Indian Ocean Exchange

Built into virtually all discussions of the Indian Ocean region is the notion that maritime exchange occurred frequently, in large volumes and over long distances, and that it

constituted a substantial source of revenue that state structures benefited from on a significant scale and thus actively monopolised to varying degrees at different times. The formation of a large-scale integrated distribution network along the northern Indian Ocean rim during the later 1st and earlier second millennia AD, is seen in many ways as setting the course of development towards a proto-globalised economy well before the expansion of European influence during the early modern period (Chaudhuri, 1985; Abu-Lughod, 1989; Frank, 1998; Wink, 2002). In not necessarily directly connected ways, the later Sasanian and Abbasid periods are both widely regarded as key periods in which overall levels of commercial activity increased (e.g. Whitehouse & Williamson, 1973; Daryaee, 2003 and Ricks, 1970; Whitehouse, 1988; 67) and when the role of the Persian Gulf as a gateway between the heartlands of the powerful empires of the Middle East and the Indian Ocean region were enhanced (Daryaee, 2009; Whitcomb, 2009a). The question regarding how commercial revenue should be measured in relative terms against other potential sources of state income, such as land-taxes, household taxes, etc. has been raised in Chapter 1. One of the major problems in much of the discussion of the subject so far, has been the absence of empirical data with which to gauge any potential changes in the overall volume and scale of exchange activity, and thus to critically assess its potential economic contribution.

8.3 A Quantitative Ceramic Index

The evidence provided in the form of quantified ceramic finds provides a unique opportunity to measure long-term change in the volume and composition of one aspect of the maritime exchange system. The relatively low value of ceramics compared with a variety of other attested commodities means that they are rarely likely to have constituted the primary motivation for goods exchange. At the same time, the wide distribution of ceramics within the region indicates that they were frequently incorporated as part of the commodity mix. The fact that ceramics can often be reasonably accurately dated and sourced on the basis of simple visual examination, and the fact that they are one of the few commodities that are found consistently preserved within the archaeological record, makes them a particularly important resource for

reconstructing patterns of exchange, particularly in a period where few other dependable sources of economic history survive.

The key source of ceramic evidence for reconstructing patterns of long-term economic change is the accumulation of material built up through use and discard within stratified archaeological contexts. The quantification of such material provides the basis for examining underlying changes in assemblage composition in terms of the overall volume and content of ceramic exchange. More specifically, ceramic data provide a basis with which to examine how exchange was constituted in terms of the sources of origin of different products, the relative contribution of longer or shorter distance exchange mechanisms and the nature of the products according to other variables. Factors such as the functional characteristics of vessels, or the overall variety of products represented are important in allowing a more detailed characterisation and interpretation of the ceramic exchange process.

8.4 Integrated Analysis of Ceramic Exchange

This study represents an attempt to utilise all of the sources of quantified ceramic finds data that are *currently* available. In a few cases this includes assemblages that are already adequately described and published. Due to a variety of factors examined in detail elsewhere, previous attempt made to standardise the categorisation and recording of ceramics from different sites have been limited (**Section 2.2**). As a result it is necessary in most cases to extract further information from existing sources by reworking the categorisation of the material using class descriptions, illustrations, catalogue entries and finds database records. In some cases unpublished or partially published data have been entirely reworked by recording from selected elements of the archives or by recording directly from the finds themselves. A crucial aspect of this study has been the attempt to record the ceramic data from all sites according to a single standardised system of ceramic classification: the Integrated Indian Ocean Ceramic Classification or IIOCC (**Section 2.3**) and within the framework of a unified ceramic periodisation (Ceramic Periods 1-6) (**Section 2.4**).

Having established an integrated framework for analysis, the other key methodological consideration has been the approach to ceramic quantification. Again, deeply embedded factors have contributed towards the relatively slow general adoption of quantitative finds recording within the Indian Ocean region, and this has had a profound influence on the evidence currently available for use within this study (**Sections 3.2 & 3.3**). The benefits and disadvantages of different approaches to ceramic quantification have been considered, and in the end, despite potential limitations, basic sherd count figures have been utilised in order to achieve the broadest possible basis for comparison within the region using the sources of information currently available (**Sections 3.4 & 3.5**).

In total suitable data have been obtained from 13 different sites scattered widely within the Persian Gulf and western Indian Ocean region dated between the 4th and later 13th century. The core attributes of each of these sites is set out in terms of the site's history, size, function, geographical setting and relationship to the coastal environment (**Chapter 4**). Here it has also been possible to examine the approaches taken during archaeological investigation. In a separate section, the key considerations surrounding the nature, quality and extent of the ceramic finds data have been presented (**Chapter 5**). This includes information on the phasing and dating of assemblages, and the recording of ceramic finds data, particularly in terms of the process of establishing classificatory correlations.

Although the geographical and chronological coverage provided by the 13 assemblages is uneven, and the data available vary widely in quality, this study represents the first time that it has been possible to examine questions concerning long-term changes in the volume and composition of ceramic exchange with access to such a large number of sites and volume of ceramic finds data. The attempt to directly compare the results from as many as 13 different sites and over 4 million fragments of pottery, exceeds any attempt that has previously been made. As such, this study represents the application of a tightly focused, problem-driven and evidence-based methodology to answer specific questions regarding the long-term development of the Indian Ocean economy during an episode of major historical transition. The research further reinforces the absolute centrality of

quantitative recording as the foundation for the interpretation of ceramics derived from archaeological investigation.

8.5 Principal Findings of the Analysis

The quantitative analysis of ceramic assemblages presented in Chapters 6 and 7, provides the opportunity to directly compare the data from multiple locations across the western Indian Ocean. The specific focus of the analysis has been to measure chronological changes and regional variation in the proportion of ceramics from different sources of origin or functional type. It is clear that there are a range of features in the ceramic evidence provided that fundamentally challenge conventional reconstructions of the long-term development of Indian Ocean exchange. From the analysis provided it appears that:

- Ceramics distributed via long-distance maritime exchange within the western Indian Ocean only ever account for a small proportion of the ceramics in general use
- Despite other significant processes of political and economic transformation taking place during the later 1st and early 2nd millennium AD, the overall proportion of long-distance ceramic exchange in the Indian Ocean remains relatively constant through time
- Where the different processes of regional and long-distance exchange can be differentiated for assemblages from the Persian Gulf, it can be shown that it is actually regional-scale exchange that accounts for a high proportion of the exchange activity taking place
- Exotic imports are not necessarily characterised by products of especially refined quality. A significant proportion of exotic ceramic imports, particularly within the Persian Gulf, consist of vessels used as the packaging for other commodities, or special purpose utilitarian products such as cooking pots
- The most dramatic change that occurred during the transition between the Sasanian, Early Islamic and Abbasid periods appears to have been in the increasing diversity and overall visibility of the ceramic assemblage in circulation. There also

> appears to have been a growing emphasis on the use of vessels for the purposes of food consumption and display

So far the various conclusions arising from the analysis in Chapter 6 and 7 have been examined largely on an inter-site and inter-period comparative basis. Before moving on to finally consider some of the broader implications of the ceramic analysis, it will be useful to attempt to further refine our understanding of the core conclusions by re-examining the data from a summative perspective. This can be achieved by combining the information from individual sites and analysing broader sets of variables, such as the combined data for the Persian Gulf. To recap briefly on the main variables applied within the study, a distinction has been drawn between three different scales of ceramic distribution. Because of the generalised nature of the information available on the provenance of most categories of pottery, the definition of different scales of distribution represents something of an approximation. Local pottery includes material likely to come from within the general nearby catchment of a given site. Often it is defined simply by the pottery that is most common within a given assemblage and therefore presumed to be locally available. Products of regional-scale exchange include those from a similar cultural area. The Persian Gulf for example is defined as one region. Other regions may be less clearly defined geographically, but include, for the purposes of this study, East Africa and South Asia. The products of long-distance exchange are defined as those that pass between regions, for example products from the Persian Gulf found in East Africa, etc.

The other broad level of categorisation applied within the analysis relates to vessel types or functions. Again it is difficult to provide strict distinctions, but broadly an attempt has been made to attribute particular classes, and in a few cases individual vessel types, to the categories of transport containers, tables wares, and general utilitarian products. Transport containers include most obviously vessels such as amphorae, but also large thick-walled storage jars. Tablewares include glazed pottery and other obviously refined categories such as eggshell wares that were most likely to have been used for water cooling and serving. The term ‘utilitarian’ is admittedly problematic as all categories of vessel have some utility. Essentially though it includes products such as cooking pots and a wide variety of unglazed jars, bowls, etc. that may have been used for a variety of tasks

such as food-processing, storage, etc. Finally there are the sites, eight of which come from the Persian Gulf, two from East Africa and three from South Asia. The full details related to the characteristics of these sites and the nature of the ceramic data obtained from them is outlined above (**Chapter 4 & 5**).

8.5.1 Long Distance Exchange

By combining the products of local and regional exchange for sites within the Persian Gulf, a general analysis of long-distance exchange across all parts of the study area can be provided (**Table 8.1**, **Fig. 8.1**, **Fig. 8.2**). Certain factors are particularly striking. Despite the imbalance in attention that both archaeologists and art historians dedicate to exotic imports, they constitute a relatively insignificant proportion of the ceramic vessels in regular use. In itself this simply reinforces a point that has already been widely acknowledged, particularly in previous instances where exotic imports have been measured as a proportion of the ceramic assemblage as a whole (see for example Tampoe, 1989: figs. 99-109; Kennet, 2004: 92-106; Rougeulle, 2005: 226). What is significant about the results presented here is the limited range of variation across all of the sites, and the fact that this key finding can now be supported on the basis of such a large volume of ceramic finds data.

Area	Origin	Value	CP1 (400-650)	CP2 (650-750)	CP3 (750-825)	CP4 (825-900)	CP5 (900-1025)	CP6 (1025-1250)
Persian Gulf	Exotic	No.	235	107	228	699	257	251
		%	5.0	4.1	2.6	4.9	2.9	0.8
	Local	No.	4493	2525	8507	13686	8624	31976
		%	95.0	95.9	97.4	95.1	97.1	99.2
		Total	4728	2632	8735	14385	8881	32227
Non-Persian Gulf	Exotic	No.	11051	13	2833.25	6730.25	2934.25	5567.3
		%	0.3	4.2	4.4	2.2	4.5	5.0
	Local	No.	3679508	294	61230.8	296239	62211.3	106275
		%	99.7	95.8	95.6	97.8	95.5	95.0
		Total	3690559	307	64064	302970	65145.5	111842

Table 8.1 *Sherd counts and percentages of sherds by period from the Persian Gulf and non-Persian Gulf areas sub-divided into locally produced and exotic imports. Persian Gulf = Bushehr (CP1), Siraf (CP3-6), Bilad al-Qadim (CP3-6), A'Ali (CP4), Sir Bani Yas (CP2), Kush (CP1-6) & Sohar (CP2-4); Non-Persian Gulf = Manda (CP3-6), Shanga (CP3-6), Sanjan (CP2-6), Pattanam (CP1) & Anuradhapura (CP1, CP4). In cases where an assemblage cannot be allocated to a single ceramic period, counts have been divided equally between each of the periods to which they belong. Note also, figures measured in weight in grams from Anuradhapura have been included here as though they were sherd counts (see Section 5.2.13 for more details).*

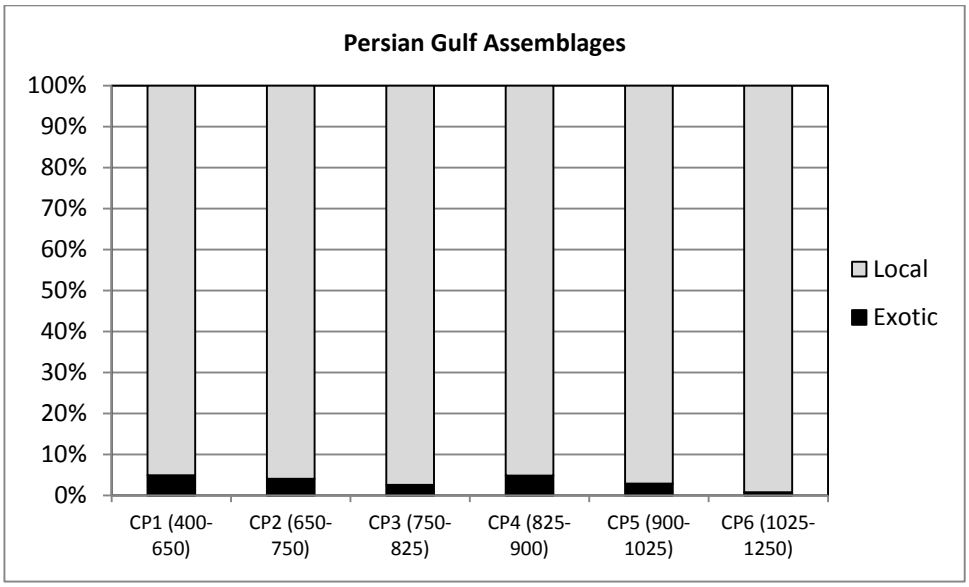


Fig. 8.1 *Proportion of local to exotic ceramics by period in assemblages from the Persian Gulf. For figures see above* (**Table 8.1**).

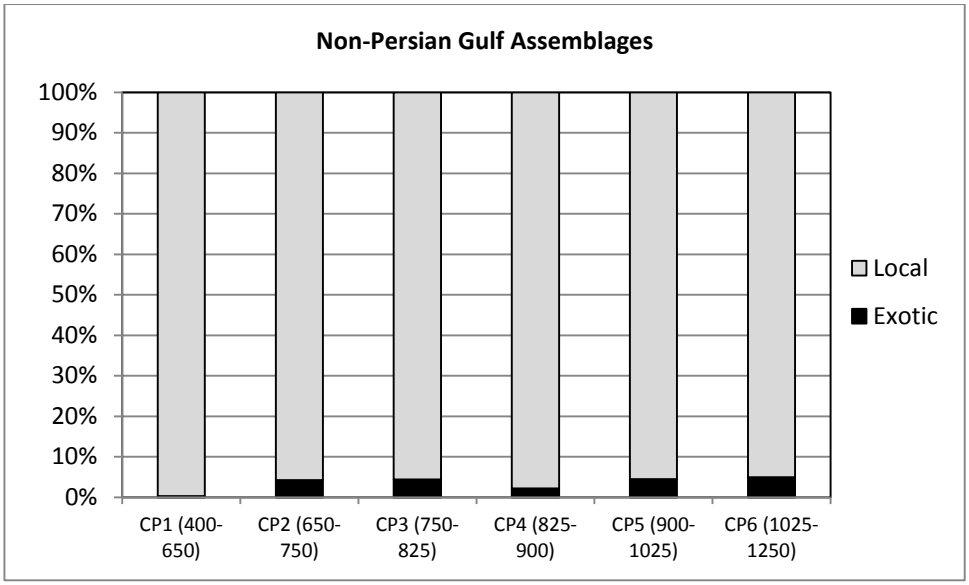


Fig. 8.2 *Proportion of local and exotic ceramics by period in assemblages from East Africa and South Asia. For figures see above* (**Table 8.1**).

Against a backdrop of slight and potentially meaningful variation in the occurrence of exotic imports as a proportion of the assemblages from different sites (**Chapter 6**), the combined figures for the Persian Gulf and other areas of the western Indian Ocean is actually strikingly similar. Typically in most periods, exotic imports account for between around 4-5% of the assemblages recorded. Where there is variation from this pattern, the chronological dimension revealed within the results appears potentially significant. Here there is a real lack of synchronisation in the trajectory of development between the Persian Gulf and the broader western Indian Ocean. Particularly notable within the current context is the drop by around half in the proportion of exotic imports in assemblages from the Persian Gulf area during the mid-8th to early 9th century period (CP3) and a similar scale of reduction for the sites in the wider western Indian Ocean slightly later during the 9th century (CP4). These findings are represented but not revealed with the same clarity in the analysis presented in Chapter 6. That they should occur within a period that has been widely portrayed as one of substantial growth and development of long-distance trade is surprising and significant, and will be discussed again in more detail below (see **Sections 8.5.5 & 8.6.1**).

8.5.2 Regional vs. Long-Distance Exchange

Further significant detail is provided where the products of long-distance and regional-scale exchange can be differentiated (**Table 8.2**, **Fig. 8.3**). Here again, the data show that local pottery vastly dominates assemblages within the Persian Gulf. What the figures also indicate is that a sizable proportion of ceramics in general use, were provided via regional-scale exchange networks. In some cases, such as the monastic settlement on the island of Sir Bani Yas, the vast majority, or perhaps all of the ceramics were provided from regional sources (**Chapter 6**). This data strongly reinforces the notion of the Persian Gulf as a closely integrated unit of interaction with high levels of provisioning, exchange and interdependence linking together coastal communities distributed along both its northern and southern shores (Potter, 2009: 4). Although it is large-scale distribution networks that continue to attract most attention and are widely regarded as the major driver of the Indian Ocean economy, it seems very likely that short and medium distance exchange may actually have formed the staple of the economic activities that took place.

SOURCE	**VALUE**	**CP1** (400-650)	**CP2** (650-750)	**CP3** (750-825)	**CP4** (825-900)	**CP5** (900-1025)	**CP6** (1025-1250)
Local	No	3362	1565	6968	8258.5	5904.5	28080
	%	75.9	59.5	79.8	57.4	66.5	87.1
Regional	No	924	958	1539	5426.5	2719.5	3896
	%	20.9	36.4	17.6	37.7	30.6	12.1
Exotic	No	141	107	228	700	257	251
	%	3.2	4.1	2.6	4.9	2.9	0.8
Totals		4427	2630	8735	14385	8881	32227

Table 8.2 *Combined figures for sites in the Persian Gulf showing the number of sherds by period derived from local sources or from regional-scale or long-distance exchange. Figures combined from Bushehr (CP1), Siraf (CP3-6), Bilad al-Qadim (CP3-6), A'Ali (CP4), Sir Bani Yas (CP2), Kush (CP1-6) & Sohar (CP2-4). In cases where an assemblage cannot be allocated to a single ceramic period, counts have been divided equally between each of the periods to which they belong*.

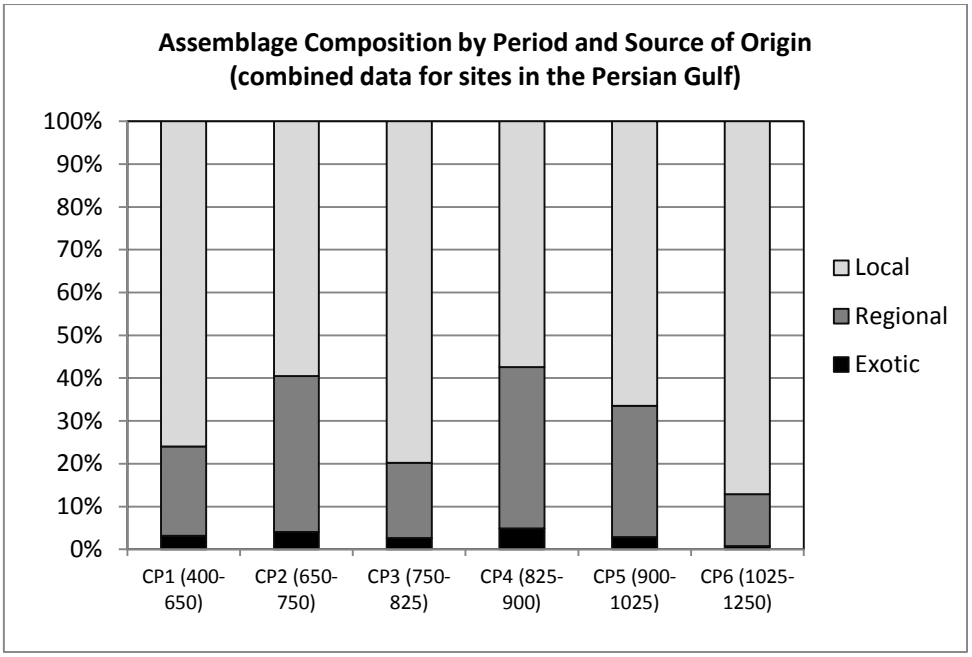


Fig. 8.3 *Combined figures for sites in the Persian Gulf showing the proportion of ceramics by period derived from local sources or from regional-scale and long-distance exchange. For figures see above* (**Table 8.2**).

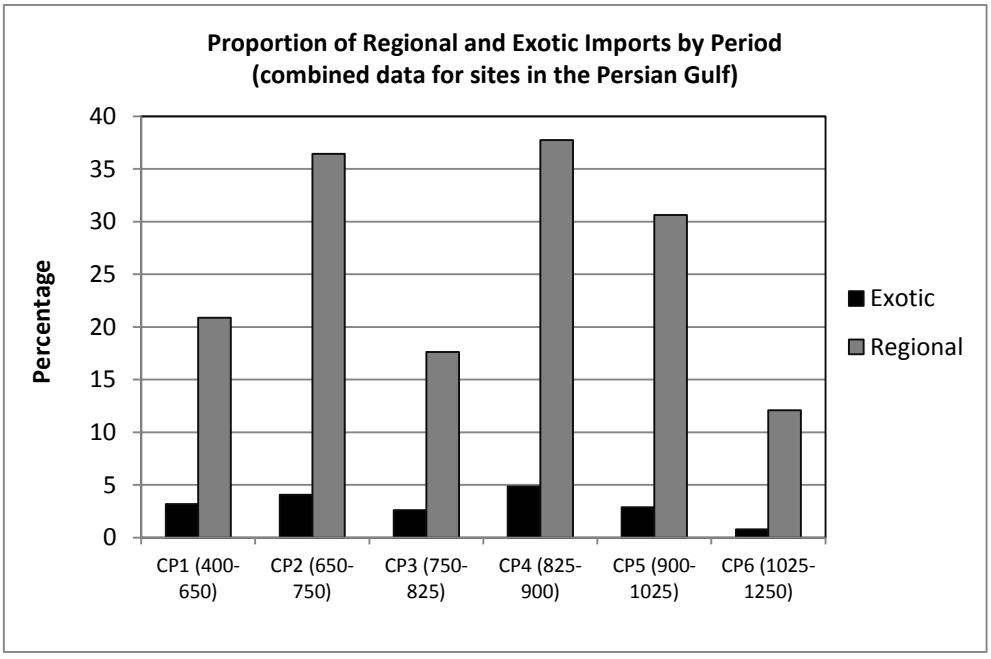


Fig. 8.4 *Combined figures for sites in the Persian Gulf comparing the proportion of ceramics by period derived from regional-scale and long-distance exchange. For figures see above* (**Table 8.2**).

The nature and interaction between long-distance and regional scale exchange systems can be further examined through focusing on these categories specifically (**Fig. 8.4**). Here

the chronological fluctuations in the supply of ceramics are further accentuated. Over the course of the study period, the proportion of ceramic derived from regional-scale exchange reaches peak levels of around 30-35% during separate episodes between the mid-7th to mid-8th (CP2) and the early 9th to early 11th centuries (CP4-5). Between these peaks, there are troughs where close to half the proportion of material – between around 15-20% – is derived from regional-scale exchange. These troughs occur at the beginning and end of the chronological sequence and between the mid-8th to early 9th century (CP3). The trough during the early Abbasid period appears particularly surprising; as has been noted above, this occurs in a period widely associated with trade growth. While the overall proportion of exotic imports consistently remains at below 5%, it is notable that the peaks and troughs in both categories appear to mirror one another, suggesting that both types of distribution pattern may to a certain extent have been influenced by the same economic factors.

8.5.3 Functional Composition of Ceramic Exchange

Another significant conclusion that emerges from the analysis relates to the function of vessels that were distributed via maritime exchange (**Chapter 7**). Ceramic vessels are likely to have been distributed for a variety of different purposes including most notably as containers and packaging for other sorts of commodities, as part of the personal equipment of those engaged in travel within the region, and as a specific cargo item with retail potential. The various alternative motives for moving ceramics over long distances have different implications, particularly as the first two imply non-targeted causes for the distribution of ceramic finds. Perhaps surprisingly, and importantly, the analysis undertaken here relating vessel forms to broad functional categories, indicates that dedicated container vessels actually account for only a small proportion of the ceramics in circulation (**Table 8.3**, **Figs. 8.5-6**). Within the period of the investigation, there is some evidence for a change in the pattern of occurrence of transport container vessels. Following a peak in their use between the mid-7th to mid-8th centuries (CP2), the overall proportion of transport container vessels continues to progressively decline. This pattern clearly coincides with the decline of categories such as Torpedo jars (TORP) and Large Incised Storage Vessels (HARLIM, REBROC, CREAC – LISV types). Tablewares by contrast,

undergo a progressive increase up to a peak during the 9th century (CP4). In general though, assemblages of all periods are heavily dominated by utilitarian products.

AREA	FUNCTION	VALUE	CP1 (400-650)	CP2 (650-750)	CP3 (750-825)	CP4 (825-900)	CP5 (900-1025)	CP6 (1025-1250)
Persian Gulf	Container	No	205	279	318	461	191	184
		%	4.6	11.7	3.7	4.1	2.1	0.6
	Tableware	No	883	187	1009	4200	2725	5293
		%	20.0	7.8	11.7	37.6	29.6	16.4
	Utility	No	3337	1924	7300	6521	6282	26763
		%	75.4	80.5	84.6	58.3	68.3	83.0
Non- Persian Gulf	Container	No	0	0	402.75	509.25	430.25	536.75
		%	0.0	0.0	0.6	0.7	0.7	0.5
	Tableware	No	0	0	1636.8	1951.3	1657.3	4156.8
		%	0.0	0.0	2.5	2.6	2.6	3.7
	Utility	No	0	0	62193	72579	62816	107763
		%	0.0	0.0	96.8	96.7	96.8	95.8

Table 8.3 *Sherd counts and percentages of sherds by period from the Persian Gulf and non-Persian Gulf areas sub-divided by functional type. Persian Gulf = Bushehr (CP1), Siraf (CP3-6), Bilad al-Qadim (CP3-6), Sir Bani Yas (CP2), Kush (CP1-6) & Sohar (CP2-4); Non-Persian Gulf = Manda (CP3-6), Shanga (CP3-6) & Sanjan (CP2-6). In cases where an assemblage cannot be allocated to a single ceramic period, counts have been divided equally between each of the periods to which they belong.*

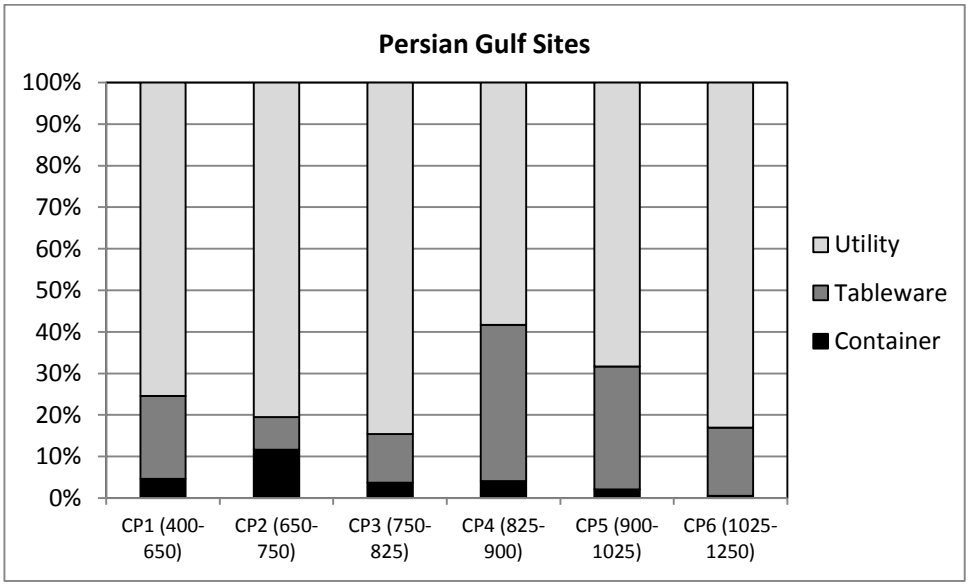


Fig. 8.5 *Proportion of the main functional types by period based on the combined figures for assemblages within the Persian Gulf. For figures see above* (**Table 8.3**).

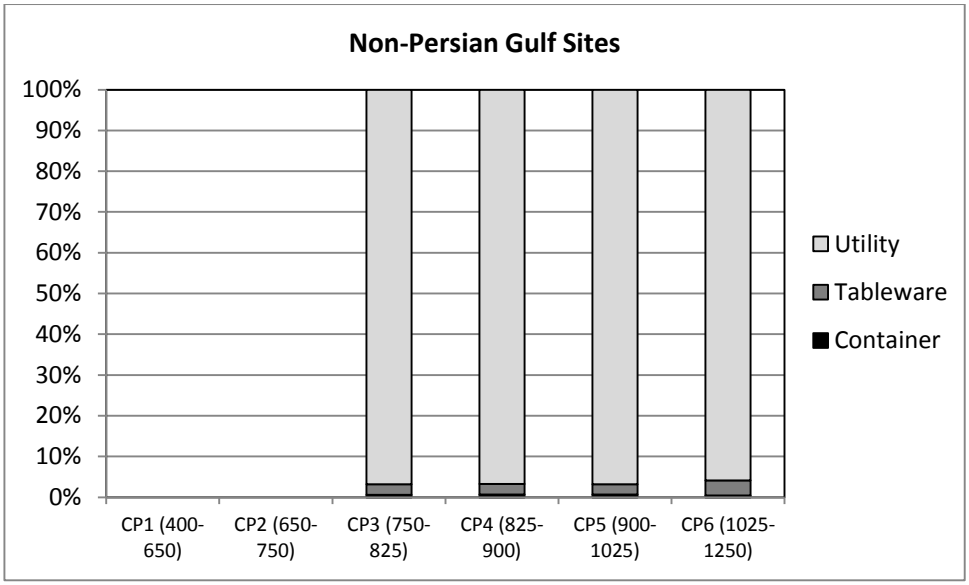


Fig. 8.6 *Proportion of the main functional types by period based on the combined figures for assemblages from East Africa and South Asia. For figures see above* (**Table 8.3**).

8.5.4 Dynamics of Scale and Ceramic Function

As well as the overall assemblage composition, it is important to consider the functional characteristics of imported categories themselves. At an individual site level, there are significant differences in assemblage composition that appear to correspond to some extent with factors of site location and function (**Chapter 7**). Seen at a collective level, the relative proportions of transport containers, tablewares and utilitarian products remains relatively stable *within* each of the respective areas: the Persian Gulf, and the wider western Indian Ocean (**Fig. 8.7, Fig. 8.8**). Where there is a substantial and significant contrast, is *between* these two areas. Imports derived from long-distance exchange found within the Persian Gulf are consistently dominated by utilitarian products, while those which occur in assemblages in other areas of the western Indian Ocean appear to be dominated by tablewares. This contrast is likely to be indicative of fundamentally different dynamics driving the demand for long-distance exchange of ceramics within these different areas, with predominantly glazed and brightly coloured vessels associated with food consumption and display often manufactured within the Persian Gulf area (particularly in lower Mesopotamia and southwest Iran) in demand in East Africa and South Asia. In the Persian Gulf, where such products were available through regional-scale exchange, exotic imports are dominated by products such as South Asian cooking

pots, which would have been required for their particular technical properties, and possibly also because of the specific cultural associations.

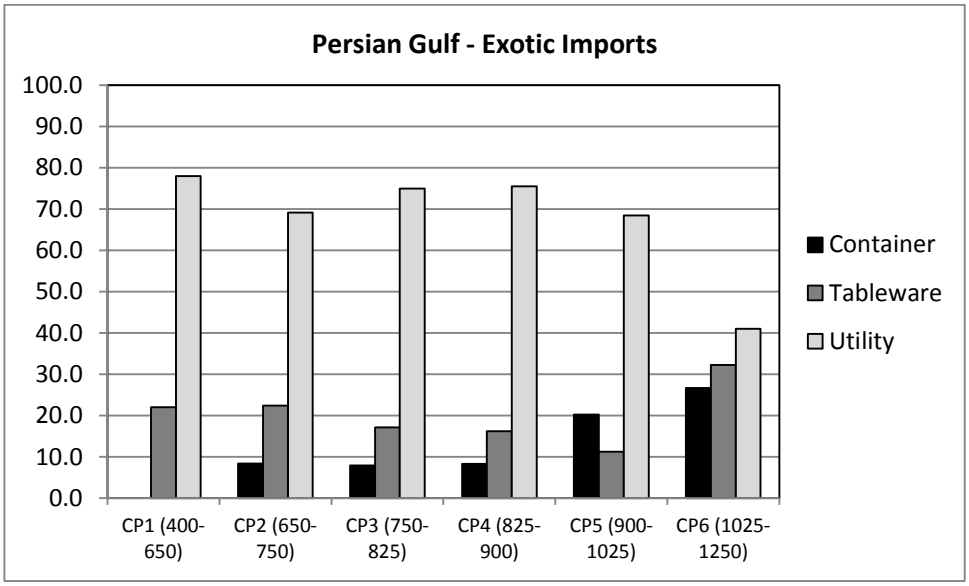


Fig. 8.7 *Composition of exotic ceramic imports within the Persian Gulf broken down by functional type and period*.

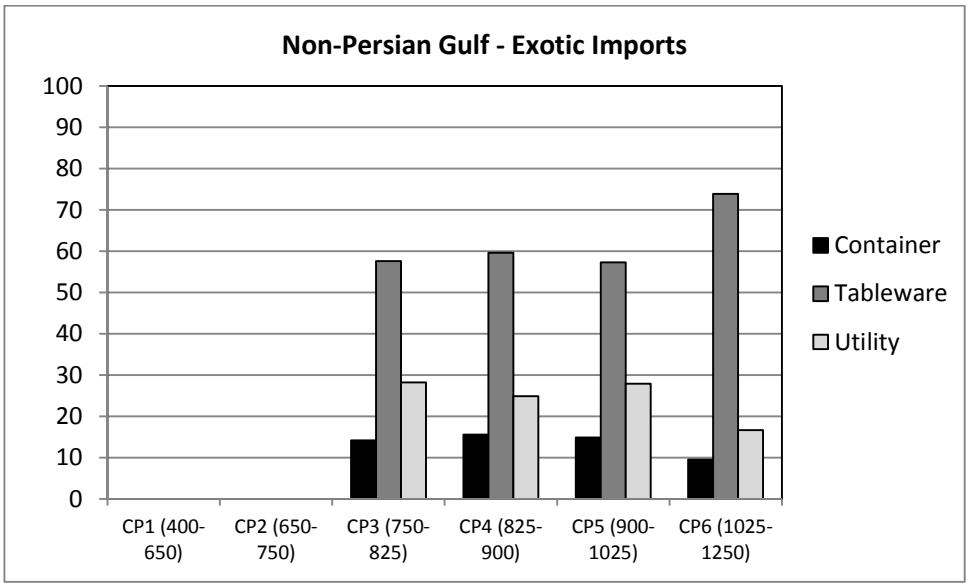


Fig. 8.8 *Composition of exotic ceramic imports within East Africa and South Asia broken down by functional type and period*.

Ceramics that circulated via regional-scale exchange within the Persian Gulf appear to be subject to a different set of dynamics. As has already been described to some extent,

transport containers, and in this case, utilitarian products, follow a similar trajectory of development, with the peak period for both categories occurring between the mid-7th to mid-8th centuries (CP2), followed by a progressive decline thereafter. In their place, tablewares witness what amounts to a major and dramatic explosion with levels increasing from around 20% of the assemblage in the period from the mid-7th to mid-8th centuries (CP2), up to levels of close to 90% by the 9th century (CP4). While the relative proportions of transport containers, tablewares and utilitarian products within the assemblage of exotic imports remained largely stable throughout the period under consideration, the nature of regional ceramic exchange was transformed entirely. The transition from the 7th to mid-8th centuries into the later 8th and 9th centuries is marked by a shift from a regional exchange pattern characterised by a more balanced mix of transport container vessels, large quantities of general purpose coarse wares and plain turquoise-blue glazed tablewares, towards one that is dominated to a significant extent by a far more visible assemblage made up of a wide variety of different coloured glazed wares such as Opaque Glazed Ware, Splashed Glazed Ware and Sgraffiato. This is accompanied by a modest increase in the overall proportion of ceramics derived from long-distance and regional-scale exchange during the transition from the 8th to the 9th century. What this does not appear to amount to though, is a dramatic explosion in overall levels of ceramic exchange during the height of power of the Abbasid caliphate. Instead what we seem to be seeing is a significant change in the qualitative characteristics of ceramic exchange in this period.

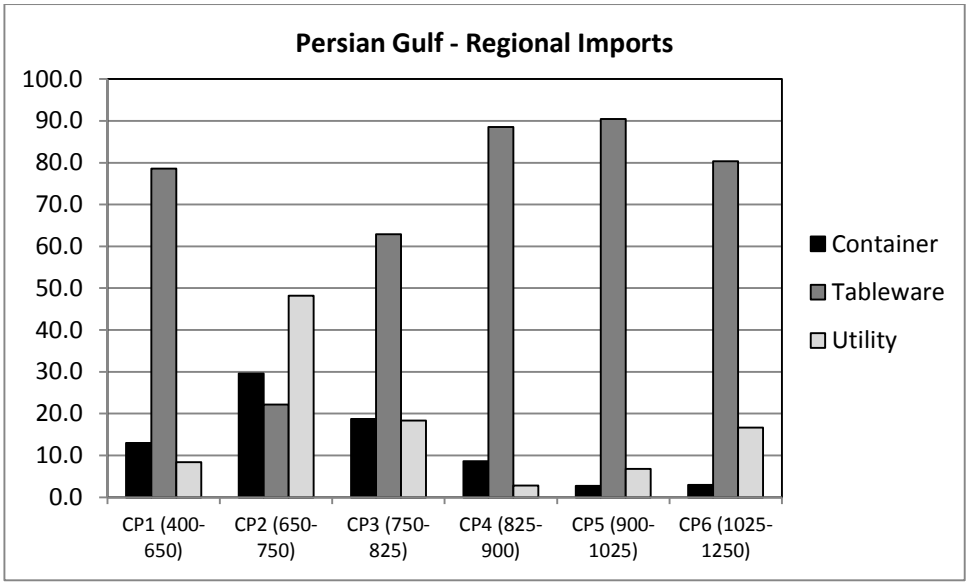


Fig. 8.9 *Composition of ceramics derived from regional-scale exchange within the Persian Gulf broken down by functional type and period*.

8.5.5 Summary of Major Findings

As has been outlined earlier, conventional reconstructions have often been established on the basis of various significant, but anecdotal sources, including non-quantified ceramic finds. By systematically comparing the quantities of ceramics supplied by long-distance exchange, it is possible to demonstrate that such material only ever accounted for a small proportion of the material in regular use. Of even more significance, is the fact that there is very little evidence for consistent change in the overall proportion of ceramics provided by long-distance exchange through time. Events such as apparent expansion of trade during the Abbasid period have no obvious correlation in terms increasing volumes of ceramic exchange. Instead the most significant factor in determining access to the products of long-distance exchange appears to have been site status and function. Certain contemporary coastal settlements such as Siraf appear to have actively participated in long-distance exchange, while others, such as Bilad al-Qadim, did not (see **Chapter 6**).

The available quantitative ceramic evidence also provides important insights into various aspects of the structure and organisation of exchange within the Western Indian Ocean region. Perhaps most obvious is the evidence for the significant importance of regional

exchange mechanisms within the Persian Gulf. Although there is notable variation in the overall proportion of ceramics derived from regional-scale exchange between sites and from individual sites through time, one common factor remains: between one in four to one in two pots in daily use within the Persian Gulf were supplied via sources from within the wider Persian Gulf area, but often over distances of several hundred kilometres remove. The regional-scale supply of ceramics appears to have occurred irrespective of whether sites acted as a major hub for commercial exchange, or where merely modest-scale settlements with a mixed resource base situated within the coastal area. The data available for regional-scale ceramic exchange within the Persian Gulf suggests an exceptionally high degree of connectivity within the area and a close degree of integration of all types of settlements into a unified exchange system. Presumably such an exchange system acted as a significant resource base for settlement within the area. What is not yet clear is whether the Persian Gulf region is exceptional in this regard, or if this characterisation applies to the broader Western Indian Ocean as a whole. Obtaining suitable ceramic data to test this hypothesis from areas such as South Asia or East Africa must remain a high priority for future research.

In terms of the content of ceramic exchange, the data available are also revealing. Of significance to note is the fact that container vessels used for the packaging of other types of goods account for a small proportion of ceramic vessels that were exchanged. Instead most vessels would have been exchanged specifically as a commodity, either for use in serving and display, or for other more utilitarian purposes. However it is important to acknowledge that this point may be overemphasised in the analysis that has been presented here. The reliable determination of vessel functions remains a particularly problematic exercise, and it is difficult to establish whether vessels such as small jars or even cooking pots may at times have been used variously for transport packaging and other applications once their contents had been removed. What is clear is that ceramic products supplied via long-distance exchange do not only consist of those more obviously connected with sumptuary display. At least within the Persian Gulf, such vessels constitute an increasingly high proportion of those supplied via regional-scale exchange, while products from exotic sources contain a more stable and balanced mix of products such as cooking-pots, containers and tablewares.

Finally, there is some evidence that the most significant change that occurred during the period under consideration was in terms, not so much of an increasing volume of ceramic exchange, but in the overall diversity of ceramic products. This last aspect is perhaps the most difficult to measure and quantify. The information that one would ultimately need to obtain to determine such a factor is accurate evidence for the range and location of different sources involved in ceramic production at different times. The other aspect that requires consideration is ceramic diversity as measured by the range of different vessel forms, styles of decoration, etc. and these are potentially even more subjective considerations. What is obvious, even at a qualitative level, is that factors such as the introduction of small but increasing quantifies of East Asian ceramic imports into the Western Indian Ocean from the later 8th century, vastly increased both the overall range, and the geographic spread of the sources from which imports where derived. The increasing use distinct styles of coloured decoration during the 9th century, and the availability of such pottery within the wider Western Indian Ocean, also provide a tangible indication of an increase in the variety of products in circulation.

8.6 Wider Implications

In this final section of the study, the aim is to examine the broader implications of a selection of the key findings generated from the quantitative ceramic analysis that has been presented above. There are clearly a broad range of factors that warrant potential consideration and the discussion offered here cannot by virtue be one that is comprehensive. One of the central aims of this study has been to present an analysis that remains tightly focused on the available ceramic evidence, with the hope that this important, but specific evidence source can be used an index against which other classes of evidence can be compared. It therefore remains the task of those specialists working in different fields and with different sets of evidence, to assess the extent to which the body of information presented here either conforms with, or challenges other alternative perspectives. What can be offered here is a limited discussion focusing on certain salient characteristics. Of most pressing importance is: the way in which the quantitative ceramic analysis provided feeds into our understanding of the long-term trajectory of economic development within the Western Indian Ocean region; what the evidence reveals about

the structure and organisation of Indian Ocean exchange, and how these ideas feed in to a wider set of debates surrounding the role of the Indian Ocean in the formation of pre-modern world-systems.

8.6.1 Chronological Trajectory of Development

One of the central issues that this study set out to address was to establish a broader chronological trajectory of development within the Western Indian Ocean in terms of changing patterns in the overall volume of ceramic exchange. This quest stems from the view that events across the Western Indian Ocean can be understood as part of a wider integrated system[56]. It is also based on the key assumptions that:

- The proportions and overall quantity of pots in the archaeological record directly reflect the actual proportions and quantities of pots in use
- That we can use ceramic exchange as a proxy to measure the overall scale of exchange around the Indian Ocean and that there is a relationship between the proportion and quantities of non-local pottery found in the archaeological record and overall patterns of exchange

Evidence for the long-term trajectory of economic development within the Western Indian Ocean is admittedly complicated by the nature and quality of the evidence currently available. Particularly in the period from the 5th to mid-8th, the evidence from Bushehr, Sir Bani Yas and Sohar all come from selective find samples and are therefore not necessarily reliable (see **Chapter 5**). The evidence from Kush is extremely important in providing controlled quantitative data spanning this period, but as we have seen, the composition of the ceramic assemblage from Kush diverges significantly from that of a number of other sites within the Persian Gulf during later periods (**Chapter 6**), and it may well do so during this earlier time-period as well. Within the wider Western Indian Ocean, there is currently no quantitative data available for the 5th to mid-8th century period from East Africa. For South Asia, we still await the important detail that will be provided by

[56] For a similar historical application see Beaujard, 2005 or a related archaeological approach see Kennet, 2004.

more complete results from the on-going work at Pattanam. At Anuradhapura the information consists of a very small selection of ceramic imports from a set of heavily disturbed deposits associated with the terminal phase of the site's occupation. As one moves into the mid-8th century period and later, the range and quality of quantified ceramic evidence from all areas improves and the reliability of the potential conclusions emerging are strengthened.

Despite the remaining issues of incomplete evidence, on the basis of the information that it has so far been possible to obtain, the picture is fairly clear. Ceramics supplied via long-distance exchange account for a very small proportion of the material in regular use, and there appears to be very little significant change in the overall proportion of long-distance ceramic exchange through the period under consideration. In fact if anything, there is a notable drop in the overall proportion of both regional-scale and long-distance exchange in the Persian Gulf in the period from the mid-8th to early 9th century (**Fig. 8.3**) and in proportion of long-distance exchange within the wider Western Indian Ocean during the 9th century (**Fig. 8.2**). The availability of more data from other sites always has the potential to alter the picture, but taken at face value on the basis of the substantial information that has already been obtained, the implications in terms of our understanding of the history of this period are important.

For the Sasanian period there remains a significant debate concerning the extent of the state's commercial involvement in the Persian Gulf and wider Western Indian Ocean. Various aspects of this debate have been outlined above (**Section 1.8.2**) and will not be returned to again here. What is of interest to note is that while the composition of ceramic exchange during the Sasanian period was clearly different to that of later periods, the overall proportion of products derived from long-distance exchange may not have been substantially different. This remains a crucial issue for further investigation and there is an important need now to obtain better quality data from other areas of Sasanian settlement within the Persian Gulf to help to further test this hypothesis.

Likewise, the Early Islamic period from the 7th to mid-8th century remains fairly poorly understood. It appears from the ceramic evidence that important changes may have

occurred in this period, in particular with growth in volume of regional scale exchange, and in the dramatic change in composition of that exchange, with an increased use of transport containers, and a fall-off in the use of tablewares. This was clearly fuelled in part by the prevalence of Torpedo Jars in this period, and the available indications are, that many of the vessels encountered in other areas of Western Indian Ocean, such as South Asia (Tomber, 2007; Stern, et al., 2008) may actually belong to this period. Our understanding of the 7th and 8th centuries in various parts of the Indian Ocean is likely to improve substantially in the near future with the publication of additional data, for example from the settlements of Kadhima in Kuwait Bay (Blair, Kennet & al-Duwīsh, 2012), and a number of relatively early dated settlements in East Africa such as Tumbe (Flexner, Fleisher & LaViolette, 2008), Fukuchani and Unguja Ukuu (Crowther, et al., 2013).

In terms of our understanding of the development of maritime exchange in the period from the mid-8th to later 9th centuries, the implications of the evidence obtained from this study are particularly profound. Clearly there were important qualitative changes in the commercial history of the Indian Ocean during the early Abbasid period that have long been recognised, most notably the development of direct navigation and exchange between the Western Indian Ocean and the Far East (see for example Hourani, 1947; 1951; Bivar, 1970; Rougeulle, 1996). However, such changes do not appear to be reflected in a significant upsurge in the overall volume of ceramic exchange or a growing availability of exotic products. In order to describe the changes of this period, it may be that other types of measures need to be taken into consideration. For example, not just the proportion of exotic imports in general use, but also the overall number of destinations these reached, the number and geographic extent of the sources they are drawn from, and the overall diversity of the products themselves. The available indications are that ceramics exports from the Persian Gulf did most likely reach more destinations distributed over a more extensive geographic area during the Abbasid period than in the Sasanian period (see for example Wilding, 1977; Glover, 2002; Priestman, in press (b)). This point is clearly significant. At the same time, charting this distribution has not been the focus of this study. Instead what we have been specifically concerned with is measuring changing patterns of ceramic consumption on the basis of quantified finds

from stratified contexts. This evidence provides an indication not of the spread, but of the overall volume of use. The volume of exotic imports in the early Abbasid period appears to remained largely unchanged.

Another significant element of the evidence provided that helps to understanding the organisation of long-distance exchange in this period, is the information that emerges for the uneven distribution of imported ceramics within the Persian Gulf. This is shown particularly clearly in the almost complete absence of exotic imports from the substantial coastal settlement and regional centre of Bilad al-Qadim, in contrast to the heavy participation in long-distance exchange during the contemporary occupation of the port city of Siraf. This suggests that there was an important structured component to long-distance exchange during the Abbasid period. The question then is really, to what extent did the influences of long-distance trade permeate through broader Abbasid society; or more fundamentally, to what extent did it underpin the central elements of the economy of the period?

These are big questions that no doubt have complex answers. As has already been made clear in discussions earlier (**Section 1.8.5**), the historical and archaeological evidence for the Abbasid period is not necessarily one of unqualified prosperity and growth. While aspects of high culture undoubtedly flourished, the catastrophic crisis in Mesopotamian agriculture gathered increasing momentum though the 9th century (summarised by Wilkinson, 2003). There is also evidence for major civil unrest and profound turmoil within the administration (Crone, 1980; Bennison, 2009). Within the wider Persian Gulf, there is actually so far limited evidence of occupation in this period, and at least some indication of a shift toward more ephemeral forms of settlement and widespread settlement relocation (see for example Kennet, 2002a; Priestman, 2005a). How then should we understand the organisation of trade during this period?

8.6.2 Structure and Organisation of the Indian Ocean Economy

One of the most striking aspects revealed by the quantitative ceramic evidence is the relative importance of regional-scale exchange networks. Within the Persian Gulf, where

the quality of information on ceramic provenance allows this aspect to be considered, it can be shown that through time, between around a quarter to a half of all pottery being used was manufactured non-locally, but from sources within the broader regional area of the Persian Gulf. As such, regional exchange can be shown to be a far more significant source in the provision of ceramics than long-distance exchange. In itself this is probably not surprising. What the evidence describes is a basic distance/interaction frequency drop-off that one might expect (Renfrew, 1975). What it does force one to reconsider is the reconstruction that has been frequently applied in our understanding of the maritime economy of the Indian Ocean (see for example **Section 1.9**). To paraphrase the point made earlier 'did maritime exchange occur frequently, in large volumes and over long distances, and did such long-distance exchange constitute the major driver of the Indian Ocean economy'? Certainly in terms of the distribution of ceramic products, regional exchange mechanisms played a far more active part. If we assume that most exchange was not driven by the demand for ceramics, and that ceramics simply formed one component within a broader goods exchange processes, it appears that the economic life-blood of maritime economy, at least within the Persian Gulf area, was not driven so much by 'Indian Ocean trade', but by local and regional markets. It remains to be seen whether other areas of the Western Indian Ocean operated according to similar principals as those that can now be demonstrated for the Persian Gulf.

If ceramic exchange was dominated by regional, and to an even greater extent localised exchange patterns, what then was the significance of long-distance exchange? Put more simply, how did pots move around? There are a variety of mechanisms that one might envisage, though it will not necessarily be possible to distinguish between them on the basis of the available archaeological evidence. The scale and volume of exchange is critical in determining the range of potential possibilities. Did long-distance ceramic exchange occur, for example, predominantly in the form of large consignments of material forming the bulk element of the cargo carried by trading vessels? In addition to the important shipwreck evidence, which will be considered again in a moment, the ubiquitous nature of certain types of imports across the Western Indian Ocean, and the evidence of ceramic mass-production, particularly in the Persian Gulf and China, lends weight to this type of argument. Another high-volume mode of distribution may have

been for smaller consignments of ceramics to be moved around as part of a more varied mix of high-frequency commercial exchanges.

Alternatively, if the overall volume of long-distance ceramic exchange was not actually that high, then it is possible to envisage a more diverse, less structured and ultimately less 'trade-like' set of distribution mechanisms. Exotic items may at times have circulated, for example, as part of the personal household equipment of those who travelled within the region, or during episodes of migration and dispersal. In an important example where exceptionally good quality information on the classification and provenance of ceramics has been established, it is possible to infer from archaeological evidence the presence of small numbers of individuals with a particular ethnicity, stationed in various parts of Roman Britain (Swan, 2009). We are clearly still a long way off from establishing such an accurate level of understanding for the Indian Ocean region. At the same time, the presence of products such as South Asian cooking-pots in the Persian Gulf and East Africa is potentially informative. The quantity of such finds is seemingly incompatible with the notion of wayfarers and itinerant individuals, but it may well be that their supply was organised as part of the general provisioning process associated with a relatively mobile community.

The existence of specific supply networks within the Indian Ocean region seems important. Particular religious networks are one such example. Within the Persian Gulf the case of Christian communities, who established themselves on islands, especially during the Early Islamic period, is an important case in point. As has been emphasised above, such communities present a type of paradox; on the one hand placing themselves in deliberate isolation, and on the other, retaining a strong proselytising mission (Elders, 2003: 233; Payne, 2011). Such communities also depended almost entirely on regional-scale provisioning, including for specific items such as wine. Archaeological evidence for such activity may well be represented in the form of Torpedo Jar (TORP.S) fragments recovered from the excavation (Carter, 2008: 85) and the potential Christian dimension of Torpedo Jar distribution is one aspect that requires further investigation.

Although again outside the geographic scope of the present study, the example of 8th to 10th century Iraqi Turquoise-Blue Alkaline-Glazed Jars (TURQ.T, Type JR5) in Japan is also informative (Priestman, in press (b)). These vessels, which are extremely common in contexts within the Persian Gulf and Western Indian Ocean, circulated in Japan in small but appreciable quantities, but are found exclusively associated with buildings connected with the highest levels of the religious and political elite. The precise mechanisms of transfer to Japan are still a matter open to debate. What is clear is that the meaning and value of such objects was substantially transformed within an East Asian context, and it may well be that this was a process involving the exchange of rare and exotic objects within the East Asian Buddhist community, which represented the main channel of communication between China and Japan (Batten, 2006).

This brings us then to consider the evidence from the Belitung wreck discovered off the coast of Indonesia (Krahl, *et al*., 2010). The essential characteristics of the Belitung wreck have been outlined earlier (**Section 1.8.4**). It is a vessel seemingly of Middle Eastern construction, built with wood from sources within the Western Indian Ocean and containing a cargo, the preserved and salvaged component of which is dominated by large quantities of mass-produced ceramics from China. The first thing that is important to note about the Belitung wreck is that wreck data from anywhere in the Indian Ocean from this early date are extremely rare. There are more wrecks known from Southeast Asia and East Asia than other areas of the Indian Ocean, but most of these are later dated. There are currently only two other wrecks known for the pre-11th century period, and both of these belong to Southeast Asia lashed-lug vessels dated to the 10th century (Guy, 2004). In both cargos, Chinese ceramics and other exotic items represent one element within a broad mix of commodities that were circulating within the Southeast Asian regional exchange network (Guy, 2004). What this means is that the Belitung wreck is so far exceptional and this makes its interpretation problematic. There may well be, for example, particular reasons for its discovery that make it generally atypical, such as the large quantity of ceramic vessels it contained. These clearly enhance the both the overall survival of the cargo and the chances of the wreck's discovery.

What the Belitung wreck does provide is evidence for a boat of Western Indian Ocean origin sailing west from China around the mid-9th century. This has been widely interpreted as the first direct archaeological evidence for structured directional exchange of a mass-produced ceramic cargo and the existence of a close economic relationship spanning a large sector of the Indian Ocean (Flecker, 2010). The cargo has been seen as "…a barometer of the level of commercial development that gained momentum during the Tang Dynasty (618 – 907), when industrial-scale production emerged for the first time…shaped by market demand" (Guy, 2010: 20). Against the backdrop of this interpretation, it is helpful to briefly consider some of the other possibilities. It may well be that the boat was not bound direct for the Middle East, as it has been tempting to imagine. There is also a strong likelihood that even if the ultimate destination was a port such as Siraf, the cargo would have been broken up *en route* and have taken on a different composition by the time it arrived there. There is also even the possibility that a foreign vessel was involved in plying East Asian trade.

Again the quantification of the assemblage from the Belitung wreck is informative. The cargo contains an estimated total of 55,000 relatively standardised Changsha bowls (Guy, 2010: 19). Here there is an interesting miss-match in the scales of evidence provided by different sources. A single cargo such as the Belitung wreck would be capable of generating somewhere in the region of 600,000 fragments of Changsha pottery once those vessels entered regular circulation[57]. At the same time, across what could be classed as a relatively substantial assemblage of 21,787 sherds recovered from Trench A at Siraf, Changsha bowls account for just 65 sherds, or 0.01% a Belitung-style consignment. Given the issues of product loss and dispersal within the archaeological record, and the overall volume of deposits that it is possible to sample, the correlation of

[57] Of the 161 Changsha bowls individually listed within a recent selective catalogue of the Belitung wreck finds, 88% have a rim diameter of 16cm (Krahl, *et al*. 2010: 236-49). If one ignores for convenience sake the dished profile of these hemispherical vessels, the circle encompassed by a 16cm diameter bowl has a surface area of 201cm². Based on the recorded dimensions of an assemblage of 232 sherds of Changsha bowls recovered from the archaeological excavation at Siraf in the British Museum (Priestman, forthcoming), the average sherd size is 4.9 x 3.6cm. Again ignoring the curvature of the sherds and going on the simplified basis of the sherds being square, this suggests that the average sherd surface area is 17.6cm², providing a total of around 11 sherds per vessel. Given that there are around 55,000 Changsha bowls represented within the cargo (Guy, 2010: 19), this provides a potential sherd yield for the Belitung cargo of 605,000 sherds.

these figures may well be consistent with many Belitung-style consignments having arrived at Siraf. If this is the case, this opens up another whole set of possibilities that need to be taken into consideration regarding the actual visibility of structured long-distance exchange within the archaeological record.

8.6.3 'Local World Systems' in the Indian Ocean

Ideas related to the volume and composition of long-distance trade actually lie at the heart of a broader debate concerning the formation of a world-system in the Indian Ocean in the pre-modern period. Wallerstein's initial 'world-systems theory' was conceived in connection with the distinctive developments in Europe that gave rise to capitalism and the industrial revolution in the 16th century (1974). Others have argued that the concept of an integrated world economy should be extended much further back in time (Frank & Gills, 1993). By emphasising the power and productivity of China and India and the formation of an intense zone of economic interaction within the Indian Ocean that attained progressive momentum through the first and second millennia AD, Frank argues that there is nothing inherently exceptional about the industrialisation process in Europe and indeed that this was a short-lived episode of dominance that essentially appropriated power structures formed at an earlier time in Asia (Frank, 1998: 224). This argument has now been passed back and forth several times. Wallerstein counters by arguing that pre-modern economic interaction does not qualify as a world-system because the level of interaction achieved did not reach the same critical standards that apply to modern capitalism (Wallerstein, 1991: 191). In addition he argues that it is it is important to

> "…distinguish [between] trade *within* an historical system (primarily in 'necessities') and trade *between* separate systems (primarily in 'luxuries'). Because of the technology of transport before modern times and hence because of its high cost, 'long-distance' trade had necessarily to be in low-bulk, high-profit goods, and these had to be 'luxuries'" (Wallerstein, 1991: 191).

This argument is rejected in turn on the basis of textual and archaeological evidence, which indicate that non-luxury goods formed an essential part of trade interactions within the Indian Ocean from the earliest times (Beaujard, 2005: 449). As is clearly

indicated by the authors themselves, the one central factor that is missing from all of this discussion, is a secure basis with which to quantitatively measure the scale of interaction and the level of economic interaction that would enable a systematic comparison across space and time. As has been repeatedly argued here, the ceramic evidence provides a unique opportunity to do so. Only basic methodological factors related to the accurate quantitative recording of ceramics and the development of an agreed classification and chronology have so far held back the full use of ceramic data. Much more essential groundwork remains to be done in these areas, but at this moment we stand right on the tipping point of this vast reservoir opening itself up as a resource upon which to develop a systematic, quantitative and fully independent analysis of one component of the exchange interactions that took place within the region. Furthermore, the information on ceramic exchange provides a direct insight into a fundamental aspect of the economy, which lies almost entirely outside the scope of conventional history. This study represents an initial and preliminary foray into this largely uncharted territory. Although there remain all sorts of problems with some of the data that have been presented, these have been set out as clearly as possible. What it has been possible to achieve is the first attempt to compare multiple sources of quantitative data from across the region. What the results seem to suggest is that the truth – as is often the case – may lie somewhere between the Wallerstein/Frank/Beaujard debate. Non-luxury goods such as Indian cooking-pots or African timber were clearly exchanged over long-distances in a systematic fashion in pre-modern times. At the same time, long-distance trade represents a tiny fraction of the exchange that took place. While exotic products may always have held an elevated position within the cultural imagination of the time, the real drivers of the Indian Ocean economy operated at a local and regional level.

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Appendix I – Ceramic Classes

The following provides a full list of ceramic classes defined within the Indian Ocean Ceramic Classification (IIOCC). These have been used as the basis for the analysis undertaken within this study and are a referred throughout the text above using a shortened acronym of the full class name in the form of a class codes written in upper case letters. As has been outlined elsewhere (**Section 2.3**), the ceramic class categories have been determine by combining the results of several previous studies. The resulting class and fabric descriptions represent a compilation of information from previously published sources and forthcoming publications. The sources include:

- The study of the phased and quantified assemblages from Kush ($4^{th}/5^{th}$ – 13^{th} century) and al-Mataf (14^{th} – $16^{th}/17^{th}$ century) in Ras al Khaimah in the United Arab Emirates (Kennet 2004).
- Material from the Williamson Collection, which includes over 17,000 pieces of pottery collected during surface survey of more than 1000 Sasanian and Islamic period sites distributed widely through southern Iran. The survey was undertaken by between 1968 and 1971 (Williamson, 1970) and the finds deposited with the Ashmolean Museum were subsequently processed and recorded at the University of Durham (Priestman & Kennet, 2002; Priestman, 2003; 2005a).
- The largest component of foreign division of finds from the excavation of the c.7^{th} – 15^{th} century occupation of the medieval port of Siraf held by the British Museum (Whitehouse, 2009; Priestman, forthcoming).
- Smaller additional studies undertaken on finds from: Sir Aurel Stein's survey of southern Iran held in the British Museum and the Peabody Museum in Harvard (Priestman, 2004); field surveys in the Bushehr area (Carter, Challis, Priestman & Tofighian, 2006) and the Minab Plain (Kennet, Priestman, Khosrowzadeh & Ali, 2006) and work on the excavated assemblages from Manda and Shanga in Kenya (Priestman, 2010a), Sohar in Oman, and Kush in the United Arab Emirates (Priestman, 2011a).

A full concordance between the ceramic classification schemes presented on the basis of previous studies is included above (**Table 2.1**). This shows the way in which groups have been subdivided, amalgamated or recombined based on revised information that has come to light at each stage of the investigation (**Section 2.3.5**). The full description of the classes is provided below. Each class entry covers the main attributes that allow one to recognise and distinguish that category including a description of the fabric, vessel forms and surface treatment. An assessment is also given of the degree of homogeneity within each class. Class entries are arranged in thematic order and can be looked up either based on their place within the table of contents, or via the alphabetically arranged table of class codes. Class descriptions are supplemented by illustrations. This includes colour images of a representative selection of sherds for each category (Plates 1-174), together with schematic illustrations of recognised vessel forms. Individual elements of vessel forms – rims, bases, etc. – have been arranged into a formal type-series, which is presented below (Appendix II). Type codes listed in association with each class entry can be used to provide a cross-reference between these two elements of the catalogue.

Ceramic Class List – Thematic Order

Group	Class Code	Class Name	Date	Origin
Red/Grey Wheel-Made Coarse Wares	CONG.G	Grey 'Conglomerate' Coarse Ware	3rd-5thC?	Southern Iran
	HARLIM.E	Early Hard Lime-Spalled Ware	4th-6thC?	Southern Iran
	HARLIM	Hard Lime-Spalled Ware	6th-8thC	Southern Iran
	FINLIM	Fine Sandy Lime-Spalled Red Ware	6th-8thC	Southern Iran
	REBROS	Gritty Red/Brown Slipped Ware	(late)8th-10thC	Siraf, Southern Iran
	CREAC	Cream Coated Red Ware	(late)8th-10thC	Siraf, Southern Iran
Orange/Buff Wheel-Made Coarse Wares	ORGPIN	Pink Organic Tempered Ware	7th-9thC	Oman
	BEARTH	Black-Fired Earthenware	2ndC BC - 4thC AD	Southern Iran?
	FLAKEY	Flakey Earthenware	7th-8thC	Ras al-Khaimah
	SPOT	Spotty Ware	10th-12thC	Ras al-Khaimah
	WAPO	Cream Pots with Incised Wavy Decoration	12th-13thC	Ras al-Khaimah
	REGTEC	Red-Grit Tempered Cream Coloured Ware	12th-15thC	Southern Iran
Fine/Sandy Buff Coarse Wares	EGG.PI	Plain or Incised Eggshell Ware	8th-10thC	Southern Iraq
	WHITE.PI	Plain or Incised White Ware	(mid)8th-12thC	Southern Iraq
	WHITE.A	Applique Decorated White Ware	(mid)8th-10thC	Southern Iraq
	BUFF.I	Incised Decorated Buff Ware	(mid)8th-12thC	Southern Iraq
	BUFF.S	Stamp Decorated Buff Ware	(mid)8th-12thC	Southern Iraq
	BUFF.P	Plain Buff Ware	(mid)8th-10thC	Southern Iraq
	SPORC	Soft Porous Cream Coloured Ware	(late)8th-10thC	Southern Iraq
	TORP.RG	Red Grit Tempered Torpedo Jars	(mid)8th-10thC	Southern Iraq
	TORP.S	Sandy Torpedo Jars	3rd-10thC	Southern Iraq
	TRC	Torpedo Jar Related Class	3rd-10thC	Southern Iraq
	HONEY	Honeycomb Ware	8th-9thC	Southern Iraq
	STAMP	Stamp Marked Jars	8th-9thC	Southern Iraq
	RUST	Rusticated Jars	8th-9thC	Southern Iraq
	FIBIC	Fine Incised Buff Coloured Ware	9th-12thC	Southern Iran?
	HARC	Hard Fine Cream Coloured Ware	12th-15thC	Southern Iran
Fine Moulded Wares	EGG.M	Moulded Eggshell Ware	(mid)8th-12thC	Southern Iraq

Group	Class Code	Class Name	Date	Origin
	EGG.R	Red Eggshell Ware	9th-11thC	Southern Iran?
	WHITE.M	Moulded White Ware	(mid)8th-12thC	Southern Iraq
	MEW	Moulded Ewers	12th-13thC	Southeast Iran
	MEW.MO	Ewer Moulds	12th-13thC	Southeast Iran
Fine Slipped/Painted Wares	SLIP.R	Fine Red Slipped Ware	2ndC BC-6thC AD	Southern Iran
	SLIP.B	Fine Black Slipped Ware	3rd-8thC	Southern Iran
	SLIP.TB	Thick Brown Slipped Ware	3rd-8thC	Southern Iran
	SLIP.PBR	Painted Brown Slipped Ware	1st-2ndC?	Southern Iran
	FOPW.1	Fine Orange Painted Ware, Group 1	3rd-6thC	Southeast Iran
	FOPW.2	Fine Orange Painted Ware, Group 2	3rd-6thC	Southeast Iran
Handmade Coarse Wares	CHAM	Crude Handmade Ware	Not known	Southern Iran
	CHAM.N-ID	Non-Identified Crude Handmade Ware	Not known	Southern Iran
	JULFAR	Julfar Ware	14th-16thC	Julfar, Eastern Arabia
	JULFAR.PB	Purple and Black Julfar Ware	16th-17thC	Julfar, Eastern Arabia
	JULFAR.RW	Red and White Julfar Ware	(late)15th-17thC	Julfar, Eastern Arabia
	HMPW.1	Handmade Painted Ware, Group 1	11th-13thC	Southern Iran
	HMPW.2	Handmade Painted Ware, Group 2	11th-13thC	Southern Iran
	HMPW.BST	Brittle Stone-Tempered Handmade Painted Ware	3rd-6thC?	Southeast Iran
	HMPW.CC	Coarse Cream Bodied Handmade Painted Ware	11th-13thC	Southern Iran
	HMPW.ORG	Organic Tempered Handmade Painted Ware	11th-13thC	Southern Iran
	HMPW.RB	Red on Brown Handmade Painted Ware	11th-13thC	Southern Iran
	HMPW.SA	Fine Sandy Handmade Painted Ware	11th-13thC	Southern Iran
	INC.M	Minab Incised Ware	14th-15thC	Minab, Southeast Iran
	HAGRIT	Hard Grit Tempered Cream/Pink Coloured Ware	12th-15thC	Southern Iran
	LIME	Coarse Lime-Tempered Ware	14th-16thC	Bahrain?
	CHOC	Chocolate Chip Ware	(mid)17th-19thC	Eastern Arabia
	INCIMP	Incised and Impressed Ware	17th-19thC	Jarun Island, Southeast Iran
Non-Identified Coarse Wares	CW.N-ID	Non-Identified Coarse Wares	Not known	Not known
South Asian Coarse Wares	IRPW	Indian Red Polished Ware	1st-8thC	Gujarat, India
	IRPW.RC	Indian Red Polished Ware Related Class	1st-8thC	Gujarat, India

Group	Class Code	Class Name	Date	Origin
	HARMIC	Hard Micaceous Red Ware	7th-10thC?	South Asia
	BRISAN	Brittle Sandy Painted Ware	7th-10thC?	South Asia
	SBBW	Soft Black Burnished Ware	7th-9thC	Gujarat, India
	BUFRAB	Buff Red and Black Ware	8th-10thC	India
	LINVES	Large Indian Storage Vessels	8th-10thC	India
	IRAB	Indian Red and Black Ware	11th-14thC	Gujarat, India
	INCOP	Mixed Indian Cooking Pots	Not known	South Asia
East African Coarse Wares	EACOP	East African Cooking Pots	8th-10thC	East Africa
Blue/Green Alkaline-Glazed Wares	TURQ.YG	Yellow-Green Alkaline-Glazed Ware	5th-(mid)8thC	Southern Iraq
	TURQ.T	Turquoise Alkaline-Glazed Ware	(late)8th-10thC	Southern Iraq
Moulded Glazed Wares	GLAMO.Y	Yellow Glazed Moulded Ware	(late)8th-9thC	Southern Iran?
Opaque-Glazed Wares	OPAQ.W	Monochrome White Opaque-Glazed Ware	(early)9th-10thC	Southern Iraq
	OPAQ.C	Cobalt Decorated Opaque-Glazed Ware	(early)9th-(mid)9thC	Southern Iraq
	OPAQ.WC	White on Cobalt Opaque-Glazed Ware	(early)9th-(mid)9thC	Southern Iraq
	OPAQ.TS	Turquoise Splashed Opaque-Glazed Ware	(mid)9th-10thC	Southern Iraq
	OPAQ.TBS	Turquoise and Black Splashed Opaque-Glazed Ware	(mid)9th-10thC	Southern Iraq
	OPAQ.LG	Opaque-Glazed Ware with Monochrome Gold Lustre	(late)9th-10thC	Southern Iraq
	OPAQ.LR	Opaque-Glazed Ware with Monochrome Ruby Lustre	(mid)9th-(late)9thC	Southern Iraq
	OPAQ.LP	Opaque-Glazed Ware with Polychrome Lustre	(mid)9th-(late)9thC	Southern Iraq
	OPAQ.PS	Polychrome Splashed Opaque-Glazed Ware	(mid)9th-10thC	Southern Iraq
	OPAQ.T	Monochrome Turquoise Opaque-Glazed Ware	(mid)9th-10thC	Southern Iraq
	OPAQ.B	Monochrome Black or White on Black Opaque-Glazed Ware	(mid)9th-10thC	Southern Iraq
	OPAQ.BW	Black on White Opaque-Glazed Ware	(mid)9th-10thC	Southern Iraq
	OPAQ.BT	Black on Turquoise Opaque-Glazed Ware	(mid)9th-10thC	Southern Iraq
	OPAQ.CP	Eggshell/White Ware Painted with Coloured Opaque Glaze	(early)9th-(mid)9thC	Southern Iraq
	OPAQ.N-ID	Non-Identified Opaque-Glazed Ware	(early)9th-10thC	Southern Iraq
Clear Splashed-Glazed Wares	SPLASH.GW1	Green and White Splashed-Glazed Ware - Cream Body	(mid)9th-10thC	Southern Iraq
	SPLASH.GW2	Green and White Splashed-Glazed Ware - Orange Body	(mid)9th-10thC	Southern Iran
	SPLASH.P1	Polychrome Splashed Glazed Ware - Cream Body	(mid)9th-10thC	Southern Iraq
	SPLASH.P2	Polychrome Splashed Glazed Ware - Orange Body	(mid)9th-10thC	Southern Iran

Group	Class Code	Class Name	Date	Origin
Early Sgraffiatos	GRAF.EP1	Early Polychrome Splashed Sgraffiato - Group 1	(early)10th-(mid)11thC	Southern Iran
	GRAF.EP2	Early Polychrome Splashed Sgraffiato - Group 2	(early)10th-(mid)11thC	Southern Iran
	GRAF.EG	Early Monochrome Green Sgraffiato	(early)10th-(mid)11thC	Southern Iran
	GRAF.EY	Early Monochrome Yellow Sgraffiato	(early)10th-(mid)11thC	Southern Iran
	GRAF.TL	Thin-Lined Sgraffiato	(early)10th-(mid)11thC	Southern Iran
Late Sgraffiatos	GRAF.H	Hatched Sgraffiato	(mid)11th-12thC	Tiz, Southeast Iran
	CHAMP	Champlevé Sgraffiato	(mid)11th-13thC	Tiz, Southeast Iran
	GRAF.DI	Deeply Incised Splashed Sgraffiato	(mid)11th-13thC	Southern Iran
	GRAF.LP	Late Polychrome Sgraffiato	(mid)11th-13thC	Southern Iran
	GRAF.GW	Green on White Splashed Sgraffiato	(mid)11th-13thC	Southern Iran
	GRAF.GYB	Green, Yellow and Brown Splashed Sgraffiato	(mid)11th-13thC	Southern Iran
	GRAF.S	Slip-Painted Sgraffiato	(mid)11th-13thC	Southern Iran
	GRAF.LG	Monochrome Green Sgraffiato	(mid)11th-13thC	Southern Iran
	GRAF.LY	Monochrome Yellow Sgraffiato	(mid)11th-13thC	Southern Iran
	GRAF.M	Monochrome Mustard Sgraffiato	(mid)11th-13thC	Southern Iran
	MONO.G	Monochrome Green Glazed Ware	(mid)11th-13thC	Southern Iran
	MONO.Y	Monochrome Yellow Glazed Ware	(mid)11th-13thC	Southern Iran
	GRAF.N-ID	Non-Identified/Degraded Late Sgraffiato	(mid)11th-13thC	Southern Iran
Slip-Painted Wares	SPW.BG	Slip-Painted Ware with White and Black on a Brown Ground	10th-12thC	Southern Iran
	SPW.YB	Slip-Painted Ware with Yellow and Brown on a White Ground	10th-12thC	Southern Iran
	SPW.BW	Slip-Painted Ware with Brown on a White Ground	10th-12thC	Southern Iran
	SPW.N-ID	Slip-Painted Ware Non-Identified/Degraded	10th-12thC	Southern Iran
Frit Bodied Wares	FRIT.EM	Early Monochrome Frit	(mid)11th-13thC	Southern Iran
	FRIT.LM	Late Monochrome Frit	14th-16thC+	Southern Iran
	FRIT.L	White Glazed Frit with Gold or Red Lustre	12th-14thC	Kashan, Central Iran
	FRIT.BL	Blue Glazed Frit with Gold Lustre	12th-13thC	Kashan, Central Iran
	FRIT.I	Incised Decorated Monochrome Frit	14th-16thC	Southern Iran
	FRIT.M	Moulded and Appliqué Decorated Monochrome Frit	12th-13thC	Southern Iran
	FRIT.MIN	Enamel Painted 'Minai' Frit	(late)12th-(early)13thC	Kashan, Central Iran
	FRIT.BW	Blue and White Underglaze-Painted Frit	14th-17thC+	Southern Iran

Group	Class Code	Class Name	Date	Origin
	FRIT.TB	Turquoise and Black Underglaze-Painted Frit	14th-17thC+	Southern Iran
	FRIT.GW	Green and White Decorated Frit	14th-17thC+	Southern Iran
	FRIT.UGP	Underglaze-Painted Frit	14th-17thC+	Southern Iran
	FRIT.EI	Enamel Imitation Frit	18th-19thC	Southern Iran
	FRIT.N-ID	Non-Identified Frit	14th-17thC+	Southern Iran
Underglaze-Painted Wares	MGPAINT.1	Manganese Purple Underglaze-Painted, Group 1	11th-13thC	Bahrain?
	MGPAINT.2	Manganese Purple Underglaze-Painted, Group 2	17th-19thC	Southern Iran
	UGP.BW	Blue and White Underglaze-Painted Ware	14th-17thC+	Southern Iran
	UGP.TB	Turquoise and Black Underglaze-Painted Ware	14th-17thC+	Southern Iran
	UGP.CB	Crude Black Underglaze-Painted Ware	14th-17thC+	Southern Iran
	UGP.BG	Brown and Green Underglaze Painted Ware	17th-19thC	Southern Iran
	UGP	Non-Identified Underglaze-Painted Ware	14th-17thC+	Southern Iran
Late Monochrome Glazed Wares	MONO.LG1	Late Monochrome Green Glazed Ware, Group 1	14th-17thC	Siraf, Southern Iran
	MONO.LG2	Late Monochrome Green Glazed Ware, Group 2	14th-17thC	Southern Iran
	KHUNJ	Khunj/Bahla Ware	14th-17thC	Khunj, Southern Iran
	SPECLE.1	Speckled Glaze Ware - Cream Fabric Blue/Green Glaze	14th-17thC	South Arabia?
	SPECLE.2	Speckled Glaze Ware - Red Fabric, Mixed Colour Glaze	14th-17thC	South Arabia?
	MONTUR	Monochrome Turquoise Glazed Ware	15th-17thC	Southern Iran
Other Late Glazed Wares	YEMEN	Yemeni Yellow	13th-(early)14thC	Yemen
	REDYEL	Red Yellow Ware	17th-20thC	Southern Iran
Other Glazed Objects	GT	Glazed Tiles	Not Known	Various
	KD.1	Kiln Debris - Trivets	Not known	Various
	KD.2	Kiln Debris - Stacking Bars	Not known	Various
	KD.3	Kiln Debris - Clinker	Not known	Various
	KD.4	Kiln Debris - Wasters	Not known	Various
Non-Identified Glazed Wares	GW.N-ID	Non-Identified/Degraded Glazed Ware	Not Known	Various
Stoneware Storage-Vessels	STONE.BLU	Green Glazed Stoneware Jars with Blue Highlights	7th-(early)8thC	China
	STONE.BG1	Black Glazed Stoneware Storage Jars, Group 1	(mid)8th-(early)9thC	East Asia
	STONE.BG2	Black Glazed Stoneware Storage Jars, Group 2	(mid)8th-(early)9thC	East Asia
	DUSUN	Dusun Green Glazed Stoneware Storage Vessels	(late)8th-11thC	Guangdong, China
	MTB.1	Martaban Black Glazed Stoneware Storage Jars, Group 1	14th-17thC	Southeast Asia

Group	Class Code	Class Name	Date	Origin
	MTB.2	Martaban Black Glazed Stoneware Storage Jars, Group 2	14th-17thC	Southeast Asia
Painted Stoneware	CHANG	Changsha Ware	(mid)8th-9thC	Changsha, China
White Stoneware	GWSG.1	Green on White Splashed-Glazed Stoneware, Group 1	9th-10thC	Hunan, China
	GWSG.2	Green on White Splashed-Glazed Stoneware, Group 2	9th-10thC	Hunan, China
	GYSG	Green on Yellow Splashed-Glazed Ware	(mid)9th-(late)9thC	China
	GM	Green Glazed Moulded Ware	10thC	China
	WWSL	Slipped White Stoneware	(mid)9th-10thC	Henan, China
	CIZHOU	Cizhou Ware	14thC	Hebei, China
White Glazed Stoneware	CREAM	Opaque Cream Coloured Glazed Ware	15th-17thC	Southeast Asia
Green Glazed Stoneware	STONE.GU	Guangdong Green Glazed Stoneware	(early)9th-(mid)9thC	Guangdong, China
	YUE.1	Yue Ware - Group 1	(early)9th-(mid)9thC	Shanglinhu, China
	YUE.2	Yue Ware - Group 2	(mid)9thC	Shanglinhu, China
	YUE.3	Yue Ware - Group 3	9thC	Shanglinhu, China
	YUE.4	Yue Ware - Group 4	10thC	Shanglinhu, China
	YAOZ	Yaozhou Ware	11thC	Yaozhou, China
	LQC	Longquan Celadon	(late)13th-15thC	Zhejiang, China
	GDC.1	Guangdong Celadon - Group 1	(late)13th-15thC	Guangdong?, China
	GDC.2	Guangdong Celadon - Group 2	13th-14thC	Guangdong, China
	JDC	Jingdezhen Celadon	15th-16thC	Jingdezhen, China
	STONE.GRY	Grey Glazed Stoneware	13th-(mid)14thC	China
	STONE.PLG	Patchy Light Green Glazed Stoneware	(mid)8th-(early)9thC	Tuan Chau, Vietnam
	STONE.BUR	Burmese Green Glazed Stoneware	15th-17thC	Twante, Burma
	STONE.THAI	Thai Green Glazed Stoneware	15th-(early)17thC	Thailand
Porcelain	XING	Xing Ware	9th-10thC	Hebei, China
	WW	White Ware	9th-12thC	China
	CWW	Carved White Ware	11th-13thC	Guangdong, China
	QING	Qingbai Ware	11th-13thC	Jiangxi, China
	DEH	Dehua White Ware	12th-13thC	Fujian, China
	CBW.1	Chinese Blue and White - Group 1	15th-(early)17thC	Jingdezhen, China
	CBW.2	Chinese Blue and White - Group 2	17th-19thC	Jingdezhen, China
	ENAM	Enamelled Porcelain	16thC	China

Group	Class Code	Class Name	Date	Origin
	VBW	Vietnamese Blue and White	14th-16thC	Vietnam
East Asian Non-Identified	EAST.N-ID	Non-Identified East Asian	Not known	East Asia
European	CHIN	European China	18th-20thC	Europe
	STONE.EU	European Stoneware	17th-19thC	Europe

Integrated Indian Ocean Ceramic Classification class listed by thematic grouping, as they appear in the class catalogue below.

Class List – Alphabetical Order

Class Code	Class Name	Date	Origin	Source
BEARTH	Black-Fired Earthenware	2ndC BC - 4thC AD	Southern Iran?	Kush
BRISAN	Brittle Sandy Painted Ware	7th-10thC?	South Asia	Siraf
BUFF.I	Incised Decorated Buff Ware	(mid)8th-12thC	Southern Iraq	Siraf
BUFF.P	Plain Buff Ware	(mid)8th-10thC	Southern Iraq	Siraf
BUFF.S	Stamp Decorated Buff Ware	(mid)8th-12thC	Southern Iraq	Siraf
BUFRAB	Buff Red and Black Ware	8th-10thC	India	Siraf
CBW.1	Chinese Blue and White - Group 1	15th-(early)17thC	Jingdezhen, China	Siraf
CBW.2	Chinese Blue and White - Group 2	17th-19thC	Jingdezhen, China	Siraf
CHAM	Crude Handmade Ware	Not known	Southern Iran	Siraf
CHAM.N-ID	Non-Identified Crude Handmade Ware	Not known	Southern Iran	Siraf
CHAMP	Champlevé Sgraffiato	(mid)11th-13thC	Tiz, Southeast Iran	Siraf
CHANG	Changsha Ware	(mid)8th-9thC	Changsha, China	Williamson
CHIN	European China	18th-20thC	Europe	Williamson
CHOC	Chocolate Chip Ware	(mid)17th-19thC	Eastern Arabia	Kush
CIZHOU	Cizhou Ware	14thC	Hebei, China	Williamson
CONG.G	Grey 'Conglomerate' Coarse Ware	3rd-5thC?	Southern Iran	Bushehr Survey
CREAC	Cream Coated Red Ware	(late)8th-10thC	Siraf, Southern Iran	Siraf
CREAM	Opaque Cream Coloured Glazed Ware	15th-17thC	Southeast Asia	Williamson
CW.N-ID	Non-Identified Coarse Wares	Not known	Not known	Siraf
CWW	Carved White Ware	11th-13thC	Guangdong, China	Siraf
DEH	Dehua White Ware	12th-13thC	Fujian, China	Siraf
DUSUN	Dusun Green Glazed Stoneware Storage Vessels	(late)8th-11thC	Guangdong, China	Siraf
EACOP	East African Cooking Pots	8th-10thC	East Africa	Siraf
EAST.N-ID	Non-Identified East Asian	Not known	East Asia	Siraf
EGG.M	Moulded Eggshell Ware	(mid)8th-12thC	Southern Iraq	Siraf
EGG.PI	Plain or Incised Eggshell Ware	8th-10thC	Southern Iraq	Siraf
EGG.R	Red Eggshell Ware	9th-11thC	Southern Iran?	Kush
ENAM	Enamelled Porcelain	16thC	China	Williamson
FIBIC	Fine Incised Buff Coloured Ware	9th-12thC	Southern Iran?	Siraf
FINLIM	Fine Sandy Lime-Spalled Red Ware	6th-8thC	Southern Iran	Siraf
FLAKEY	Flakey Earthenware	7th-8thC	Ras al-Khaimah, Eastern Arabia	Kush

Class Code	Class Name	Date	Origin	Source
FOPW.1	Fine Orange Painted Ware, Group 1	3rd-6thC	Southeast Iran	Williamson
FOPW.2	Fine Orange Painted Ware, Group 2	3rd-6thC	Southeast Iran	Williamson
FRIT.BL	Blue Glazed Frit with Gold Lustre	12th-13thC	Kashan, Central Iran	Siraf
FRIT.BW	Blue and White Underglaze-Painted Frit	14th-17thC+	Southern Iran	Williamson
FRIT.EI	Enamel Imitation Frit	18th-19thC	Southern Iran	Williamson
FRIT.EM	Early Monochrome Frit	(mid)11th-13thC	Southern Iran	IIOCC
FRIT.GW	Green and White Decorated Frit	14th-17thC+	Southern Iran	Williamson
FRIT.I	Incised Decorated Monochrome Frit	14th-16thC	Southern Iran	Siraf
FRIT.L	White Glazed Frit with Gold or Red Lustre	12th-14thC	Kashan, Central Iran	Siraf
FRIT.LM	Late Monochrome Frit	14th-16thC+	Southern Iran	IIOCC
FRIT.M	Moulded and Appliqué Decorated Monochrome Frit	12th-13thC	Southern Iran	Siraf
FRIT.MIN	Enamel Painted 'Minai' Frit	(late)12th-(early)13thC	Kashan, Central Iran	Siraf
FRIT.N-ID	Non-Identified Frit	14th-17thC+	Southern Iran	Williamson
FRIT.TB	Turquoise and Black Underglaze-Painted Frit	14th-17thC+	Southern Iran	Williamson
FRIT.UGP	Underglaze-Painted Frit	14th-17thC+	Southern Iran	Siraf
GDC.1	Guangdong Celadon - Group 1	(late)13th-15thC	Guangdong?, China	Williamson
GDC.2	Guangdong Celadon - Group 2	13th-14thC	Guangdong, China	Williamson
GLAMO.Y	Yellow Glazed Moulded Ware	(late)8th-9thC	Southern Iran?	Siraf
GM	Green Glazed Moulded Ware	10thC	China	Williamson
GRAF.DI	Deeply Incised Splashed Sgraffiato	(mid)11th-13thC	Southern Iran	Williamson
GRAF.EG	Early Monochrome Green Sgraffiato	(early)10th-(mid)11thC	Southern Iran	Siraf
GRAF.EP1	Early Polychrome Splashed Sgraffiato - Group 1	(early)10th-(mid)11thC	Southern Iran	Siraf
GRAF.EP2	Early Polychrome Splashed Sgraffiato - Group 2	(early)10th-(mid)11thC	Southern Iran	Siraf
GRAF.EY	Early Monochrome Yellow Sgraffiato	(early)10th-(mid)11thC	Southern Iran	Siraf
GRAF.GW	Green on White Splashed Sgraffiato	(mid)11th-13thC	Southern Iran	IIOCC
GRAF.GYB	Green, Yellow and Brown Splashed Sgraffiato	(mid)11th-13thC	Southern Iran	IIOCC
GRAF.H	Hatched Sgraffiato	(mid)11th-12thC	Tiz, Southeast Iran	Siraf
GRAF.LG	Monochrome Green Sgraffiato	(mid)11th-13thC	Southern Iran	Siraf
GRAF.LP	Late Polychrome Sgraffiato	(mid)11th-13thC	Southern Iran	Siraf
GRAF.LY	Monochrome Yellow Sgraffiato	(mid)11th-13thC	Southern Iran	Siraf
GRAF.M	Monochrome Mustard Sgraffiato	(mid)11th-13thC	Southern Iran	Siraf
GRAF.N-ID	Non-Identified/Degraded Late Sgraffiato	(mid)11th-13thC	Southern Iran	Williamson
GRAF.S	Slip-Painted Sgraffiato	(mid)11th-13thC	Southern Iran	Williamson
GRAF.TL	Thin-Lined Sgraffiato	(early)10th-(mid)11thC	Southern Iran	Siraf
GT	Glazed Tiles	Not Known	Various	Siraf

Class Code	Class Name	Date	Origin	Source
GW.N-ID	Non-Identified/Degraded Glazed Ware	Not Known	Various	Siraf
GWSG.1	Green on White Splashed-Glazed Stoneware, Group 1	9th-10thC	Hunan, China	Williamson
GWSG.2	Green on White Splashed-Glazed Stoneware, Group 2	9th-10thC	Hunan, China	Williamson
GYSG	Green on Yellow Splashed-Glazed Ware	(mid)9th-(late)9thC	China	Williamson
HAGRIT	Hard Grit Tempered Cream/Pink Coloured Ware	12th-15thC	Southern Iran	Siraf
HARC	Hard Fine Cream Coloured Ware	12th-15thC	Southern Iran	Siraf
HARLIM	Hard Lime-Spalled Ware	6th-8thC	Southern Iran	Siraf
HARLIM.E	Early Hard Lime-Spalled Ware	4th-6thC?	Southern Iran	IIOCC
HARMIC	Hard Micaceous Red Ware	7th-10thC?	South Asia	Siraf
HMPW.1	Handmade Painted Ware, Group 1	11th-13thC	Southern Iran	Siraf
HMPW.2	Handmade Painted Ware, Group 2	11th-13thC	Southern Iran	Siraf
HMPW.BST	Brittle Stone-Tempered Handmade Painted Ware	3rd-6thC?	Southeast Iran	Williamson
HMPW.CC	Coarse Cream Bodied Handmade Painted Ware	11th-13thC	Southern Iran	Williamson
HMPW.ORG	Organic Tempered Handmade Painted Ware	11th-13thC	Southern Iran	Williamson
HMPW.RB	Red on Brown Handmade Painted Ware	11th-13thC	Southern Iran	Williamson
HMPW.SA	Fine Sandy Handmade Painted Ware	11th-13thC	Southern Iran	Williamson
HONEY	Honeycomb Ware	8th-9thC	Southern Iraq	Siraf
INC.M	Minab Incised Ware	14th-15thC	Minab, Southeast Iran	Siraf
INCIMP	Incised and Impressed Ware	17th-19thC	Jarun Island, Southeast Iran	Williamson
INCOP	Mixed Indian Cooking Pots	Not known	South Asia	Siraf
IRAB	Indian Red and Black Ware	11th-14thC	Gujarat, India	Siraf
IRPW	Indian Red Polished Ware	1st-8thC	Gujarat, India	Siraf
IRPW.RC	Indian Red Polished Ware Related Class	1st-8thC	Gujarat, India	Siraf
JDC	Jingdezhen Celadon	15th-16thC	Jingdezhen, China	Williamson
JULFAR	Julfar Ware	14th-16thC	Julfar, Eastern Arabia	Siraf
JULFAR.PB	Purple and Black Julfar Ware	16th-17thC	Julfar, Eastern Arabia	Siraf
JULFAR.RW	Red and White Julfar Ware	(late)15th-17thC	Julfar, Eastern Arabia	Siraf
KD.1	Kiln Debris - Trivets	Not known	Various	Williamson
KD.2	Kiln Debris - Stacking Bars	Not known	Various	Williamson
KD.3	Kiln Debris - Clinker	Not known	Various	Williamson
KD.4	Kiln Debris - Wasters	Not known	Various	Williamson
KHUNJ	Khunj/Bahla Ware	14th-17thC	Khunj, Southern Iran	Siraf
LIME	Coarse Lime-Tempered Ware	14th-16thC	Bahrain?	Siraf
LINVES	Large Indian Storage Vessels	8th-10thC	India	Siraf
LQC	Longquan Celadon	(late)13th-15thC	Zhejiang, China	Siraf

Class Code	Class Name	Date	Origin	Source
MEW	Moulded Ewers	12th-13thC	Southeast Iran	Williamson
MEW.MO	Ewer Moulds	12th-13thC	Southeast Iran	Williamson
MGPAINT.1	Manganese Purple Underglaze-Painted, Group 1	11th-13thC	Bahrain?	Siraf
MGPAINT.2	Manganese Purple Underglaze-Painted, Group 2	17th-19thC	Southern Iran	Siraf
MONO.G	Monochrome Green Glazed Ware	(mid)11th-13thC	Southern Iran	Siraf
MONO.LG1	Late Monochrome Green Glazed Ware, Group 1	14th-17thC	Siraf, Southern Iran	Siraf
MONO.LG2	Late Monochrome Green Glazed Ware, Group 2	14th-17thC	Southern Iran	Siraf
MONO.Y	Monochrome Yellow Glazed Ware	(mid)11th-13thC	Southern Iran	Siraf
MONTUR	Monochrome Turquoise Glazed Ware	15th-17thC	Southern Iran	Siraf
MTB.1	Martaban Black Glazed Stoneware Storage Jars, Group 1	14th-17thC	Southeast Asia	Williamson
MTB.2	Martaban Black Glazed Stoneware Storage Jars, Group 2	14th-17thC	Southeast Asia	Williamson
OPAQ.B	Monochrome Black/White on Black Opaque-Glazed Ware	(mid)9th-10thC	Southern Iraq	Siraf
OPAQ.BT	Black on Turquoise Opaque-Glazed Ware	(mid)9th-10thC	Southern Iraq	Siraf
OPAQ.BW	Black on White Opaque-Glazed Ware	(mid)9th-10thC	Southern Iraq	Siraf
OPAQ.C	Cobalt Decorated Opaque-Glazed Ware	(early)9th-(mid)9thC	Southern Iraq	Siraf
OPAQ.CP	Eggshell/White Ware Painted with Coloured Opaque Glaze	(early)9th-(mid)9thC	Southern Iraq	Siraf
OPAQ.LG	Opaque-Glazed Ware with Monochrome Gold Lustre	(late)9th-10thC	Southern Iraq	Siraf
OPAQ.LP	Opaque-Glazed Ware with Polychrome Lustre	(mid)9th-(late)9thC	Southern Iraq	Siraf
OPAQ.LR	Opaque-Glazed Ware with Monochrome Ruby Lustre	(mid)9th-(late)9thC	Southern Iraq	IIOCC
OPAQ.N-ID	Non-Identified Opaque-Glazed Ware	(early)9th-10thC	Southern Iraq	Williamson
OPAQ.PS	Polychrome Splashed Opaque-Glazed Ware	(mid)9th-10thC	Southern Iraq	Siraf
OPAQ.T	Monochrome Turquoise Opaque-Glazed Ware	(mid)9th-10thC	Southern Iraq	Siraf
OPAQ.TBS	Turquoise and Black Splashed Opaque-Glazed Ware	(mid)9th-10thC	Southern Iraq	Siraf
OPAQ.TS	Turquoise Splashed Opaque-Glazed Ware	(mid)9th-10thC	Southern Iraq	Siraf
OPAQ.W	Monochrome White Opaque-Glazed Ware	(early)9th-10thC	Southern Iraq	Siraf
OPAQ.WC	White on Cobalt Opaque-Glazed Ware	(early)9th-(mid)9thC	Southern Iraq	Siraf
ORGPIN	Pink Organic Tempered Ware	7th-9thC	Oman	IIOCC
QING	Qingbai Ware	11th-13thC	Jiangxi, China	Siraf
REBROS	Gritty Red/Brown Slipped Ware	(late)8th-10thC	Siraf, Southern Iran	Siraf
REDYEL	Red Yellow Ware	17th-20thC	Southern Iran	Siraf
REGTEC	Red-Grit Tempered Cream Coloured Ware	12th-15thC	Southern Iran	Siraf
RUST	Rusticated Jars	8th-9thC	Southern Iraq	Siraf
SBBW	Soft Black Burnished Ware	7th-9thC	Gujarat, India	Siraf
SLIP.B	Fine Black Slipped Ware	3rd-8thC	Southern Iran	Williamson
SLIP.PBR	Painted Brown Slipped Ware	1st-2ndC?	Southern Iran	Williamson

Class Code	Class Name	Date	Origin	Source
SLIP.R	Fine Red Slipped Ware	2ndC BC-6thC AD	Southern Iran	Siraf
SLIP.TB	Thick Brown Slipped Ware	3rd-8thC	Southern Iran	Williamson
SPECLE.1	Speckled Glaze Ware - Cream Fabric Blue/Green Glaze	14th-17thC	South Arabia?	Siraf
SPECLE.2	Speckled Glaze Ware - Red Fabric, Mixed Colour Glaze	14th-17thC	South Arabia?	Williamson
SPLASH.GW1	Green and White Splashed-Glazed Ware - Cream Body	(mid)9th-10thC	Southern Iraq	Siraf
SPLASH.GW2	Green and White Splashed-Glazed Ware - Orange Body	(mid)9th-10thC	Southern Iran	Siraf
SPLASH.P1	Polychrome Splashed Glazed Ware - Cream Body	(mid)9th-10thC	Southern Iraq	Siraf
SPLASH.P2	Polychrome Splashed Glazed Ware - Orange Body	(mid)9th-10thC	Southern Iran	Siraf
SPORC	Soft Porous Cream Coloured Ware	(late)8th-10thC	Southern Iraq	Siraf
SPOT	Spotty Ware	10th-12thC	Ras al-Khaimah, Eastern Arabia	Kush
SPW.BG	Slip-Painted Ware - White and Black on a Brown Ground	10th-12thC	Southern Iran	Williamson
SPW.BW	Slip-Painted Ware - Brown on a White Ground	10th-12thC	Southern Iran	Williamson
SPW.N-ID	Slip-Painted Ware - Non-Identified/Degraded	10th-12thC	Southern Iran	Williamson
SPW.YB	Slip-Painted Ware - Yellow and Brown on a White Ground	10th-12thC	Southern Iran	Williamson
STAMP	Stamp Marked Jars	8th-9thC	Southern Iraq	Siraf
STONE.BG1	Black Glazed Stoneware Storage Jars, Group 1	(mid)8th-(early)9thC	East Asia	Siraf
STONE.BG2	Black Glazed Stoneware Storage Jars, Group 2	(mid)8th-(early)9thC	East Asia	Siraf
STONE.BLU	Green Glazed Stoneware Jars with Blue Highlights	7th-(early)8thC	China	Siraf
STONE.BUR	Burmese Green Glazed Stoneware	15th-17thC	Twante, Burma	Siraf
STONE.EU	European Stoneware	17th-19thC	Europe	Williamson
STONE.GRY	Grey Glazed Stoneware	13th-(mid)14thC	China	Siraf
STONE.GU	Guangdong Green Glazed Stoneware	(early)9th-(mid)9thC	Guangdong, China	Siraf
STONE.PLG	Patchy Light Green Glazed Stoneware	(mid)8th-(early)9thC	Tuan Chau, Vietnam	Siraf
STONE.THAI	Thai Green Glazed Stoneware	15th-(early)17thC	Thailand	Williamson
TORP.RG	Red Grit Tempered Torpedo Jars	(mid)8th-10thC	Southern Iraq	Siraf
TORP.S	Sandy Torpedo Jars	3rd-10thC	Southern Iraq	Siraf
TRC	Torpedo Jar Related Class	3rd-10thC	Southern Iraq	Williamson
TURQ.T	Turquoise Alkaline-Glazed Ware	(late)8th-10thC	Southern Iraq	Siraf
TURQ.YG	Yellow-Green Alkaline-Glazed Ware	5th-(mid)8thC	Southern Iraq	Siraf
UGP	Non-Identified Underglaze-Painted Ware	14th-17thC+	Southern Iran	Siraf
UGP.BG	Brown and Green Underglaze Painted Ware	17th-19thC	Southern Iran	Williamson
UGP.BW	Blue and White Underglaze-Painted Ware	14th-17thC+	Southern Iran	Williamson
UGP.TB	Turquoise and Black Underglaze-Painted Ware	14th-17thC+	Southern Iran	Williamson
UGP.CB	Crude Black Underglaze-Painted Ware	14th-17thC+	Southern Iran	Williamson
VBW	Vietnamese Blue and White	14th-16thC	Vietnam	Williamson

Class Code	Class Name	Date	Origin	Source
WAPO	Cream Pots with Incised Wavy Decoration	12th-13thC	Ras al-Khaimah, Eastern Arabia	Kush
WHITE.A	Applique Decorated White Ware	(mid)8th-10thC	Southern Iraq	IIOCC
WHITE.M	Moulded White Ware	(mid)8th-12thC	Southern Iraq	Siraf
WHITE.PI	Plain or Incised White Ware	(mid)8th-12thC	Southern Iraq	Siraf
WW	White Ware	9th-12thC	China	Siraf
WWSL	Slipped White Stoneware	(mid)9th-10thC	Henan, China	Williamson
XING	Xing Ware	9th-10thC	Hebei, China	Siraf
YAOZ	Yaozhou Ware	11thC	Yaozhou, China	Siraf
YEMEN	Yemeni Yellow	13th-(early)14thC	Yemen	Williamson
YUE.1	Yue Ware - Group 1	(early)9th-(mid)9thC	Shanglinhu, China	Siraf
YUE.2	Yue Ware - Group 2	(mid)9thC	Shanglinhu, China	Siraf
YUE.3	Yue Ware - Group 3	9thC	Shanglinhu, China	Siraf
YUE.4	Yue Ware - Group 4	10thC	Shanglinhu, China	Siraf

Integrated Indian Ocean Ceramic Classification classes listed in alphabetical order. Column on right indicates the primary source of the class/fabric description, which includes the following: Kush = Kennet, 2004; Bushehr Survey = Carter, Challis, Priestman & Tofigian, 2006; Williamson = Priestman, forthcoming; Siraf = Priestman, forthcoming; IIOCC = class defined for the first time during this study.

Class Descriptions

Red/Grey Wheel-Made Coarse Wares

Class Code: CONG.G

Class Name: Grey 'Conglomerate' Coarse Ware

Types: None

Illustration: None

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Consistently grey coloured pottery through the core and surface containing abundant black platelet inclusions. The fabric is hard but has a slightly chalky feel. Vessels are mostly medium to large sized jars and bowls generally with fairly simple everted rim forms.

Integrity: Very standardised class, potentially a useful period indicator.

Surface Treatment: Plain.

Vessel Forms: Usually medium to large sized bowls and jars with plain simple forms.

Parallels and Dating: 3rd – 5th century? The class occurs in a number of the assemblages recorded during the Bushehr Hinterland Survey (Carter, Challis, Priestman & Tofighian, 2006: fig. 13: 18-24, 27-29), and has subsequently been noted in small quantities in a number of assemblages within the wider area of the Persian Gulf. In the area of Bushehr and Dashtestan the class occurs in assemblages that appear to post-date the Hellenistic period, but which predate the introduction of the hard lime-spalled categories described below (HARLIM).

Origin: Southern Iran, Dashtestan area?

Class Code: HARLIM.E

Class Name: Early Hard Lime-Spalled Ware

Types: None

Illustration: None

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: HARLIM.E essentially shares the same characteristics as HARLIM (see below). It is a somewhat superficial category that has been created for the purposes of the

IIOCC in order to draw a distinction between earlier dated vessel types that have previously been recorded as CLINKY, SMAG.B and LISV.B (Priestman, 2005a), and the later development of the class referred to elsewhere as SMAG and LISV (Kennet, 2004). For reasons stated below, these various categories have inherent limitations and here they are all subsumed under the HARLIM terminology. The information currently available is not sufficient to accurately describe the earlier development of the HARLIM tradition and therefore HARLIM.E provides a temporary stop-gap that captures certain categories likely to be dated within the range of the c.4th - 6th centuries.

Vessel Forms: Typically small to medium sized jars with a simple 'S' profile rim. Also small to large sized jars, bowls and storage vessels with a distinct brittle grey fabric that may be part of the earlier development of the HARLIM tradition.

Parallels and Dating: 4th – 6th century. The distinction in dating particularly between the class categories of CLINKY and SMAG (equivalent here to HARLIM.E and HARLIM), was initially based on the results of a test excavation undertaken at the site of Khatt in Ras al-Khaimah (Kennet, 1998). The clearing of a section exposed through the settlement mound in Area 3, revealed a large refuse pit (Pit 7), the lower fill of which has been dated the 4th - 5th centuries and contains fragments of CLINKY. Higher up within the sequence the assemblage is dominated by SMAG (Kennet, 1998: 111, fig. 5, 11-12, fig. 6, 19). At Kush CLINKY occurs in abundance particularly within Phases W-01 - E-01 dated to the 4th/5th - 6th centuries (Kennet, 2004: 62, table 3). Through time there is a clear transition with the more complex rim forms associated with SMAG replacing the earlier vessel types and remaining as the dominant coarse ware within the assemblage through to the 8th or 9th century (Kennet, 2004: 80, table 41).

Origin: Southern Iran, possibly the general Siraf/Bushehr region.

Class Code: HARLIM

Class Name: Hard Lime Spalled Ware

Types: BR72-74, BR77-78, BR80, BR90, JR51, JR55-57, JR60-63, OC14, LISV0-1, LISV3-4, LISV6-10

Illustration: Plates 1-2

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact fabric with an irregular fracture, and coarse inclusions dominated by crushed red or black platelets. The class is similar and very likely closely related to REBROS and CREAC but has more advanced sintering, a 'clinky' quality and a core consistently fired to red, dark purple or grey. Surfaces can either be plain or have a darker slip covering. In either case the surface tends to be darker than the core and the difference between late firing reduction and a slip covering can be difficult to distinguish. Vessels include a mix of mostly medium and large sized bowls and jars with a combination of simple thickened or flange rims or complex rim types, particularly associated with small jars.

COLOUR		
Colour	Red/reddish grey	Weal red/dark reddish grey
Core	10R 5/8	10R 4/4
Margin	Same as core	Same as core
Surface	10R 5/1	10R 4/1

Integrity: Some variation in the degree of sintering and firing colour. The distinction between HARLIM and REBROS is at times somewhat arbitrary and difficult to maintain.

Vessel Forms: The class extends across a wide range of types including small and medium sized handled jars with simple thickened rims, medium and large sized jars with various forms of everted rim and some medium and large sized bowls with a fattened rim or a sharply angled and square edged flange rim. Some of the vessel types occurring in association with HARLIM are shared with REBROS and CREAC while others occur exclusively with this class.

Surface Treatment: Exteriors surfaces of jars and closed bowls and interior and exterior surfaces of open bowls are mostly darker than the core, either from a late firing reduction or a reddish brown slip covering that changes colour with the degree of reduction. Apart from the slip, most smaller vessels are plain. Large vessels are often decorated with simple, crudely incised wavy bands. Incised decoration becomes increasingly complex on large storage vessels.

Fabric: Hard, compact, well-sintered fabric fired to strong red, dark purple or grey turning darker on the surface. The fracture tends to be irregular with occasional voids. Coarse grit inclusions are dominated by crushed angular platelets fired to red, reddish-brown or black together with some soft, rounded buff-coloured sedimentary inclusions. These appear to turn yellow and partially spall in darker pieces with more advanced sintering. The size, sorting and frequency of coarse inclusions vary across the sample, partly on the basis of vessel size. This appears to be the same fabric as that represented in association with CREAC and HARLIM, but with differences in prevailing firing regime.

INCLUSIONS		
	1	2
Colour	Red/black	Buff/yellow
Size	<0.1 - 3mm	<0.1 - 2mm
Shape	Angular	Rounded
Freq.	3%	Occ. – 3%
Sorting	V. poor	Good
ID	Crushed platelets	Sedimentary stone

Specifications: High density with a compact structure, a gritty feel and an irregular fracture.

Parallels and Dating: 6th – 8th century. HARLIM incorporated a number of class categories that have previously been recorded as CLINKY, SMAG and LISV (Kennet, 2004). While these groups have already started to gain traction within the archaeological literature, they appear inherently problematic categories to work with as all essentially describe different vessel types that are

likely to come from the same centres of production. Furthermore, CLINKY, SMAG and LISV appear to be part of longer production tradition that we admittedly still do not fully understand, but which one can clearly see continuing on into the 9th – 10th century products of the Siraf region described below under the categories of REBROS and CREAC. At Siraf HARLIM appears to be replaced by REBROS and CREAC, which then become the dominant coarse ware industries within the region (see above). Finds of HARLIM at Siraf may well be concentrated within the areas of earliest occupation at the site belonging primarily to the 7th – 8th centuries or earlier.

Origin: Southern Iran, possibly Siraf.

Class Code: FINLIM

Class Name: Fine Sandy Lime-Spalled Red Ware

Types: LISV11

Illustration: Plate 3

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Large, thick walled storage-jars and vats with thickened rims mostly with some simple incised decoration below the rim exterior. Some vessels have a white slip wash covering the exterior though this is not ubiquitous. In terms of fabric FINLIM appears to be closely related to HARLIM and to a lesser extent REBROS and CREAC. The fabric is predominantly fired orange, or reddish-grey. Compared with HARLIM, FINLIM has less developed sintering and does not tend to fire to strong red or purple. Although there is some variability in coarse inclusions, most sherds contain crushed angular red platelets and numerous fine buff or grey inclusions. Surfaces tend to have a compact smooth quality with some lime spalling.

COLOUR		
Colour	Red/light red	Weak red
Core	2.5YR 5/6	2.5YR 4/2
Margin	Same as core	Same as core
Surface	2.5YR 6/4	2.5YR 5/2

Integrity: Some variation in frequency and sorting of coarse inclusions but generally consistent and distinctive.

Vessel Forms: Large thick-walled jars and vats. A common type has a closed mouth with a thickened rim flattened on the top with a slight lip a wide sloping shoulder (LISV11). Few vessels appear to be necked. Some vat forms have a wide mouth, a thickened rim and vertical barrel shaped sides.

Surface Treatment: The upper vessel portion immediately below the rim exterior is usually decorated with crude, thick lined and shallow incised marks consisting of straight and wavy bands and short oblique or vertically aligned slashes.

Fabric: Hard, very compact fabric fired to orange or reddish grey within minor change through the core in more reduced examples. The fabric contains numerous coarse inclusions, most noticeably crushed angular platelets together with fine buff or grey inclusions, some of which are partially burnt out. Surfaces are generally pitted intermittently with lime-spalling.

INCLUSIONS		
	1	2
Colour	Red/black	Buff/grey
Size	<0.1 - 3mm	<0.1 - 2mm
Shape	Angular	Sub-rounded
Freq.	3%	3-7%
Sorting	V. poor	Fair
ID	Crushed platelets	Stone grit

Specifications: High density with a compact structure, a gritty feel and an irregular fracture.

Parallels and Dating: 6th – 8th century. FINLIM is equivalent to LISV.A in the Williamson Collection (Priestman, 2005a: 178-79, pl. 1). The material finds close parallel with LISV recovered in quantity from the Bushehr Peninsula, which seems to have been abandoned around the time when Siraf underwent dramatic grown (Priestman, 2005a). Similar LISV has been recorded at Sir Bani Yas, a site dated to between the mid-7th – mid-8th centuries (Carter, 2008: 86-87, figs. 14: 2-7; 15) and Kush where a scatter of material occurs up to Phase E-04 dated to the late 8th century[58] (Kennet, 2004: fig. 31). These examples can be contrasted with the LISV that came to predominate in the Siraf assemblage with a coarser fabric, more sharply incised decoration including multiple bands of rilling, and a specific range of vessel forms.

Origin: Southern Iran.

Class Code: REBROS

Class Name: Gritted Red/Brown Slipped Ware

Types: BR72-79, JR49-59, H7, SP3, LISV4

Illustration: Plates 4-5

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact fabric with an irregular fracture and coarse inclusions dominated by crushed red or black platelets. The class is similar and very likely closely related to HARLIM and CREAC but has a far more varied fabric colour including pieces fired to cream, grey

[58] Note Phase E-04 is the earlier of two Phases within Period III dated as a whole to the late 8th – early 9th century (Kennet, 2004: tables 2-3). The next phase contains the earliest Samarra horizon pottery suggesting that only Phase E-05 extends into the early 9th century, or at least that Phase E-04 extends no later than the very early 9th century, depending on when exactly the 'Samarra horizon' was introduced.

or red. In addition the surfaces are covered with a patchy reddish-brown, grey or red slip. The slip colour seems to correspond to the tone of body and was mostly likely determined by firing atmosphere rather than its content. Some pieces are also left plain without a slip.

COLOUR			
Colour	Pale yellow	Light red	Greyish brown
Core	2.5Y 8/3	10R 5-6/6	10YR 5/2
Margin	Same as core	Same as core	Same as core
Surface	Same as core	10R 6/6	Same as core

Integrity: Fabric colour varies widely and appears to be linked to the degree of sintering with the cream coloured fabric associated with lower-fired pieces and red and greys associated with more developed sintering. Fabric hardness and firing atmosphere in tern affect the appearance of the coarse inclusions.

Vessel Forms: The class extends across a wide range of types including small, medium and large sized open bows with various forms of everted rim and closed vessels with everted rims or rilled necks. Some of the vessel types occurring in association with REBROS are shared with CREAC and HARLIM while others occur exclusively with this class. Large plain or incised storage jars also represent an important component, in particular a very distinctive type with a short, vertical, heavy collar rim with deep grooves running round the exterior, possibly to provide purchase for the attachment of a skin cover (LISV1).

Surface Treatment: Exterior surfaces of jars and interior and exterior surfaces of bowls are generally covered all over with a dark-grey, brown or red coloured slip. Apart from the slip, most smaller vessels are plain or have a simple rilled neck and straight incised bands. Larger vessels are often incised with wavy bands and other motifs. Some smaller vessels also have simple incised decoration.

Fabric: Hard, compact fabric fired to buff, light orange, red or reddish grey often with streaky variation through the core. The fracture tends to be irregular with some thin flat voids. Coarse grit inclusions are dominated by crushed angular platelets fired to red, reddish-brown or black together with some soft, rounded buff-coloured lime inclusions. The size, sorting and frequency of coarse inclusions vary across the sample, partly on the basis of vessel size. This appears to be the same fabric as that represented in association with CREAC and HARLIM, but with certain differences in firing regime.

INCLUSIONS		
	1	2
Colour	Red/black	Buff
Size	<0.1 - 3mm	<0.1 - 1mm
Shape	Angular	Rounded
Freq.	3%	Occasional
Sorting	V. poor	Good
ID	Crushed platelets	Limestone

Specifications: Average density with a compact granular structure, a rough feel and an irregular fracture.

Parallels and Dating: Late 8th – 10th century. After CREAC, REBROS appears to be the most common coarse ware class from Siraf and was most likely manufactured at the site. Exact parallels are somewhat more difficult to identify but certainly some of the small jars and large incised storage vessels from Manda in East Africa should belong to REBROS or HARLIM depending of the firing of the fabric (Chittick, 1984: figs. 40; 41: a-b; 46). Similarly a large incised storage vessel from Level VI at Sohar is the same as LISV3 (Kervran, 2004: fig. 30: 2). Some vessels from the 'Barbar well' in Bahrain may belong to this class (Frifelt, 2001: 22-23, figs. 30; 32).

Origin: Siraf.

Class Code: CREAC

Class Name: Cream Coated Red Ware

Types: BR72, BR77, BR80-89, JR51, JR58-59, OC12-14, LISV1, LISV4-6

Illustration: Plates 6-7

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact fabric with frequent crushed red or sometime black platy grits. The core and margins are typically fired to a strong reddish orange with the main platy inclusions appearing red, while the surfaces are coated in a cream coloured slip. Some pieces, mostly smaller vessels, appear cream coloured throughout the core with the platy inclusions appearing black. A further variant is pieces with a red fabric and a pink surface where the cream clip is particularly thin or absent.

COLOUR		
Colour	Red	Very pale brown
Core	10R 5/8	10YR 7/4
Margin	Same as core	Same as core
Surface	10R 6/6	10YR 8/4

Integrity: Very consistent and distinctive. There does remain a possibility that the black and red platy inclusions are different and that this represents two different but closely related products. However, there appears to be continuous variation with some pieces containing dark reddish-grey inclusions or a mixture of red and black inclusions in a single sherd. This indicates that the colour of the inclusions is more likely influenced by firing conditions.

Surface Treatment: Surface decoration is type specific. Some vessel types are plain, many have simple rilling or heavy throwing lines on the body. Particular types are consistently more elaborately decorated such as the small or medium sized half closed bowl (BR85) with deep rilling below the rim, incised wavy bands, a short strap handle and a small narrow spout on the opposing side. A large wide-mouthed, barrel-shaped, lidded vat (JR59) has a projecting crenulated 'pie crust' flange and incised wavy bands below. The full decorative repertoire consists of rilling, incised wavy bands and different forms of applied chain-ridge.

Vessel Forms: Wide range of vessel forms, mostly medium or large sized bowls with different types of everted rim. Some of the vessel types occurring in association with CREAC are shared with REBROS and HARLIM while others are class specific. One of the most diagnostic and common types is an open bowl with straight flared walls and a large thickened flange rim often with a sharp fold between the base of the flange and the side. This type was commonly referred to as the 'Siraf pie dish' (Costa & Wilkinson, 1987: 188). Also included are wide shallow dishes, open platters and a range of closed vessel types including small jars up to large incised storage vessels. Most jar types have a rilled collar neck. Very small vessels include lamps and flat bottomed straight sided cups most likely used for measuring.

Fabric: Hard, compact fabric fired to a strong reddish-orange or buff. The fracture can have a distinct laminar structure or be varied and irregular and contains some voids. Where the fabric is fired to buff, some variation with thin layers of pink can be seen in the core. Coarse grit inclusions are dominated by crushed angular platelets fired to red, reddish-brown or black together with some soft, rounded buff-coloured sedimentary inclusions. The size, sorting and frequency of coarse inclusions vary across the sample, partly on the basis of vessel size. This appears to be the same fabric as that represented in association with REBROS and HARLIM, but with certain consistent differences in firing regime.

INCLUSIONS		
	1	2
Colour	Red/black	Buff
Size	<0.1 - 5mm	<0.1 - 1mm
Shape	Angular	Rounded
Freq.	3-10%	Occasional
Sorting	V. poor	Good
ID	Crushed platelets	Sedimentary stone

Specifications: Average density with a compact granular structure, a rough feel and an irregular sometimes laminar fracture.

Parallels and Dating: Late 8th – 10th century. CREAC appears to be the main coarse ware class represented at Siraf and was most likely manufactured at the site. The class circulated very widely within the Persian Gulf, Oman and East Africa. Identical material to that from Siraf has been recovered in field scatters and from the Arja mine complex in the hinterland of Sohar in Oman (Costa & Wilkinson, 1987: 188, fig. 99), from Manda in East Africa (Chittick, 1984: 90, figs. 47: a-e; 48-49) and Bilad al-Qadim in Bahrain (Carter, 2005: 119-21, figs. 4.1: 18-20, 22; 4.2: 24; 4.5: 4-5). Carter regards much of this material as being local, largely on the basis this the material occurs so frequently in the assemblage (2005: 113), however direct parallels with the coarse wares manufactured at Siraf indicate that a significant portion of the unglazed pottery from Bilad al-Qadim was manufactured on the northern side of the Persian Gulf in Iran.

Origin: Siraf.

<u>Rough Orange/Buff Wheel-Made Coarse Wares</u>

Class Code: ORGPIN

Class Name: Pink Organic Tempered Ware

Types: None defined

Illustration: Plate 8

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, fairly coarse pinkish-buff coloured fabric that contains abundant burnt out organic inclusions in the form of short stalks. Vessels include a wide variety of small to large sized bowls and jars. Jars often have complex rims with ridged zones around the neck. Vessel types appear to closely mimic those associated with Hard Lime Spalled Wares (HARLIM) but the fabric is clearly different.

Colour: Pinkish-buff

Integrity: Coherent and distinctive type so far only attested in the assemblage from Sohar in Oman.

Surface Treatment: Generally plain.

Vessel Forms: Various small to large sized bowls generally with fairly thick walls and a slightly fatted rim together with a wide range of jar types often with complex ridged zones around the neck.

Fabric: Hard and compact, fairly coarse pinkish-buff coloured fabric with minimal colour variation through the core. The fabric contains numerous organic inclusions which appear as burned out short stalk shaped voids on the vessel surface.

Specifications: Average density with a compact structure, a gritty feel and an irregular fracture.

Parallels and Dating: 7th – 9th century. The clear stylistic links between ORGPIN and HARLIM indicate that this likely to be a local imitation of that industry. It is therefore likely to share a similar dating. The class is also particularly well represented through the early part of the Sohar Town excavation (Kervran, 2004: fig. 10: 6-7).

Origin: The class is so far only attested in the assemblage from Sohar indicating probably manufacture close to or within the site.

Class Code: BEARTH

Class Name: Black-Fired Earthenware

Types: None defined

Illustration: None

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: "*This is a coarse earthenware with a rough fracture and numerous white inclusions. The body is well fired, which gives it a metallic sound. It has been fired in reducing conditions to give a black appearance. The forms are usually large storage vessels and the surface of body sherds is usually covered with broad flat ribs or raised panels about one centimetre wide. Small sherds can be confused with reduced Julfar ware and the class can also easily be confused with LISV*" (Kennet, 2004: 78).

Surface Treatment: Exterior covered with wide flat ribs.

Vessel Forms: Large storage jars.

Parallels and Dating: 2nd century BC – 4th century AD or later? "*This class seems to be closely related to the tradition of 'thick black ware' (céramique noir épaisse), which occurs at Mlayha and al-Dūr from the 2nd century B.C. until at least the 4th century AD (Mouton 1992: 103, 147), but it is impossible to be certain of this identification in most cases…One sherd was recorded from al-Mataf, 28 were recorded from the 1994 Survey and 48 in the early areas at Hulaylah (Kennet 1994: ware 16). Seven sherds were found at Kush, but only two were from Phases W-04 and E-04 in the phased sequence (7th - early 9th century). The identification of the Kush sherds is more certain than those from the survey*" (Kennet, 2004: 78).

Origin: Southern Iran?

Class Code: FLAKEY

Class Name: Flakey Earthenware

Types: None defined

Illustration: None

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: "*These are brittle, thin-walled jars (c. 6 mm) of a well-levigated clay with a sub-conchoidal fracture. They are hard fired with occasional red or black angular platelets quite similar to those seen in JULFAR. The fabric is a reddish yellow (7.5YR 8/6). The surface is covered with a distinctive matt-red slip or paint with a rough surface, which flakes off easily. Horizontal bands of incised lines seem to be common. Vessels are jars with wide mouths*" (Kennet, 2004: 85).

Surface Treatment: Surfaces generally covered with a flaky red slip.

Vessel Forms: Wide-mouthed jars.

Parallels and Dating: 7th – 8th century. The class is so far only attested in the assemblage from Kush. It is a clearly defined category and the lack of comparable finds from elsewhere may reflect localised production and limited circulation. Some of the forms appear to be related those associated with HARLIM imports, and like ORGPIN in Oman, this may be a local imitation industry. Within the Kush assemblage, two sherds occur within the stratified sequence in Phase E-03 indicating a 7th – 8th century dating (Kennet, 2004: 85).

Origin: Ras al-Khaimah.

Class Code: SPOT

Class Name: Spotty Ware

Types: None defined

Illustration: None

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: "*This is a very friable, notably light-weight, cream or pale olive (5Y 6/3) coloured ware with abundant air holes and dense, badly-sorted, angular, black inclusions up to 5 mm in size. The body is normally between 8 and 10 mm in thickness. The fracture is rough and the surface is often covered with a pale slip. The forms are normally jars or pots, with rare bowls. A further two sub-groups have been defined: Coarse Spotty (SPOT.C) and Fine Spotty (SPOT.F):*

SPOT.C
As above but the body thickness is normally between 10 and 15 mm and the angular black inclusions are sometimes red. The shoulder of the vessels is often decorated with single incised wavy lines and incised comb lines.

SPOT.F
Body thickness between 4 and 8 mm. The fabric is more variable than C. SPOT, the inclusions are mainly black and many are around 1 mm in size. The fabric can be a little lighter and more yellow (to 2.5Y 8/4 pale yellow). Many sherds are burned to a black or reddish colour on the exterior, suggesting that they have been used for cooking. Some sherds are decorated with fine incised lines" (Kennet, 2004: 86-87).

Surface Treatment: Generally covered with a pale slip or wash. Can also have simple incised decoration.

Vessel Forms: Mostly jars. Also a few bowls.

Parallels and Dating: 10^{th} – 12^{th} century. The class appears to be very closely related to WAPO (see below). The main distinguishing features are generally thicker walls and a softer fabric. Both categories are so far only attested in the assemblage from Kush. The lack of comparable finds from elsewhere may reflect localised production and limited circulation. At the same time SOT and WAPO compare closely to CREAC. Indeed, while most pieces have a soft and crumbly fabric that is clearly different, the harder fired pieces would be very difficult to distinguish. One problem in reliably distinguishing SPOT and CREAC is that there are very few diagnostic fragments within the Kush assemblage, so the forms associated with SPOT are not well defined. At Kush "*SPOT began to circulate from Phase E-06 (9th - 11th century) onwards, with only a single sherd of SPOT.C occurring in Phases E-04 and E-05. There appears to have been a slow transition from SPOT.C, which was predominant in the earlier Phases, towards SPOT.F, which was predominant from Phase E-08 (late 11th/early 12th century) onwards*" (Kennet, 2004: 87).

Origin: Ras al-Khaimah.

Class Code: WAPO

Class Name: Cream Pots with Incised Wavy Decoration

Types: None defined.

Illustration: None

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: "*The fabric is quite varied, most commonly it is pale yellow (2.5Y 8/2) with a rough fracture with common, small, angular, black inclusions that give the surface a slightly speckled appearance. Some sherds have many small air holes, some have lime and quartz inclusions and a more variable fracture. The ware tends to be well fired, though not as strong or high-fired as CLINKY or LISV. The core tends to be a little pinker than the surface. There is no systematic surface treatment, most sherds seem to have been washed or wiped and a few have been treated with a salt-water slip. Nonetheless the class, which is probably more of a 'tradition' than a ware, has a distinctive creamy, well-finished look with a distinct range of forms and surface decoration…All vessels are large, wheel-made jars with incised wavy decoration on the exterior below the rim or shoulder*" (Kennet, 2004: 87). Features not mentioned in the published description include the frequent presence of some organic inclusions visible as short burnt out voids on the surface. Also instead of jars, many of the forms could also be described as closed bowls. In certain respects WAPO appears similar to CREAC which makes their differentiation slightly problematic. The key differences seem to be the somewhat different vessel forms and more finely sorted black grit inclusions associated with WAPO.

Surface Treatment: Covered with a wash and decorated with a simple incised wavy band below the rim.

Vessel Forms: Large jars

Parallels and Dating: 12th – 13th century. The class is so far only attested in the assemblage from Kush. It is a clearly defined category and the lack of comparable finds from elsewhere may reflect localised production and limited circulation. Given the similarities between WAPO and CREAC it is conceivable that this industry emerged in the UAE to fill the vacuum left after the decline of Siraf area coarse wares in the early 11th century. At Kush "*thirty-six sherds…occur between Phase E-07 and E-11...This suggests a 12th and 13th-century date*" (Kennet, 2004: 87).

Origin: Ras al-Khaimah.

Class Code: REGTEC

Class Name: Red-Grit Tempered Cream Coloured Ware

Types: JR66-67, OC15

Illustration: Plate 9

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, cream or pink coloured ware with crushed angular red or black platelet inclusions and rounded white grits. On Type JR66 the upper exterior and rim interior is covered with a thin patchy red or brown coloured slip. Type JR67 has no slip but fairly elaborate, radially aligned panels of deeply incised decoration.

COLOUR		
Colour	Reddish-yellow/pink	Very pale brown
Core	5YR 7/4-6	10YR 7/4
Margin	Same as core	Same as core
Surface	5YR 8/3	10YR 8/3

Integrity: Coherent class quite similar to CREAC but with a different range of vessel forms and overall a different quality.

Vessel Forms: The class covers a narrow range of distinctive vessel types. These include a squat, wide mouthed jar with a downward folded rim ending in a pointed lip. A short strap handles is attached on one side with a short round spout on the opposing side (JR66). The second main type is a jar with a flared neck and multiple complex handles attached around the circumference. The handles alternate between a single rounded strap and a double strap with modelled transverse ribs in the form of a ladder. Handles are surmounted by thick-topped ornamental thumb stops (JR67). A final vessel type is formed of a narrow flaring mouth pressed together to hold in place the bottom part of a square section ring with multiple grooves along the outer edge. These appear to be suspension loops of some sort, but it is not clear what they were attached to and what the overall vessel form looked like when complete (OC15).

Surface Treatment: Surface treatments are type specific (see above). The main forms of finish include a pink or brown slip, deep, thin-lined incised decoration and complex modelling.

Fabric: Hard, compact cream or pink coloured fabric turning darker buff or pink in the core. The fabric contains fairly frequent coarse inclusions, including crushed angular red or black platelets and rounded white inclusions.

INCLUSIONS		
	1	2
Colour	Red/black	Opaque white
Size	<0.1 – 1mm	<0.1 – 1mm
Shape	Angular	Rounded
Freq.	3%	2%
Sorting	Poor	Good
ID	Stone platelets	Rounded grit

Specifications: Average density with a compact structure, a fine gritty feel and clean slightly irregular fracture.

Parallels and Dating: 12th – 15th century. The class is so far only attested at Siraf. Most of the material comes from Site C in layers associated with the later occupation of the city.

Origin: Southern Iran, Siraf area?

<u>Fine/Sandy Buff Wheel-Made Coarse Wares</u>

Class Code: EGG.PI

Class Name: Plain or Incised Eggshell Ware

Types: JR32-33, JB5-7, H4

Illustration: Plate 10

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact finely levigated light-cream coloured fabric belonging mostly to a single vessel type with a flat base, a low rounded body, a tall flaring neck and a single looped handle with a rounded section and a distinctive 'turban top' thumb stop. Vessels all have thin walls of 4mm of less and are generally plain. Exterior surfaces appear to have been covered in a fine self-slip which is only discernable in the fresh section break. A few sherds have some incised decoration.

COLOUR	
Colour	Pale yellow
Core	2.5Y 8/3
Margin	Same as core
Surface	2.5Y 8/2 (outer surface)

Integrity: Coherent and distinctive class although the distinction made between EGG.PI and WHITE.PI is fairly arbitrary. Both classes share the same fabric and on the whole the main difference is simply in wall thickness. However, it is notable that few vessel forms are shared between EGG.PI and WHITE.PI.

Vessel Forms: Mostly small, very thin-walled jars with a flat base that can be simple, slightly raised with a turned beaded edge, or raised on a low beaded foot ring. The body tends to be squat and pariform with a well-defined angle at the beginning of a tall, straight, flaring neck. Rims are fine and pointed and have a single long looping handle that projects up from the rim and is attached below at the shoulder. Handles have a roughly circular section often with a grooved channel running down the exterior and are surmounted by an applied thumb-stop with a flattened top of more elaborate multi-tiered pinnacle or 'turban'. Other shape variants occur including a distinctive flared pointed rim with a slight carination.

Surface Treatment: Mostly plain with a smooth self-slip covering the exterior. Some vessels have a slight raised band at the top of the shoulder immediately below the neck. Some vessels also have more elaborate decoration including rilled necks, combed incising, chattering around the body, fine-lined incised decoration and on some handles detailed applied and impressed decoration.

Fabric: Compact, finely levigated extremely lightweight and brittle cream coloured fabric with a smooth chalky texture and no visible inclusions. The fabric appear to be very closely related and possibly the same as that found on Opaque-Glazed Wares (see OPAQ.W).

Inclusions: None.

Specifications: Low density with a compact chalky structure, a smooth feel and a clean semi-conchoidal fracture.

Parallels and Dating: 8th – 10th century. The class is equivalent to EGG from Kush, which occurs in particularly high frequency in Phase E-06 dated to the 9th – 11th century and thereafter diminishes rapidly through the remained of the sequence (Kennet, 2004: 61, table 27, fig. 28: 'Types 67-68'). Identical vessels also occur at Susa (Kervran, 1977: figs. 30: 1-2, 13-14; 31: 1-2, 5-12). A feature that is particularly striking in the Siraf assemblage is the absence of a type of small Eggshell Ware jar with squared or slightly indented sides sometimes with vertical linear indentations. This type is well represented at Susa (Kervran, 1977: fig. 30: 1-6) and a number of other sites. The absence of this material from Siraf may have significant chronological implications.

Origin: Southern Iraq.

Class Code: WHITE.PI

Class Name: Plain or Incised White Ware

Types: JR34-39, JR41, H5-6, OC7-8

Illustration: Plate 11

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Medium sized jars with a compact, finely levigated, light cream-coloured fabric that appears very similar or identical to that associated with EGG.PI. The main difference is that vessels are larger with walls of 5mm or more thickness. Vessel forms are also different and much more diverse. Most pieces have surface decoration that can be incised, applied or occasionally impressed.

COLOUR	
Colour	Pale yellow
Core	2.5Y 8/2-3
Margin	Same as core
Surface	2.5Y 8/2

Integrity: Coherent and distinctive class with a wide range of distinctive vessel types.

Vessel Forms: Medium sized jars mostly with tall straight necks and various distinctive types of short everted or relatively complex fattened rim. Vessels often have a handle attached at the rim and shoulder. These are generally thick and can have a rounded section, flattened section or twin-rounded section.

Surface Treatment: The large majority of vessels have surface decoration while a few remain plain. Decoration includes a wide range of modes of application. The most common form includes rilling on the neck but this can be combined or replaced by fine incised designs, often arranged in vertical registers, appliqué buttons placed in a band below the rim or a crenulated rim flange. Handles can be left plain or have a large, multi-tiered 'turban top' thumb stop on the top. Other handles include double twined strips or a thick circular section handle with appliqué elements along the outer edge. Two particularly distinctive decorative arrangements include a jar with deeply cut radial flutings around the shoulder and bands of incised ring-and-dot motifs below (Type OC7) and a second with a lattice of finely combed diamonds on the shoulder each of which is filled with a large punctured dot (Type OC8). Both arrangements find direct parallels at other sites (see below).

Fabric: Compact, finely levigated, low or medium density fabric fired to a light-cream or orange-buff colour. The fabric is smooth with a chalky texture, and no visible inclusions, or occasionally isolated coarse elements and voids. The fabric appear to be closely related and possibly the same as that found on Opaque-Glazed Wares (see OPAQ.W).

Inclusions: None.

Specifications: Low to medium density with a compact chalky structure, a smooth feel and a clean semi-conchoidal fracture.

Parallels and Dating: Mid-8th – 12th century. WHITE.PI equates largely with WHITE.C and WHITE.F from Kush and al-Mataf (Kennet, 2004: 75) though there are minor differences. Kennet does not distinguish between wheel made and moulded material and ring-and-dot incised decorated pieces are included within the closely related EGG class rather than within the thicker walled WHITE category. At both Kush and Bilad al-Qadim, the evidence points towards the decline of thin-walled, plain EGG towards the end of the 10th century and the growth of thicker-walled and more elaborately decorated WHITE categories during the 11th – 12th centuries (Kennet, 2004: 57, 61, tables 25-27, figs. 29-30; Carter, 2005: 115, 121, 130, 138, 146). At Siraf most of the WHITE.PI most likely relates to the later occupation of the site, however, this does not exclude the possibility of particular types having an earlier dating extending back to the later 8th century. Similarly the tradition of fine cream coloured vessels continues into the al-Mataf sequence up to the 15th century (Kennet, 2004: 57) and certain types here could potentially be dated later than the 12th century, though this seems much less likely given to consistency displayed within the class. Further close parallels for the class can be found at Susa (Kervran, 1977: figs. 24: 1-13; 27: 2-14) including matches for two distinctive decorative schemes described above (Type OC7 = Kervran, 1977: figs. 27: 2, 4-5; 28: 5-6, pl. XI: 7-8 and Type OC8 = fig. 27: 9, 11, pl. XI: 6).

Origin: Southern Iraq.

Class Code: WHITE.A

Class Name: Applique Decorated White Ware

Types: None defined

Illustration: Plate 12

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Medium sized jars with a compact, finely levigated, light cream-coloured fabric that appears very similar or identical to that associated with EGG.PI and WHITE.PI. The main distinguishing characteristic from the other classes is that the exterior surfaces are elaborately decorated with a combination of applique and incised elements. Walls are generally around 4-6mm thick.

COLOUR	
Colour	Pale yellow
Core	2.5Y 8/2-3
Margin	Same as core
Surface	2.5Y 8/2

Integrity: Coherent and distinctive variant of White Ware category.

Vessel Forms: The decoration appears to be associated medium sized jars but the overall vessel forms have not been established.

Surface Treatment: Extremely elaborate combinations of fine incised decoration and applied elements. Often the applique is in the form of creepers and vines.

Fabric: Compact, finely levigated, low or medium density fabric fired to a light-cream or orange-buff colour. The fabric is smooth with a chalky texture and no visible inclusions.

Inclusions: None.

Specifications: Low to medium density with a compact chalky structure, a smooth feel and a clean semi-conchoidal fracture.

Parallels and Dating: Mid-8th – 10th century. This is a particularly elaborate version of White Ware that is so far attested only at a few sites and seemingly in conjunction with other elements of the glazed Samarra horizon.

Origin: Southern Iraq.

Class Code: BUFF.I

Class Name: Incised Decorated Buff Ware

Types: None

Illustration: Plate 13

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Closely related to WHITE.PI but with a slightly coarser and grainier fabric that tends towards a greenish or yellowish buff colour rather than a pale creamy white. Most vessels are large necked jars with strap handles, thick walls (7 - 13mm) and complex incised decoration covering the shoulder region. Some plain sherds are also represented but these may come from the lower vessel portions that were undecorated.

COLOUR		
Colour	Pale yellow	Very pale brown/pale yellow
Core	5Y 8/3	7.5YR 7/4
Margin	Same as core	10YR 7/3
Surface	Same as core	2.5Y 8/2

Integrity: Coherent and distinctive class.

Vessel Forms: Very few diagnostic sherds represented. All sherds appear to belong to large necked jars. In some cases the neck section is short. One large semi-complete vessel, which may be typical, has a tall pariform body with a flat narrow base with a turned rib around the edge, a high shoulder and four equidistantly placed looping handles attached from the top of the shoulder apparently to the rim, though this section is missing.

Surface Treatment: Roughly smoothed exterior surfaces that are plain up to the shoulder. Shoulder regions are decorated with complex but quite crudely incised decoration. Often this is arranged in panels filled with cross hatching or long ling-line arcs between the handle regions flanked by oblique slashes or foliar elements. Some incised decoration is also combined with limited impressed elements, mostly achieved with a multi-toothed liner implement used to fill diamonds or 'leaves'.

Fabric: Compact, finely levigated, low or medium density fabric fired to a greenish-buff or light-orange colour. The fabric is smooth with a chalky texture, and consistently contains occasional partly burnt out yellowish-brown inclusions, voids and sometimes other infrequent mixed coarse inclusions.

INCLUSIONS		
	1	2
Colour	Brown	Voids
Size	≤0.5mm	≤1mm
Shape	rounded	Sub-angular
Freq.	Occasional	2%
Sorting	Good	Poor
ID	Soft semi-voided material	Air pockets

Specifications: Low to average density with a compact chalky structure, a smooth feel and a slightly irregular fracture.

Parallels and Dating: Mid-8thth – 12th century. BUFF.I is very closely related to WHITE.PI and essentially represents a continuation of the tradition into a large range of vessel sizes. As such it seems likely that BUFF.I shares the same dating (see WHITE.PI above). Close specific parallels for these large vessels and the style of incised decoration with which they are associated can be found at Susa (Kervran, 1977: fig. 22: 1-7).

Origin: Southern Iraq.

Class Code: BUFF.S

Class Name: Stamp Decorated Buff Ware

Types: None

Illustration: Plate 14

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Large, relatively thick-walled jars (9-10mm) with handles and a fine, compact, well-levigated, cream coloured fabric that sometimes turns light-pink towards the core. The class appears to be closely related to BUFF.I but is differentiated on the basis of a distinctive form of decoration consisting of a series of narrow horizontal registers covering the shoulder region filled with various repeated stamped motifs.

COLOUR		
Colour	Pale yellow	Very pale brown/pale yellow
Core	5Y 8/3	7.5YR 7/4
Margin	Same as core	10YR 7/4
Surface	Same as core	2.5Y 8/2

Integrity: Coherent and very distinctive class where surface decoration survives. Non-decorated portions would be difficult to identify.

Vessel Forms: Large jars with distinct neck break and a handle attached at the shoulder.

Surface Treatment: Mostly likely only the shoulder regions were decorated. Decoration consistent of a series of narrow horizontal registers delimited with incised bands above and below and filled with repeated stamped motifs. A single stamped motif occupies one register and tends to alternative with a band formed from another motif placed between. Stamped deigns include such devices as a set of concentric rings, concentric rings in a tear-drop shape or floral patterns and leaf-shaped patterns.

Fabric: Fine, compact, well-levigated, cream coloured fabric sometimes turning light pink towards the core. The matrix has a chalky quality and contains some small voids and occasional varied coarse inclusions.

INCLUSIONS	
	1
Colour	Voids
Size	≤1mm
Shape	Sub-angular
Freq.	3%
Sorting	Poor
ID	Air pockets

Specifications: Average density with a compact structure, a smooth feel and clean fracture.

Parallels and Dating: Mid-8thth – 12th century. There are no known specific parallels for this distinctive class, however in terms of the fabric, decoration technique and vessel form, this appear to be part of the more general BUFF.I tradition and should share the same dating (see BUFF.I above).

Origin: Southern Iraq.

Class Code: BUFF.P

Class Name: Plain Buff Ware

Types: BR26

Illustration: Plate 15

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Fine, slightly porous but reasonably compact, low density, greenish-cream coloured fabric. In terms of fabric this appears to be closely related to BUFF.I, however unlike the closed vessels in that class, BUFF.P contains a single plain open bowl type with a heavy projecting clubbed rim. The type and fabric appear to be identical to that represented in association with TURQ.T vessels. This is most likely an unglazed version of the same production as TURQ.T.

COLOUR		
Colour	Pale yellow	Very pale brown/pale yellow
Core	5Y 8/3	10YR 7/4
Margin	Same as core	Same as core
Surface	Same as core	2.5Y 8/2

Integrity: BUFF.P is effectively a type though it is one that does not fit within the conventional class definition. On the one hand the fabric and unglazed surfaces would place these vessels within the BUFF.I category. On the other hand, the type appears to have stronger links with the

TURQ.T tradition and this is further supported by the quality of the fabric. Is very likely that glazed and unglazed versions of Type BR26 were manufactured together at the same centre(s) of production.

Vessel Forms: The class covers only a single vessel form and might thus be better places within one of the existing classes. The type is a large, thick-walled, straight sided, flaring open bowl with a heavy projecting clubbed rim (BR26). The type is the identical to one represented within the Alkaline-Glazed Ware tradition and given the similarity of fabric, this can really be regarded as an unglazed version of the same production.

Surface Treatment: Plain.

Fabric: Fine, slightly porous but reasonably compact, low density greenish-cream coloured fabric. The matrix has a chalky quality and contains some small voids and large partly voided buff-brown inclusions.

INCLUSIONS		
	1	2
Colour	Buff	Void
Size	≤1.5mm	≤1mm
Shape	Well-rounded	Angular, liner/
Freq.	2%	2%
Sorting	Good	Fair
ID	Soft mineral inclusions	Air pockets

Specifications: Low density with a fine porous structure, a gritty feel and an irregular fracture.

Parallels and Dating*:* Mid-8th – Late 10th century. BUFF.P covers a single vessel type which is the same as one well represented within the later Alkaline Glaze Ware tradition (see TURQ.T above). The type also finds close parallel in unglazed vessels well represented within the assemblage from Sir Bani Yas dating quite narrowly between the mid-7th – mid-8th centuries, though reference to rolled quartz inclusions within the fabric of this pottery indicate that it may not be identical (Carter, 2008: 79-81, fig. 7).

Origin: Southern Iraq.

Class Code: SPORC

Class Name: Soft Porous Cream Coloured Ware

Types: LISV1

Illustration: Plate 16

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Large, thick-walled storage-jars with a fine, soft, but reasonably compact, porous, low-density greenish-cream coloured fabric similar to that represented within the BUFF classes. SPORC seems to be associated with a single vessel type with a narrow collar neck with deep rilling down the exterior (LISV1) and simple incised and applied decoration covering the upper part of the exterior. Interior surfaces and the rim exterior are covered with a lining of bitumen similar to that associated with Torpedo Jars (TORP.S and TORP.RG).

COLOUR	
Colour	Pale yellow
Core	5Y 8/2-3
Margin	Same as core
Surface	Same as core

Integrity: Only small numbers of sherds belonging to this class are attested from Siraf but all are consistent and very distinctive. SPORC appears to be closely related to BUFF.I and may actually just be another type within this class.

Vessel Forms: Large, thick-walled storage-jars with a narrow collar neck with deep rilling down the exterior. The vessels were most likely used for liquid transportation. The rilled collar mouth could have been closed with a skin and sealed with a wound binding. The shoulder of the same type in other classes often has a series of short loop handles for lifting the vessels, mostly likely with some form of crane or winch.

Surface Treatment: Interior surfaces and rim exteriors are splashed with a lining of bitumen to seal the porous surface. In addition to the deep rilling covering the collar of the rim, the upper portion of the exterior is decorated with a series of simple fine combed bands and applied and thumb impressed ‘chain-ridge’ strips.

Fabric: Compact but brittle, finely levigated, low or medium density fabric fired to a greenish or yellowish-buff. The fabric is smooth with a chalky texture, and consistently contains occasional partly burnt out yellowish-brown inclusions.

INCLUSIONS	
	1
Colour	Brown
Size	<0.1-2mm
Shape	Rounded
Freq.	2%
Sorting	Good
ID	Soft semi-voided material

Specifications: Low to average density with a compact chalky structure, a smooth feel and a slightly irregular semi-conchoidal fracture.

Parallels and Dating: Late 8th – 10th century. SPORC covers a single distinctive vessel type that is more commonly associated with the hard red or grey lime-spalled Siraf areas coarse wares (e.g. HARLIM or REBROS). These are well represented at Manda from the earliest beach scatter deposits which contain other material from the Persian Gulf such appliqué decorated Alkaline Glazed Ware, but none of the 'Samarra horizon' glazed wares of the early 9th century (Chittick, 1984: fig. 40: c, e). This is indicative of a period of trade contact between the Persian Gulf and East Africa beginning before the early 9th century, most likely during the mid-late 8th century. LISV1 is found widely distributed within the Persian Gulf, though little has so far been published. A single near complete example comes from the Church of the East monastery at Kharg (Steve, 2003: pl. 13: 1). At Siraf it continues as one of the most distinctive and best represented forms of LISV through the main period of occupation, though usually it is manufactured in local fabrics such as those associated with HARLIM, REBROS and CREAC. SPORC represents the manufacture of this same type mostly likely in central or southern Iraq at a contemporary date.

Origin: Central or southern Iraq.

Class Code: TORP.RG

Class Name: Red Grit Tempered Torpedo Jars

Types: JR42

Illustration: Plate 17

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Large, tall, wide-belied jars with a long pointed base, a narrow neck and a fattened rim. Vessels appear to be handmade though in some cases the rim and shoulder portion are thrown and have heaving ribbing marks. Exteriors are smoothed but are otherwise plain. Interior surfaces are covered with a thick coating of dark-brown bitumen. The fabric is fine and rather brittle with a chalky texture, a low density and fired to buff of greenish-cream. Under magnification the fabric has a distinctive appearance with very abundant small voids and red

grit inclusions and a relatively low sand content. Sometime the red grit appears to partially burnt out leaving voids with a red halo.

COLOUR	
Colour	Pale yellow
Core	5Y 8/3
Margin	Same as core
Surface	Same as core

Integrity: Well defined, distinctive class.

Vessel Forms: Large, thick-walled jars with a long pointed base squared off at the end. The vessels have a wide belly that tapers towards the rim. The rim is heavily fattened with a projecting bulb on the interior and the lip itself coming to a point.

Surface Treatment: Plain apart from a thick dark-brown bitumen coating covering the interior and sometime trickling down the exterior from the rim.

Fabric: Fine, compact, slightly porous and brittle yellowish or greenish-buff coloured fabric with a smooth chalky texture and very abundant fine red grit and voids together with quartz and occasional black grit inclusions. The red grit appears to burn out to form the voids and some pieces contain less voids and more red grit while other contain almost entirely voids. The voids can also be slightly discoloured with red around the edges. Unlike the more typical TORP fabric, this has a finer and possibly lower sand content with less visible quartz grains.

INCLUSIONS			
	1	2	3
Colour	Red grit	White and black	Voids
Size	≤0.1mm	≤0.1mm	≤0.1mm
Shape	Sub-angular	Sub-rounded	Sub-angular
Freq.	0-10%	7%	0-10%
Sorting	V. good	V. good	V. good
ID	Red grit	Quartz and mineral grit	Burnt out red grit

Specifications: Low density with a compact semi-porous structure, a fine gritty feel and pitted irregular fracture.

Parallels and Dating: Mid-8th – 10th century. This is broadly related to TORP.1-4 in the Williamson Collection (Priestman, 2005a: 208-09, pls. 64-67) and TORP from Kush (Kennet, 2004: 63). Torpedo Jars are a type of amphora, which have a very long currency within the Persian Gulf spanning the period from the Parthian era up to around the 9th or 10th century. TORP.RG is a particular distinctive category of TORP that can be clearly distinguished from the

rest of the tradition on the bases of the abundant red grit, the lighter yellowish-buff coloured fabric containing less sandy inclusions and, perhaps most obviously, specific aspects of the vessel form including the large scale of the vessels, a rim type with a heavy internal bulb and bases that are long, pointed and solid throughout the point. This type of TORP appears to belong to the last phase of the TORP tradition. It appears to be absent from the sites on the Bushehr peninsula where Torpedo jars are found in abundance. At Sir Bani Yas, which was abandoned around the mid-8th century, most of the Torpedo jars are of a type consistent with those from Bushehr (Carter, 2008: 85, fig. 13), however there are two sherds within the assemblage that represent a direct match to TORP.RG (personal observation[59]) suggesting that the class had begun to circulate from as early as the mid-8th century. This same variant occurs at Sohar (Kervran, 2004: figs. 22 *bis*: 3; 24: 2) in Level V and Manda (Chittick, 1984: 88, fig. 43: a-c) Period Ia.

Origin: Southern Iraq.

Class Code: TORP.S

Class Name: Sandy Torpedo Jars

Types: None

Illustration: Plate 18

Clay: Earthenware **Production**: Hand and wheel-made

Defining Characteristics: Large, tall, elongated cylindrical jars with a long pointed base or a short dimple, a narrow neck and rolled fattened collar rim. Vessels appear to be handmade though in some cases the rim and shoulder portion are thrown and have heaving ribbing marks. Exteriors are otherwise plain while the interior is covered with a thick coating of dark-brown bitumen. The fabric is fine, rather brittle, heavily sand tempered and fired to yellowish-buff or more often buff-orange. Often the exterior surface is cream coloured while the fabric turns orange through the margin and core.

COLOUR	
Colour	Reddish yellow/brownish yellow/pale yellow
Core	7.5YR 6/6
Margin	10YR 6/6 (outer margin)
Surface	2.5Y 8/2 (outer surface)

[59] I am grateful to Dr. Robert Carter for facilitating the direct comparison of samples of Torpedo Jars from Sir Bani Yas with those from Siraf at the British Museum and for discussions regarding the material.

Integrity: Coherent well defined class. Some variation in the fabric in terms of the size and sorting of sandy inclusions.

Vessel Forms: Large and tall elongated cylindrical vessels with a long wedge shaped painted base squared off at the end or a short dimple with the sides more rapidly expanding. The vessels taper towards the top and have a narrow mouth with a rolled and flattened lip. In comparison to TORP.RG, TORP.S vessels appear to be smaller and to have thinner walls with the rim folded on the exterior and bases that include both the dimple form and a long wedge shaped form. While the wedge shaped forms appears similar in both classes, with TORP.S the base remains hollow almost to the end of the point.

Surface Treatment: Plain apart from a thick dark-brown bitumen coating covering the interior and sometime trickling down the exterior from the rim.

Fabric: Hard, compact, brittle and porous fabric containing abundant finely sorted sandy inclusions including rolled grains of quartz. The fabric tends to be fired to a strong reddish yellow in the core turning to brownish yellow in the outer margin and a smooth pale yellow on the exterior surface suggesting that the vessels were probably self-slipped.

Specifications: Average to high density with a compact granular structure, a gritty feel and a fine pitted irregular fracture.

INCLUSIONS	
	1
Colour	White, grey, red
Size	≤0.1mm
Shape	Sub-rounded
Freq.	10%
Sorting	V. good
ID	Quartz based sand

Parallels and Dating: 3rd – 9th century. This is the same as TORP.1-4 in the Williamson Collection (Priestman, 2005a: 208-09, pls. 64-67) and TORP from Kush (Kennet, 2004: 63). TORP sherds occur at a large number of coastal sites within the Persian Gulf, in India and around the Arabia peninsula. Most of the dated contexts where they occur belong to the later Sasanian and Early Islamic periods. In addition to the 13 findspots identified on the Iranian coast of the Persian Gulf by Williamson (Priestman, 2005a), TORP has been recovered from Kush where 25 sherds occur within the phased sequence with a concentration between Phases W-03 - E-04 dated to between the 4th - 9th centuries (Kennet, 2004: 63, table 3, fig. 36: 'Type 74'). Examples also come from Jazirat al-Ghanam, a Sasanian watch station on the Musandam Peninsula dated to the mid to late Sasanian period (de Cardi, 1975: 55, fig. 8: 36), and Sohar where illustrated pieces occur in Levels II and V of the Sohar Town 1986 excavation and Level V of the Sohar Moat IV excavation dated by the excavator to between the mid-2nd – late 9th centuries (Kervran, 2004: tables 1-2, figs. 10: 15; 11: 6; 22 bis: 3; 24: 2).

Origin: Southern Iraq.

Class Code: TRC

Class Name: Torpedo Jar Related Class

Types: None defined

Illustration: Plate 19

Clay: Earthenware **Production**: Hand and wheel-made?

Defining Characteristics: The class displays the same fabric as TORP.S but with an entirely different set of forms including short-necked jars and heavy open bowls with simple rims. In the Williamson classification this group has been further sub-divided into TRC.1 with a yellow fabric and TRC.2 with a coarse, sandy, orange-brown fabric (Priestman, 2005a: 209), but here no attempt has been made to separate out the sandy Torpedo Jar fabrics as any consistent distinctions appear to be difficult to consistently maintain (Tomber, Carter & Priestman, 2010).

COLOUR	
Colour	Pale yellow
Core	2.5Y 7/4
Margin	"
Surface	2.5Y 7/3

Integrity: Coherent well defined class but with some variation in the fabric in terms of the size and sorting of sandy inclusions.

Surface Treatment: Plain smoothed surfaces.

Vessel Forms: Narrow mouthed jars with a rolled and flatted lip. Also some large open bowl or basin forms with an everted lip.

Fabric: Hard, light-yellow, fine, sandy earthenware. Under the hand lens, many small voids are visible together with black grots and very small, red flecks that are only just visible.

INCLUSIONS			
	1	2	3
Colour	Black	Semi translucent white	Red
Size	0.1 - 0.5mm	0.25mm	0.1mm
Shape	Sub-angular	Rounded	Sub-angular
Freq.	0 - 5%	0 - 5%	0 - 5%
Sorting	Good	V. good	Good
ID	Stone grit	Quartz	Stone grit

Specifications: Average weight with a compact granular and slightly porous structure, a fine gritty feel and a fine irregular fracture.

Parallels and Dating: 3rd – 9th century. Stylistic similarities between TRC and TORP suggest that TRC should be dated to the same period (see TORP.S above).

Origin: Southern Iraq.

Class Code: HONEY

Class Name: Honeycomb Ware

Types: None defined

Illustration: Plate 20

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Heavy, handmade storage-jars with a distinctive honeycomb effect decoration produced by lines of closely-spaced fingertip impressions covering most of the exterior but stopping before the base and neck. The fabric is a hard yellow or yellowish-green with a consistent background of fine red grit and rolled quartz grains inclusions.

COLOUR	
Colour	Pale yellow
Core	5Y 7/4
Margin	Same as core
Surface	2.5Y 7/4

Integrity: Coherent and readily recognisable.

Vessel Forms: Large thick-walled jars.

Surface Treatment: Exterior surface marked with rows of closely spaced circular finger impressions.

Fabric: Hard, light-yellow, fine, sandy earthenware. Under the hand lens, many small voids are visible together with very small, red flecks that are only just visible together with rolled sandy quartz grits.

INCLUSIONS		
	1	2
Colour	Red	Semi translucent white
Size	<0.1mm	≤0.1mm
Shape	Sub-angular	Rounded
Freq.	3%	Occasional
Sorting	V. good	V. good
ID	Red flecks	Quartz grains

Specifications: Average weight with a compact granular and slightly porous structure, a fine gritty feel and a fine irregular fracture.

Parallels and Dating: 8th – 9th century. The class was at one time regarded as a Sasanian type-fossil (Adams, 1965: fig. 14: m). In fact none have been recovered from a dated Sasanian context. The only securely dated finds include a single sherd from Kush in Phase E-05 related to the 8th/9th century (Kennet, 2004: 59, table 3). Other finds are attested from 7th – 8th century occupation contexts at Tulul al-Ukhaydir (Finster & Schmidt, 1976: 148), al-Qusur (Patitucci & Uggeri, 1984: 195, 204, tav. LX: b) and Area D at Jazirat al-Hulaylah (Sasaki, & Sasaki, 1996: fig. 46: 95-43, 95-34).

Origin: Southern Iraq.

Class Code: STAMP

Class Name: Stamp Marked Jars

Types: None

Illustration: Plate 21

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Large thick-walled handmade jars with uneven interior surfaces and carefully smoothed exteriors. The main defining feature is the presence of a round stamp mark placed on the shoulder region of the exterior. The fabric is fine greenish-cream coloured and contains some fine, well-sorted sandy grit and organic inclusions.

COLOUR	
Colour	Pale yellow
Core	5Y 8/2
Margin	Same as core
Surface	Same as core

Integrity: Reasonable consistent characteristics, but it is not clear whether body sherds without stamp marks would be easy attributed to the same class.

Vessel Forms: Large thick-walled jar with a rounded globular body.

Surface Treatment: Exterior surfaces are plain and smooth with a round stamped mark on the shoulder. Stamped marks are between 2.5 - 2.8cm in diameter and consist of intricately segmented concentric rings.

Fabric: Compact, fine, green-cream coloured fabric with a soft, chalky, semi-porous structure. In the fresh section some stalky organic inclusions are visible together with occasional finely sorted mixed sandy grits.

INCLUSIONS		
	1	2
Colour	Black, white, red	Yellow or void
Size	≤0.1mm	3mm
Shape	Sub-rounded	Elongated
Freq.	Occasional	Occasional
Sorting	Good	V. poor
ID	Mixed sandy grits	Stalky organic inclusions

Specifications: Average density with a compact, semi-porous structure, a fine gritty feel and fine irregular fracture.

Parallels and Dating: 8th – 9th century. The class was at one time regarded as a Sasanian type-fossil (Adams, 1965: 14: b-d), however only particular types of stamp mark appear to be associated with the Sasanian period (Simpson, 2013). The segmented concentric circular stamp motif appears to be diagnostic of later stamp marked jars that belong the Early Islamic period. Large numbers of jars with an identical motif have been recovered from the early 8th century site of al-Qusur (Patitucci & Uggeri, 1984: figs. 55: 579; 56: 603; 57: 618-19; 61: 662; 74: 743; 89: 556). A further example is also attested from the 7th – 8th century occupation of Jazirat al-Hulaylah (Sasaki & Sasaki, 1996: fig. 46: 95-19).

Origin: Southern Iraq.

Class Code: RUST

Class Name: Rusticated Jars

Types: None

Illustration: Plate 22

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Large handmade jars with a fine, hard, yellowish-buff coloured fabric. Interior surfaces are extremely uneven with finger impressions in the surface, exteriors are smoothed flat and have broad combed sets of lines arranged in long contiguous loops executed when the vessel surface was still extremely wet and soft.

COLOUR	
Colour	Pale yellow
Core	5Y 8/3
Margin	Same as core
Surface	5Y 8/2

Integrity: So far only attested on the basis of two sherds from Siraf.

Vessel Forms: Large jars with medium thickness walls.

Surface Treatment: Vertical registers of long contiguous looping lines executed with a 2 or three toothed comb with broad ends of 2-5mm wide while the vessel surface was still extremely wet and soft.

Fabric: Compact, finely levigated, slightly brittle and semi-porous yellowish-buff coloured fabric, which contains lumps of yellowish-orange material that has partially burn out to form voids with discoloration towards the margins.

INCLUSIONS	
	1
Colour	Yellowish-orange
Size	≤1.5mm
Shape	Rounded
Freq.	2%
Sorting	Fair
ID	Burnt out material

Specifications: Average density with a compact semi-porous structure, a gritty feel and an irregular fracture.

Parallels and Dating: 8th – 9th century. No known parallels for this class though the fabric and mode of vessel manufacture suggest that RUST is closely related to STAMP and HONEY and should therefore share a similar dating (see discussion of STAMP and HONEY above).

Origin: Southern Iraq.

Class Code: FIBIC

Class Name: Fine Incised Buff Coloured Ware

Types: LISV12

Illustration: Plate 23

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Large straight necked and handled vessels with comb incised decoration on the exterior and a fine, hard and very compact orange fabric with mixed sandy inclusions. Compared with other vessels within the LISV category, the fabric is fine and the walls relatively thin.

COLOUR	
Colour	Light brown
Core	7.5YR 6/4
Margin	Same as core
Surface	Same as core

Integrity: Under the hand lens the fabric appears rather varied and there may be more than one class represented.

Vessel Forms: Large jars with a straight neck, a wide flat strap handle attached below the rim and at the shoulder and a thickened rim.

Surface Treatment: Between the rim and handle the neck portion has deep rilling. Further down the neck and shoulder are decorated with straight, wavy and arcing bands of broad comb incised lines.

Fabric: Hard, compact and fine-grained sandy fabric fired to a consistent pale orange. Under magnification the fabric has a fine grainy structure and mixed sandy inclusions.

Inclusions: Varied.

Specifications: Average density with a compact structure, a fine gritty feel and an irregular fracture.

Parallels and Dating: 9th – 12th century. No specific parallels are known for this material. In general FIBIC falls somewhere between the LISV definition and incised wares more often represented on a fine cream coloured fabric such as BUFF.I. The dating seems more likely to be aligned with the latter.

Origin: Southern Iran?

Class Code: HARC

Class Name: Hard Fine Cream Coloured Ware

Types: JR64-65

Illustration: Plate 24

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Fine, hard, cream-coloured ware sometimes turning pink in the core. The fabric contains no visible inclusions, but a certain level of variation in fabric quality indicates that there may actually be more than one class represented. All sherds belong to small or medium sized jars.

COLOUR		
Colour	Pale yellow	Reddish yellow/Pale yellow
Core	2.5Y 8/3	5YR 7/6
Margin	Same as core	Same as core
Surface	2.5Y 8/2	2.5Y 8/2

Integrity: Certain diversity in the quality of the fabric indicates that this material may actually belong to more than one class. Class distinctions are difficult to establish due to the complete lack of visible coarse inclusions.

Vessel Forms: Mostly small to medium sized jars. Two distinctive forms occur, one with a rounded domed over rim (JR65) and the second with a straight neck with an internally fattened lip and a deep narrow grove below the exterior lip (JR64).

Surface Treatment: Interior and exterior surfaces appear to be covered with a thin cream self-slip wash but otherwise are left plain.

Fabric: Hard, compact, finely levigated cream-coloured fabric sometimes turning pink in the core. The fabric contains no visible inclusions and has a fine grainy and a clean semi-conchoidal fracture.

Inclusions: None.

Specifications: Average density with a compact structure, a fine gritty feel and a slightly irregular semi-conchoidal fracture.

Parallels and Dating: 12th – 15th century. The class may be equivalent to FINT in the Williamson Collection. Certainly some of the forms appear to be the same; however, in the Williamson Collection classification FINT appears rather an ill-defined category (Priestman, 2005a: 186, pl. 17). Most of the FINT from Siraf comes from deposits situated close to the surface associated with other relatively late pottery such as JULFAR, LIME, MGPAINT.1, etc. This material all relates to the later occupation of the city after the main period of the decline, which occurred during the late 10th/early 11th century.

Origin: Southern Iran.

Fine Moulded Wares

Class Code: EGG.M

Class Name: Moulded Eggshell Ware

Types: None defined

Illustration: Plate 25

Clay: Earthenware **Production**: Moulded

Defining Characteristics: Thin-walled vessels (2-3mm) with a finely levigated, compact, light cream-coloured fabric and extremely detailed moulded decoration on the exterior. Vessels appear to have been slip moulded and the decoration appears in relief apart from on handles were it is stamped.

COLOUR	
Colour	Very pale brown/pale yellow
Core	10YR 8/3
Margin	2.5Y 8/2
Surface	5Y 8/2

Integrity: Coherent class.

Vessel Forms: In the assemblage from Siraf a number of sherds are associated with an unusual multi-faceted vessel, the overall form of which cannot be established. Another attested one-off form includes a small, short and straight sided bowl, or possibly a lid, with a squared and internally bevelled rim.

Surface Treatment: Exterior surfaces are covered with extremely intricate relief moulded decoration consisting of finely beaded borders around floral freezes or sets of repeated floral elements.

Fabric: Compact, finely levigated, low-density fabric fired to a light cream colour turning slightly pink towards the core. The fabric has a smooth chalky texture with no visible inclusions. It appears to be very closely related and possibly the same as that found in association with Opaque-Glazed Wares (see OPAQ.W).

Inclusions: None.

Specifications: Low density with a compact chalky structure, a smooth feel and a clean semi-conchoidal fracture.

Parallels and Dating: Mid-8th – 12th century. There are no known precise parallels for this moulded pottery, however they appear to be part of the same production tradition as EGG.PI (see above). At Kush Eggshell Wares are described as including some moulded material, suggesting that the distinction made here between thrown and moulded categories has not been implemented in that study (Kennet, 2004: 61).

Origin: Southern Iraq.

Class Code: EGG.R

Class Name: Red Eggshell Ware

Types: None defined

Illustration: None

Clay: Earthenware **Production**: Moulded

Defining Characteristics: "This is an eggshell-like, very thin-walled ware made of a much harder-fired fabric with a distinctive reddish core (2.5YR 7/6) and a pale-yellow slip on the interior and exterior (5Y 8/3). The vessels appear to be wheel made rather than mould made" (Kennet, 2004: 83).

Integrity: The class is only attested at Kush where all sherds possibly come from the same vessel. In case, this is a distinctive class.

Surface Treatment: Not specified.

Vessel Forms: Jars.

Parallels and Dating: 9th – 11th century. "With a single exception all of the sherds in the phased sequence come from Phase E-06 (9th to 11th century) suggesting that this class had a very limited

lifespan at Kush…[however] many of the sherds are from contexts 1811 and 1812, and may be from the same vessel" (Kennet, 2004: 83).

Origin: Southern Iran?

Class Code: WHITE.M

Class Name: Moulded White Ware

Types: None defined

Illustration: Plate 26

Clay: Earthenware **Production**: Moulded

Defining Characteristics: Compact, finely levigated, light cream or light orange-coloured fabric that appears similar or the same as that represented in association with WHITE.PI and EGG.PI/M. Vessels are mostly medium sized jars with a globular body and an out turned foot ring. Exterior surfaces have raised relief decoration. The class is readily distinguishable from EGG.M by having thicker walls (5-6mm), simpler decoration and surfaces that remain rather rough and uneven with heaving join lines on the interior where the vessels were slip-cast in separate pieces and luted together to form a complete vessel.

COLOUR	
Colour	Pale yellow
Core	2.5Y 8/2-3
Margin	Same as core
Surface	2.5Y 8/2

Integrity: Fairly consistent though it has not yet been possible to work with a large assemblage belonging to this category.

Vessel Forms: Mostly medium-sized jars with a well-developed short out turned foot ring, a rounded globular body and a tall straight flaring neck ending in a simple pointed lip. Some other one-off types are represented in the assemblage from Siraf including a small press moulded disc or platter with a raised lip and radial decoration filling the interior identical to an illustrated example from Susa (Kervran, 1977: fig. 28: 16).

Surface Treatment: Simple raised relief decoration covering the shoulder and neck regions of jars. Common designs include horizontal registers of intertwined calligraphy or repeated decorative elements.

Fabric: Compact, finely levigated, low or medium density fabric fired to a light cream or orange-buff colour. The fabric is smooth with a chalky texture, and no visible inclusions, or occasionally isolated and varied coarse elements and voids

Inclusions: None.

Specifications: Low to medium density with a compact chalky structure, a smooth feel and a clean semi-conchoidal fracture.

Parallels and Dating: Mid-8th – 12th century. There are no known precise parallels for this class, however it appears to be closely related to EGG.PI/M and WHITE.PI and therefore a similar dating seems most probable. The class is also related to the moulded ewer category (MEW) described below.

Origin: Southern Iraq?

Class Code: MEW

Class Name: Moulded Ewers

Types: None defined

Illustration: Plate 27

Clay: Earthenware **Production**: Moulded

Defining Characteristics: Highly ornate vessels manufactured in several sections in press moulds and crudely luted together. Decoration covers most of the vessel exterior. The fabric has a 'dry' appearance and is slightly porous and brittle. The colour varies between dark to light grey, brown or orange. This may be indicative of several different centres of production. Variation in wall thickness and base and neck size suggests that several different sizes of the same vessel form were manufactured.

COLOUR		
Colour	Grey	Light brown
Core	2.5Y 5.5/1	7.5YR 6/4
Margin	"	"
Surface	"	7.5YR 7/3

Integrity: Distinctive class, but there is evidence for the manufacture of these vessels from several different locations distributed widely through southeast Iran. Closer study of fabrics and decorative elements may be required to distinguish between the products of different centres of production.

Surface Treatment: Complex-intertwining arabesques usually contained within radial panels. Also more simple registers of vertically placed petals used on the shoulder or towards the base of the foot pedestal. Blank areas are usually left to separate the various elements of decoration.

Vessel Forms: The form is a handled water jar or ewer with a high raised foot, a rounded body and flaring neck with a simple pointed rim.

Fabric: Very fine consistently reduced grey or oxidised orange and brown fabric with few visible inclusions and a porous brittle structure.

Inclusions: None.

Specifications: Light weight with a compact but porous structure, a light gritty feel and a fine, irregular fracture.

Parallels and Dating: 12th – 13th century. The class is well represented in Phases 1 and 2 at Tepe Dasht-i-Deh dated to the 12th – 13th centuries but is absent from Phase 3 dated to the 14th century (Williamson, 1971d: 183) and also from other 14th 'Minab Incised Ware' sites in the Musandam peninsula (de Cardi, 1975: 17, 64).

Origin: Direct evidence for the production of MEW comes from the discovery of moulds and firing wasters at a number of sites in the Minab plain, the Jiruft plain and the Soghun Valley. Within the Williamson Collection, the bulk of the moulds and some misfired pieces come from the single site of P1. There are also a significant number of misfired pieces from K154 and K130, two separate sites in the Minab plain. The latter lies a few kilometres northwest of the modern town of Minab, and the former has not yet been relocated. In the Stein Collection, most of the moulds come from one site, Shahr-i-Daquianus in the upper Halil-Rud, which is probably the same site as P1. There is also a second site Qalat Sarawan, a few kilometres south of the town of Minab, which is not well represented amongst Stein's finds in the British Museum, but which Stein describes as producing a thick scatter of relief decorated pottery (Stein, 1937: 184). Further west in the Soghun Valley, large quantities of MEW emerged from the excavation of Tepe Dasht-i-Deh, including some evidence for local production at the site (Williamson, 1971d: 184). Finally, a kiln was identified at site R67A between Buluk and Fars associated with a mass of moulded ware and monochrome and polychrome Sgraffiato wasters (Prickett, 1986: 1168).

Class Code: MEW.MO

Class Name: Moulded Ewer Moulds

Types: None defined

Illustration: Plate 28

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Thick-walled open clay moulds with raised or impressed decoration, which has been stamped into the wet clay rather than carved. The outsides are left uneven and often have finger impressions. Each mould would have been used to press-mould sections of moulded ewer, which were then luted together with slurry. Various fabrics are represented on the moulds. Interestingly there appears to be a direct correlation between some of the fabrics represented on the moulds and those that occur on the sub-classes of Ewer as they were defined in the study of the Williamson Collection (Priestman, 2005a: 206-07). These associations

seem to be supported by matches in the motifs found on the moulds and those that occur on the surface of the corresponding sub-classes.

Integrity: Consistent and distinctive category of object, but fabrics seem to vary and are indicative of multiple centres of manufacture.

Surface Treatment: Various motifs as seen on vessels.

Vessel Forms: Cylindrical moulds open at both ends used for press moulding different sections of the vessel.

Fabric: Very fine consistently reduced grey or oxidised orange and brown fabric with few visible inclusions and a porous brittle structure.

Inclusions: None.

Specifications: Average weight with a compact structure, a gritty feel and a fine, irregular fracture.

Parallels and Dating: 12th – 13th century. See discussion of MEW above.

Origin: Southeast Iran. See discussion of MEW above.

Fine Slipped/Painted Wares

Class Code: SLIP.R

Class Name: Fine Red Slipped Ware

Types: None defined

Illustration: Plate 29

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Small shallow open dishes and jars with a fine, well-levigated, fully oxidised orange fabric with small quantities of very fine sand temper. Interior and upper exterior surfaces of bowls and exterior surfaces of jars are covered with reddish-purple slip.

COLOUR	
Colour	Reddish yellow
Core	5YR 6/5
Margin	Same as core
Surface	Same as core

Integrity: The class has consistent characteristics but is likely to have multiple points of origin. Variation is evident in terms of the different types of coarse inclusions, vessel forms and the colour and quality of the slip.

Vessel Forms: Various small open bowls and dishes often with a simple pointed lip or a thickened everted lip. One of the most characteristic forms has a slight carination low down in the wall and a thin pointed or rounded lip. Also various small jar forms.

Surface Treatment: Interior and upper exterior surfaces of open vessels and exterior surfaces of closed vessels covered in a plain reddish purple slip.

Fabric: Hard, fine-grained, fully-oxidised, orange earthenware with very few visible inclusions or with a fine, rather variable sand temper.

Inclusions: Occasional and varied.

Specifications: Average weight with a compact structure, a smooth feel and a fine, clean or sub-conchoidal fracture.

Parallels and Dating: 2nd century BC – 6th century AD. The class as a whole represents a long lived tradition and it is only through the identification of forms that it is possible to date the material more closely.

Origin: Southeast Iran.

Class Code: SLIP.B

Class Name: Fine Black Slipped Ware

Types: None defined

Illustration: Plate 30

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Reduced, coarse grey fabric with a patchy matt-black slip covering all surfaces. Closed and open vessels are represented, the range of forms is wide but the style as a whole is distinctive. Most vessels are medium sized but large and small vessels are also present.

Integrity: Coherent class.

Surface Treatment: Smaller bowls are usually plain but sometimes have incised wavy bands framed by straight bands below the rim. The same is true for closed forms, though there are decorated examples with raised ridges combined with deeply incised wavy bands or rilling.

Vessel Forms: Mostly medium to large sized jars and bowls.

Fabric: Fine, tight-grained, consistently-reduced, light-grey or light yellow-grey earthenware with very few visible inclusions and some small voids that can be seen under the hand lens.

INCLUSIONS	
	1
Colour	Voids
Size	<0.5 - 1mm
Shape	Rounded or elongated
Freq.	c.1%
Sorting	Fair
ID	Voids

Specifications: Average to dense in weight with a slightly porous but compact structure, a soapy feel and a fine irregular fracture.

Parallels and Dating: 3rd – 8th centuries. The class occurs in the fortress area of Qasr-i Abu Nasr, which it has been suggested can be dated on numismatic evidence to between the 3rd – 8th centuries (Whitcomb, 1985a: figs. 43; 50: m).

Origin: Southern Iran

Class Code: SLIP.TB

Class Name: Thick Brown Slipped Ware

Types: None defined

Illustration: Plate 31

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Thick, slightly glossy opaque reddish-brown (2.5YR 3/1) or black/dusky red (2.5YR 4/4) slip on a light or occasionally darker orange body. The slip is often degraded and occurs on the interior and exterior, or on the interior and exterior of the rim only. Closed forms and everted rimmed bowls tend to have deeply incised decoration. In addition, there is a group of distinctive medium-sized bowls with folded rims and slip mostly restricted to the interior of the vessels. Other aspects of slip cover and decoration are form specific.

COLOUR		
Colour	Light brown	Reddish yellow
Core	7.5YR 6/4	5YR 6/6
Margin	Same as core	Same as core
Surface	5YR 7/6	5YR 7/6

Integrity: Coherent and readily distinguishable from the rest of the red and black slipped wares.

Surface Treatment: Medium sized bowls are plain. Smaller bowls and jars can have quite large areas filled with deeply incised bands, wavy lines and grids.

Vessel Forms: Open bowls with folded rims, club rimmed bowls, shallow bowls, beaked rimmed bowls and mixed open forms.

Fabric: Fairly hard and compact, fully-oxidised, orange or orange-buff earthenware with a slightly rough appearance in the fracture. Under the hand-lens varied inclusions and frequent voids are visible.

INCLUSIONS				
	1	2	3	4
Colour	Opaque white	Buff/orange	Brick red	Voids
Size	<0.5 - 1mm	1 - 3mm	<0.5 - 1mm	<0.5 - 1mm
Shape	Sub-rounded	Sub-angular	Sub-angular	Rounded or elongated
Freq.	≤1%	<1%	≤1%	2 - 3%
Sorting	Good	Fair	Good	Fair
ID	Lime?	Hard grit	Stone or grog?	Voids

Specifications: Average density with a compact structure, a rough but soapy feel and a fine, irregular fracture.

Parallels and Dating: 3rd – 8th century. Good parallels for this class come from Qasr-i Abu Nasr. The class occurs in the fortress area of Qasr-i Abu Nasr, which is has been suggested can be dated by numismatic evidence to between the 3rd – 8th centuries (Whitcomb, 1985a: figs. 50: g, i-k, n, p; 52: j, l, o-q).

Origin: Southern Iran

Class Code: SLIP.PBR

Class Name: Painted Brown Slipped Ware

Types: None defined

Illustration: Plate 32

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Fairly fine, hard, oxidised orange fabric with a brown-slipped and heavily burnished surfaces painted with black, brown or bichrome decoration with brown/red slip and black lines, which contrast with zones of the bare, light-coloured fabric. Sherds often have a soft soapy feel.

COLOUR	
Colour	Reddish yellow
Core	5YR 6/5
Margin	Same as core
Surface	Same as core

Integrity: Coherent and distinctive class.

Surface Treatment: Simple broad bands, chevrons, palmettes and lattice type arrangements. Strong contrast between the light colour of the body, the brown/red slip and the black decoration.

Vessel Forms: Shallow open bowls with a sharply everted, rounded lip and jars with sloping shoulders and a rounded body.

Fabric: Hard, fine-grained, fully-oxidised, orange earthenware with very few visible inclusions.

Inclusions: None.

Specifications: Average weight with a compact structure, a smooth feel and a fine, clean or sub-conchoidal fracture.

Parallels and Dating: 1st – 2nd century? A similar class has been noted at ed-Dur from surface finds collected from Area K during an early survey of the site, perhaps pointing to a dating within the 1st or 2nd centuries (Phillips, pers. comm. 2003).

Origin: Southern Iran?

Class Code: FOPW.1

Class Name: Fine Orange Painted Ware, Group 1

Types: None defined

Illustration: Plate 33

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Finely levigated, dense, orange fabric which is either plain or covered with a bright reddish-orange slip and black painted decoration. The walls tend to be thin and the surfaces are often, though not always, burnished on the interior and exterior. The class appears to be associated only with a single type which is a tall, straight-sided beaker with a flaring rim. FOPW.1 is similar to FOPW.2 can be distinguished on the basis of a number of characteristics. The main difference is that the surfaces all have a high burnish leaving a soft shiny finish, which can be detected even when the material is degraded. Both interior and exterior surfaces are burnished, although on the exterior the action is vertical leaving distinctive striations.

Decorative motifs are also different to those found in association with FOPW.2. Lozenges are almost completely absent and instead the predominant motif is a hanging volute below the rim bordered by solid bands. Tight wavy bands are also used either loose or as frames and panels within fringed borders.

COLOUR	
Colour	Reddish yellow
Core	7.5YR 6/6
Margin	Same as core
Surface	Same as core

Integrity: Coherent and distinctive class.

Vessel Forms: Tall, straight-sided beaker with a flaring rim and a flat base. The vessels often have small-perforated handles just below the rim, which were probably used for the attachment of a cord.

Surface Treatment: Exterior surface covered in a fine red burnished slip with black painted decoration (see above).

Fabric: Finely levigated, hard, compact earthenware with a clean, sub-conchoidal fracture and some very small, occasional sandy inclusions. The fabric is predominantly oxidised to orange.

INCLUSIONS	
	1
Colour	Various
Size	≤0.1mm
Shape	Sub-angular
Freq.	Occ.
Sorting	Good
ID	Sandy elements

Specifications: Average weight with a compact structure, a smooth feel and a clean or sub-conchoidal fracture.

Parallels and Dating: 3rd – 6th century. The class does not appear to be dated earlier than the 3rd century based on its occurrence in Period 1 of Area F at ed-Dur (Potts, 1998: 209). At Kush FOPW is concentrated primarily within Phases W-01 - E-01 dated to between the 4th – 6th centuries (Kennet, 2004: table 3). This evidence contradicts the suggestion by Potts that FOPW went out of circulation by the 4th century (Potts, 1998: 209). The FOPW from Kush corresponds with FOPW.2, whereas FOPW.1 corresponds closely to the FOPW recovered from Tepe Yahya Level I (Lamberg-Karlovsky, 1970: 10, fig. 4: i-m). Interestingly FOPW.1 mostly comes from inland sites closer to the Tepe Yahya area.

Origin: Southeast Iran (Kerman or Hormuzgan). Williamson collected FOPW from 25 different sites, of which 20 come from the Minab, Halil-Rud and Rudan areas in Hormuzgan and Kerman provinces. Together the sherds from these 20 sites make up 99% of the FOPW assemblage in the

Williamson Collection (Priestman, 2005a: 224-25). During Stein's survey of southern Iran he recorded 11 sites with FOPW, nine of which come from Kerman province and 2 from Iranian Baluchistan. Stein's sites have been recorded from a combination of published plates (Stein, 1937: pls. XX: 3, 4, 6, 10, 36, 46; XXVII: 20; XXV: 15, 20), site descriptions (Stein, 1937: 141-42), and finds that were examined during a study of the Stein Collection in the British Museum (Priestman, 2004). Four sites were also identified by Sajjadi in the Rudbar area, two of which had already been noted by Stein (Sajjadi, 1989). In the Soghun Valley area, FOPW occurs at Tepe Yahya (Lamberg-Karlovsky, 1970: fig. 4: a, d, e, i-m). On the opposite shores of the Persian Gulf, FOPW has been recovered from Kush (Kennet, 2004: 61-62, fig. 34), ed-Dur (Lecomte, 1993: 200, fig.12: 1-4; Potts, 1998: fig. 2: 8), Mleiha (Benoist, Mouton & Schiettecatte, 2003: 71, fig. 9: 2-3), Qala'at al-Bahrain (Højlund & Andersen 1997: 213-15, figs. 886-896) and from one or possibly two sites on the Masandam Peninsula in northern Oman (de Cardi, 1975, 57-58, fig. 9: 41-62). Together the evidence suggests that FOPW originated in southeast Iran and that small quantities were traded predominantly within the lower Persian Gulf, although outlying pieces have been noted at Bushehr (Whitehouse & Williamson, 1973: 38, fig. 5: a-c) and Qana' in Yemen (Sedov, 1996: 21-23, fig. 6: 2-7).

Class Code: FOPW.2

Class Name: Fine Orange Painted Ware, Group 2

Types: None defined

Illustration: Plate 34

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Finely levigated, dense, orange fabric which is either plain or covered with a bright reddish-orange slip and black painted decoration. The walls tend to be thin and the surfaces are often, though not always, burnished on the interior and exterior. The most common form is a tall, straight-sided beaker with a flaring rim and a flat base or a small globular jar with either a flat base or a thin flaring foot ring. The main characteristic that distinguishes FOPW.2 from FOPW.1 is the decoration. This consists of solid lozenges framed by straight bands situated above the foot and below the lip of beakers and around the neck of jars. Wavy bands framed by straight bands are also common. Jars tend to have a simpler decorative scheme comprised mostly of thick bands. Some pieces have thin, washy-looking decoration on the interior that Williamson refers to as a "shadow image" produced by the transfer of decoration between vessels stacked within one another during firing (Williamson, 1972: 99). This does not seem the most likely explanation, for although it is difficult to make sense of the internal decoration, the surfaces of the vessels are burnished with the black paint sealed below the burnished layer.

COLOUR		
Colour	Reddish yellow	Grey
Core	7.5YR 6/6	5Y 6/1
Margin	Same as core	7.5YR 6/6
Surface	Same as core	Same as margin

Integrity: Coherent and distinctive class.

Vessel Forms: The most common form is a tall, straight-sided beaker with a flaring rim and a flat base. The vessels often have small-perforated handles just below the rim, which were probably used for the attachment of a cord. The class also includes a small globular jar form with a very slightly fattened and gently everted rim, a long neck, sloping shoulders and a rounded belly. The base is either flat or raised slightly on a thin flaring foot ring.

Surface Treatment: Exterior surface covered in a fine red burnished slip with black painted decoration (see above).

Fabric: Finely levigated, hard, compact earthenware with a clean, sub-conchoidal fracture and some very small, occasional sandy inclusions. The fabric is predominantly oxidised to orange, though sometimes a portion or the whole of the core is reduced to light grey.

INCLUSIONS	
	1
Colour	Various
Size	≤0.1mm
Shape	Sub-angular
Freq.	<1 - 2%
Sorting	Good
ID	Sandy elements

Specifications: Average weight with a compact structure, a smooth feel and a clean or sub-conchoidal fracture.

Parallels and Dating: 3rd – 6th century. Precise parallels for the sub-class are represented in the assemblage from Kush where the material is concentrated primarily within Phases W-01 – E-01 dated to between the 4th – 6th centuries (Kennet, 2004: table 3). This may be an indication that FOPW.2 is slightly later dated than FOPW.1, though this cannot be confirmed.

Origin: Southeast Iran (Kerman or Hormuzgan). See discussion of FOPW.1 above.

Handmade Coarse Wares

Class Code: CHAM

Class Name: Crude Handmade Ware

Types: CP6-8, OC10

Illustration: Plate 35

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Crudely built handmade vessels with irregular profiles and plain uneven surfaces, often with fine textile impressions on the exterior. A fairly wide range of vessels types are represented within the class including both closed and open types. Vessels are made from a coarse, low-fired brittle and crumbly fabric with numerous coarse inclusions irregularly fired to buff or orange sometimes with variation across the surface and through the core.

COLOUR		
Colour	Light brown	Brown
Core	7.5YR 6/4	7.5YR 5/4
Margin	Same as core	7.5YR 5/6 (outer margin)
Surface	Same as core	Same as margin

Integrity: Coherent, well defined and distinctive class with fairly broad colour variation.

Vessel Forms: simple open bowls, jars with a gently everted lip, vessels with a small cup attached to a long thick handle, platters and lids.

Surface Treatment: Exterior surfaces are rough and uneven. Some vessel forms are marked with fine cloth impressions. Particular vessel types are decorated with applied or crude incised decoration including oblique slashes along the handles and rims of lids or handled cupped vessels (OC10), or applied and crenulated 'chain ridges' on small flat bottomed vessels (CP6). Two vessel types also sometimes have roughly applied brown painted decoration following the rim (CP7) or the rim and the interior (CP6).

Fabric: Low-fired brittle and crumbly fabric with abundant coarse inclusions. Inclusions are mostly of a single variety: crushed angular and platy red or reddish-brown stony grits. The fabric is irregularly fired to orange-buff throughout, or strong orange sometimes turning to grey in the core and interior margin.

INCLUSIONS	
	1
Colour	Brown/red
Size	<0.1 - 2mm
Shape	angular
Freq.	7%
Sorting	poor
ID	Crushed stony grit

Specifications: Average density with a brittle granular structure, a harsh feel and a hackly laminar fracture.

Parallels and Dating: Not known. The class has strong affinities to CHAM.1-3 in the Williamson Collection though it may not necessarily be the same (Priestman, 2005a: 194-95, pls. 32-35). Parallels have been drawn with Proto-Julfar Ware that occurs at Kush through Periods III and IV dated to between the 8th – 11th centuries (Kennet, 2004: 53), but it is not clear if these are actually the same.

Origin: Southern Iran, Siraf area?

Class Code: CHAM.N-ID

Class Name: Non-Identified Crude Handmade Ware

Types: None

Illustration: None

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Crudely built handmade vessels with irregular profiles and plain uneven surfaces. The class displays extensive variation in fabric and vessel form. Evidently there are a range of distinct classes loosely bound by a general set of traits. Vessels are all made from a coarse, low-fired, brittle and crumbly fabric with numerous coarse inclusions.

Integrity: Extensive variation in fabric, firing and vessel forms indicative of a range of distinct classes.

Colour: Various.

Vessel Forms: Quite a wide range of different vessel forms including jars with a simple everted lip, bowls and platters. The range of vessel forms is similar to those represented in the more coherent CHAM class.

Surface Treatment: Mostly plain. Some surface decoration occurs in the form of crude incisions on handles and applied and impressed chain ridges around the body.

Fabric: Low-fired brittle and crumbly fabric, generally with abundant coarse inclusions. The fabric is often irregularly fired to orange, buff or cream.

Inclusions: Various.

Specifications: Various.

Parallels and Dating: No known. The material is mixed and diverse, potentially dating to different periods, through general similarities with CHAM and Proto-Julfar Ware suggest that there may be a widespread tradition plain crude handmade vessels circulating within the Persian Gulf region during a single unified chronological horizon.

Origin: Southern Iran.

Class Code: JULFAR

Class Name: Plain Julfar Ware

Types: CP3-5, JR44

Illustration: Plates 36-37

Clay: Earthenware **Production**: Mostly handmade apart from CP5 (see below)

Defining Characteristics: Handmade or slow-turned jars and round-bottomed cooking-pots made from a coarse orange/red or grey fabric with a rough, hackly fracture, containing frequent and distinctive small sub-angular red or grey platelets. The surfaces are either grey or week orange or a combination of the two. Exterior surfaces are plain apart from a horizontal rib in Types CP3 and CP4.

COLOUR		
Colour	Red/weak red/light red	Grey/light brownish grey
Core	10R 5/8	10YR 6/1
Margin	10R 5/4	10YR 6/2 (outer margin)
Surface	10R 6/6	Same as margin

Integrity: Some variation in firing colour and, the presence or absence or white lime inclusions. Variation often appears to be type specific. CP5 in particular stands out as consistently having a reduced grey fabric and being wheel-thrown rather than slow turned or handmade.

Vessel Forms: Mostly medium sized, round bottomed cooking-pots with a slightly closed mouth, horizontal lug handles attached towards the top or the bottom of the sides and a gently

fattened rim. In addition there are some large jars with thick everted flange rims together with a selection of one-off types.

Surface Treatment: Generally plain but with some minimal decoration that is type specific. CP3 and CP4 have a continuous raised band that incorporate projecting handles a short distance below the rim. CP5 has horizontal lug handles low down toward the base together with a slight raised and flattened turned band immediately below a slightly squared rim. JR44 vessels are plain.

Fabric: Brittle, grainy earthenware fired to brick-red or dark-grey with frequent, angular, badly-sorted, opaque-red or grey platelets. Some pieces are also flecked with small spots of lime which can be frequent. Fabric colour tends to vary through the core and over the vessel surface.

INCLUSIONS		
	1	2
Colour	Red or grey	White
Size	<0.1 - 4mm	<0.1 - 2mm
Shape	Angular platelets	Sub-rounded
Freq.	7%	0 - 7%
Sorting	V. poor	Fair
ID	Stone platelets	Lime flecks

Specifications: Light to average weight with a compact granular structure, a gritty feel and an irregular laminar fracture.

Parallels and Dating: 14th – 16th century. Julfar Ware is a long-lived tradition that first appears as a significant element in the Kush sequence during Phase E-08 in the late 11th/early 12th century and continued in production up to the mid-20th century. JULFAR from Siraf is equivalent to JULFAR.3 and JULFAR.4 from Kush/al-Mataf study (Kennet, 2004: 53) and JUL in the Williamson Collection (Priestman, 2005a: 226-27, pl. 59). None of the material appears to belong to the earlier groups better represented towards the end of the sequence at Kush. The main type represented here, CP4 is equivalent to CP1.2 which becomes common at al-Mataf in Phase II in the 14th century and begins to decline by Phase IV in the 16th century (Kennet, 2004: 53-55, tables 21-23). The same type has been recorded during earlier work at Julfar (Hansman, 1985: fig. 14: a-d) and at Qala'at al-Bahrain mostly outside the fortress (Frifelt, 2001: 87, figs. 147: a; 148). CP3 represents a minor variant of CP4 and the same parallels apply. Large flange rimmed jars, often with lime inclusions are similar to Kennet's type CP7.1 (Kennet, 2004: fig. 24: Type 'CP7.1') and a version of Julfar Ware recorded in the Williamson Collection (JUL.RC form JRC: 01), neither of which occur in the sequence at al-Mataf suggesting that they are later in date and thus dated to the mid-17th century and later, though superficially the firing and fabric appears similar to the rest of the JULFAR group. Type CP5 remains anomalous in being wheel-thrown, having a more consistently grey fabric and a form that does not appear to be represented at Kush or al-Mataf. This Type may derive from a different source; however, the fabric and general characteristic of the cooking pot are consistent with the Julfar Ware tradition.

Origin: Julfar, Ras al-Khaimah (U.A.E.).

Class Code: JULFAR.PB

Class Name: Purple and Black Julfar Ware

Types: CP1-2

Illustration: Plate 38

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Dark-grey, handmade or slow-turned Julfar Ware cooking-pots with thin brittle walls and rounded bottom and a slightly fattened or beaded closed rim. Rims are mostly decorated with a painted band of purple, and on one type, short deep incisions along the rim. Some rims are also plain. Vessels often have fine pointed handles attached just below the rim, a feature that is particular to this sub-class.

COLOUR		
Colour	Dark reddish grey	Red/dark reddish grey
Core	2.5YR 4/1	2.5YR 4/6 (inner half)
Margin	Same as core	2.5YR 4/1 (outer margin)
Surface	Same as core	Same as margin

Integrity: Typically JULFAR.PB is fired to a dark grey and has a purple painted band around the rim. The material is similar to JULFAR but can be distinguished on the basis of vessel type, the presence of painted decoration, consistent dark grey reduction, thinner walls, smaller, less frequent coarse inclusions, and more advanced sintering giving the material a noticeable 'clinky' quality. A small number of sherds might also be included within the class that are fired to a strong orange or buff and which sometimes do not have a painted purple decoration, but which share the same vessel types (CP1 and CP2) and fine 'clinky' quality. In a larger assemblage these groups might be assigned to a separate sub-class, particularly given the consistency displayed by JULFAR.PB.

Vessel Forms: Medium sized round-bottomed cooking pots with and slightly closed mouth and an externally fattened beaded rim (CP1) or a simple fattened rim with a rounded lip (CP2). Both types have fine pointed handles attached at the rim or slightly below.

Surface Treatment: Most examples (see exceptions above) have a painted band of reddish-purple along the rim. Most CP1 vessels also have regularly-spaced, short, deep, oblique slashes along the rim. CP2 vessels are generally otherwise plain, though non-painted examples can have thin incised wavy bands below the rim.

Fabric: Hard, brittle, earthenware fired to dark-grey sometimes turning to orange towards the inner half of the core. The fabric contains frequent, angular, badly-sorted, opaque-grey platelets. Some pieces are also flecked with small spots of lime.

INCLUSIONS		
	1	2
Colour	Grey	White
Size	<0.1 - 0.5mm	<0.1 - 2mm
Shape	Angular platelets	Sub-rounded
Freq.	3%	occ.
Sorting	Fair	Fair
ID	Stone platelets	Lime flecks

Specifications: Light to average weight with a compact granular structure, a gritty feel and an irregular laminar fracture.

Parallels and Dating: 16th – 17th century. This is the same as JUL.PB in the Williamson Collection (Priestman, 2005a: 228, pl. 58) and is equivalent to JULFAR.2 from al-Mataf (Kennet, 2004: 53-55). One of the types represented, CP2 is equivalent to CP1.1 which begins to replace CP1.2 as the dominant Julfar Ware cooking-pot type from Phase IV at al-Mataf in the 16th century. The type continued to increase in frequency through the rest of the sequence up to the abandonment of al-Mataf in the earlier 17th century and may continue in circulation some time beyond this date. The same type has also been recorded during earlier work at Julfar (Hansman, 1985: fig. 14: g-h, j). The 2nd type (CP1) that is equally well represented in the JULFAR.PB assemblage from Siraf is curiously omitted from Kennet's al-Mataf typology, though it is included within the earlier publication of Julfar (Hansman, 1985: fig. 14: i) and is present at Qala'at al-Bahrain (Frifelt, 2001: fig. 150: a-b).

Origin: Julfar, Ras al-Khaimah (U.A.E.).

Class Code: JULFAR.RW

Class Name: Red and White Julfar Ware

Type(s): OC9

Illustration: Plate 39

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Handmade or slow-turned spouted jars and bowls made from a coarse orange fabric with a rough, hackly fracture, containing frequent and distinctive small sub-angular red platelets and some flecks of lime. The sub-class is easy to distinguish from other types of Julfar Ware as the surfaces are washed all over with a thin white slip and painted with

stripes of red. There are also subtle differences in the quality of the fabric, which tends to be fired to a darker red and to have a particularly brittle, granular quality.

COLOUR	
Colour	Red
Core	2.5YR 5/8
Margin	Same as core
Surface	Same as core

Integrity: Coherent and distinctive.

Vessel Forms: Almost all sherds come from a single distinctive type (OC9) of bridge-spout jug with a flat base, a piriform body, a slightly flared neck with a fattened lip, a long strap handle and a straight bridge spout. Where the bridge of the spout joins the neck, there is a pronounced horizontal rib which forms the upper terminal for the strap handle on the opposing side. There are also examples of JULFAR.RW decoration associated with a low closed bowl with a thickened rim and slightly squared lip.

Surface Treatment: Exterior surfaces of jars and both surfaces of bowls are covered in a thin white wash over-painted in simple lines of reddish purple placed either vertically or horizontally depending on the particular portion of the vessel.

Fabric: Hard, brittle, earthenware fired to a strong brick-red with frequent, angular, badly-sorted, opaque-red platelets and occasional flecks of lime. The fabric colour can vary through the core turning darker either toward the interior or exterior margin.

INCLUSIONS		
	1	2
Colour	Red	White
Size	<0.1 - 2mm	<0.1 - 3mm
Shape	Angular platelets	Sub-rounded
Freq.	3-5%	occ.
Sorting	Poor	Fair
ID	Stone platelets	Lime flecks

Specifications: Light to average weight with a compact granular structure, a gritty feel and an irregular laminar fracture.

Parallels and Dating: Late 15th – 17th century. This is the same as JUL.RW in the Williamson Collection (Priestman, 2005a: 229, pl. 56) and is equivalent to JULFAR.1 from al-Mataf, where it occurs throughout the sequence from Phases II - REC dated to the 14th – 17th centuries, but with a dramatic increase in circulation evident slightly earlier than JULFAR.PB in Phase III dated to the late 15th/early 16th century (Kennet, 2004: 53-55, table 7). The main JULFAR.RW type (OC9) is equivalent to types JR2.1 and JR2.3 (which mostly appear to be the same type) from al-Mataf (Kennet, 2004: fig. 22: 'Types J2.1 and J2.3'). The type has also been identified during earlier

work at Julfar (Hansman, 1985: 64, fig. 17: h) and at Qala'at al-Bahrain (Frifelt, 2001: 93-4, fig. 160: a-b). The bowl type is equivalent to type B1.1 from al-Mataf (Kennet, 2004: fig. 22: 'Type B1.1') and has also been recorded by Hansman (1985: 62, fig. 16: c, e).

Origin: Julfar, Ras al-Khaimah (U.A.E.).

Class Code: HMPW.1

Class Name: Handmade Painted Ware, Group 1

Types: None

Illustration: Plate 40

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Closed, flat-bottomed, handmade, vessels made from a coarse, low-fired friable cream coloured fabric with a blocky structure and varied coarse inclusions. Exterior surfaces are decorated with distinctive, very detailed, relatively fine-lined geometric decoration generally containing areas of cross-hatch lattice and rows of simple volutes.

COLOUR	
Colour	Pale yellow
Core	5Y 8/2
Margin	Same as core
Surface	Same as core

Integrity: The coarse inclusions seem extremely varied yet the general quality of firing and decorative scheme appears consistent and readily distinguishable from other categories of HMPW represented in inland Fars (see Priestman, 2005a: 219-23; Whitcomb, 1991).

Vessel Forms: Medium sized closed vessels with a wide, low body, a simple flat base and a round-section or flattened strap handle attached to the neck and shoulder. Some handles have a projecting point applied to the handle. No complete profiles are preserved but fragments from the neck portion indicate that at least some of the vessels, if not all, had a tall straight neck.

Surface Treatment: Exterior surfaces are decorated all over with very complex, relatively fine lined, dark purple painted designs generally including zones filled with a cross-hatch lattice or a solid fill. Open areas are filled with other decorative elements, often rows of simple volutes joined to a straight line.

Fabric: Soft, crumbly cream coloured fabric with a blocky structure and numerous coarse inclusions, the nature of which varies extensively. Common elements include blocks of light orange of pink sedimentary stone, some darker mineral inclusions and in some pieces rolled grains of quartz.

INCLUSIONS			
	1	2	3
Colour	Light orange/ pink	Dark grey	Opaque white
Size	<0.1 - 2mm	≤1mm	≤1mm
Shape	Sub-angular	rounded	Well rounded
Freq.	3%	occasional	0% - occ.
Sorting	poor	good	good
ID	Sedimentary stone	Stone grit	quartz

Specifications: Low density with a soft friable structure, a harsh feel and hackly laminar fracture.

Parallels and Dating: 11th – 13th century. HMPW.1 is well represented within the assemblage from Siraf and appears to be a local category to this area. The class is equivalent to PAW.SCC in the Williamson Collection, which was also collected from the area of Siraf (Priestman, 2005a: 220-21). The class is part of a widespread tradition of crude pseudo-prehistoric handmade painted wares belonging roughly to the 11th – 13th century period, which have been particularly well documented in the Marv-Dasht area of Fars (Whitcomb, 1991), but which also occur across other areas of Iran and much of the Near East from Egypt to Afghanistan (Johns, 1998). Pieces with a very similar decorative scheme to HMPW.1 have been recovered Qala'at al-Bahrain, where they are believed to derive from a source in Syria (Frifelt, 2001: 92-3, figs. 154-56). This identification seems unlikely, particularly given the widespread adoption of the tradition and its broad geographical occurrence. HMPW.1 was most likely manufactured locally within the area of Siraf with pieces from Qala'at al-Bahrain derived from the same source.

Origin: Southern Iran, Siraf area?

Class Code: HMPW.2

Class Name: Handmade Painted Ware, Group 2

Types: JR43

Illustration: Plate 41

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Crude, handmade vessels made from a coarse, low-fired friable fabric with a blocky structure and varied coarse inclusions. Vessels are mostly closed with a saggy profile. Some have round or flat section strap handles with an applied projecting point. Exterior

surfaces are decorated with simple thick-lined designs; often chevrons painted in dark purple or purple combined with white.

COLOUR	
Colour	Very pale brown
Core	10YR 8/3
Margin	10YR 7/4
Surface	Same as margin

Integrity: The general decorative scheme is relatively consistent but there is extensive variation in the nature of coarse inclusions and firing colour. Some pieces may have the same fabric as HMPW.1 but the decoration is different. Others are clearly not the same, including pieces fired to strong orange turning grey or brown in the core. With a larger sample it may be possible to further sub-divide the class into more coherent categories.

Vessel Forms: Mostly closed vessels including tall straight necked jars and a vessel with a wide gently everted lip and a saggy profile. Some, or possibly all vessels have a round or flat section strap handle applied to the neck and shoulder with a pointed projecting thumb stop applied to the top. An example of a small square legged incense burner from Siraf also belongs within the class.

Surface Treatment: Exterior surfaces covered all over with simple, broad-lined geometric designs consisting mostly of multiple chevrons painted in dark purple or alternating lines of purple and white. Bichrome painted decoration occurs only on pieces with a red firing body.

Fabric: Soft, crumbly cream or orange coloured fabric with a blocky structure and numerous coarse inclusions, the nature of which varies extensively across the sample.

Inclusions: Various.

Specifications: Low density with a soft friable structure, a harsh feel and hackly laminar fracture.

Parallels and Dating: 11th – 13th century. HMPW.2 is part of a widespread tradition of crude pseudo-prehistoric handmade painted wares belonging roughly to the 11th – 13th century period, which have been particularly well documented in the Marv-Dasht area of Fars (Whitcomb, 1991), but which also occur across other areas of Iran and much of the Near East from Egypt to Afghanistan (Johns, 1998). No specific parallels are known for HMPW.2.

Origin: Southern Iran, Siraf area?

Class Code: HMPW.BST

Class Name: Brittle Stone-Tempered Handmade Painted Ware

Types: None defined

Illustration: Plate 42

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Hard and thin walled, clinky-fired brittle brown fabric with abundant coarse angular stone grit inclusions and in some cases, fragments of lime. Vessels are handmade and the surfaces are murky orange with patches of fire clouding. Decoration consists of red bands and washes, overlain with black lines.

COLOUR		
Colour	Yellowish red, light reddish brown	Dark grey, reddish yellow
Core	5YR 5/6	5YR 4/1
Margin	Same as core	Same as core
Surface	5YR 6/3-4	7.5YR 6.5/4

Integrity: Very coherent and distinctive class.

Surface Treatment: Bands or large areas, (often the entire vessel exterior), covered in washes of red, iron-based pigment overlain with bands of black often framing wavy bands or short chevrons.

Vessel Forms: Jars with a rounded body, a flaring mouth with a pointed or thickened lip, some with simple rolled rim and a flat base or recessed foot well.

Fabric: Hard, brittle, fawn-brown earthenware with abundant graded angular stone grit inclusions, and in some cases fragments of lime.

INCLUSIONS		
	1	2
Colour	2.5YR 5/1-3	8/N or 10YR 8/2
Size	0.25 - 3mm	0.5 - 3mm
Shape	Angular	Sub-rounded
Freq.	5 - 15%	0 - 2%
Sorting	Fair	Fair
ID	Stone grits	Lime

Specifications: High to average density with a granular structure, a harsh feel and a hackly fracture.

Parallels and Dating: 3rd – 6th century? The class is equivalent to PAW.BST in the Williamson Collection (Priestman, 2005a: 222). Survey in the Minab and Rudan suggested that HMPW.BST may be associated with FOPW of the 3rd – 6th centuries at PK16 in the Rudan area, although the presence of a few 11th – 13th century glazed ware sherds at the site mean that it is not possible to rule out a later date for the class (Kennet, Priestman, Khosrowzadeh & Ali, 2006).

Origin: Southeast Iran.

Class Code: HMPW.CC

Class Name: Coarse Cream Bodied Handmade Painted Ware

Types: None defined

Illustration: Plate 43

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Hard fired, coarse, grit-tempered handmade or slow turned painted ware. Vessels are small and medium sized and include bowls, jars and handled forms. Decoration is bold and covers much of the vessel surface and is rendered in black or red iron pigment.

COLOUR			
Colour	Pale yellow	Reddish-yellow, pinkish-yellow	Greyish-brown, light grey
Core	2.5Y 8/1	5YR 6/6	10YR 5.5/2
Margin	Same as core	5YR 6/7	Same as core
Surface	Same as core	7.5YR 7/5	10R 7/2

Integrity: Coherent and distinctive class.

Surface Treatment: Fast broad strokes filling large areas of the vessel, mostly exteriors though sometimes interiors on bowls. Lose lattice is the most common motif. Less structured elements are also present.

Vessel Forms: Simple open bowls, handled jars and jugs and softly carinated beakers.

Fabric: Hard, tightly-fired earthenware with advanced sintering, though it still feels soft and soapy. The fabric has variable levels of well-sorted homogenous black or dark reddish-black grits (probably the same material but fired to different colours). The body is generally fired to a light creamy orange or grey/green, mainly within a consistent oxidised range.

INCLUSIONS	
	1
Colour	5YR 4/1 or 10R 5/6
Size	<0.5 - 2mm
Shape	Sub-angular
Freq.	<1 - 5%
Sorting	Fair
ID	Red or black grit

Specifications: Average density with a compact granular structure, a slightly rough, soapy feel and an irregular fracture.

Parallels and Dating: 11th – 13th century. Part of the widespread pseudo-prehistoric handmade painted ware tradition that can be dated within the range of the 11th – 13th centuries (Whitcomb, 1991: 103).

Origin: Southern Iran, Fars Province?

Class Code: HMPW.ORG

Class Name: Organic Tempered Handmade Painted Ware

Types: None defined

Illustration: Plate 44

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Soft chalky-textured fabric with occasional solid inclusions and numerous fibrous voids left by burnt out organic material. The pottery is painted with black and is very similar to HMPW.1 but has less grit and an organic temper. The pottery appears to be handmade or slow turned.

COLOUR		
Colour	Pale yellow	Weak red, pale yellow
Core	5Y 7.5/2	2.5YR 5.5/4
Margin	Same as core	Same as core
Surface	Same as core	2.5Y 8/3

Integrity: Coherent and distinctive class.

Surface Treatment: Fairly complex motifs including pseudo-calligraphic elements.

Vessel Forms: Simple open bowls or rounded closed forms.

Fabric: Soft and chalky or hard and porous, cream or orange earthenware with occasional coarse inclusions and frequent elongated voids left by burned-out organic temper.

INCLUSIONS		
	1	2
Colour	2.5/N	Voids
Size	0.25 - 1mm	0.5 - 6mm
Shape	Sub-rounded	Elongated
Freq.	0 - 1%	7 - 15%
Sorting	Good	Poor
ID	Black stone grits	Organic temper

Specifications: Average weight with a loose structure, a soapy feel and a fine irregular fracture.

Parallels and Dating: 11th – 13th century. Part of the widespread pseudo-prehistoric handmade painted ware tradition that can be dated within the range of the 11th – 13th centuries (Whitcomb, 1991: 103).

Origin: Southern Iran, Fars Province?

Class Code: HMPW.RB

Class Name: Red on Brown Handmade Painted Ware

Types: None defined

Illustration: Plate 45

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Uneven, thin walled, reddish-brown, handmade pottery with heavily burnished surfaces and thin lines of red decoration. The decoration is comprised of well-spaced, loosely structured meandering lines.

COLOUR	
Colour	Red
Core	2.5YR 5/6
Margin	Same as core
Surface	2.5YR 6/6

Integrity: Coherent class.

Surface Treatment: Medium to thin, iron red pigment lines, arranged in meandering tendril-like configurations. Some vessels have more structured elements like dots or wavy lines. Decorated on the exterior only but burnished on the interior and exterior.

Vessel Forms: Closed bell shaped jars and small open bowls.

Fabric: Coarse, hard, compact and brittle, deep reddish-brown earthenware. The broken section has a distinctive 'blocky' fracture that makes the fabric appear as though it has a coarse grit temper, although none is actually visible.

INCLUSIONS		
	1	2
Colour	2.5YR 5/4	10R 3/1
Size	<0.5 - 1mm	≤0.5mm
Shape	Angular	Sub-angular
Freq.	≤3%	≤3%
Sorting	Fair	Good
ID	Pink red grits	Black stone grit

Specifications: Average density with a compact granular structure, a rough feel and an irregular fracture.

Parallels and Dating: 11th – 13th century. Part of the widespread pseudo-prehistoric handmade painted ware tradition that can be dated within the range of the 11th – 13th centuries (Whitcomb, 1991: 103).

Origin: Southern Iran, Fars Province?

Class Code: HMPW.SA

Class Name: Fine Sandy Handmade Painted Ware

Types: None defined

Illustration: Plate 46

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Hard orange fabric with a very fine sandy texture and thin degraded dark red or maroon coloured decoration on a plain buff surface. Vessels appear to be handmade or slow turned.

COLOUR	
Colour	Light brown, pink
Core	7.5YR 6/4
Margin	Same as core
Surface	7.5YR 7/3

Integrity: Coherent class.

Surface Treatment: Broad bands and in-filled areas with wavy lines, dots and other devised between.

Vessel Forms: Medium sized jars.

Fabric: Hard, slightly flaky, buff-orange earthenware with a sandy texture and no visible inclusions.

Specifications: Average weight with a compact, granular structure, a gritty feel and a clean fracture.

Parallels and Dating: 11th – 13th century. Part of the widespread pseudo-prehistoric handmade painted ware tradition that can be dated within the range of the 11th – 13th centuries (Whitcomb, 1991: 103).

Origin: Southern Iran, Fars Province?

Class Code: INC.M

Class Name: Minab Incised Ware

Types: None

Illustration: Plate 47

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Closed, straight necked jars with a fine, compact buff coloured fabric coated over the exterior and interior with a lighter creamy-buff coloured slip. Exterior surfaces are decorated with distinctive intricate impressed marks forming panels that have been compared to textile designs (Frifelt, 2001: 96).

COLOUR	
Colour	Light brown
Core	7.5YR 6/4
Margin	Same as core
Surface	Same as core

Integrity: Coherent and distinctive class.

Vessel Forms: Vessels appear to be a single type of jar with a globular body and tall straight neck. The body portion is handmade following the hammer and anvil technique (de Cardi, 1975: 64) while the neck appears to have been thrown separately and attached to the body.

Surface Treatment: Exterior surfaces are covered with registers formed from neat closely spaced, impression marks produces using a range or different pointed stamps. Very similar

techniques of surface decoration can be seen today amongst the Shiu potters of Lima in the Musandam region of Northern Oman, where a wide range of small wooden implements are used to produce impression marks on vessels when they are leather hard (Richardson & Dorr, 2003: 74).

Fabric: Hard, compact, consistent orange or buff coloured fabric with a fine pitted grainy structure produced by numerous very small finely sorted sandy inclusions and frequent fine voids.

INCLUSIONS		
	1	2
Colour	White/grey	voids
Size	≤0.1mm	≤0.2mm
Shape	Sub-rounded	Rounded
Freq.	5%	7%
Sorting	Good	Fair
ID	Crystalline grits	Air pockets

Specifications: Medium density with a compact structure, a gritty feel and a fine irregular fracture.

Parallels and Dating: 14th – 15th century. This is the same as INC.M recovered during the 2005 Hormuzgan survey (Kennet, Priestman, Khosrowzadeh, & Aali, 2006). The class was first recorded by Williamson (de Cardi, 1975: 27). He noted it absence from Phases 1 and 2 at Tepe Dasht-i Deh dated to the 12th – 13th centuries, and its first appearance in Phase 3, dated to the 14th century (Williamson, 1971d: 183). Similar pottery has been recovered from 14 sites on the Musandam peninsular (de Cardi, 1975: 27, 64, 66, fig. 10) and from Qala'at al-Bahrain largely from outside the fortress (Frifelt, 2001: 96-99, figs. 165-167; 171).

Origin: Hormuzgan.

Class Code: HAGRIT

Class Name: Hard Grit Tempered Cream/Pink Coloured Ware

Types: JR40

Illustration: Plate 48

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Medium sized jars of a single type with a gently shoulder, a squared and recessed exterior lip and a slightly recessed interior bevel. The vessels are fired to cream or pink and have a very distinctive fabric containing sub-angular black grits and numerous rounded grains of quartz. Exterior surfaces are smooth and are covered with a 'self-slip' coating. Interior

surfaces are fairly irregular. This combined with fine horizontally striations in the surface indicates that the vessels were manufactured by hand on a slow turning devise.

COLOUR		
Colour	Light yellowish brown/very pale brown	Reddish-yellow/light red
Core	10YR 6/4	7.5YR 6/6
Margin	10YR 7/4	2.5YR 6/6 (outer margin)
Surface	2.5Y 8/3	Same as margin

Integrity: Only a small number of sherds belong to this class are represented within the assemblage from Siraf but all are very consistent and distinctive.

Vessel Forms: Only one vessel type represented within the class. This is a medium sized jar with a fairly short neck, gently sloping shoulders, and a distinctive rim with a squared a recessed outer lip and a slightly recessed bevel on the interior.

Surface Treatment: Exterior surfaces are 'self-slipped' and appear cream coloured or pink.

Fabric: Hard, compact fabric fired to cream or pink on the surface and turning to darker buff in the core. The fabric contains a consistent range of frequent coarse inclusions including sub-angular black stone and rounded opaque white or grey quartz grits.

INCLUSIONS		
	1	2
Colour	Opaque white	Black
Size	<0.1 – 1mm	≤0.5mm
Shape	Rounded	Sub-angular
Freq.	3-5%	3-5%
Sorting	V. good	V. good
ID	Quartz	Stone grit

Specifications: Average density with a compact structure, a rough feel and a fine irregular fracture.

Parallels and Dating: 12th – 15th century. There are no known parallels for this class. Most of the material from Siraf comes from Site E and from contexts associated with other relatively late pottery such as JULFAR, LIME, MGPAINT.1, etc. This material all relates to the later occupation of the city after the main period of the decline which occurred during the late 10th/early 11th century.

Origin: Southern Iran?

Class Code: LIME

Class Name: Coarse Limestone-Tempered Ware

Types: JR20

Illustration: Plate 49

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Dense semi-vitrified tan coloured ware with large sub-rounded lime inclusions. The vessels have a narrow neck with an inverted flat-topped rim and short vertical strap handles/loops on the outside.

COLOUR		
Colour	L. brown/pink	Very pale brown
Core	7.5YR 6/4	10YR 7/4
Margin	7.5YR 7/4	10YR 8/3
Surface	Same as margin	Same as margin

Integrity: Very consistent and readily recognisable class.

Vessel Forms: Mostly a single distinctive type of storage-jar or transport container with thick robust walls, a flat toped inverted flange rim and a long straight gently expanding neck with a low waist towards the base. Short vertically aligned strap handles are applied high up just below the rim. Some other vessel types also appear to have been manufactured in the same fabric including a thick-walled bowl with a gently flanged internally bevelled rim.

Surface Treatment: None.

Fabric: Very hard and dense, semi-vitrified, tan-yellow earthenware with frequent, large, sub-rounded lime inclusions and abundant well-sorted rolled quartz grits visible through the core and on the surface. The core tends to turn slightly lighter towards the margins and frequency of lime inclusions varies quite widely, though some lime is always present.

INCLUSIONS		
	1	2
Colour	White	Semi-trans. white
Size	0.1 - 5mm	0.5 - 1.5mm
Shape	Sub-rounded	Well-rounded
Freq.	Occ. - 10%	3-5%
Sorting	V. poor	V. good
ID	Lime	Rolled quartz

Specifications: Dense and semi-vitrified with a compact and granular structure, a rough feel and a slightly irregular fracture.

Parallels and Dating: 14th – 16th century. This is the same as LIME in the Williamson Collection (Priestman, 2005a: 210, pl. 63). A significant quantity of LIME sherds were recovered from the al-Mataf Mosque sequence from Phases II - VI dated to the 14th – 16th centuries (Kennet, 2004: 59, tables 7-8). A reduction in LIME sherds in the REC Phase of both the Mosque and Occupation areas suggests that the class went out of circulation before the abandonment of al-Mataf in the late 16th/early 17th century (Kennet, 2004). The characteristic LIME storage-jar vessel (JR20) has been reported from a number of Middle or Later Islamic period sites on the Arabian side of the Persian Gulf including al-Mataf (Kennet, 2004: 59, fig. 31: 'Type 105'), Qala-at al-Bahrain (Frifelt, 2001: 63, fig. 90), Bilad al-Qadim (Carter, 2005: 153, fig. 4.5: 14) and survey sites in Bahrain (Larsen, 1983: 292, fig. 69: a-b). A distinctive bowl type with a bevelled rim and an internal lip appears to belong to the same fabric and class. This association was also noted by Larsen (1983: 292, fig. 70: k-l).

Origin: The fabric is very distinctive and appears distinct from any of the coarse wares known from southern Iran. A concentration of reported finds from Bahrain may point to a Bahraini origin, though no specific production site it currently known.

Class Code: CHOC

Class Name: Chocolate Chip Ware

Types: None defined

Illustration: Plate 50

Clay: Earthenware **Production**: Handmade

Defining Characteristics: "*These vessels are thick-walled (1-2 cm), large storage jars. The fabric is most often grey but can also be buff, and is distinguished by frequent, large (1-7 mm), sub-angular, black inclusions. The exterior is frequently decorated with incised decoration*" (Kennet, 2004: 80).

Surface Treatment: Often with incised decoration.

Vessel Forms: Large thick walled jars.

Parallels and Dating: Mid-17th – 19th century. *"…The total absence of sherds from Kush indicates that it did not circulate in Ras al-Khaimah in the Sasanian or Early Islamic periods. Only one sherd was found at al-Mataf, in Phase Rec of the Mosque (not shown in Table 7 and Table 8). In addition, three sherds were picked up in Area 74 and it has also been found associated with recent occupation at a number of other sites. The evidence confirms that this class dates to the post-al-Mataf period and can therefore been used as a post-al-Mataf type fossil*" (Kennet, 2004: 81). Small quantities have also been noted in the 'Late Islamic 1b' assemblage dated to the mid-

17th to 19th centuries at the site of Bayt Bin ʿĀtī in the Qaṭṭāra Oasis of al-ʿAin (Power & Kaabi, forthcoming).

Origin: Eastern Arabia.

Class Code: INCIMP

Class Name: Incised and Impressed Ware

Types: None defined

Illustration: Plate 51

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Thick-walled bowls with a simple profile, a flat base and a thickening of the wall at the side/base junction. The interior surfaces are covered with clean deeply impressed dots and incised lines. The fabric is fine-grained, light orange-buff coloured with occasional pronounced reddening of the core and is fairly hard and heavy with no visible inclusions but a slightly pitted surface and occasional large construction voids.

COLOUR		
Colour	Pale yellow	Light brown/v. pale brown
Core	2.5Y 8/3	7.5YR 6/4
Margin	Same as core	Same as core
Surface	Same as core	10YR 7/4

Integrity: Highly distinctive and stylistically unified class.

Surface Treatment: Deep impressed dots are often placed in lines or scattered within panels delineated by incised lines. Lines can be used to frame panels or as free flowing elements. Decoration tends to cover most of the interior surface.

Vessel Forms: Simple open bowls with rounded or everted rims and a flat base.

Fabric: Fine-grained, dense, compact, light-cream to orange earthenware with no visible inclusions.

Specifications: High density with a compact structure, a rough feel and a fine, irregular fracture.

Parallels and Dating: Survey in the Minab area produced a single INCIMP sherd from a site dominated by pottery of the 17th - 20th centuries, but also containing some finds extending back to the 12th/13th centuries (Kennet, Priestman, Khosrowzadeh & Ali, 2006). The evidence is therefore by no means conclusive, although the suggestion is that INCIMP may be a relatively modern class.

Origin: Most of the INCIMP in the Williamson Collection comes from the Minab area and all from the eastern regions of the survey indicating that it is most likely to be a local product to this area.

Non-Identified Coarse Wares

Class Code: CW.N-ID

Class Name: Non-Identified Coarse Wares

Types: None

Illustration: None

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Mixed wheel-made, unglazed pottery that cannot be assigned to any of the other classes of pottery and which does not match any of the coarse wares known from the Williamson Collection, Siraf or other studies undertaken of Sasanian and Islamic pottery circulating within the Persian Gulf. Most of the material does appear to originate from somewhere within the Persian Gulf region rather than being imports from elsewhere.

Integrity: Diverse and extremely mixed, often just one-off examples.

Parallels and Dating: Not known.

Origin: Persian Gulf?

South Asian Coarse Wares

Class Code: IRPW

Class Name: Indian Red Polished Ware

Types: JR21

Illustration: Plate 52

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Very hard, finely levigated fabric with a clean sub-conchoidal fracture fired to strong reddish-orange, sometime turning grey in the core. Exterior surfaces are covered

with a bright orange slip which is evenly burnished but can have a slightly streaky appearance. All sherds belong to a single type with a sharply everted squared flange rim with carefully tooled incised depressions along the outer face of the rim, the interior flange/neck interface and sometime mid-way down the shoulder.

COLOUR		
Colour	Red	Reddish grey/weak red/red
Core	2.5YR 5.5/6	2.5YR 5/1
Margin	Same as core	2.5YR 5/2
Surface	Same as core	2.5YR 5.5/6

Integrity: Clearly defined, readily recognisable and with a strong internal consistency.

Vessel Forms: Small jar with a rounded globular body, a sharply everted flange rim with a squared outer face and a raised base. The base is carefully turned with a concave recess in the underside with a raised and flattened central boss.

Surface Treatment: Exterior surfaces covered with a bright orange evenly burnished slip. Also tooled bands around the shoulder, outer rim face and interior flange/neck interface.

Fabric: Very hard, finely levigated earthenware with no visible inclusions and a clean or semi-conchoidal fracture. The majority of pieces are thoroughly oxidised to a strong orange though some turn to grey in the core or over particularly zones of the body, particularly the side and base.

Inclusions: None.

Specifications: Average to dense in weight with a compact structure, a soft feel and a clean or semi-conchoidal fracture.

Parallels and Dating: 1st – 8th century. Williamson first noted IRPW in a Persian Gulf at Bushehr, where he attributed the material to the 1st – 3rd century AD, based on a number of parallels drawn from Indian contexts (Williamson, 1972: 100 'type 2', fig. 5; Whitehouse & Williamson, 1973: 38-9, fig. 5: d-f). Since Williamson's initial recognition of IRPW in Near Eastern contexts, further finds have appeared in excavations at Sohar in Oman, Qana' in Yemen and Kush in the U.A.E. (Kervran, 1996: 38-43; Sedov, 1996: fig. 6: 8-9; Kennet, 2004: 65-66), indicating that it circulated not only within the Persian Gulf, but right around the Arabian Peninsula. At Kush, 39 sherds of IRPW were recovered from the stratified sequence. These were distributed between Phases E-01 – E-04 dated to between the 5th – 8th centuries, although the vast majority of pieces come from Phases E-03 – E-04 suggesting that it was most common during the 7th – 8th centuries (Kennet, 2004: table 3). Besides pushing the terminal date for the class forwards, this evidence may be an indication that other IRPW finds from within the Persian Gulf and Western Indian Ocean are also later dated than has previously been supposed (Kennet, 2004: 65-6).

Origin: Gujarat, India.

Class Code: IRPW.RC

Class Name: Indian Red Polished Ware Related Class

Types: None

Illustration: Plate 53

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Similar to IRPW in having a finely levigated fabric with a sub-conchoidal fracture and evenly burnished exterior surfaces but the fabric is fired to a dirty brownish-orange or grey and appears to be unslipped or slipped with a non-coloured coating. One sherd, which is consistently reduced to grey, has painted bands of black, red and white.

COLOUR		
Colour	Yellowish red	Brown
Core	5YR 5/6	7.5YR 5/2
Margin	Same as core	Same as core
Surface	Same as core	Same as core

Integrity: A small and disparate selection of pieces held together by some unifying characteristics such as the fine fabric, sub-conchoidal fracture and evenly burnished surfaces. With a larger sample, IRPW.RC would most likely be sub-divided into a number of individual classes.

Vessel Forms: Small globular jars. Only body sherds represented in the assemblage from Siraf but these appear to belong to similar vessel type to more typical IRPW.

Surface Treatment: Some pieces have painted decoration. This consists of bands or red flanked by bands of black and separated by bands of white around the shoulder.

Fabric: Hard, compact, finely levigated fabric fired to a dull orange, orange reduced to grey in the core or reduced grey throughout.

Inclusions: None or very fine and occasional.

Specifications: Average density with a compact structure, a soft feel and a clean or semi-conchoidal fracture.

Parallels and Dating: 1st – 8th century. There are no known parallels for this type of material, however the apparent similarities with IRPW suggest that the dating is most likely to be the same (see discussion above).

Origin: Gujarat, India.

Class Code: HARMIC

Class Name: Hard Micaceous Red Ware

Types: JR23, JR45-47

Illustration: Plate 54

Clay: Earthenware **Production**: Wheel-made/handmade

Defining Characteristics: Hard, compact, orange fabric with some fine sandy inclusions. Can be slightly flaky but not brittle like the main Indian cooking pot classes such as BUFRAB or IRAB. All vessel are closed jars with various types of sharply everted rim, mostly elaborated with some banding or tooling reminiscent of IRPW. An important distinguishing feature of HARMIC is that all of the small to medium sized vessel are wheel-made while only large jars, namely JR47 are handmade. Most vessels are left plain but some are decorated with simple black bands around the shoulder or inside the rim.

COLOUR	
Colour	Reddish brown/Red/l. red
Core	5YR 5/4
Margin	10R 5/6
Surface	10R 6/6

Integrity: Within the Indian assemblage HARMIC is clearly distinct from other categories, however there remains some internal variation within the class suggesting that the material comes from several centres of production. Whether these all occur within a limited geographic area cannot be determined.

Vessel Forms: Medium to large sized jars with rounded globular bodies and rims that can be simple and everted but are more often complex with a sharply everted flange accentuated by a series of tooled or thrown depressions and ridges.

Surface Treatment: Most vessels are plain and un-burnished. A few sherds have brownish-red slip covering the exterior together with simple fairly wide bands of black pigment applied to the shoulder or the inside of the rim.

Fabric: Hard, compact, orange fabric with some variation towards darker red or a hint of grey in the core. The fabric always contains fine flecks of mica visible on the surface. Within the fresh section it is possible to make out numerous fine sandy inclusions and abundant micro spalling voids with yellow halos.

INCLUSIONS		
	1	2
Colour	Voids	Grey/white
Size	≤0.7mm	≤0.1mm
Shape	Rounded	Angular
Freq.	3-5%	3%
Sorting	Good	V. good
ID	Micro spalling	Sandy grits

Specifications: High density with a compact structure, a fine gritty feel and a fine irregular fracture.

Parallels and Dating: 7th – 10th century? HARMIC from Siraf is similar to BPCR in the Williamson Collection (Priestman, 2005a: 213-14, pl. 89). The temptation is to assign this material to the same class code; certainly it belongs to same general production tradition, however there also appear to be differences include less use of chaff temper and an absence of heavily grit tempered fabrics. Equally there are pieces within the class that may have been assigned to the catch-all FIRE class used for a certain variety of material in the Williamson Collection and at Kush (Kennet, 2004: 66). These are fairly generic categories and precise definition seems to be problematic.

Origin: South Asia, possibly India or Pakistan.

Class Code: BRISAN

Class Name: Brittle Sandy Painted Ware

Types: None

Illustration: Plate 55

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Brittle, light pinkish-orange coloured fabric with abundant finely sorted sandy inclusions that are particularly apparent on the weathered and slightly pitted interior surfaces. Vessel tend are relatively thin walled and include a range of jar types, some of which have a distinctive projecting collar around the shoulder. The most characteristic feature is the exterior surfaces which are often covered with a white wash and painted with crude red and/or black decoration mostly consisting of bands. Other types of decoration also occur including rusticated appliqué strips, more complex appliqué decoration and stamped motifs.

COLOUR	
Colour	L. red/reddish yellow/ very pale brown
Core	2.5YR 6/6
Margin	5YR 6/6
Surface	10YR 7/4

Integrity: With a larger assemblage, BRISAN could most likely be subdivided into a number of separate classes, based primarily on the style and application of the decoration. In particular pieces with stamped or more complex appliqué decoration appear to belong to somewhat different traditions. At the same time, all of the material shares general characteristic in common, particularly in the firing and the brittle sandy quality of the fabric.

Vessel Forms: Wide medium sized jars which appear to turn quite sharply at the waist. Also particularly characteristic is a form with a projecting flange at the base of the shoulder.

Surface Treatment: Various types of decorative arrangement occur, mostly involving different combinations of slip and painting. Exterior surfaces can either be slipped in reddish-brown and painted in black or slipped with a white wash and painted in red, black or more often a combination of both colours. Painted decoration tends to consist of sets of broad bands around the shoulder region. In some cases these frame more complex elements such as feely painted rosettes. Vessels with a raised collar around the shoulder invariably have a rough unfinished surface bellow the collar and are smoother, slipped and painted above the collar. Some painted pieces also have a flattened appliqué cordon around the shoulder rusticated with deep, closely spaced, oblique impressed lines. Single examples exist within the assemblage from Siraf of a vessel with more complex appliqué decoration consisting of a vertically impressed cordon and a button with a triangular impression in the centre and another vessel with small multiple stamped rosettes.

Fabric: Hard, compact fabric that is brittle and flaky with a slightly laminar structure and abundant fine sandy inclusions and fine flecks of mica. The fabric is generally thoroughly oxidised to brownish-orange or red though sometimes it turns darker shades towards the core.

INCLUSIONS	
	1
Colour	Grey/white
Size	≤0.1mm
Shape	Angular
Freq.	7%
Sorting	V. good
ID	Quartz sand

Specifications: Average or slightly low density with a compact granular structure, a fine gritty feel and a fine irregular fracture.

Parallels and Dating: 7^{th} – 10^{th} century? Some characteristics of BRISAN are similar to PAINT from Kush (Kennet, 2004: 66-67), however this pottery is handmade. Parallels for some pieces

might also be drawn with the painted Indian pottery from Sohar (Kervran, 1996: 38, fig. 6: 13-21), though none of this material displays the same freely painted decoration as is found on BRISAN from Siraf. While it remains difficult to find an exact parallel for this class, it appears to be related to the repertoire of painted Indian pottery associated with the first few centuries of the Islamic period.

Origin: India.

Class Code: SBBW

Class Name: Soft Black Burnished Ware

Types: JR22

Illustration: Plate 56

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Soft, porous, brittle and crumbly fabric that is consistently reduced to dark grey, occasionally turning to a dull orange or brown. The fabric contains some organic inclusions and unlike other Indian classes, very little visible mica. The fabric has a low specific density. Vessel surfaces are mostly plain apart from some tooled grooves around the rim and shoulder and a high burnishing on the exterior, which where well preserved, appears oily black. Most often though, the surfaces are degraded. Vessels are mostly medium sized, round bottomed cooking-pots with a short constricted neck, a sharply everted flange rim and relatively thick walls.

COLOUR	
Colour	Grey with contrasting colour in the core
Core	5GY 2.5/1 - Greenish black
Margin	10YR 5/2 - Greyish brown
Surface	10YR 3/2 - Very dark greyish brown

Integrity: Coherent, well defined and readily recognisable class though with some variation in the hardness and nature of coarse inclusions, which may be indicative of multiple centres of production.

Vessel Forms: Medium sized cooking-pots with a rounded base, a low globular body, a short neck and a sharply everted flange rim that can be left plain, but is more often accompanied by a series of tooled grooves along the exterior lip, or the interior of the flange and flange/neck interface.

Surface Treatment: Exterior surfaces are heavily burnished to a glossy black but this has mostly degraded leaving a plain matt surface. Vessels can be plain or simply decorated with a wide shallow depressed band immediately bellow the neck or a series of shallow tooled bands covering parts of the rim, flange interior and neck.

Fabric: Very soft and brittle, heavily reduced earthenware with a consistent grey surface and sharply defined discolouration in the core. Often a dark black layer is sandwiched by greenish-grey towards the margins or the reverse can occur with the fabric turning lighter towards the centre. In section the core appears laminated and is typically tempered with thin fragments of crushed shell and some fine sub-rounded grit inclusions. Some mica does occur but this is much less evident than with other Indian classes.

INCLUSIONS		
	1	2
Colour	White	grey
Size	≤2mm	≤0.4mm
Shape	Angular	Sub-rounded
Freq.	7%	Occasional
Sorting	V. poor	Fair
ID	Crushed shell	Stone grit

Specifications: Low density with a soft porous structure, a rough feel and an irregular laminar fracture.

Parallels and Dating: 7th – 9th century. This is the same class as SBBW in the Williamson Collection (Priestman, 2005a: 212-13) and from Kush (Kennet, 2004: 66). At Kush a small cluster of sherds occur in the phased sequence between Phases E-02 – E-04 dated to the 7th – early 9th centuries. Thereafter remaining sherds appear to be residual (Kennet, 2004: 66, table 3).

Origin: India, west coast.

Class Code: BUFRAB

Class Name: Buff Red and Black Ware

Types: JR24-29, OC6

Illustration: Plate 57

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Hard and brittle sandy textured fabric that tends to be fired to a light pinkish-buff or can be somewhat reduced to murky orange-grey, but always has flecks of mica visible on the surface. Vessels include a range of small to medium sized jars generally with a wide short neck and sharply everted rim. Exterior surfaces are covered with a reddish-orange slip which stops on the interior just inside the neck/shoulder angle. Apart from the slip exterior

surfaces can be plain or marked with repeated impressed designs or aligned linear 'pedalling' marks. Exterior surfaces vary in colour from the red of the slip to zones of dark brown or black. Blackening appears to be from use rather than firing.

COLOUR		
Colour	Pink	Grey/reddish-brown
Core	5YR 7/4	5YR 5/1
Margin	Same as core	5YR 5/4
Surface	Same as core	Same as margin

Integrity: Coherent well defined class. Some potential variation but generally consistent and distinctive.

Vessel Forms: Small to medium sized jars or cooking-pots with a low wide profile and most likely rounded bases. Vessels are generally wide mouthed with a short neck and a sharply everted flange rim. Rims are generally fairly simple but include a range of distinctive types. One characteristic vessel type has a flange projecting from the shoulder (OC6).

Surface Treatment: Exterior surfaces are covered in a reddish-brown or reddish-purple coloured slip which stops on the interior just inside the neck/shoulder interface. The slip surface is almost invariably slightly worn but occasionally where it is better preserved, shows evidence of burnishing. Other common types of decoration include simple raised or incised bands around the shoulder or more complex stamped or incised patterning either as a single horizontal register or covering a larger zone of the body.

Fabric: Hard and brittle, slightly porous fabric with abundant coarse sandy inclusions. Generally it is fired to a relatively light pinkish-buff or murky orange-grey. On reduced pieced some darkening occurs towards the core.

INCLUSIONS		
	1	2
Colour	Semi-translucent white/red	Red
Size	0.1-3mm	<0.1-1mm
Shape	Sub-rounded	Sub-rounded
Freq.	10%	0-3%
Sorting	Good	Poor
ID	quartz	Red stone, slightly burnt out

Specifications: High specific density with a compact granular structure, a gritty feel and an irregular somewhat laminar fracture.

Parallels and Dating: 8th – 10th century. This is the same class as IRBS in the Williamson Collection (Priestman, 2005a: 214-15). Limited independent dating evidence exists for this class; however it represents the main South Asian cooking-pot class at Siraf indicating that it is likely to share the same dating as the main occupation of the site.

Origin: India, west coast.

Class Code: LINVES

Class Name: Large Indian Storage Vessels

Types: JR48

Illustration: Plate 58

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Fairly hard and brittle, vegetal tempered fabric with flecks of mica visible on the surface and occasional coarse inclusions. The fabric tends to be fired to a dull orange-brown darkening to grey in the core. Vessels are all large, thick-walled jars with a fairly narrow neck and a robust fattened, everted, flange rim. The exterior of the neck is often marked with a groove just above the angle change with the shoulder. Exterior surfaces appear to have originally been covered with a red slip similar to BUFRAB, but in most cases this has worn away.

COLOUR	
Colour	Grey/reddish yellow
Core	5YR 5/1
Margin	5YR 5/6
Surface	5YR 5/6

Integrity: Rather a small selection of sherds and some variation is evident in the fabric but typologically this is a consistent and distinctive category.

Vessel Forms: Large thick walled storage-jars with robust sharply everted and fattened flange rims.

Surface Treatment: Exterior surfaces appear to have been covered with a red slip but it is not clear if all vessels had the same surface treatment.

Fabric: Hard but brittle and slightly porous, low density, sandy textured fabric with abundant vegetal inclusions that have burnt out leaving short linear voids. The fabric tends to be predominantly oxidised to dull orange-brown but turns darker towards the core.

Inclusions: Frequent short linear voids visible on the surface and in section from burnt-out vegetal inclusions and occasional and very mixed coarse inclusions.

Specifications: Low to average density with a porous structure, a rough feel and an irregular somewhat laminar fracture.

Parallels and Dating: 8th – 10th century. Very close parallels for LINVES jars from Siraf come from Period I at Manda (Chittick, 1984: fig. 44: a) and Level III at Sohar (Kervran, 2004: fig. 11: 17-18), both roughly contemporary with the main phase of occupation at Siraf. Clearly this type of storage-vessel had a wide circulation in this period though they may not have been present at any site in abundance. LINVES are the only type of large storage vessel of Indian origin, and as such they provide a potentially important insight into the pattern of goods circulation, especially when viewed in relation to other known transport vessels originating within the Persian Gulf and Far East.

Origin: India, west coast.

Class Code: IRAB

Class Name: Indian Red and Black Ware

Types: JR30

Illustration: Plate 59

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Brittle, sandy textured, micaceous, reddish-brown earthenware with patchy black fire blackening on the exterior. Interior and exterior surfaces are covered with a brick-red slip, though this is often badly degraded. The main form represented is a wide-mouthed cooking-pot with a strongly everted rim. The surfaces have a slight burnish or polish but this is usually worn away.

COLOUR		
Colour	Red/reddish brown	Brown/red/redd-ish brown
Core	10R 5/8	10YR 5/3
Margin	Same as core	2.5YR 4/6
Surface	5YR 5/6	5YR 5/6

Integrity: Coherent class closely related to but distinguishable from BUFRAB.

Vessel Forms: Sherds all belong to a low wide mouthed cooking-pot with a rounded base and a sharply everted flange rim, often with a squared lip.

Surface Treatment: Interior and exterior surfaces are covered with a dark purplish or reddish-orange coloured slip which appears blackened from use over much of the body and was originally burnished on the exterior. Other decoration includes a low raised ridge around the

shoulder and tooled grooves concentrated mostly around the shoulder, lip or inside of the flange.

Fabric: Soft, brittle earthenware with a fine, abrasive, sandy texture, fired to a reddish-brown with patchy areas of fire blackening from use. The cores are either consistently oxidised or slightly reduced to grey. The fabric contains abundant, poorly-sorted, sub-angular quartz grains in addition to smaller, mixed, sandy elements and high levels of mica.

INCLUSIONS		
	1	2
Colour	Translucent white/pink	Silver or gold
Size	0.1 - 1mm	≤0.1mm
Shape	Sub-rounded	Flakes
Freq.	5 - 10%	Occasional
Sorting	Fair	Good
ID	Quartz grains	Mica

Specifications: Average density with a soft porous granular structure, a gritty feel and a fine irregular laminar fracture.

Parallels and Dating: 11th – 14th century? This is the same as IRAB in the Williamson Collection (Priestman, 2005a: 211-12, pl. 88). The class also compares closely with examples noted in Islamic levels at Qala'at al-Bahrain dated to the 14th – 16th centuries (Frifelt, 2001: 87, 91, figs. 149: b; fig. 151) and from surface collections made at the site of al-Mataf, which was occupied between the 14th - 17th centuries (Hansman, 1985: fig. 11: a, c). At Kush the same class code has been applied to a group of reddish-brown South Asian cooking-pots that are found distributed throughout the sequence, but with a particular concentration in the earliest phase, (W-01), dated to the 4th/5th century through to Phase E-03/E-04 dated to the 8th/9th century (Kennet, 2004: 66, table 3). Although this would appear to indicate an early dating for the class, re-examination of the sherds in question (Priestman, 2011a) indicates that most actually compare closely with the earlier dated category BUFRAB. IRAB thus appears to the main Indian cooking-pot class that evolves out of the earlier BUFRAB tradition.

Origin: India, west coast.

Class Code: INCOP

Class Name: Mixed Indian Cooking-Pots

Types: OO

Illustration: None

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Hard, brittle sandy textured fabrics with varying levels of silver and gold mica flecks visible on the surface. Vessels are mostly small the medium sized cooking-pots with wide mouths and sharply everted rims. Surfaces are mostly plain but can be slipped or decorated with incised lines or raised bands.

Colour: Various

Integrity: Generic and extensively mixed.

Vessel Forms: Small to medium sized cooking-pots or jars with a wide mouth and sharply everted flange rim.

Surface Treatment: Some pieces are slipped and burnished or marked with incised decoration, tooled grooves around the shoulder, lip or flange interior or a raised band around the shoulder.

Fabric: Various, hard sandy and micaceous. Tends to be fired to orange brown or grey.

Specifications: Various.

Inclusions: Various.

Parallels and Dating: Not known.

Origin: South Asia.

East African Coarse Wares

Class Code: EACOP

Class Name: East African Cooking-Pots

Types: BR71, JR31

Illustration: Plate 60

Clay: Earthenware **Production**: Handmade

Defining Characteristics: Fairly hard and brittle coarse fabric containing abundant gold mica flecks and abundant grit temper. The fabric tends to be fired to a dull pinkish or yellowish-orange with fire blackening on the exterior and some discolouration through the core. Vessels are handmade with saggy profiles and uneven rims. Some vessel types have incised or impressed decoration on the exterior.

COLOUR		
Colour	Red/Brown	Brown/light brown/very pale brown
Core	10R 5/6	7.5YR 5/4
Margin	7.5YR 5/4	7.5YR 6/4
Surface	Same as margin	10YR 7/4

Integrity: Certain attributes are consistent and allow one to distinguish the material from handmade cooking pots derived from other regions such as those from South Asia; however there is considerable variation in the nature and frequency of coarse inclusions and in firing colour and vessel form indicating that it should be possible to distinguish between a number of different classes given access to a larger sample.

Vessel Forms: Handmade vessels with uneven profiles. The main vessel type is a closed mouthed jar or cooking-pot with a saggy, everted 'S' profile rim (JR31). Other types include a thick walled bowl with a squared rim (BR71).

Surface Treatment: Decoration appears to be type specific. Cooking-pot JR31 can be plain or more often has a simple girdle of incised decoration around the shoulder, often in the form of arcing lines that intersect, or a double set of wavy lines. BR71 is always plain.

Fabric: Fairly hard but very brittle and generally slightly porous fabric containing abundant flecks of gold mica and different kinds of coarse inclusions, some of which produce small zones of spalling on the surface. The fabric tends to fired to a dull pinkish or yellowish-orange with strong blackening on the surface, which may have resulted from use rather than the original firing.

Inclusions: Mixed coarse grit inclusions such as crushed red or black platelets, rounded quartz inclusions and gold mica. The nature and frequency of coarse inclusions varies widely within the generic EACOP class.

Specifications: Low density with a loose somewhat laminar structure, a harsh feel and a hackly fracture.

Parallels and Dating: 8th – 12th century. Much of the EACOP exported from East Africa to the Middle East belongs within the so called 'Tana tradition', which describes handmade vessels circulating roughly within the area of 'Swahili speaking cultures' along the East African coast (Horton, 1996b: 243). EACOP includes material of diverse origin and the dating varies according to specific type. The main type represented (JR31) has a well-developed 'S' profile rim and simple incised decoration. This fits within the general tradition of baggy 'S' profile rimmed cooking pots such as: Type 1a from Shanga, which is found particularly concentrated in Phases 3-4 in the main Trench 6-10 sequence dated to the 9th century (Horton, 1996b: fig. 168: a-d, table 11); Types 1a-d at Manda found in Periods I and II (Chittick, 1984: figs. 56-59); and, Period 1a Types 1 and 2 and Period 1b Type 1 from Unguju Ukuu (Juma, 2004: figs. 6.2: 1-11; 6.3: 1-11; 6.8: 1-2, 4-8). None of these assemblages, however, contains an exact match for JR31. Most of examples cited have a more sinuous profile and lack the specific decorative motif found on the

examples of JR31 from Siraf. The closest parallel for this type at Shanga is the rare category, Type 6, which is believed to be an import, possibly from the Comoros Islands (Horton, 1996b: 254, fig. 171: g). This identification is further supported by the material illustrated from six 'Dembeni Phase' sites of the 9th – 10th century, which include large numbers of vessels similar to JR31 with a rolled rim and incised decoration consisting of a simple band of intersecting arcs (Wright, 1984: figs. 11: g-k; 13: d-i). No known parallels exist for the square rimmed bowl in the assemblage from Siraf (Type 71), though again they appear most similar to some thick walled bowls from the Comoros Islands, though in this case, without any evidence for the use of red graphite surface treatment (Wright, 1984: fig. 14: a-b, t).

Origin: The closest parallels that can be established for Types JR31 and BR71 from Siraf are examples from the Comoros Islands. However, regional differences within the Tana tradition is still any area that requires substantial additional research (Fleisher & Wynne-Jones, 2011).

Blue/Green Alkaline-Glazed Wares

Class Code: TURQ.YG

Class Name: Yellow-Green Alkaline-Glazed Ware

Types: JR12

Illustration: Plate 61

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Porous, fine, sandy buff-yellow coloured fabric with a light olive-green glaze often covering the interior only. The most characteristic form is a basin with upright sides, a single, or several raised bands, low lug-handles and a distinctive bifurcating rim. Other bowl forms with variations on the bifurcating rim appear to belong to the same sub-class. The class can be most obviously be differentiated from TURQ.T buy the forms, the glaze and to a lesser extent the fabric.

COLOUR	
Colour	Pale yellow
Core	5Y 8/3-4
Margin	Same as core
Surface	2.5Y 8/4

Integrity: Coherent well-defined class.

Vessel Forms: Wide jars or basins with upright sides, applied crescent shaped lug handles, raised bands and a slightly in-turning rim with a distinctive notch or bifurcation. Also some bowl forms with the same fabric and glazing.

Surface Treatment: Glazed, often on the interior only with a light olive-green coloured glaze that can be badly weathered and degraded. Exterior surfaces mostly appear to be marked with simple incised decoration consisting of a broad wavy band or bands below the rim.

Fabric: Fine-grained, gritty, slightly brittle, buff-yellow earthenware. Under the hand lens numerous sandy inclusions dominated by quartz grains are visible, together with numerous small voids.

INCLUSIONS		
	1	2
Colour	Semi-opaque white	Grey or red
Size	≤0.5mm	<0.5mm
Shape	Sub-angular	Sub-angular
Freq.	5 - 10%	0 - 3%
Sorting	V. good	V. good
ID	Quartz grits	Other sandy elements

Specifications: Average to light density with a compact granular structure, a gritty feel and an irregular fracture.

Parallels and Dating: 5th – mid-8th century. TURQ.YG is equivalent to ALK.2 in the Williamson Collection (Priestman, 2005a: 234). The light olive-green glaze fits most closely with the description of Kennet's earlier alkaline glazes (Kennet, 2004: 'TURQ.1 & 2', 29). The class is characterised by a distinctive type (BR12) with bifurcating rim dated by Williamson on the basis of its absence both from 3rd – 5th century levels at Coche and [mostly] from the 8th - 9th century foundation levels at Siraf (Williamson, 1971-72: 10-11). A more reliably basis for dating its is provided by the evidence from Kush, where small numbers of the same type (Type 64) occur in the stratified sequence in Periods I and II, dated to the 5th – 7th/8th centuries (Kennet, 2004: table 16). The occurrence of the class in the earliest contexts from Siraf and on sites from Bushehr where appliqué decorated Alkaline Glazed Ware is absent (Priestman, 2005b), suggests that TURQ.YG went out of circulation before the mid-8th century.

Origin: No specific work has been carried out on this sub-category, however petrographic analysis undertaken on a range of TURQ.T specimens from Siraf indicated that there were several different manufacturing centres all based in southern Iraq (Mason & Keall, 1991: 57). The close relationship between TURQ.T and TURQ.YG would suggest that these results should equally apply to this category.

Class Code: TURQ.T

Class Name: Turquoise Alkaline-Glazed Ware

Types: BR25-28, BR30, JR5-11, JR13, JB3, OC2, OC4, H3

Illustration: Plates 62-66

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Monochrome turquoise or blue-green coloured glaze usually covering both the exterior and interior, though on closed forms the glaze often appears thin and discoloured on the interior. The fabric is light buff-yellow with a fine gritty feel and sometimes contains small, rolled quartz grains. The fabric can be quite brittle though often it is hard. Vessels include a wide range of jars and bowl and other specialised types.

COLOUR	
Colour	Pale Yellow
Core	5Y 8/3-4 or 2.5Y 7-8/3
Margin	Same as core
Surface	Same as core

Integrity: Coherent well-defined class with limited variation.

Vessel Forms: The class encompasses a broad range of forms and functional types. Vessel types appear to be the most useful criterion for sub-dividing the long-lived Alkaline-Glazed Ware tradition.

Surface Treatment: TURQ.T typically has a relatively well-preserved dark turquoise-blue or lighter turquoise-blue glaze covering the interior and exterior. Lighter pieces on the whole appear to represent the same glaze colour but in a more degraded condition. Certainly lighter and darker blue glaze is represented across all the same forms. Apart from the glaze, most pieces are undecorated. Exceptions to this include Type JR5 or its associated body sherds: OC2 that have appliqué decoration consisting of round flattened buttons, straight or wavy strips and sometimes more complex decorated rosettes. Often the necks of these vessels are decorated with heavy rilling or an incised ‘saw-tooth’ line. Other decorated vessels include JR10 with complex deep gouged decoration covering a large part of the body. Finally there are heavy jars ornamented with a chain ridge placed around the shoulder or waste. Appliqué decoration and gouged designs appear to be particularly characteristic features of decoration only found on Blue/Green Alkaline-Glazed Ware of the Early Islamic period. Chain-ridges possibly have a longer currency.

Fabric: Fine-grained, gritty, slightly brittle, buff-yellow earthenware. Under the hand lens some pieces have numerous sandy inclusions dominated by well-rounded quartz grains, together with numerous small voids.

INCLUSIONS	
	1
Colour	Semi-opaque white
Size	≤0.5mm
Shape	Sub-rounded
Freq.	0 - 3%
Sorting	Good
ID	Quartz grits

Specifications: Average to light density with a compact granular structure, a gritty feel and an irregular fracture.

Parallels and Dating: Late 8th – 10th century. TURQ.T is equivalent to ALK.1 in the Williamson Collection (Priestman, 2005a: 234-39, pl. 90). Alkaline-Glazed Ware is first documented in the Persian Gulf region from the 3rd century BC (Kennet, 2004: 29). Evidence from al-Mataf suggests that small quantities may have continued in circulation as late as the 15th century (Kennet, 2004: 29-30), although material of such a late date would be better placed within the post Sgraffiato monochrome glaze tradition, represented here by MONO.LG1-2. A more conventional terminal dating for TURQ.T is provided by the evidence from Shanga in East Africa where the class tails off dramatically after Phase 8 in the Trench 6-10, suggesting a decline in circulation during the 10th century (Horton, 1996b: 277, fig. 197). This conclusion appears to be supported at Sharma in Yemen, where only a few sherds occur on the surface or in the lowest levels of the site, the latter of which can be dated to the late 10th century (Rougeulle, 2005: 226-27).

Origin: Petrographic thin-section analysis conducted on specimens of Types JR5/OC2, JR9 and JB3 from Siraf indicated a close comparison to kiln furniture and waster material collected within the vicinity of al-Basra in southern Iraq and now housed in the Metropolitan Museum in New York (Mason & Keall, 1991: 52-53, 57). More recent petrographic analysis of samples recovered during survey in the Deh Luran plain seems to support the location of production for this class within southern Iraq (Hill, Speakman & Glascock, 2004: 597).

<u>Moulded Monochrome Glazed Wares</u>

Class Code: GLAMO.Y

Class Name: Yellow Glazed Moulded Ware

Types: BR91-92

Illustration: Plate 67

Clay: Earthenware **Production**: Moulded

Defining Characteristics: Small thin-walled vessels with fine moulded decoration and a badly degraded bright yellow glaze. The fabric is very fine and compact and fired to oxidised tones of creamy-buff or orange.

COLOUR		
Colour	Reddish yellow	Pale yellow
Core	5YR 7/6	2.5Y 7/3
Margin	7.5YR 7/4	Same as core
Surface	Same as margin	Same as core

Integrity: More than one fabric is represented within the class so objects of a clearly unified concept and design were evidently being manufactured at different production centres.

Vessel Forms: Small, thin-walled vessels with simple squared rims. The most common types appear to be a shallow open dish, often with a lobed rim and pronounced internal ridges (BR91). Also common is a half closed bowl with moulded decoration on the exterior (BR92).

Surface Treatment: Covered on both interior and exterior surfaces with a white slip and the remnants of 'canary yellow' glaze, the original colour of which is difficult to determine due to its degraded condition. Facing surfaces - interiors of open bowls and exteriors of closed bowls and jars - are marked with detailed moulded decoration, often double lined borders below the rim flanked with hanging loops or filled with foliar patterning.

Fabric: Hard, very finely levigated, oxidised buff-yellow or light orange fabric with no visible inclusions. Fractured surfaces tend to be clean and sub-conchoidal.

Inclusions: None

Specifications: Average density with a compact structure, a smooth feel and a clean sub-conchoidal fracture.

Parallels and Dating: Late 8th – 9th century. A number of features suggest strong parallels between this class a Green Moulded Ware (GM) imported from the Far East, including the monochrome yellow or green glaze, the intricate moulded decoration, thin walls, small vessel size and particular vessel forms, especially the shallow open dish type (BR91). If GLAMO.Y represented in imitation of GM, then it should be dated no earlier than the first introduction of GM as an import to the Persian Gulf. GM appears to have been amongst the early East Asian imports to the region appearing sometime within the later 8th century and probably going out of circulation before the end of the 9th century.

Origin: The cream coloured fabric on some pieces is indicative of Iraqi production. This would fit with the relatively early dating of this class that places it amongst the earliest examples of the Islamic lead-glaze tradition, which appears to have flourished initially within Iraq and later to have been disseminated to Iran (Priestman, 2005a: 104-27). The more orange firing quality of some pieces may also point to dual production of the class within Iran, though clearly such a

scheme may be a gross over simplification. The problem requires further testing through petrographic analysis.

Opaque-Glazed Wares

Class Code: OPAQ.W

Class Name: Monochrome White Opaque-Glazed Ware

Types: BR3, BR46-54, BR56-57, BB25-30, JR14, OC4

Illustration: Plate 68

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, light-yellow fabric with a thick, plain, opaque white glaze covering the interior and exterior. The glaze is poorly fitted and has a tendency to exfoliate from the body. Most pieces are open vessels, particularly bowls with a gentle flaring rim and cleanly turned squared foot ring. Some closed forms are represented but these are not as commonly associated with OPAQ.W as with some coloured categories, such as OPAQ.PS and OPAQ.B.

COLOUR	
Colour	Pale yellow
Core	2.5Y 8/3
Margin	Same as core
Surface	Same as core

Integrity: Coherent, well-defined class. Only where the glaze has partially or wholly exfoliated is it difficult to determine which Opaque-Glazed Ware sub-class a sherd belongs to.

Vessel Forms: The commonest form is an open bowl with a gently flaring rim and raised vertical ridges on the interior accompanied by slight notches in the rim. The inside of the bowl can be flat (BB25) or have a distinctive sharp step down to the interior floor (BB27). The underside always has a finely turned, squared foot ring. This may have chronological significance as it mirrors a similar change noted in the introduction of the 'stepped floor' in connection with Chinese Yue Wares during the 9th.

Surface Treatment: Covered over the interior and exterior with a plain white opaque glaze. Otherwise plain apart from the internal ridge and notch in the rim of BR3.

Fabric: Finely levigated, hard, creamy-yellow earthenware with a fine irregular fracture. The fabric can be un-tempered, but more often it has some poorly-sorted, rounded quartz inclusions.

INCLUSIONS	
	1
Colour	Translucent white
Size	<0.5 - 1mm
Shape	Rounded
Freq.	0 - 5%
Sorting	Poor
ID	Quartz grains

Specifications: Low density with a compact structure, a rough feel and a fine irregular fracture.

Parallels and Dating: Early 9th – 10th century. OPAQ.W is the same as TIN.W1 in the Williamson Collection and YBTIN from Kush (Priestman, 2005a: 239-40; Kennet, 2004: 32). Evidence from Siraf indicates that OPAQ.W was introduced as one of the first elements in the 'Samarra horizon' during Period 4 of the Site A sequence (Whitehouse, 1979b: 52, fig. 3). A study of the surface occurrence of pottery in connection with closely dated individual palace structures from Samarra, indicates that OPAQ.W was not introduced until after the foundation of the main city in AD 836 (Northedge & Kennet, 1994: 33).

Origin: Southern Iraq.

Class Code: OPAQ.C

Class Name: Cobalt Decorated Opaque Glazed Ware

Types: BR3, BR46-47, BR49, BB25-26, BB28, BB30

Illustration: Plate 69

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, light-yellow fabric with a thick, opaque white glaze covering the interior and exterior. This is decorated with trails of crisp dark cobalt blue lines. Forms include mostly simple open bowls.

Integrity: Coherent well-defined class.

Surface Treatment: Covered in an opaque white glaze decorated with dark cobalt-blue pigment applied minimally as trailed lines or brushwork forming either abstract lines or pseudo-calligraphic and floral patterns. Cobalt pigments react in a different manner to copper oxide used in OPAQ.TS and instead of running into the glaze in diffuse splashes, sits slightly proud of the surface and remains stable lending itself to a more controlled application.

Fabric: See OPAQ.W

Parallels and Dating: Early – mid-9th century. OPAQ.C is the same as TIN.CT in the Williamson Collection (Priestman, 2005a: 242-43). This class does not occur at Kush and should not be confused with COBALT (see OPAQ.TS 'Parallels and Dating' below). Evidence from Siraf suggests that OPAQ.C was introduced together with OPAQ.W in Period 4 of the Site A sequence as one of the first innovations of the 'Samarra horizon', which appears later in the sequence than the coin hoard in Period 1 of the Great Mosque dated AD 803-04 (Whitehouse, 1979b: 52, 56, fig. 3). A study of surface finds from Samarra has indicates that OPAQ.C does not occur anywhere on the main city site itself, but only at the site of Qatul dated to AD 834-35 (Northedge & Kennet, 1994: 25). From this evidence it appears that the class must have had a very short currency, as Samarra was founded only a year later in AD 836. The class is almost certainly an imitation of the rare Chinese blue and white ware from the Gongxian kilns in Hunan; the only complete examples of which have been recovered from the Belitung shipwreck dated to around the mid-9th century (Guy, 2001-02: 20, 25, figs. 10-11).

Origin: Southern Iraq.

Class Code: OPAQ.WC

Class Name: White on Cobalt Opaque-Glazed Ware

Types: BR3, BR55, BB25, OC4

Illustration: Plate 70

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, light-yellow fabric with a thick, opaque cobalt-blue glaze covering the interior and exterior. Types BR3 and OC4 appear to be monochrome cobalt blue, while BR55 has a bichrome effect of decoration over-painted in white.

Integrity: Coherent and distinctive class.

Vessel Forms: Monochrome cobalt-blue vessels include small simple bowls and a lamp. Bichrome white on cobalt pieces are restricted to the distinctive class-specific type with straight flaring walls, a triangular lip and a sharp angle at the base. The base is wide and flat with a turned recess in the middle reminiscent of the 'bi-disc' base associated with early Chinese porcelain and Yue Ware.

Surface Treatment: Covered over the interior and exterior with a monochrome cobalt-blue glaze that can be left plain or is over-painted with white decoration. Decorative motifs appear stylistically closely related to OPAQ.C consisting of minimal vertically aligned registers if pseudo calligraphy. This scheme is essentially a colour reversal of that found on OPAQ.C with white on cobalt-blue as opposed to cobalt-blue on white. The latter appears far more visually striking and appears to have been produced more extensively. The use of cobalt pigment as the predominant glaze colorant is also likely to have been more costly.

Fabric: See OPAQ.W

Parallels and Dating: Early – mid-9th century. The strong stylistic association between OPAQ.WC and OPAQ.C and use of cobalt pigment suggests that these two classes are most likely to be chronologically associated. OPAQ.C appears as one of the earliest elements of the 'Samarra horizon' together with OPAQ.W (see above). Specific parallels for this colour combination have not been identified elsewhere.

Origin: Southern Iraq.

Class Code: OPAQ.TS

Class Name: Turquoise Splashed Opaque-Glazed Ware

Types: BR3, BR46-47, BR50, BR53-54, BR57-58, BB25-27, BB30, JR14-15, OC4

Illustration: Plate 71

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, light-yellow fabric with a thick, opaque white glaze covering the interior and exterior. Surfaces are decorated with diffuse splashes of bright turquoise copper oxide pigment. The glaze is poorly fitted and has a tendency to exfoliate from the body.

Integrity: Coherent well defined class.

Vessel Forms: The class covers a similar wide range of vessel forms to OPAQ.W. Most vessels are open bowls. Lamps seem to be disproportionately well represented.

Surface Treatment: Plain white glaze with splashes of turquoise blue or green copper oxide that react in an unstable manner and diffuse within the glaze melt. Splashes cover the facing surfaces only: interiors of bowls and lamps and exteriors of jars.

Fabric: See OPAQ.W

Parallels and Dating: Mid-9th – 10th century. OPAQ.TS is the same as the turquoise splashed component of TIN.TBS in the Williamson Collection and COBALT from Kush (Priestman, 2005a: 241; Kennet, 2004: 32-33). As I have previously noted, 'COBALT' is a misleading appellation as these pieces are splashed with turquoise copper oxide, not the cobalt blue, which is associated with a separate and earlier dated category (OPAQ.C). Although Whitehouse's terminology leaves some doubt, it would seem that OPAQ.TS appears at Siraf as part of the second stage in the 'Samarra horizon' in Period 5 of the Site A sequence (Whitehouse, 1979b: 52, fig. 3). Similarly at Kush, OPAQ.TS appears a Phase later than OPAQ.W in Phase E-06 dated to the 9th – 11th centuries (Kennet, 2004: 32-3, table 3). This picture is supported by a study of surface finds at

Samarra which produced abundant finds of the class from areas occupied from AD 836 to 885 - 895 (Northedge & Kennet, 1994: 29).

Origin: Southern Iraq.

Class Code: OPAQ.TBS

Class Name: Turquoise and Black Splashed Opaque-Glazed Ware

Types: OC4

Illustration: Plate 72

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, light-yellow fabric with a thick, opaque white glaze covering the interior and exterior. Surfaces are decorated with diffuse splashes of bright turquoise copper oxide and black manganese pigment. The glaze is poorly fitted and has a tendency to exfoliate from the body.

Integrity: Coherent well defined class though fragments only baring copper green splashes would be assigned to OPAQ.TS.

Vessel Forms: Similar repertoire of vessel forms to OPAQ.TS.

Surface Treatment: Zones of turquoise and black splashing on the interior. Turquoise tends to run into the glaze and appear diffuse while the manganese reacts in a more stable manner forming solid blotches.

Fabric: See OPAQ.W

Parallels and Dating: Mid-9th – 10th century. This is the same class as the turquoise and black splashed component of TIN.TBS in the Williamson Collection (Priestman, 2005a: 241, pl. 117) and COBALT at Kush (Kennet, 2004: 32-33). Dating for OPAQ.TBS should be the same as OPAQ.TS as these two groups are stylistically very closely related (see OPAQ.TS 'Parallels and Dating' above).

Origin: Southern Iraq.

Class Code: OPAQ.LG

Class Name: Opaque-Glazed Ware with Monochrome Gold Lustre

Types: BR3, BR48-49, BR54, BB25, BB28

Illustration: Plate 73

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, light-yellow fabric with a thick, opaque white glaze covering the interior and exterior. This is over-painted with detailed gold lustre decoration that is often badly degraded and survives only as a faint yellow trace. Where completed degraded OPAQ.LG sherds are indistinguishable from OPAQ.W.

Integrity: Coherent well defined class but recognition is dependent on preservation.

Vessel Forms: Mostly small thin walled open vessels. Some closed forms are also represented.

Surface Treatment: Plain white glaze over painted with metallic monochrome gold lustre that appears as a yellow stain when degraded. Most decoration is very poorly preserved but where it does survive it generally consists of panels filled with repeated elements such as dashes or dots. Exteriors of bowls are often decorated with vertically aligned brush strokes.

Fabric: See OPAQ.W

Parallels and Dating: Late 9^{th} – 10^{th} century. This is the same class as the TIN.ML in the Williamson Collection (Priestman, 2005a: 244, pl. 121) and LUSTRE at Kush (Kennet, 2004: 33-34). Evidence from the Site P1 and M2 sequences at Siraf indicate that OPAQ.LG was introduced as one of the latest elements of the Samarra horizon together with GRAF.EP (Whitehouse, 1979b: 54, fig. 4). A study of surface finds from Samarra suggests that these events took place at the very end of the 9th or more likely the beginning of the 10th century, as there have been no finds of OPAQ.LG from the main city at Samarra which was occupied up until at least AD 885 - 895 (Northedge & Kennet, 1994: 29, 33).

Origin: Southern Iraq.

Class Code: OPAQ.LR

Class Name: Opaque-Glazed Ware with Monochrome Ruby Lustre

Types: None defined

Illustration: Plate 74

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, light-yellow fabric with a thick, opaque white glaze covering the interior and exterior over-painted with monochrome ruby-red lustre. Lustre painting is often badly degraded and survives only as a faint coloured trace.

Integrity: Coherent well defined class but recognition is dependent on preservation.

Vessel Forms: Mostly small to medium sized open bowls, one close vessel is represented by a non-diagnostic body sherd so the original for is not certain.

Surface Treatment: Plain opaque white glaze over-painted with metallic ruby-red lustre that appears as a faint coloured stain when degraded. Most decoration is very poorly preserved but where evident appears to be similar to that associated with OPAQ.LG consisting of panels filled with repeated elements such as dashes or dots. Exteriors of bowls are often decorated with vertically aligned brush strokes.

Fabric: See OPAQ.W

Parallels and Dating: Mid – late 9th century. This category falls within the definition of TIN.PL in the Williamson Collection (Priestman, 2005a: 244-45, pl. 120). A distinction has been drawn between polychrome and monochrome lustres in terms of the technical and chronological development of the tradition (see below). Normally 'ruby' red lustre is placed amongst the polychrome lustre category, however in this case, red is the only lustre colour used. It is therefore not entirely clear where this category belongs. If placed amongst the polychrome lustres, it may be earlier dated than OPAQ.LG. Unlike that category, significant quantities of polychrome lustre have been recovered from the main city site of Samarra indicating that the class was in circulation between AD 836 when the city was founded and AD 885 - 895 when it was abandoned (Northedge & Kennet, 1994: 33).

Origin: Southern Iraq.

Class Code: OPAQ.LP

Class Name: Opaque-Glazed Ware with Polychrome Lustre

Types: BR3, BB26, BB28

Illustration: Plate 75

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, light-yellow fabric with a thick, opaque white glaze covering the interior and exterior. This is over-painted with a combination of copper-brown, gold lustre and ruby-red lustre. Lustre painting is often badly degraded and survives only as a faint coloured trace.

Integrity: Coherent well defined class but recognition is dependent on preservation.

Vessel Forms: Mostly small to medium sized open bowls.

Surface Treatment: Plain white glaze over-painted with metallic ruby-red, copper-brown and gold lustre that appears as a faint coloured stain when degraded. Most decoration is very poorly preserved but where evident appears to be similar to that found on OPAQ.LG consisting of panels filled with repeated elements such as dashes or dots. Exteriors of bowls are often decorated with vertically aligned brush strokes.

Fabric: See OPAQ.W

Parallels and Dating: Mid – late 9th century. This is the same class as the TIN.PL in the Williamson Collection (Priestman, 2005a: 244-45, pl. 120). Unlike OPAQ.LG, significant quantities of OPAQ.LP have been recovered from the main city site of Samarra indicating that the class has an earlier dating and was in circulation between AD 836 when the city was founded and AD 885 - 895 when it was abandoned (Northedge & Kennet, 1994: 33).

Origin: Southern Iraq.

Class Code: OPAQ.PS

Class Name: Polychrome Splashed Opaque-Glazed Ware

Types: BR3, BR50, BR52, BR58, BB25, BB27, BB29-30, JR14-15

Illustration: Plate 76

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, light-yellow fabric with a thick, opaque white glaze covering the interior and exterior decorated with bright splashes of green, turquoise-blue, brownish-yellow and purple or black. Compact colour combinations occur on the facing surfaces: interior of bowls and exteriors of jars. Exteriors of bowls tend to be splashed but more minimally and often only with one colour, generally green or turquoise-blue.

Integrity: Coherent and distinctive class. Some potential cross over with OPAQ.B.

Vessel Forms: A mixture or simple medium sized open bowls and closed jar forms. Closed forms are far more common in this category than with other Opaque-Glazed Wares apart from OPAQ.B.

Surface Treatment: Colours are mostly applied in crude radiating vertical stripes. Remaining white zones are sometime filled in with spots or elementary motifs. All of the colours run into the glaze and into one another giving a haphazard splashed appearance.

Fabric: See OPAQ.W

Parallels and Dating: Mid-9th – 10th century. This class can at times be difficult to distinguish from its closely related clear lead-glazed counterpart, SPLASH.P1 and the two groups generally appear to be conflated within the archaeological literature. The only differentiating featured between the two is the slightly brighter and more finely levigated creamy-yellow fabric and the thick opaque quality of the glaze associated with OPAQ.PS. Otherwise it seems that these two groups must be closely related and are therefore likely to share a similar dating. For the discussion of dating see SPLASH.P1 below.

Origin: Southern Iraq.

Class Code: OPAQ.T

Class Name: Monochrome Turquoise Opaque-Glazed Ware

Types: BR3, BR46, BR49-50, BR56, BR58, BB25, BB27, OC4

Illustration: Plate 77

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, light-yellow fabric with a thick, opaque monochrome turquoise glaze covering the interior and exterior.

Integrity: Coherent well defined class. Could be confused with TURQ.T but the fabric is more finely levigated.

Vessel Forms: Wide range of forms mostly bowls but also a number of different types of closed vessel. Type range is similar to OPAQ.W.

Surface Treatment: Opaque monochrome turquoise-blue glaze covering both the interior and exterior.

Fabric: See OPAQ.W

Parallels and Dating: Mid-9th – 10th century. This is the same class as the TIN.T in the Williamson Collection (Priestman, 2005a: 243, pl. 118). In the discussion of Opaque Glazed Wares from Siraf and Kush (Whitehouse, 1979b; Kennet, 2004: 31-34, tables 3; 18-19) there has been no indication of the dating of coloured monochromes, they are however unlikely to belong to the earliest phase of the Samarra horizon and were probably introduced as part of the diversification of Opaque Glazed Wares from the mid-9th – 10th century.

Origin: Southern Iraq.

Class Code: OPAQ.B

Class Name: Monochrome Black or White on Black Opaque-Glazed Ware

Types: BR3, BR46, BR50, BR57, BB25, BB27, JR15-16

Illustration: Plate 78

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, light-yellow fabric with a thick, opaque black glaze covering the interior and exterior. Some vessels are also decorated with splashes of white. Surfaces tend to be slightly degraded and white pigment can appear as a silvery shadow. It is not clear exactly what the appearance of these vessels would have been when in their original condition.

Integrity: Coherent well defined class. Some potential overlap between this class and OPAQ.PS, particularly for closed vessels that share the same forms.

Vessel Forms: A reasonably wide range of forms, mostly simple open bowls but also a number of closed vessels. Closed vessels are better represented in association within OPAQ.B than in most Opaque Glazed Ware sub-classes. Closed vessels are very similar in form to those associated with OPAQ.PS and there is clearly stylistic overlap between these two sub-classes.

Surface Treatment: Monochrome black glaze, sometimes with limited splashed of white. On open bowls this can be arranged in rough cross motif occupying the whole of the interior of the vessel. Areas of black colouring have a tendency to take on an iridescent sheen.

Fabric: See OPAQ.W

Parallels and Dating: Mid-9th – 10th century. Strong typological and stylistic parallels between the OPAQ.B and OPAQ.PS indicate that this class is most likely to belong to the second phase of the Opaque Glazed Ware tradition dated from the mid-9th century. Specific parallels for this colour combination noted in the assemblage from Siraf have not been identified elsewhere.

Origin: Southern Iraq.

Class Code: OPAQ.BW

Class Name: Black on White Opaque-Glazed Ware

Types: BR3, BR50, BR58, BB25

Illustration: Plate 79

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, light-yellow fabric with a thick, opaque white glaze covering the interior and exterior decorated on the interior with diffuse splashes of black manganese pigment.

Integrity: Coherent well defined class.

Vessel Forms: All small to medium sized open bowls.

Surface Treatment: Opaque white glaze covering the interior and exterior decorated on the interior with splashes of black manganese, often in broad radial, vertically arranged stripes similar to those associated with OPAQ.PS.

Fabric: See OPAQ.W

Parallels and Dating: Mid-9th – 10th century. Stylistically this appears to belong to the colour splashed categories of Opaque Glazed Wares introduced during a second phase starting from the mid-9th century. Three sherds of what appear to be the same class were recovered from the phased sequence at Kush in Phase E-06 dated generally to the 9th century (Kennet, 2004: 33).

Origin: Southern Iraq.

Class Code: OPAQ.BT

Class Name: Black on Turquoise Opaque-Glazed Ware

Types: BR3

Illustration: Plate 80

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, light-yellow fabric with a thick, opaque turquoise-blue glaze covering the interior and exterior decorated on the interior with diffuse splashes of black manganese pigment.

Integrity: Coherent distinctive category.

Vessel Forms: Small open bowls.

Surface Treatment: Opaque turquoise-blue glaze covering the interior and exterior decorated on the interior with diffuse splashes of black manganese arranged in broad radial vertically aligned stripes.

Fabric: See OPAQ.W

Parallels and Dating: Mid-9th – 10th century. Stylistically this appears to belong to the colour splashed categories of Opaque Glazed Wares introduced during a second phase starting from the mid-9th century. Specific parallels for this colour combination noted in the assemblage from Siraf have not been identified elsewhere.

Origin: Southern Iraq.

Class Code: OPAQ.CP

Class Name: Eggshell/White Ware Painted with Coloured Opaque Glaze

Types: None

Illustration: Plate 81

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Small or medium sized jars with a compact, finely levigated, light cream-coloured fabric and distinctive surface decoration consisting of painted lines of coloured opaque glaze on top of a plain unglazed surface. Other than the surface decoration, the vessel types appear to be the same as those associated with EGG.PI and WHITE.PI. Decoration includes the use of thick opaque glaze coloured cobalt-blue and yellow. The colours and style of application suggests a close connection between this category and OPAQ.C.

COLOUR	
Colour	Pale yellow
Core	2.5Y 8/2-3
Margin	Same as core
Surface	2.5Y 8/2

Integrity: Coherent and very distinctive class.

Vessel Forms: Small thin walled beakers with a flaring neck or medium sized jars with a rounded body and handle attached at the shoulder.

Surface Treatment: Plain unglazed surfaces decorated with thick opaque glaze applied as fairly crude painted decoration which sits proud of the body. Most of the decoration is applied as lines of cobalt-blue with bright orange/yellow used to block in and fill components of the decoration.

Fabric: Compact, finely levigated, low or medium density fabric fired to a light-cream or orange-buff colour. The fabric is smooth with a chalky texture, and contains either no visible inclusions or occasionally isolated and varied coarse elements and voids. The fabric appear to be closely related and possibly the same as that associate with Opaque-Glazed Wares (see OPAQ.W).

Inclusions: None or occasional varied.

Specifications: Low to medium density with a compact chalky structure, a smooth feel and a clean semi-conchoidal fracture.

Parallels and Dating: Early – mid-9th century. The use of cobalt-blue diluted within an opaque glaze medium appears technically and stylistically identical to the decoration associated with OPAQ.C. Indeed the existence of OPAQ.CP concurs exactly with the results obtained by a combination of microscopic examination and Beta Ray Back Scatter analysis of OPAQ.C sherds from Hira, which indicated that where the cobalt-blue pigment was applied directly to the body it appeared turbid and stood proud of the surface, while on pieces were the colour had been applied on top of the glaze, the colour sat flat and appeared brighter (Tamari, 1995: 140). One possible reason for the use of a thicker solution when applying colour direct to the body may have been to avoid the colour being absorbed by the porous fabric. Given the evident overlap between OPAQ.C and OPAQ.CP it can be assumed that this class shares the same dating within the earliest part of the 'Samarra horizon'. The apparent scarcity of the class would support a short period of circulation. Similar material with painted decoration over a plain unglazed body also occurs at Susa (Koechlin, 1928a: pl. X: 72, 75, 78-79, 81; Kervran, 1977: fig. 28: 10-11).

Origin: Southern Iraq.

Class Code: OPAQ.N-ID

Class Name: Non-Identified Opaque-Glazed Ware

Types: None defined

Illustration: None

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, light-yellow fabric with a thick, opaque glaze covering the interior and exterior. The glaze has a poor fit within the body often causing it to exfoliate. Pieces in this category have either lost their glaze entirely or the glaze surface has degraded to such an extent that the surface colour can no longer be identified.

Integrity: Clearly recognisable category but the condition of the material does not allow pieces to be assigned to a specific sub-class.

Vessel Forms: Mostly small to medium sized open bowls. Also some closed vessels.

Surface Treatment: Covered with a degraded opaque glaze.

Fabric: See OPAQ.W

Parallels and Dating: Early 9th – 10th century. Pieces potentially dated any time within the currency of the Opaque Glazed Wares, see above.

Origin: Southern Iraq.

Clear Splashed-Glazed Wares

Class Code: SPLASH.GW1

Class Name: Green and White Splashed-Glazed Ware - Cream Body

Types: BR3, BR50-51, BR60, BB31

Illustration: Plate 82

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Open bowls with a hard, finely levigated, light cream coloured fabric covered on the interior and whole exterior with a clear lead-glaze, splashed with diffuse zones of dark bottle green. Green splashed contrast with the clear glaze showing white over the body and can be arranged randomly or in vertical streaks.

COLOUR	
Colour	Pale yellow
Core	2.5Y 8/3-4
Margin	Same as core
Surface	Same as core

Integrity: Consistent application of glazing and decoration but with some subtle variation in fabric quality.

Vessel Forms: Various open vessels, most commonly a medium sized open bowl with a flaring rim (BR3) and a carefully turned foot ring (BB31).

Surface Treatment: Clear lead-glaze coving the interior and exterior splashed randomly or in vertical streaks with dark green. The glaze is often badly weathered losing its shiny surface and taking on an iridescent sheen.

Fabric: Hard, compact, finely levigated light cream-coloured fabric with very fine dark inclusions a numerous very small voids.

INCLUSIONS		
1	2	3
black	Grey or red	Voids
<0.1mm	<0.5mm	≤0.1mm
sub-angular	Sub-angular	Sub-rounded
<3%	0 - 3%	3%
far	V. good	Poor
stony grit	Other sandy elements	Air pockets

Specifications: Average density with a compact structure, a fine gritty feel and a clean irregular fracture.

Parallels and Dating: Mid-9th – 10th century. This is the same as SPL.GW with Fabric 84 in the Williamson Collection (Priestman, 2005a: 248-49, pls. 108-09). The glaze colour scheme of white with dark green splashes is clearly an imitation of GWSG manufactured in southern China and first imported to the Middle East during the 9th century. At Siraf Clear Splashed Glazed Wares, both polychrome and green and white colour schemes, together with Opaque Splashed Glazed Ware, emerge as part of the second stage in the 'Samarra horizon' during Period 5 of the Site A sequence; a phase later than OPAQ.W and OPAQ.C (Whitehouse, 1979b: 52, fig. 3). A recent study of surface finds from different historically dated areas of Samarra has confirmed the fact that SPLASH.GW and SPLASH.P were introduced later than the earliest elements of the Samarra horizon, probably during the mid-9th century and certainly before the occupation of al-Mutawakkiliyya in AD 861 (Northedge & Kennet, 1994: 33).

Origin: Closer study of Splashed-Glazed Ware fabrics is likely to reveal multiple production centres, as already suggested by the variation in course inclusions. By analogy with other categories such as Opaque-Glazed Ware, Turquoise Alkaline-Glazed Wares and Eggshell Wares, categories with pale cream coloured fabrics are more likely to come from southern Iraq.

Class Code: SPLASH.GW2

Class Name: Green & White Splashed-Glazed Ware - Orange Body

Types: BR3, BR50, BB25, BB31, JR17, OC4

Illustration: Plate 83

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Mostly open and some closed vessels with a hard, finely levigated, orange coloured fabric covered on the interior and whole exterior with a white slip and a clear lead-glaze, splashed with diffuse zones of dark bottle green. Green splashed contrast with the clear glaze showing white over the cream slip. Splashes can be arranged randomly or in vertical streaks.

COLOUR		
Colour	Reddish-yellow	Pink
Core	5YR 7/6	7.5YR 7/4
Margin	5YR 6/6	7.5YR 8/4
Surface	Same as margin	Same as margin

Integrity: Consistent application of glazing and decoration but with fairly extensive variation in fabric quality.

Vessel Forms: Mostly open bowls and together with some closed jars.

Surface Treatment: Covered with a white slip and a clear lead-glaze splashed randomly or in vertical streaks with dark green. The glaze is often badly weathered losing its shiny surface and taking on an iridescent sheen.

Fabric: Hard, compact, finely levigated orange-coloured fabric with occasional mixed inclusions of black, red or buff coloured grits and some small voids.

INCLUSIONS		
	1	2
Colour	Mixed	Voids
Size	≤0.3mm	≤0.2mm
Shape	Rounded	Sub-angular
Freq.	<3%	2%
Sorting	Fair	Poor
ID	Mixed grits	Air pockets

Specifications: Average density with a compact structure, a fine gritty feel and a clean irregular fracture.

Parallels and Dating: Mid-9th – 10th century. This is the same as SPL.GW with Fabric 85 in the Williamson Collection (Priestman, 2005a: 248-49, pls. 108-09). For discussion of dating see SPLASH.GW1 ‘Parallels and Dating’ above.

Origin: Closer study of Splashed-Glazed Ware fabrics is likely to reveal multiple production centres, as already suggested by the variation in course inclusions. By analogy with other categories, particularly of Sgraffiatos, pieces with an orange coloured fabric are more likely to come from southern Iran.

Class Code: SPLASH.P1

Class Name: Polychrome Splashed Glazed Ware - Cream Body

Types: BR3, BR46, BR50-51, BB25, BB27, BB32, JB4, OC4

Illustration: Plate 84

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Mostly open and some closed vessels with a hard, finely levigated, light-cream coloured fabric covered on the interior and exterior with a clear lead-glaze, splashed with diffuse zones of green and yellowish-brown and in some cases dark purplish-brown or black. This class can be difficult to distinguish from OPAQ.PS which has a similar scheme of splashed decoration and a cream coloured fabric. The main differentiating features appear to be the slightly coarser body on some pieces and the thin non-opacified quality of the glaze.

COLOUR		
Colour	Pale yellow	Very pale brown
Core	2.5Y 8/4	10YR 8/4
Margin	Same as core	10YR 8/3
Surface	Same as core	Same as margin

Integrity: Consistent application of glazing and decoration but with fairly extensive variation in fabric quality and the nature and frequency of coarse inclusions. Several different production centres are represented.

Vessel Forms: Mostly medium sized open bowls with cleanly turned squared foot rings. Also some closed vessels. These appear to be more common with polychrome Splashed Glazed Ware than with green and white Splashed Glazed Ware.

Surface Treatment: Clear lead-glaze coving the interior and exterior with random splashes or vertical streaks of green, yellowish-brown or dark brown or black. Colours tend to run into one another and to cover the whole of the vessel surface. Unlike SPLASH.GW1-2, no plain white spaces are left between the coloured splashes.

Fabric: Hard, compact, finely levigated light-cream coloured fabric. Beyond these general characteristics the fabric displays extensive variation with colour ranging from bright cream to light pink and from compact and very finely levigated with no visible inclusions, to a fabric with a slightly porous structure and abundant coarse inclusions.

Inclusions: For the more heavily tempered version of the fabric see below.

INCLUSIONS		
	1	2
Colour	red or black	voids
Size	≤0.5mm	≤0.2mm
Shape	rounded	sub-angular
Freq.	5%	3%
Sorting	fair	good
ID	stony grits (volcanic?)	air pockets

Specifications: Average weight with a compact structure, a fine or rough gritty feel and a clean irregular fracture.

Parallels and Dating: Mid-9th – 10th century. This is the same as SPL.P with Fabric 84 in the Williamson Collection (Priestman, 2005a: 249, pl. 110). For discussion of dating see SPLASH.GW1 'Parallels and dating' above.

Origin: Closer study of Splashed-Glazed Ware fabrics is likely to reveal multiple production centres, as already suggested by the variation in course inclusions. By analogy with other categories such as Opaque-Glazed Ware, Turquoise Alkaline-Glazed Wares and Eggshell Wares, categories with pale cream coloured fabrics are more likely to come from southern Iraq.

Class Code: SPLASH.P2

Class Name: Polychrome Splashed Glazed Ware – Orange Body

Types: BR3, BR46, BR50-51, BB25, BB27, BB32, JR17-18, JB4

Illustration: Plate 85

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: A mixture of open and closed vessels with a hard, finely levigated, pink to light-orange coloured fabric covered on the interior and exterior with a clear lead-glaze splashed with diffuse zones of green and yellowish-brown and in very rare cases, dark purplish-brown.

COLOUR		
Colour	Pink	Light red
Core	7.5YR 7/4	2.5YR 6/6
Margin	7.5YR 8/4	Same as core
Surface	Same as margin	Same as core

Integrity: Consistent application of glazing and decoration but with fairly extensive variation in fabric quality and the nature and frequency of coarse inclusions. Several different production centres are represented.

Vessel Forms: Mostly medium sized open bowls with cleanly turned squared foot rings. Also some closed vessels. These appear to be more common with polychrome Splashed Glazed Ware than with green and white Splashed Glazed Ware.

Surface Treatment: Clear lead-glaze coving the interior and exterior with random splashes or vertical streaks of green and yellowish-brown often in an alternate arrangement. Occasionally green and yellow is combined with dark purplish-brown. Colours tend to run into one another and to cover the whole of the vessel surface. Unlike SPLASH.GW1-2, no plain white spaces are left between the coloured splashes.

Fabric: Hard, compact, finely levigated pink to light-orange coloured fabric generally with no visible inclusions. The fabric displays some variation particularly in firing colour. Ultimately the distinction made here between 'cream coloured' and 'orange coloured' fabrics (SPLASH.P1 and SPLASH.P2) may be rather arbitrary and would be better dealt with by sub-dividing the class on the basis of specific fabric composition. A larger sample would be required in order to undertake this exercise and it remains uncertain whether the fabric could be accurately classified simply on the basis of macroscopic techniques.

INCLUSIONS		
	1	2
Colour	buff	voids
Size	≤0.5mm	≤0.1mm
Shape	sub-rounded	sub-rounded
Freq.	occasional	occasional
Sorting	fair	good
ID	lime stone?	air pockets

Specifications: Average density with a compact structure, a fine gritty feel and a clean irregular fracture.

Parallels and Dating: Mid-9th – 10th century. This is the same as SPL.P with Fabric 85 in the Williamson Collection (Priestman, 2005a: 249, pl. 110). For discussion of dating see SPLASH.GW1 'Parallels and dating' above.

Origin: Southern Iran.

Early Sgraffiatos

Class Code: GRAF.EP1

Class Name: Early Polychrome Splashed Sgraffiato – Group 1

Types: BR3, BR50-51, BR59, BB25, BB27

Illustration: Plate 86

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, finely levigated, pink coloured fabric with few visible inclusions and a tight structure that appears slightly grainy under magnification. Vessels are all open bowls with simple or gently everted rims and squared or rounded foot rings. Interior and exterior surfaces are covered with a white slip with splashed colours mostly in green and yellow and occasionally purple/brown under a transparent glaze that continues over the foot and base. Interior surfaces are also decorated with broad incised lines (1mm) cutting though the white slip to reveal the darker body below. Apart from the incised decoration, GRAF.EP is very closely related stylistically to SPLASH.P1-2.

COLOUR		
Colour	Reddish yellow	Pink
Core	5YR 6/6	7.5YR 7/4
Margin	Same as core	Same as core
Surface	Same as core	Same as core

Integrity: Stylistically coherent and well defined but some variation in fabric (see below) indicating that there were several production centres for this class.

Vessel Forms: Mostly medium sized open bowls including vessels with simple straight or everted rims and low dishes with wide flange rims. The majority of vessels have squared or rounded foot rings though some dishes have a flat base.

Surface Treatment: Interior and exterior surfaces covered with a white slip and clear lead-glaze splashed with diffuse zones of bottle-green, yellowish-brown and sometimes dark purple interspersed with clear areas of white. The colours tend to run into one another and intermix. Where purple is used, it tends to be as a separator between the white background and other colours. The commonest colour scheme is green, yellow and white with green predominating, but there are pieces where yellow predominates and others with the full set of colours that includes purple. Purple never appears on pieces that do not also have green and yellow. Incised decoration consists of broad lines (1mm) generally consisting of a borders below the rim filled with oblique slashes and formal registers filling the rest of the body.

Fabric: Typically the fabric is hard, compact very finely levigated with no visible inclusions and fired to a consistent orange or pink. Under 10x magnification the fresh section often has a distinctive fine grainy or ‘furry’ appearance. Other clearly distinct fabrics have also been

included within the class, usually as one-offs. These include a piece with profuse red stony inclusions, some pieces with a fine grainy cream coloured fabric and no visible inclusions and several other categories. These groups can only be differentiated by looking at the fresh section break and would be better handled through a program of systematic thin-section analysis with access to a large sample. It is a notable feature that some of the more unusual forms such as flange rimmed dishes and pieces from the one-off category are often accompanied by fabric that is atypical.

Inclusions: None or varied.

Specifications: Average density with a compact structure, a smooth feel and a fine irregular fracture.

Parallels and Dating: Early 10th – mid-11th century. At Siraf GRAF.EP (Style I Sgraffiato) was introduced as one of the later elements in the Samarra horizon, probably during the early 10th century (Whitehouse, 1979b: 59). Certain changes that occurred in the style and production of Sgraffiato in the later 11th century allow one to distinguish GRAF.EP from the later styles of sgraffiato (Kennet, 2004: 34).

Origin: Southern Iran.

Class Code: GRAF.EP2

Class Name: Early Polychrome Splashed Sgraffiato – Group 2

Types: BR3, BR50, BB27

Illustration: Plate 87

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, levigated typically light-orange coloured fabric with abundant fine rolled spherical quartz inclusions. Vessels are all open bowls with simple or gently everted rims and squared or rounded foot rings. Interior and exterior surfaces are covered in a white slip and splashed with green and yellow decoration under a transparent glaze that continues over the foot and base. Interior surfaces are further decorated with fine incised lines (0.5mm) cut though the white slip to reveal the darker body below. Apart from the incised decoration GRAF.EP2 is very closely related stylistically to SPLASH.P1-2.

COLOUR	
Colour	Pink
Core	7.5YR 8-7/4
Margin	Same as core
Surface	Same as core

Integrity: Coherent class with well-defined consistent traits. GRAF.EP2 can only be reliably distinguished from GRAF.EP1 through examination of the fresh section break seen under magnification. At the same time, there appear to be number of further factors that differentiate these classes, including the generally pale quality of the body, the fine swirling incised decoration and the absence of purple as part of the colour repertoire.

Vessel Forms: Mostly medium sized open bowls including vessels with simple straight or everted rims and squared or rounded foot rings.

Surface Treatment: Interior and exterior surfaces covered with a white slip and clear lead-glaze splashed with diffuse zones of bottle-green and yellowish-brown interspersed by clear areas of white. The colours tend to run into one another and intermix. Incised decoration consists of fine lines (0.5mm) generally consisting of a borders below the rim filled with oblique slashes and swirling motifs filling the rest of the body.

Fabric: Hard, compact very finely levigated light-orange coloured fabric that consistently contains a background of rolled spherical quartz inclusions and occasional flecks of limestone. Otherwise similar in composition to the fabric of GRAF.EP1.

INCLUSIONS		
	1	2
Colour	opaque white	voids
Size	≤0.5mm	≤0.2mm
Shape	well rounded	rounded
Freq.	5%	3%
Sorting	v. good	fair
ID	rolled quartz	air pockets

Specifications: Average weight with a compact structure, a smooth feel and a fine irregular fracture.

Parallels and Dating: Early 10th – mid-11th century. At Siraf GRAF.EP (Style I Sgraffiato) was introduced as one of the later elements in the Samarra horizon, probably during the early 10th century (Whitehouse, 1979b: 59). Certain changes that occurred in the style and production of Sgraffiato in the later 11th century allow one to distinguish GRAF.EP from the later styles of sgraffiato (Kennet, 2004: 34).

Origin: Southern Iran.

Class Code: GRAF.EG

Class Name: Early Monochrome Green Sgraffiato

Types: BR50, BB27

Illustration: Plate 88

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, finely levigated, orange coloured fabric with few visible inclusions and a tight structure that appears slightly grainy under magnification. Vessels are all open bowls with simple rims and squared foot rings. Interior and exterior surfaces are covered with a white slip and a transparent bottle-green coloured lead glaze which continues over the foot and base. Interior surfaces are decorated with broad incised lines (1mm) cutting though the white slip to reveal the darker body below.

COLOUR	
Colour	Reddish yellow
Core	5YR 7-6/6
Margin	Same as core
Surface	Same as core

Integrity: Stylistically coherent and well defined but with some variation in fabric (see below) indicating that there may have been several production centres for this class.

Vessel Forms: Mostly medium sized open bowls including vessels with simple gently everted rims and squared foot rings.

Surface Treatment: Interior and exterior surfaces covered with a white slip and clear bottle-green coloured lead-glaze. One of the characteristic features of GRAF.EG glazing is the 'soft' quality of the surface sheen. Vessel interiors can be left plain or are more often incised with broad lines (1mm). Incised decoration is similar in style to that associated with GRAF.EP1 with double straight borders below the rim filled with oblique slashes and free-flowing swirling motifs occupying the rest of the body.

Fabric: GRAF.EG fabric displays similar characteristics to that associated with GRAF.EP1. Typically this is hard, compact and very finely levigated with no visible inclusions and fired to a strong consistent pink or orange. Under 10x magnification the fresh section often has a distinctive fine grainy or 'furry' appearance. Other clearly distinct fabrics have also been included within the class, usually as one-offs. These include pieces with a fine grainy cream coloured fabric and no visible inclusions together with several other categories.

Inclusions: Generally none.

Specifications: Average density with a compact structure, a smooth feel and a fine irregular fracture.

Parallels and Dating: Early 10th – mid-11th century. Generally monochrome green glazed sgraffiato has been associated with the late sgraffiato tradition of the mid-11th – 13th centuries. GRAF.EG has a monochrome green glaze but other features show that it clearly belongs within the early sgraffiato tradition including the repertoire of traditional 'Samarran horizon' forms, glazing on the interior and exterior, and decoration clearly linked stylistically to GRAF.EP1-2. For a discussion of the relevant dating see GRAF.EP1-2 'Parallels and Dating above'.

Origin: Southern Iran.

Class Code: GRAF.EY

Class Name: Early Monochrome Yellow Sgraffiato

Types: BR3, BR50-51, BB25, BB27, BB31

Illustration: Plate 89

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, finely levigated orange or cream coloured fabric with few visible inclusions. Vessels are mostly open bowls with simple rims and squared foot rings. Interior and exterior surfaces are covered with a white slip and a transparent yellowish-brown coloured lead glaze which continues over the foot and base. Interior surfaces are decorated with broad incised lines (1mm) cutting though the white slip to reveal the darker body below.

COLOUR		
Colour	Reddish yellow	Very pale brown
Core	5YR 7-6/6	10YR 7/4
Margin	Same as core	Same as core
Surface	Same as core	Same as core

Integrity: Stylistically coherent and well defined but with extensive variation in fabric composition (see below) indicating that there were several production centres for this class.

Vessel Forms: Mostly medium sized open bowls including vessels with simple gently everted rims and squared foot rings. Also some closed vessels.

Surface Treatment: Interior and exterior surfaces covered with a white slip and clear bright yellowish-brown coloured lead-glaze. As with GRAF.EG, one the characteristic features of the glazing is the 'soft' quality of the surface sheen. Vessel interiors can be left plain or are more often incised with broad lines (1mm). Incised decoration is similar in style to that associated with GRAF.EP1 with double straight borders below the rim filled with oblique slashes and free-flowing swirling motifs occupying the rest of the body.

Fabric: Typically the fabric is hard, compact and very finely levigated with no visible inclusions and fired to a strong consistent orange. Other clearly distinct fabrics are also included within the class including some firing to a cream colour and ones with a range of different fine grit temper including some with the same distinctive fabric associated with GRAF.EP2.

Inclusions: Typically none though see above.

Specifications: Average density with a compact structure, a smooth feel and a fine irregular fracture.

Parallels and Dating: Early 10th – mid-11th century. Generally monochrome yellow glazed sgraffiato has been associated with the late sgraffiato tradition of the mid-11th – 13th centuries. GRAF.EY has a monochrome yellow glaze but other features show that it clearly belongs within the early sgraffiato tradition including the repertoire of traditional 'Samarran horizon' forms, glazing on the interior and exterior, and decoration clearly linked stylistically to GRAF.EP1-2. For a discussion of the relevant dating see GRAF.EP1-2 'Parallels and Dating above'.

Origin: Southern Iran.

Class Code: GRAF.TL

Class Name: Thin-Lined Sgraffiato

Types: BR3, BB25, BB32

Illustration: Plate 90

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, finely levigated pink coloured fabric with few visible inclusions. Vessels are all open medium sized bowls with relatively thick walls, simple gently everted rims and squared foot rings. Interior and exterior surfaces are covered with a white slip and an almost completely degraded glaze. The original glaze colouring is not clear. The most distinctive feature of the class is the fine intricate incised decoration which is cut quite deeply into the body.

COLOUR	
Colour	Pink
Core	7.5YR 7/4
Margin	Same as core
Surface	Same as core

Integrity: Coherent class the defined largely on the basis of its degraded condition. With better glaze preservation it is not clear which category these pieces would fall into. Notably the same category has been established in the Williamson Collection and at Kush and Siraf.

Vessel Forms: Medium sized open bowls with relatively thick walls, gently everted rims and squared foot rings or a flat base.

Surface Treatment: Interior and exterior surfaces are covered with a white slip and coloured lead glaze which continues over the foot and base. The glaze is almost completely degraded. Interior surfaces are incised with particularly intricate and very fine lined sgraffiato (0.2mm) cut quite deeply into the body. The most typical motif is a series of feathered scrolls contained within vertically delimited registers.

Fabric: Generally consistent fabric which is hard, compact and very finely levigated with no visible inclusions and fired to a strong consistent pink. The fabric is similar though perhaps not identical to the main fabric associated with GRAF.EP1.

Inclusions: Generally none.

Specifications: Average density with a compact structure, a smooth feel and an irregular somewhat blocky fracture.

Parallels and Dating: Early 10th – mid-11th century. This is the same as GRAF.TL in the Williamson Collection although there are certain features of the description that do not match precisely (Priestman, 2005a: 250-51). There are no known dated parallels for this class, however the fine nature of the incised decoration and the slip and glaze covering both the interior and exterior places this group within the earlier sgraffiato tradition dated most clearly by GRAF.EP1-2, see discussion of 'Parallels and Dating' (above).

Origin: Southern Iran.

<u>Late Sgraffiatos</u>

Class Code: GRAF.H

Class Name: Hatched Sgraffiato

Types: BR61, BR63-68, BB33-34

Illustration: Plate 91

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, orange coloured fabric with no visible inclusions. Vessels are medium sized open bowls and dishes. Interiors and upper rim exteriors are covered with a white slip and a transparent glossy or monochrome green lead-glaze. Interiors are further decorated with incised sgraffiato cut through the white slip to reveal the darker body below. Plain clear glazed vessels generally have isolated splashes of green, yellowish-brown and dark purplish-brown.

COLOUR	
Colour	Red
Core	2.5YR 5/6
Margin	Same as core
Surface	Same as core

Integrity: Very coherent and distinctive class.

Vessel Forms: Medium sized open bowls and dishes with a wide range of delicately finished rims including types with a fine scalloped lip and bases that are flat and slightly concave or flat with an incised recess. Vessel forms conform to a standard range of types.

Surface Treatment: Interior and upper rim exterior covered with a white lip and a colourless or green shiny lead-glaze. Interiors of colourless vessels have isolated splashes of green, brownish-yellow and dark purplish-brown separated by blank areas of white. Splashed colour covers approximately 60% of the interior surface. Incised decoration is with medium thick lines (0.7mm) and tends to be arranged as a horizontal register filling the sides and a round panel in the bases delimited by sets of straight incised bands. Plain non-incised zones are left between the two panels and below the rim. Incised decoration consists mostly of pseudo-calligraphic motifs in more or less abstracted style with either the 'letters' or the background to the 'letters' filled with closely-spaced hatching (*c*.1mm interval). Hatched incisions are with a slightly finer stylus (*c*.0.5mm) than the main elements of the decoration.

Fabric: Extremely consistent fabric. Hard and compact with no visible inclusions and fired to a consistent strong orange-brown. Under 10x magnification the fresh section break reveals a distinctive yellow mottling or micro lime spalling. This feature is consistently present throughout the sample.

INCLUSIONS	
	1
Colour	Buff-yellow
Size	≤0.1mm
Shape	Well rounded
Freq.	7-10%
Sorting	Good
ID	Lime spalling?

Specifications: Average density with a compact structure, a fine gritty feel, and a clean irregular fracture.

Parallels and Dating: Mid-11th – 12th century. GRAF.H is equivalent to Whitehouse's Style III Sgraffiato from Siraf, which occurs in levels post-dating a coin hoard of AD 1026/7 (Whitehouse, 1970: 6). The pottery occurs over a more limited area of the surface at Siraf than the maximum extent of the city dated to the 9th – 10th century and has therefore been used as a primary 'type fossil of decline' (Whitehouse, 1975: 265). There are 47 sherds of GRAF.H at Kush within the phased sequence from Phase E-06 onwards, though peaking in Phase E-08/E-09 suggesting an 11th – 12th century date range (Kennet, 2004: 35, table 3). This dating appears to be supported

by the evidence from Shanga where the equivalent Group 5a class occurs principally between Phases 10 – 14 of the Trench 6-10 sequence, placing it in a date range of AD c.1000 – 1150 (Horton, 1996b: 289, table 14). GRAF.H is widely distributed around the western Indian Ocean occurring in East Africa at Shanga (Horton, 1996b: 284, fig. 206: a-l), Manda (Chittick, 1984: pl. 32: a-b), Kilwa (Chittick, ii.1974: pl. 11: d) and Andaro (Priestman, 2010b), on the south coast of Yemen at Sharma (Rougeulle, 2005: 228, figs. 3: 1-19; 4: 1-11) and al-Shihr (Hardy-Guilbert, 2001: fig. 4: top right) and in Oman at Ras al-Hadd (Whitcomb, 1975: 126, fig. 8: a-g, i, n-q, s), Sohar (Cleveland, 1959: fig. 4: 6; Williamson, 1973b: 19; Kervran, 2004: figs. 29: 12; 33: 1-3; 34: 8-13; 36: 2, 7-11) 'Arja mine complex (Costa & Wilkinson, 1987: 88, 227) and in the north Old Ghubb 'Ali (de Cardi, 1975: fig. 9: 102-03).

Origin: Tiz, Makran coast, southern Iran. Stein's test excavation of a waster pile associated with a production site at Tiz produced a large concentration of stylistically uniform Hatched Sgraffiato (Stein, 1937: 90-91, pl. IV) identical to the material from Siraf and the other finds from East Africa, Yemen and Oman.

Class Code: CHAMP

Class Name: Champlevé Sgraffiato

Types: None

Illustration: Plate 92

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, orange coloured fabric with no visible inclusions. Interiors and upper rim exteriors are covered with a white slip and a transparent glossy lead-glaze. Interiors are further decorated with broad shaved strips cut out of the slip or more complex cut designs. These elements are generally combined with conventional sgraffiato.

COLOUR	
Colour	Light red
Core	2.5YR 6/6
Margin	Same as core
Surface	Same as core

Integrity: Coherent and distinctive class.

Vessel Forms: Mostly medium sized open bowls.

Surface Treatment: Interior surfaces are covered with a white slip and a clear, shiny, yellow-tinted lead glaze that steps onto the rim exterior. Decoration typically consist of *c*.15mm wide lines shaves out of the white slip that radiate in an irregular fashion from the interior. This champlevé decoration is often combined incised sgraffiato lines forming horizontal bands around the top of the rim or the base interior or lines running parallel or in complementary

alignments to the shaved elements. Some vessels have a thin wash or green pigment following the top of the rim flange. Other forms of champlevé that appear less common include more complex cut away pseudo-calligraphic or floral designed again generally combined with sgraffiato elements.

Fabric: Hard and compact with no visible inclusions and fired to a consistent strong orange-brown.

Inclusions: Mostly none.

Specifications: Average density with a compact structure, a fine gritty feel and a clean irregular fracture.

Parallels and Dating: Mid-11th – 13th century. Champlevé appears to be a relatively common element of the assemblage on the East African coast occurring at Manda and Kilwa as one of the principle sgraffiato types of the 11th – 13th centuries (Chittick, 1984: 79, pl. 32: c, f; Chittick, ii.1974: 303, pl. 111: c-d) and at Shanga from Phase 11 – 16 of Trench 6-10, again dated to the 11th – 13th centuries (Horton 1996b: 'Group 5b', 284, table 14). At Kush a small quantity appears from Phase E-10, dated to the late 13th century or later (Kennet, 2004: 37-38, table 3). There are relatively small quantities of the class represented in the assemblages from Siraf, the Williamson Collection and at Kush compared with those form East Africa and South Arabia indicating that CHAMP was probably more common as an export ware.

Origin: Tiz, Makran coast, Iran. Stein's test excavation of a large mound of firing debris adjacent to a production area that he identified at the port site of Tiz, on the Makran coast, produced a significant concentration of CHAMP and GRAF.H of a particularly uniform and recognisable style (Stein, 1937: 90-91). Similar material with pseudo-calligraphic radial shavings occurs at the neighbouring site of Qalat-i-Jamshid (Stein, 1937: pl. IV) and this appears to be the same as that represented on the majority of the sherds from East Africa and South Arabia. Variations within the Champlevé assemblage in the Williamson Collection suggest that there may also have been other production centres using the same technique and this seems to be further supported by the evidence from Siraf.

Class Code: GRAF.DI

Class Name: Deeply Incised Splashed Sgraffiato

Types: None defined

Illustration: Plate 93

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Small, deep, straight-sided bowls either with a projecting collar just below the rim or a gently everted lip. Both the interior and exterior are covered in a white slip with bright green and brown splashes and clear lead-glaze. The most distinctive aspect of the

class is the type of incised decoration which includes areas where the surface has been deeply cut away framed by conventional sgraffiato. The fabric is hard, well levigated and fired to orange or pink.

COLOUR	
Colour	Light reddish brown
Core	5YR 6/4-6
Margin	Same as core
Surface	Same as core

Integrity: Coherent and distinctive class, albeit generally represented only by occasional examples.

Surface Treatment: Interior and exterior surfaces covered in a white slip and a clear shiny lead-glaze with splashes of bright green and brown that covers the entire vessel surface. Exteriors are decorated with triangles cut deeply into the surface framed by regular sgraffiato.

Vessel Forms: Small, deep, straight-sided bowls with a gently everted or short projecting flange lip.

Fabric: Hard and compact with no visible inclusions and fired to a consistent strong orange-brown.

Inclusions: None.

Specifications: Average density with a compact structure, a fine gritty feel, and a clean irregular fracture.

Parallels and Dating: Mid-11th – 13th century. Appears to be the same as Type 5p from Shanga, small quantities of which occur between Phase 11 – 17 in Trench 6-10, dated to the 11th – 14th centuries (Horton, 1996b: 286, table 14, fig. 209: a-b). The 14th century sherds are probably residual as the GRAF tradition went out of production by the end of the 13th century. The same class has also been noted in Period II contexts dated to the 12th – 13th centuries at Manda (Chittick, 1984: pl. 34: a-b).

Origin: Southern Iran, possibly Tiz.

Class Code: GRAF.LP

Class Name: Late Polychrome Splashed Sgraffiato

Types: BR61, BR64-66, BR69, BB33-34

Illustration: Plate 94

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, orange coloured fabric with no visible inclusions. Vessels are mostly medium sized open bowls. Interiors and upper rim exteriors are covered with a white slip and a transparent glossy lead-glaze. Interiors are decorated with simple swirling sgraffiato of medium line thickness (0.75mm) incised through the white slip to reveal the darker body below. Surfaces are further decorated with isolated splashes of purplish brown, green and yellowish-brown separated by plain areas of white.

COLOUR	
Colour	Reddish yellow
Core	5YR 6/6
Margin	Same as core
Surface	Same as core

Integrity: Coherent and distinctive class.

Vessel Forms: Medium sized open bowls and dishes with a wide range of delicately finished rims including rims and bases that are flat and slightly concave or flat with an incised recess. Vessel forms are mostly the same as those associated with GRAF.H. Closed vessel types are also associated with the class.

Surface Treatment: Interior and upper rim exterior surfaces are covered with a white slip and transparent light-yellow tinted glaze. Interiors are also decorated with sparse swirling sgraffiato. Unlike the early splashed polychrome sgraffiato, splashed colours on GRAF.LP are mostly separated from one another by plain areas of white. Most vessels appear to combine three colours of splashing: purplish brown, green and yellowish-brown.

Fabric: Hard, compact well-levigated fabric with no visible inclusions fired to a consistent strong orange-brown. The fabric is darker orange than most pieces of early sgraffiato.

Inclusions: None.

Specifications: Average density with a compact structure, a fine gritty feel and a clean irregular fracture.

Parallels and Dating: Mid-11th – 13th century. This is the same as GRAF.LP in the Williamson Collection (Priestman, 2005a: 253). Stylistically, in terms of the palate and application of colour and typologically, in terms of vessel forms, GRAF.LP appears to be very closely related to GRAF.H and should on this basis share the same dating. At Kush 17 sherds of GRAF.LP occur within the phased sequence from Phase E-09 four phases after the first introduction of GRAF.H (Kennet, 2004: 37, table 3). It has not yet been established whether this is a typical chronological distribution for the class.

Origin: Southern Iran.

Class Code: GRAF.GW

Class Name: Green on White Splashed Sgraffiato

Types: None defined

Illustration: Plate 95

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, orange coloured fabric with no visible inclusions. Vessels are mostly medium sized open bowls. Interiors and upper rim exteriors are covered with a white slip and a transparent glossy lead-glaze. Interiors are typically decorated with simple relatively thick-lined sgraffiato (0.75-1mm) cut through the white slip to reveal the darker body below. This is combined with green colour splashes often as a band around the rim interior and also as patches across limited areas of the interior. The decoration scheme is closely related to GRAF.LP but only includes green splashed generally in combination with large areas of white.

COLOUR	
Colour	Reddish yellow
Core	5YR 6/6
Margin	Same as core
Surface	Same as core

Integrity: Coherent and fairly distinctive group though with obvious overlap with GRAF.LP. Sherds of the latter group lacking other colours than green would be assigned to this group making the distinction somewhat arbitrary.

Vessel Forms: Medium sized open bowls and dishes with a wide range of delicately finished rims including rims and bases that are flat and slightly concave or flat with an incised recess. Vessel forms are mostly the same as those associated with GRAF.H.

Surface Treatment: Interior and upper rim exterior surfaces are covered with a white slip and transparent light-yellow tinted glaze. Interiors are also decorated with simple sgraffiato and limited used of green splashes on white.

Fabric: Hard, compact well-levigated fabric with no visible inclusions fired to a consistent strong orange-brown.

Inclusions: None.

Specifications: Average density with a compact structure, a fine gritty feel and a clean irregular fracture.

Parallels and Dating: Mid-11th – 13th century. The class is closely related to GRAF.LP and therefore it is likely to share the same dating.

Origin: Southern Iran.

Class Code: GRAF.GYB

Class Name: Green, Yellow and Brown Splashed Sgraffiato

Types: None defined.

Illustration: Plate 96

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, orange coloured fabric with no visible inclusions. Vessels are mostly medium sized open bowls. Interiors and upper rim exteriors are covered with a white slip and a transparent glossy lead-glaze. Interiors are typically decorated with simple relatively thick-lined sgraffiato (0.75-1mm) cut through the white slip to reveal the darker body below. This is combined with continual merging splashes of mostly of green and yellow often combined with patches of brown where there are breaks in the underlying white slip cover. The class is similar to GRAF.LP but is distinguished by the general lack of separation between the colours that renders an appearance more similar to the early polychrome splashed sgraffiatos.

COLOUR	
Colour	Reddish yellow
Core	5YR 6/6
Margin	Same as core
Surface	Same as core

Integrity: Coherent and distinctive class.

Vessel Forms: Medium sized open bowls and dishes with a wide range of delicately finished rims including rims and bases that are flat and slightly concave or flat with an incised recess. Vessel forms are mostly the same as those associated with GRAF.H. Closed vessel types are also associated with the class.

Surface Treatment: Interior and upper rim exterior surfaces are covered with a white slip and transparent light-yellow tinted glaze. Interiors are also decorated with sparse swirling sgraffiato and continuous merging splashed mostly of green and yellow.

Fabric: Hard, compact, well-levigated fabric with no visible inclusions fired to a consistent strong orange-brown.

Inclusions: None.

Specifications: Average density with a compact structure, a fine gritty feel and a clean irregular fracture.

Parallels and Dating: Mid-11th – 13th century. The class is closely related to GRAF.LP and therefore it is likely to share the same dating.

Origin: Southern Iran.

Class Code: GRAF.S

Class Name: Slip-Painted Sgraffiato

Types: None defined

Illustration: Plate 97

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Small open bowls with a finely levigated, fabric and fired to consistent pink or orange. Interiors are covered in a white slip and a transparent shiny lead-glaze. The characteristic feature of the class is the decoration, which is comprised of small slip-painted spots placed between double incisions. Exteriors are mostly plain though some pieces have white slip stepping onto the exterior.

COLOUR	
Colour	Reddish yellow
Core	5YR 6/6
Margin	Same as core
Surface	Same as core

Integrity: Coherent and distinctive class that falls somewhere between the GRAF and SPW traditions.

Surface Treatment: Well-spaced diffuse splashes of green and brown combined with finely incised decoration cut through the slip to reveal a darker body below. Incised lines are often cut in parallel grooves with small, regularly spaced slip-painted spots placed in the space between.

Vessel Forms: Small, thin-walled bowls with gently everted rims or everted flange rims and flat bases with turned rings or a concave recess.

Fabric: Hard, compact, well-levigated fabric with no visible inclusions fired to a consistent strong pink or orange.

Inclusions: None.

Specifications: Average density with a compact structure, a fine gritty feel and a clean irregular fracture.

Parallels and Dating: Mid-11th – 13th century. No known parallels exist for this class although it appears to be related to the SPW tradition. At the same time, the class displays features typical of the late GRAF tradition of the Mid-11th – 13th centuries, such as the unglazed exterior and the Iranian style fabric and forms.

Origin: Southern Iran.

Class Code: GRAF.LG

Class Name: Monochrome Green Sgraffiato

Types: BR66, BR68, BR70, BB34

Illustration: Plate 98

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, orange coloured fabric with no visible inclusions. Interiors and upper rim exteriors are covered with a white slip and a glossy monochrome green lead-glaze with simple fairly sparse swirling sgraffiato cut through the white slip to reveal the darker body below.

COLOUR	
Colour	Reddish yellow
Core	5YR 6/6
Margin	Same as core
Surface	Same as core

Integrity: Generally consistent but with some variation in glaze colour ranging from bright emerald-green to dull brownish or yellowish-green. There is also some variation in the fabric indicating multiple production centres for this class.

Vessel Forms: Mostly medium sized open bowls with simple rims and a flat slightly concave base. Some closed vessel types are also represented but more commonly these lack sgraffiato (see MONO.G below).

Surface Treatment: Covered in a white slip and glossy monochrome green lead-glaze covering the interior and upper exterior combined with crude broad lined sgraffiato (1mm) decoration consisting mostly of loose swirls.

Fabric: Generally hard and compact with no visible inclusions and fired to a consistent strong orange-brown. There are also pieces included within the class with a different cream coloured fabric and some coarse inclusions. The main fabric group appears to be similar, or the same as that associated with GRAF.LP.

Specifications: Average density with a compact structure, a fine gritty feel and a clean irregular fracture.

Inclusions: Mostly none.

Parallels and Dating: Mid-11th – 13th century. This is equivalent to GRAF.G in the Williamson Collection and GGRAF from Kush (Priestman, 2005a: 255-56; Kennet, 2004: 35-36). The class occurs in abundance within the Kush sequence from Phase E-08 onwards, indicating an appearance in the late 11th century (Kennet, 2004: table 3). This date range is supported by evidence from East Africa. At Shanga, Groups E, F and G – though F in particular – appear to belong to this class, which first appears in the sequence from Phase 10, dated to the 11th century (Horton, 1996b: 284, 286, table 14). At Manda and Kilwa GRAF.G forms an important element of the 'simple Sgraffiato' assemblage, which together with other 'late Sgraffiatos', dominate the Period 2 and Ib assemblages of the mid-11th – late 13th centuries (Chittick, 1984: 79; Chittick, ii.1974: 303). Possible causes that have been given for the decline of sgraffiato at the end of the 13th include the mass import of Longquan Celadon from China or the disruptive influence of the Mongol invasion on production in southern Iran (Morgan, 1991: 78).

Origin: Southern Iran.

Class Code: GRAF.LY

Class Name: Monochrome Yellow Sgraffiato

Types: None

Illustration: Plate 99

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, orange coloured fabric with no visible inclusions. Interiors and upper rim exteriors are covered with a white slip and a glossy monochrome yellow lead-glaze with simple fairly sparse swirling sgraffiato cut through the white slip to reveal the darker body below. The glaze can be either light yellow or a darker honey-yellow often with brown patches where the underlying slip is thin or absent. The class is closely related to GRAF.M, and may potentially be an extension of the group. The key difference is that it lacks the distinctive freckling associated with that class.

COLOUR	
Colour	Reddish yellow
Core	5YR 6/6
Margin	Same as core
Surface	Same as core

Integrity: Consistent and distinctive class though it is not clear of the distinction drawn between this and GRAF.M is meaningful.

Vessel Forms: Non-diagnostic sherd represented from an open bowl form with a fairly thick wall.

Surface Treatment: Interior surface covered with a white slip and a pale yellowish-green coloured glaze with simple incised sgraffiato cut through the white slip to reveal the darker body below. The sgraffiato is relatively thick lined (1mm) and be executed in the same style as GRAF.LG.

Fabric: Hard and compact with no visible inclusions and fired to a consistent strong orange-brown. This appears to be the same fabric associated with the majority of Late Sgraffiato.

Specifications: Average density with a compact structure, a fine gritty feel and a clean irregular fracture.

Inclusions: Mostly none.

Parallels and Dating: Mid-11th – 13th century. The class is equivalent to some of the GRAF.M in the Williamson Collection where GRAF.LY and GRAF.M were treated as a single category (Priestman, 2005a: 257). The class clearly forms part of the late monochrome glazed sgraffiato tradition which is well represented in the phased sequence as Kush from Phase E-08 onwards suggesting an appearance in the late 11th century (Kennet, 2004: 35-36, table 3).

Origin: Southern Iran.

Class Code: GRAF.M

Class Name: Monochrome Mustard Sgraffiato

Types: BR68, BB34

Illustration: Plate 100

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, orange coloured fabric with no visible inclusions. Interiors and upper rim exteriors of open vessels are covered with a white slip and a rather glossy monochrome pale or honey yellow coloured lead-glaze with a fine dark-brown 'mustard' freckling. Interiors can be left plain or have simple fairly sparse swirling sgraffiato cut through the white slip to reveal the darker body below.

COLOUR	
Colour	Reddish yellow
Core	5YR 6/6
Margin	Same as core
Surface	Same as core

Integrity: Consistent and distinctive class though it is not clear of the distinction drawn between this and GRAF.LY is meaningful.

Vessel Forms: Mostly medium sized open bowls with simple rims and flat slightly concave base. Some closed vessel forms are also represented.

Surface Treatment: Interior and upper rim exterior covered with a white slip and transparent glossy monochrome yellow lead-glaze. The glaze ranges in colour from light yellow with pronounced dark-brown freckling to a deeper golden yellow with less freckling evident. Some pieces can appear patchy with areas of brown where the slip has been applied thinly. Vessels can be plain or have some incised sgraffiato cut through the white slip to reveal the darker body below. Sgraffiato tends to be in thick lines (1mm) and be executed in the same style as GRAF.LG consisting mostly of loose swirls.

Fabric: Hard and compact with no visible inclusions and fired to a consistent strong orange-brown. This appears to be the same fabric as occurs in association with the majority of Late Sgraffiato.

Specifications: Average density with a compact structure, a fine gritty feel and a clean irregular fracture.

Inclusions: Mostly none.

Parallels and Dating: Mid-11th – 13th century. This is the same as GRAF.M from Kush and some of the GRAF.M in the Williamson Collection (Kennet, 2004: 36; Priestman, 2005a: 257). The class clearly forms part of the late monochrome glazed sgraffiato tradition which is well represented in the phased sequence as Kush from Phase E-08 onwards suggesting an appearance in the late 11th century (Kennet, 2004: 35-36, table 3).

Origin: Southern Iran.

Class Code: MONO.G

Class Name: Monochrome Green Glazed Ware

Types: BR66, BR68, BR70, BB33

Illustration: Plate 101

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, orange coloured fabric with no visible inclusions. Interiors and upper rim exteriors are covered with a white slip and a clear, slightly glossy monochrome green lead-glaze. The class is closely related with GRAF.LG but lacks sgraffiato decoration.

COLOUR	
Colour	Reddish yellow
Core	5YR 6/6
Margin	Same as core
Surface	Same as core

Integrity: Generally consistent but with some variation in glaze colour ranging from bright emerald-green to dull brownish or yellowish-green. There is also some variation in the fabric indicating multiple production centres for this class.

Vessel Forms: Mostly medium sized open bowls with simple rims and a flat slightly concave base with an incised ring. Some closed vessel forms are also represented.

Surface Treatment: Interior and upper rim exterior covered with a white slip and a clear glossy monochrome green lead-glaze. Often bowls have a single or double incised band below the rim.

Fabric: Generally hard and compact with no visible inclusions and fired to a consistent strong orange-brown. There are also a few sherds with different cream coloured fabrics and some coarse inclusions. The main fabric group appears to be similar, or the same as that associated with GRAF.LP.

Inclusions: Mostly none.

Specifications: Average density with a compact structure, a fine gritty feel and a clean irregular fracture.

Parallels and Dating: Mid-11th – 13th century. This is the same as MONO.G in the Williamson Collection and equivalent to GMONO from Kush (Priestman, 2005a: 258-59; Kennet, 2004: 43-44). The class occurs in abundance in the Kush sequence from Phase E-08 onwards, indicating an appearance in the late 11th century (Kennet, 2004: table 3). This date range is supported by evidence from East African. At Shanga, Groups E, F and G – though F in particular – appear to belong to this class, which first appears in the sequence from Phase 10, dated to the 11th century (Horton, 1996b: 284, 286, table 14). At Manda and Kilwa, GRAF.G forms an important element of the 'simple Sgraffiato' assemblage, which together with other 'late Sgraffiatos', dominate the Period 2 and Ib assemblages of the mid-11th – late 13th centuries (Chittick, 1984: 79; Chittick, ii.1974: 303).

Origin: Southern Iran.

Class Code: MONO.Y

Class Name: Monochrome Yellow Glazed Ware

Types: BR70, BB33

Illustration: Plate 102

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, orange coloured fabric with no visible inclusions. Interiors and upper rim exteriors of open vessels are covered with a white slip and a rather glossy monochrome pale or honey yellow coloured lead-glaze with no sgraffiato added.

COLOUR	
Colour	Reddish yellow
Core	5YR 6/6
Margin	Same as core
Surface	Same as core

Integrity: Generally consistent but with some variation in glaze colour and fabric.

Vessel Forms: Mostly medium sized open bowls with simple rims and a flat slightly concave base with an incised ring. Some closed vessel types are also represented including a necked jar with a projecting collar below the rim.

Surface Treatment: Interior and upper rim exterior surfaces are covered with a white slip and transparent glossy yellow-tinted monochrome lead-glaze. The glaze often appears patchy brown and yellow where the slip has been applied thinly and some of the body shows through. Some examples have a distinctive splashed green strip along the rim interior.

Fabric: Hard and compact with no visible inclusions and fired to a consistent strong orange-brown. This appears to be the same fabric as occurs in association with the majority of Late Sgraffiatos.

Inclusions: Mostly none.

Specifications: Average density with a compact structure, a fine gritty feel and a clean irregular fracture.

Parallels and Dating: Mid-11th – 13th century. This is equivalent to MONO.Y in the Williamson Collection (Priestman, 2005a: 259-60). The class clearly forms part of the late monochrome glazed sgraffiato tradition which is well represented in the phased sequence as Kush from Phase E-08 onwards suggesting an appearance in the late 11th century (Kennet, 2004: 35-36, table 3).

Origin: Southern Iran.

Class Code: GRAF.N-ID

Class Name: Non-Identified/Degraded Late Sgraffiato

Types: None identified

Illustration: None

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, compact, finely levigated, orange coloured fabric with no visible inclusions. Interiors and upper rim exteriors of open vessels are covered with a white slip and a glossy lead-glaze with sgraffiato decoration cut through the white slip to reveal the darker body below. Pieces are either generally too degraded to attribute to one of the sub-class categories of late sgraffiato defined above. In a few cases there are also pieces with unusual colour schemes that do not fit within the categorisation of the assemblage that has been proposed.

COLOUR	
Colour	Reddish yellow
Core	5YR 6/6
Margin	Same as core
Surface	Same as core

Integrity: Generally even small and badly degraded sherds can be confidently attributed to the late sgraffiato tradition on the basis of the fabric and distinctive vessel forms, but in the absence of well-preserved glaze and decoration it is more difficult to ascribe pieces to a specific sub-class.

Vessel Forms: Mostly medium sized open bowls with simple rims and flat slightly concave base or a turned recess and a central boss. Some closed vessel forms are also represented.

Surface Treatment: Interior and upper rim exterior covered with a white slip and transparent glossy monochrome lead-glaze with sgraffiato cut through the white slip to reveal the darker body below.

Fabric: Hard and compact with no visible inclusions and fired to a consistent strong orange-brown.

Specifications: Average density with a compact structure, a fine gritty feel and a clean irregular fracture.

Inclusions: Mostly none.

Parallels and Dating: Mid-11th – 13th century (see discussion of dating above).

Origin: Southern Iran.

Slip Painted Wares

Class Code: SPW.BG

Class Name: Slip-Painted Ware with White and Black on a Brown Ground

Types: None defined

Illustration: Plate 103

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Fine, hard, orange-bodied ware with a solid, dark brown/black chestnut coloured slip ground, over-painted with white and covered with a transparent glossy lead-glaze, which is often completely degraded leaving a matt surface with the decoration and slip preserved. The most common form is an open bowl with lightly everted rim. A significant portion of the vessels are also closed forms.

COLOUR		
Colour	Reddish yellow, light brown	Red
Core	7.5YR 6/6	2.5YR 6/6
Margin	Same as core	Same as core
Surface	7.5YR 6/4	2.5YR 6/6.5

Integrity: Consistent grouping that contrasts with the other SPW sub-classes both in terms of ground slip colour and in style of decoration.

Surface Treatment: Mostly white painted lines and dots contrasted against the dark slip ground. The patterns are loose and fluid. Rings of dots or arching solid strips are particularly common. Quite large blank zones are often left between more intricate elements of patterning.

Vessel Forms: Open bowls with a simple gently everted rim and a flat slightly concave base or a squared foot ring. Also closed jars with a rounded body, a fatted folded or everted lip and a flat base.

Fabric: Finely levigated, hard, orange earthenware with a brittle, slightly powdery fracture and a smooth feel. The fabric has occasional small and varied inclusions, mostly opaque-white flecks and some micaceous elements, but these are both rare and rather insignificant.

INCLUSIONS	
	1
Colour	Opaque white
Size	<0.5mm
Shape	Sub-angular
Freq.	≤2%
Sorting	Fair
ID	Lime flecks

Specifications: Average density with a compact and slightly porous structure, a soft, gritty feel and a fine fracture.

Parallels and Dating: 10th – 12th century. Test excavation in the potter's quarter at Sirjan produced a mass of 10th – 11th century pottery manufactured at the site including examples of this distinctive variety of southern Iranian Slip Painted Ware (Williamson, 1971e: 177; Williamson, 1972: 27).

Origin: Southern Iran.

Class Code: SPW.YB

Class Name: Slip-Painted Ware with Yellow and Brown on a White Ground

Types: None defined

Illustration: Plate 104

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Fine, hard, orange-bodied ware with a solid white slip ground, over painted with brown, washes of yellow and occasional highlights of green and covered with a transparent glossy lead-glaze, which is often completely degraded leaving a matt surface with the decoration and slip preserved. The most common form is an open bowl with lightly everted rim.

COLOUR		
Colour	Reddish yellow, light brown	Red
Core	7.5YR 6/6	2.5YR 6/6
Margin	Same as core	Same as core
Surface	7.5YR 6/4	2.5YR 6/6.5

Integrity: Consistent grouping that contrasts with the other SPW sub-classes though there is some potential overlap with SPW.BW (see below).

Surface Treatment: Covered over the interior with a white slip ground over-painted with brown, washes of yellow and occasional highlights of green. Decorative elements include pseudo-calligraphic designs in dark paint framed by black zones and panels of hatching or dots. Colours are slightly diffuse but thin lines can be reasonably sharp.

Vessel Forms: Various open bowls with everted rims and a flat slightly concave base or a squared foot ring. Also some larger heavy rimmed dishes and closed jar forms.

Fabric: Finely levigated, hard, orange earthenware with a brittle, slightly powdery fracture and a smooth feel. The fabric has occasional small and varied inclusions, mostly opaque-white flecks and some micaceous elements, but these are both rare and rather insignificant.

INCLUSIONS	
	1
Colour	Opaque white
Size	<0.5mm
Shape	Sub-angular
Freq.	≤2%
Sorting	Fair
ID	Lime flecks

Specifications: Average density with a compact and slightly porous structure, a soft, gritty feel and a fine fracture.

Parallels and Dating: 10th – 12th century. Test excavation in the potter's quarter at Sirjan produced a mass of 10th – 11th century pottery manufactured at the site including examples of this distinctive variety of southern Iranian Slip Painted Ware (Williamson, 1971e: 177; Williamson, 1972: 27).

Origin: Southern Iran.

Class Code: SPW.BW

Class Name: Slip-Painted Ware with Brown on a White Ground

Types: None defined

Illustration: Plate 105

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Fine, hard, red-bodied bowls with a white slip ground over-painted with brown/black lines which would have been covered with a clear led-glaze. Most examples have completely lost their original glaze leaving the surfaces with a soft dry feel. The style of decoration is similar to SPW.YB.

COLOUR		
Colour	Reddish yellow, light brown	Red
Core	7.5YR 6/6	2.5YR 6/6
Margin	Same as core	Same as core
Surface	7.5YR 6/4	2.5YR 6/6.5

Integrity: Some of the material may originally have had splashes of yellow (some pieces have vague traces), which would put them within the SPW.YB sub-class. In fact, the whole group may be SPW.YB in a degraded state. However, the degradation is so consistent, that it appears most likely that this is a distinct group.

Surface Treatment: Covered over the interior with a white slip ground over-painted in brown or black pseudo-calligraphic and other scrawling line motifs framed by solid bands which often follow the rim or run just below.

Vessel Forms: Open bowls with a simple gently everted rim and a flat slightly concave base or a squared foot ring.

Fabric: Finely levigated, hard, orange earthenware with a brittle, slightly powdery fracture and a smooth feel. The fabric has occasional small and varied inclusions, mostly opaque-white flecks and some micaceous elements, but these are both rare and rather insignificant.

INCLUSIONS	
	1
Colour	Opaque white
Size	<0.5mm
Shape	Sub-angular
Freq.	≤2%
Sorting	Fair
ID	Lime flecks

Specifications: Average density with a compact and slightly porous structure, a soft, gritty feel and a fine fracture.

Parallels and Dating: 10th – 12th century. Test excavation in the potter's quarter at Sirjan produced a mass of 10th – 11th century pottery manufactured at the site including examples of this distinctive variety of southern Iranian Slip Painted Ware (Williamson, 1971e: 177; Williamson, 1972: 27).

Origin: Southern Iran.

Class Code: SPW.N-ID

Class Name: Slip-Painted Ware Non-Identified/Degraded

Types: None defined

Illustration: None

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Mostly open bowls with a fine, hard, orange fabric covered over the interior and rim exterior with a white slip with painted decoration most often with dark elements in black and brown sometimes with other colours added. Pieces within this category can be too degraded to assign to one of the other better defined sub-classes or of a different style with insufficient material to clearly define a further sub-class. There are clearly many regional styles of slip-painted wares and only a few of those are separately distinguished here.

Integrity: All clearly belong within the slip-painted ware tradition but pieces are either too degraded to assign to a specific sub-class or are of an as-yet uncategorised style.

Surface Treatment: Generally over the interior and rim exterior with a white slip ground, a clear lead-glaze and painted decoration in brown, black and sometimes other colours.

Vessel Forms: Mostly open bowls.

Fabric: Finely levigated, hard, orange earthenware generally with few coarse inclusions.

Inclusions: Generally none.

Specifications: Average density with a compact and slightly porous structure, a soft, gritty feel and a fine fracture.

Parallels and Dating: 10^{th} – 12^{th} century. Test excavation in the potter's quarter at Sirjan produced a mass of 10^{th} – 11^{th} century pottery manufactured at the site including examples of this distinctive variety of southern Iranian Slip Painted Ware (Williamson, 1971e: 177; Williamson, 1972: 27).

Origin: Southern Iran.

Frit Bodied Wares

Class Code: FRIT.EM

Class Name: Early Monochrome Frit

Types: BR33, BB19

Illustration: None

Clay: Frit **Production**: Wheel-made

Defining Characteristics: Fine, pure white frit bodied vessels with a thick, slightly opaque, crazed monochrome glaze covering the whole of the interior and exterior surfaces. The most common glaze colours are white or turquoise. Other noted colours include cobalt-blue or purple. Vessels for are all open bowls with thin walls, high foot rings and simple pointed rims. Observation of 20th century frit or stonepaste production in Iran indicates that vessels were thrown in multiple sections, luted together and dipped in a fine slip to create a smooth surface and to mask the joins (Wulff, 1966: 165-66, fig. 248). Although FRIT.EM sherds have no obvious ribbing on the body, faint horizontal striations on the inside of the base suggest that they were produced in the same manner described.

COLOUR	
Colour	White
Core	7.5YR 8/1
Margin	Same as core
Surface	Same as core

Integrity: Coherent well defined class, though original surfaces are often degraded and some pieces may have lost their original glaze colour.

Vessel Forms: Small to medium sized open bowls with gently curved flaring sides, mostly high straight foot rings and simple pointed rims.

Surface Treatment: Interior and exterior surfaces, including the interior of the foot are covered with a thick, slightly opaque, crazed white or clear monochrome glaze. Original glaze surfaces tend to be weathered away leaving a thin iridescent layer. At times this too can flake away leaving a powdery layer of glaze remnants below.

Fabric: Hard, fine, extremely brittle and crumbly, pure-white composite frit body with no visible inclusions, a compact well integrated matrix and very low density.

Inclusions: None.

Specifications: Low density with a compact granular structure, a fine gritty feel and an irregular fracture.

Parallels and Dating: Mid-11th – 13th century. The class is equivalent to form FMW: 01 and other '01' frit forms in the Williamson Collection (Priestman, 2005a: 278-79, pl. 153). A number of features including the fine body, thin walls, specific vessel forms and monochrome glazing place this within the 'early frit' tradition first represented in the phased sequence at Kush from Phase E-08 and absent from the sequence at Al-Mataf, suggesting a range of circulation from the late 11th - 13th centuries (Kennet, 2004: 47-48, table 3). The earliest inscribed date on a frit vessel from Iran belongs to a piece from the Khalili Collection marked AD 1139-40 (Morgan, 1994c: 155-56). From Siraf there is important evidence that indicates that early monochrome frit was introduced as some point later than the first quarter of the 11th century (Whitehouse, 1969: 46).

Origin: Southern Iran.

Class Code: FRIT.LM

Class Name: Late Monochrome Frit

Types: BB20

Illustration: None

Clay: Frit **Production**: Wheel-made

Defining Characteristics: The class has similar characteristics to FRIT.EM and may at times be difficult to distinguish, particularly when present as small non-diagnostic sherds. The main distinguishing characteristics are a slightly coarser, off-white fabric and vessels with thicker-walls. Where diagnostic elements are present, the vessel forms are also different and include flange or triangular rimmed vessels and thicker bases often with a short flaring rather than an upright pointed foot ring. As with FRIT.EM the predominant glaze colours for FRIT.LM are white or turquoise. Observation of 20th century frit or stonepaste production in Iran indicates that vessels were thrown in multiple sections, luted together and dipped in a fine slip to create a smooth surface and to mask the joins (Wulff, 1966: 165-66, fig. 248). The same techniques were most likely used in the production of this class too.

COLOUR	
Colour	White
Core	7.5YR 8/1
Margin	Same as core
Surface	Same as core

Integrity: Coherent well defined class, though original surfaces are often degraded and some pieces may have lost their original glaze colour.

Vessel Forms: Mostly small to medium sized open bowls.

Surface Treatment: Interior and exterior surfaces, including the interior of the foot are covered with a thick, slightly opaque, crazed white or coloured monochrome glaze. Original glaze surfaces tend to be weathered away leaving a thin iridescent layer. At times this too can flake away leaving a powdery layer of glaze remnants below.

Fabric: Hard, fairly coarse and extremely brittle and crumbly composite frit body firing to a pale yellow or orange off-white. Under 10x magnification the core appears heavily pitted with voids and rounded grains of quartz, though these can be difficult to make out against the similar background colour of the matrix.

INCLUSIONS		
	1	2
Colour	opaque-white	voids
Size	≤1mm	≤0.1mm
Shape	rounded	Sub-rounded
Freq.	5%	7-10%
Sorting	good	good
ID	quartz	air pockets

Specifications: Low density with a compact granular structure, a rough feel and a fine irregular fracture.

Parallels and Dating: 14th – 16th century or later.

Origin: Southern Iran.

Class Code: FRIT.L

Class Name: White Glazed Frit with Gold or Red Lustre

Types: BR33, BB19

Illustration: Plate 106

Clay: Frit **Production**: Wheel-made

Defining Characteristics: Fine, pure white, frit bodied vessels with a thick, slightly opaque, crazed white monochrome glaze covering the interior and exterior. Both interior and exterior surfaces have decoration over-painted in metallic gold or ruby-red lustre. Vessels are mostly open bowls with thin walls, simple pointed rims and high straight foot rings. See FRIT.EM for discussion concerning production.

Integrity: Coherent well-defined class though with most pieces the lustre is badly degraded. Where the lustre is completely degraded, the sherds would have been assigned to FRIT.EM leaving potential overlap between these classes.

Vessel Forms: Small to medium sized bowls with gently curved flaring sides. Vessels generally have thin walls, simple pointed rims and high straight and pointed foot rings with a slightly raised central boss. A few sherds also have heavier walls and other rim types.

Surface Treatment: Interior and exterior surfaces are covered with a thick, slightly opaque, crazed white glaze that can stop above the base or continue over the foot ring and underside. Interior and exterior surfaces have decoration over-painted in metallic lustre, mostly gold, but on some pieces also ruby-red. Decoration tends to be heavily degraded and the pieces are fragmentary so the overall decorative scheme is not apparent. Interior surfaces tend to be more elaborately decorated often with a complex arrangement of panels filled with intricate dots and circles.

Fabric: See FRIT.EM

Parallels and Dating: 12th – 13th century. This is the same as FRIT.L in the Williamson Collection and FRIT.L from Kush (Priestman, 2005a: 286-87, pl. 167; Kennet, 2004: 39), though the specific stylistic attributions may not be identical (see below). Lustre decorated frit has been discussed extensively. The most comprehensive study is based largely on art pieces held in museum and private collections (Watson, 1985). Watson describes a number of distinct stylistic schemes that are widely recognised within the associated literature. Each of these styles can be dated based on the small proportion of pieces that have date marks on their bases. During the initial development of the tradition within Iran there were two major decorative schools: the 'Monumental style', which generally has large figures shown in white against a solid lustre background, and the 'Minature style' where the motifs are painted in lustre, often in a series of registers. Later both schools appear to merge to form the 'Kashan style' where the same basic device is used as the Monumental style, but with the solid areas of lustre being enlivened with finely incised decoration (Watson, 1985: 45, 69, 88). Based on the epigraphic evidence, the Monumental and Minature styles appear to be dated roughly to the last twenty years of the 12th century, while the Kashan style can be dated to the first twenty-five years of the 13th century (Watson, 1985: 109). From AD 1226 - 1261 there is then a break during which no dated pieces have come to light. From AD 1261 there are further dated pieces, but by this time the tradition has changed somewhat with a different style of decoration and rather heavy vessel forms that draw clear influences from the Longquan Celadon tradition (Watson, 1985: 110, pls. 88-89). At Kush, all of the FRIT.L occurs in Phases E-10 to E-11 dated to the 13th/14th centuries indicating that they should belong to the Il-Khanid style, though stylistically one piece at least can be assigned to the Kashan style (Kennet, 2004: 39, table 3). Typologically the majority of the sherds from Siraf fit within the 'early frit' tradition of the 12th – 13th centuries while some thicker walled examples are more likely to be Il-Khanid, however this cannot be confirmed using the available stylistic criteria.

Origin: Southern Iran, Kashan? Watson – who has provided the most definitive study of the material, maintains that lustre decorated frit was produced exclusively at Kashan (Watson, 1985: 43-44). This assumption has not been tested.

Class Code: FRIT.BL

Class Name: Blue Glazed Frit with Gold Lustre

Types: BR33

Illustration: Plate 107

Clay: Frit **Production**: Wheel-made

Defining Characteristics: Fine, pure white, frit bodied vessels with a thick, slightly opaque, crazed white glaze with zones painted in blue, or an all-over, cobalt-blue coloured glaze covering the interior and exterior. Both interior and exterior surfaces have decoration over-painted in gold lustre, which appears dark, almost black against a blue ground. Vessels forms are all open bowls, mostly with thin walls and simple pointed rims. See FRIT.EM for discussion concerning production.

Integrity: Coherent well-defined class though with most pieces, the lustre is badly degraded. Where the lustre is completely degraded, the sherds would have been assigned to FRIT.EM or leaving potential overlap between these classes.

Vessel Forms: Mostly small to medium sized open bowls with gently curved flaring sides, thin walls and simple pointed rims. Other one-off types are represented including bowls with a strongly everted rim, a base with a wide, low, rounded foot ring and some closed vessels including examples with pedalled, multi-faceted sides.

Surface Treatment: Interior and exterior surfaces are covered with a thick, slightly opaque, crazed glaze that stops above the base. Two basic colour schemes are represented. One with a white glaze decorated with restricted cobalt-blue zones and over-painted with gold lustre. The second is covered with a cobalt-blue coloured glaze and over-painted with gold lustre. Lustre decoration tends to be badly degraded so the motifs and scheme are not clear. Commonly the rim is highlighted with a lustre band that is broader on the exterior.

Fabric: See FRIT.EM

Parallels and Dating: 12th – 13th century. Sherds with blue glaze are the same as FRIT.BL in the Williamson Collection (Priestman, 2005a: 286, pl. 166). Typologically most of the sherds fit within the 'early frit' tradition (see FRIT.W above) and should share the same dating as the early styles of lustre (see FRIT.EM above), however this cannot be determined on the basis of the decoration.

Origin: Kashan? (See FRIT.L above).

Class Code: FRIT.I

Class Name: Incised Decorated Monochrome Frit

Types: None

Illustration: Plate 108

Clay: Frit **Production**: Wheel-made

Defining Characteristics: Relatively coarse yellow or orange coloured frit bodied vessels with incised decoration cut into the body on the interior. Interior and exterior surfaces are covered with a thick, slightly opaque, crazed glazed that is badly degraded but appears to have been single colour, white or turquoise. Vessels are open bowls with relatively thick walls and a low, heavy foot ring and an everted flange rim. See FRIT.EM for discussion concerning the production technique.

COLOUR		
Colour	Pale yellow	Very pale brown
Core	5Y 8/2	10YR 8/3
Margin	Same as core	Same as core
Surface	Same as core	Same as core

Integrity: Distinctive category but potentially varied in terms of production source.

Vessel Forms: Medium sized open bowls with curved flaring sides, relatively thick walls and in some cases a sharply flanged rim and a broad heavy foot ring with a rounded profile and a slightly raised central boss.

Surface Treatment: Interior surfaces are decorated with fairly simple incised decoration cut into the body with lines of 1-2mm thickness. These show up darker where the glaze puddles in the incised lines. Decorative elements include simple bands or more complex elements including in one case from the assemblage from Siraf, a basic rosette pattern occupying the centre of the vessel. Both interior and exterior surfaces are covered with a thick, slightly opaque, crazed and badly degraded monochrome glaze that appears to stop just before the foot.

Fabric: Hard, fairly coarse and extremely brittle and crumbly composite frit body firing to a pale yellow or orange off-white. Under 10x magnification the core appears heavily pitted with voids and rounded grains of quartz, though these can be difficult to make out against the similar background colour of the matrix.

INCLUSIONS		
	1	2
Colour	opaque-white	voids
Size	≤1mm	≤0.1mm
Shape	rounded	Sub-rounded
Freq.	5%	7-10%
Sorting	good	good
ID	quartz	air pockets

Specifications: Low density with a compact granular structure, a rough feel and a fine irregular fracture.

Parallels and Dating: 14th – 16th century. This is the same as FRIT.IW and FRIT.IT in the Williamson Collection (Priestman, 2005a: 279, 283, pls. 154; 163). Stylistically the pieces are similar to complete examples in the Ashmolean Museum from Iran (Soustiel & Allan, 1995: figs. 5; 16-17), but apart from determining some criteria for regional differentiation of groups, little chronological information seems to be available, other than a general attribution of the group to the 12th – 13th centuries. Although incised decorated frit is not reported from Kush or al-Mataf, the coarse quality of the fabric and the types clearly link this material to the underglaze-painted frit tradition that is well represented in the al-Mataf sequence from the 14th century (Kennet, 2004: 38). It is not clear if the same dating applies to all incised decorated frit.

Origin: Southern Iran.

Class Code: FRIT.M

Class Name: Moulded and Appliqué Decorated Monochrome Frit

Types: None

Illustration: Plate 109

Clay: Frit **Production**: Moulded

Defining Characteristics: Fine, pure white, frit bodied vessels with a thick, slightly opaque, crazed monochrome white, turquoise-blue or cobalt-blue coloured glaze covering the interior and exterior. Vessels appear to have been press or slip-moulded and have complex relief decoration on the exterior or in one case a moulded appliqué button. Interior surfaces are slightly uneven and lack the horizontal regularity of the wheel-thrown frit categories. Vessels all appear to be tall bowls or cups with slightly closed upright sides and an everted lip.

Integrity: Coherent group in terms of fabric, form and mode of production. With a larger group of material the class could potentially be sub-divided according to glaze colour and the use of appliqué.

Vessel Forms: Closed bowls or cups with upright sides and a gently everted lip.

Surface Treatment: Exterior surfaces have complex moulded decoration starting just below the rim. Elements within the decoration are non-angular and have smooth rounded edges to facilitate extraction from the mould.

Fabric: See FRIT.EM

Parallels and Dating: 12th – 13th century. This is the same as FRIT.MW and FRIT.MT in the Williamson Collection (Priestman, 2005a: 279, 283-84, pls. 155; 164). Stylistically the pieces are similar to complete examples in the Ashmolean Museum from Iran (Soustiel & Allan, 1995: figs. 13-15) though the shapes are different. Further examples from museum collections are illustrated by Lane (1947: pls. 42-44, of which pl. 42: a-b appear to be the same form as pieces attested archaeologically from Siraf). These are generally ascribed to the late 12th – 13th centuries, though the archaeological evidence appears to be limited and no examples with inscribed dates are cited (Lane, 1947: 34-5; Soustiel & Allan, 1995). No moulded frit was found at Kush, which may indicate the style was introduced after the abandonment of the site at the end of the 13th century. Further evidence is clearly needed to provide a more secure dating of this class.

Origin: Southern Iran.

Class Code: FRIT.MIN

Class Name: Enamel Painted 'Minai' Frit

Types: None

Illustration: Plate 110

Clay: Frit **Production**: Wheel-made

Defining Characteristics: Only a single sherd of this class is represented archaeologically from Siraf. This has a fine, pure white, frit body with a thick, slightly opaque, crazed monochrome white glaze covering the interior and exterior. The interior of the vessel is decorated in an extremely complex manner with a variety of overlaid enamel colours contained with borders of thin lines painted in dark brown. The sherd comes from the base of an open bowl with a high straight foot ring. See FRIT.EM for discussion concerning the production technique.

Integrity: Only a single sherd represented so variability within the class unknown. Decorative style is extremely distinctive.

Vessel Forms: Open bowl with a high straight foot ring.

Surface Treatment: Interior and exterior are covered with a thick, slightly opaque, crazed monochrome white glaze decorated on the interior with extremely delicate and complex

enamel colours built up in a series of layers. Individual colours are generally contained within areas delimited by thin dark brown lines. Parts of the scheme was then filled in with blocks of deep red, cobalt-blue, light olive-green and pink. Finally further lines were added over the colours in white and a lustrous black. The fragment of the design that is visible includes a human figure displaying a characteristic rounded mongoloid face.

Fabric: See FRIT.EM

Parallels and Dating: Late 12th – early 13th century. Enamel painted frit, or 'Minai Ware' as it has been widely referred to, is closely related to the lustre, in that it represents a further technique of adding strong colour to the vessel surface in a secondary low temperature firing (Lane, 1947: 41). It is believed that enamel painted frit came from a single centre of production at Kashan alongside frit painted with lustre (Watson, 1985: 363). As with lustre, FRIT.MIN may have undergone a stylistic evolution from the earliest pieces with large 'monumental' figures towards an even more elaborate effect that involved filling the surface with 'miniature' decorative elements. The earliest pieces with inscribed dates belong to the late 12th century and it is assumed that the Mongol invasion resulted in a decline in the production of this type of pottery from the AD 1220s (Lane, 1947: 41-43). Stylistically the sherd from Siraf belongs to the 'miniature style' indicating a dating to within the late 12th – early 13th century and possibly towards the later part of this range. The assertion that the production of FRIT.MIN was terminated by the Mongol invasion is based on the lack of pieces with inscribed dates for a large part of the 13th century, however there may be other reasons why date inscribing ceased to be a popular practice and the hypothesis has never been tested archaeologically.

Origin: Kashan.

Class Code: FRIT.BW

Class Name: Blue and White Underglaze-Painted Frit

Types: None defined

Illustration: Plate 111

Clay: Frit **Production**: Wheel-made

Defining Characteristics: Frit-bodied bowls with thin or medium-thick walls and high ring bases. Most vessels have both the interior and exterior or the interior only decorated with cobalt blue, black or a combination of both under a transparent alkaline glaze. The glaze generally covers the whole of the vessel and appears shiny where preserved, though often it appears in a degraded condition. The class falls within the later frit tradition (Kennet, 2004: 38) with complex underglaze decoration and forms that display clear parallels with associated underglaze painted earthenware pottery.

COLOUR			
Colour	White	Pale yellow	Very pale brown
Core	5Y 8/1	5Y 8/2	10YR 8/3
Margin	Same as core	Same as core	Same as core
Surface	Same as core	Same as core	Same as core

Integrity: The whole class falls within a well-defined production tradition, however there are clearly many more sub-divisions within the class that could be made based on stylistic elements, vessel forms and specific aspects of fabric composition.

Surface Treatment: Complex and varied range of patterns and pictorial images which can appear sharp and detailed or diffuse. Many of the motifs mimic closely those found in association with Chinese Blue and White. Potentially the decoration may offer a key to the further sub-division and more precise dating of the class. The level and mode of glaze degradation appears to correspond in some cases with particular stylistic groups, this therefore appears to offer a further aspect that could help with the sub-division of the class.

Vessel Forms: Mostly small to medium sized open bowls.

Fabric: Stonepaste or frit body made from crushed quartz combined with small parts of china clay and crushed glass fired at low temperature. The paste feels light, soft and brittle and is usually pure white, though some less pure mixes occur which can appear red, buff or grey. Under the hand lens the body appears glassy and grainy. Some of the more impure frits can be difficult to distinguish from an earthenware body.

INCLUSIONS		
	1	2
Colour	opaque-white	voids
Size	≤1mm	≤0.1mm
Shape	rounded	Sub-rounded
Freq.	0-5%	7-10%
Sorting	good	good
ID	quartz	air pockets

Specifications: Low density with a soft, porous structure, a soft, powdery feel and fine, irregular fracture.

Parallels and Dating: 14th – 17th century or later. Frit with thick walls, a coarse fabric, underglaze painted decoration and vessel types such as the flange rim and heavy base are absent from the latest phases at Kush dating to the 12th – 13th centuries and well represented in the sequence from al-Mataf which begins in the 14th century (Kennet, 2004: 38). In Williamson's largely unpublished but potentially important excavations at Tepe Dasht-i Deh, the same sequence is observed with monochrome and lustre decorated frits occurring in Periods 1 and 2 and

underglaze painted frit with 'hammer rim' forms first appearing in Period 3 together with Longquan Celadon with appliqué fish (Williamson, 1971d: 183; 1972: 177, pl. XII: b). The latter in particular are particularly characteristic of the late 13th and earlier 14th centuries and similar examples occur, for example in the cargo of the Shinan shipwreck of AD 1323 discovered off the coast of Korea (Anon. 2006: pls. 123-25). Underglaze-painted fit then continues in production into the 20th century. Certain criteria should enable a further chronological sub-division of the class and many of the pieces encountered archaeologically within the Persian Gulf and Indian Ocean region appear to be dated to the pre-17th century period.

Origin: Southern Iran.

Class Code: FRIT.TB

Class Name: Turquoise and Black Underglaze-Painted Frit

Types: None defined

Illustration: Plate 112

Clay: Frit **Production**: Wheel-made

Defining Characteristics: Frit-bodied vessels decorated with detailed, crisp, black decoration under a bright turquoise glaze covering the interior and exterior, stopping just above the base. The turquoise glaze is either semi-translucent or opaque and has a tendency to degrade sometimes leaving only the black decoration still adhering. Most of the vessels are open bowls. Various specific types are represented; the most common is a simple bowl with a gently everted lip.

COLOUR			
Colour	White	Pale yellow	Very pale brown
Core	5Y 8/1	5Y 8/2	10YR 8/3
Margin	Same as core	Same as core	Same as core
Surface	Same as core	Same as core	Same as core

Integrity: The whole class falls within a well-defined production tradition, however there are clearly many more sub-divisions within the class that could be made based on stylistic elements, vessel forms and specific aspects of fabric composition.

Surface Treatment: A wide range of complex motifs similar in style to FRIT.BW. Potentially the decoration may offer a key to the further sub-division and more precise dating of the class.

Vessel Forms: Mostly small to medium sized open bowls.

Fabric: Stonepaste or frit body made from crushed quartz combined with small parts of china clay and crushed glass fired at low temperature. There are two main fabric groups associated with this class, a fine-grained, usually white coloured glassy frit and a coarser-grained crumbly yellow frit with large quartz inclusions and a more clayey looking matrix. Potentially it would be possible to sub-divide the class based on this distinction, although sometimes it would be difficult to maintain a consistent separation between the two.

INCLUSIONS		
	1	2
Colour	opaque-white	voids
Size	≤1mm	≤0.1mm
Shape	rounded	Sub-rounded
Freq.	0-5%	7-10%
Sorting	good	good
ID	quartz	air pockets

Specifications: Low density with a soft, porous structure, a soft, powdery feel and fine, irregular fracture.

Parallels and Dating: 14th – 17th century or later. See discussion of FRIT.BW 'Parallels and dating' above.

Origin: Southern Iran.

Class Code: FRIT.GW

Class Name: Green and White Decorated Frit

Types: None defined

Illustration: Plate 113

Clay: Frit **Production**: Wheel-made

Defining Characteristics: Frit-bodied vessels with an opaque, light-green alkaline-glaze covering the interior and exterior overlaid on the interior or exterior with fine, opaque white decoration. The glaze has a 'dry' matt surface and has a tendency to peel away in flakes.

COLOUR	
Colour	White
Core	5Y 8/1
Margin	Same as core
Surface	Same as core

Integrity: Small sample of this class represented within the Williamson Collection. Each piece is rather different, but the colour and decorative technique are consistent.

Surface Treatment: Reasonably well defined areas of crisp white decoration including spirals, concentric rings, flowers or free flowing trailing. The decoration contrasts strongly with the green background. On one sherd the white decoration is bordered with black.

Vessel Forms: Mixed closed and open vessels.

Fabric: Stonepaste or frit body made from crushed quartz combined with small parts of china clay and crushed glass fired at low temperature. The paste feels light, soft and brittle and is pure white. Under the hand lens the body appears glassy and grainy.

INCLUSIONS		
	1	2
Colour	opaque-white	voids
Size	≤1mm	≤0.1mm
Shape	rounded	Sub-rounded
Freq.	0-5%	7-10%
Sorting	good	good
ID	quartz	air pockets

Specifications: Low density with a soft, porous structure, a soft, powdery feel and fine, irregular fracture.

Parallels and Dating: 14th – 17th century or later. See discussion of FRIT.BW 'Parallels and dating' above.

Origin: Southern Iran.

Class Code: FRIT.UGP

Class Name: Underglaze-Painted Frit

Types: None

Illustration: None

Clay: Frit **Production**: Wheel-made

Defining Characteristics: Relatively coarse and soft light yellow, orange or white coloured frit bodied vessels. Interior and exterior surfaces are covered with a thick, slightly opaque, crazed plain or coloured glaze with underglaze painted decoration, often in black combined with fills of other colours such as turquoise or cobalt-blue. Vessels are open bowls with relatively thick walls,

a low, heavy foot ring and a rim that is often flanged or simply everted. See FRIT.EM for discussion concerning production techniques.

COLOUR		
Colour	Pale yellow	Very pale brown
Core	5Y 8/2	10YR 8/3
Margin	Same as core	Same as core
Surface	Same as core	Same as core

Integrity: Coherent well defined class in terms of the main attributes but certain features such as the fabric and stylistic scheme display considerable variation. Clearly the material is derived from different sources and could cover a significant range in terms of date. Further sub-divisions within the class could be made with a large body of material.

INCLUSIONS		
	1	2
Colour	Opaque-white	Voids
Size	≤1mm	≤0.1mm
Shape	Rounded	Sub-rounded
Freq.	0-5%	3-10%
Sorting	Good	Good
ID	Quartz	Air pockets

Specifications: Low density with a compact granular structure, a rough feel and a fine irregular fracture.

Vessel Forms: Small to medium sized open bowls with curved flaring sides, relatively thick walls, gently everted or flanged rims, and low heavy foot rings with a slightly raised central boss.

Surface Treatment: Interior and exterior surfaces are covered with a thick, semi-opaque crazed glaze that generally seems to stop just before the base. Vessels with this group are glazed and painted with colour combinations that do not fit within the main FRIT.BW and FRIT.TB colour schemes, but often using similar sets of colours. The most complex decoration occurs on the interior of bowls or exterior of jars. Exterior of bowls can be left plain or are sometimes painted, mostly with a simple horizontal band.

Fabric: Fairly coarse and extremely brittle and crumbly composite frit body firing to a pale yellow, orange or white. Under 10x magnification the core appears heavily pitted with voids and contains varying quantities of rounded grains of quartz, though these can be difficult to make out against the similar background colour of the matrix.

Parallels and Dating: 14th – 17th century or later. See discussion of FRIT.BW 'Parallels and dating' above.

Origin: Southern Iran.

Class Code: FRIT.EI

Class Name: Enamel Imitation Frit

Types: None defined

Illustration: Plate 114

Clay: Frit **Production**: Wheel-made

Defining Characteristics: Straight-sided, thin-walled, frit-bodied bowls with brightly coloured decoration over a thick, glossy, well-fitted white glaze coving both the interior and exterior. The style of glaze and decoration provides a close imitation of enamelled porcelain from East Asia.

COLOUR	
Colour	White
Core	7.5YR 8/1
Margin	Same as core
Surface	Same as core

Integrity: Coherent sub-class.

Surface Treatment: Examples in the Williamson Collection have bright red painted decoration on the interior. On the exterior a coloured band is combined with a diffuse pink criss-crossing motif. The interior decoration bears a much closer resemblance to ENAM than the exterior.

Vessel Forms: Typically an open bowl with straight flaring sides and a simple pointed rim.

Fabric: Hard, fine, extremely brittle and crumbly, pure-white composite frit body with no visible inclusions, a compact well integrated matrix and very low density.

Inclusions: None.

Specifications: Low density with a compact granular structure, a fine gritty feel and an irregular fracture.

Parallels and Dating: 18th – 19th century. The class must be dated to the same period or later as the ENAM that it imitates (Kennet, 2004: 52).

Origin: Southern Iran.

Class Code: FRIT.N-ID

Class Name: Non-Identified Frit

Types: None

Illustration: None

Clay: Frit **Production**: Wheel-made

Defining Characteristics: Frit bodies vessels that are either too degraded to assign to a specific sub-class, or which have some other unusual characteristics that cannot be related to the categories defined above.

Colour: White of off-white.

Integrity: Clearly identifiable as frit bodied vessels even when present in a degraded condition but cannot be assigned to a specific cub-class.

Inclusions: Can be a pure white frit body or be off-white often with rolled quartz inclusions and larger voids.

Specifications: Low density with a compact granular structure, a rough feel and a fine irregular fracture.

Vessel Forms: Generally small to medium sized open bowls with curved flaring sides, relatively thick walls, gently everted or flanged rims, and low heavy foot rings with a slightly raised central boss. Some closed forms are also represented.

Surface Treatment: Interior and exterior surfaces covered with glaze and sometimes painted or in glaze coloured decoration.

Fabric: Crumbly composite frit body firing to a pale yellow, orange or white.

Parallels and Dating: 14^{th} – 17^{th} century or later. See discussion of 'Late Frit' sub-classes above.

Origin: Southern Iran.

Underglaze-Painted Ware

Class Code: MGPAINT.1

Class Name: Manganese Purple Underglaze-Painted Ware, Group 1

Types: BR31, BB18

Illustration: Plate 115

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Mostly flange-rimmed bowls with blue-green glazed interiors and thick black manganese underglaze painted decoration. The glaze is usually completely degraded leaving only the black paint standing proud of the body. The fabric is hard, consistently oxidised to buff-orange and contains numerous coarse inclusions, mostly limestone and quartz.

COLOUR	
Colour	Very pale brown
Core	10YR 8/4
Margin	Same as core
Surface	Same as core

Integrity: Coherent, well-defined and very distinctive class.

Vessel Forms: Medium sized open bowls with curved flaring sides, a flanged rim and a heavy squared foot ring. All of the diagnostic sherds belong to Kennet's Type 26 with a flanged rim and Type 31 with a flanged and hooked rim (Kennet, 2004: fig. 12).

Surface Treatment: Decoration occupies the interior surfaces only. This consists of a white slip over-painted with broad black lined decoration and covered with a clear or possibly in places green or blue coloured lead-glaze. Mostly the glaze has completely weathered away leaving only the painted decorating, which characteristically stands slightly proud of the body. In some cases the surfaces have an iridescent silvery sheen where some element of the glaze remains. Decoration occupies much of the surface and consists of various elements bisecting the surface and delimiting zones filled with repetitive devices such as dots, cross hatching or series of wavy lines.

Fabric: The fabric tends to be darker than that described by Kennet for the same class (Kennet, 2004: 40). It is mostly a buff-yellow with frequent well-sorted, rounded, translucent or opaque white and grey quartz inclusions, some small voids, and variable levels of fairly well -sorted large angular lime fragments.

INCLUSIONS		
	1	2
Colour	Semi-translucent white	Opaque white
Size	≤1mm	≤3mm
Shape	Well rounded	Sub-rounded
Freq.	3-5%	Occasional
Sorting	Good	Very poor
ID	Rolled quartz	Limestone?

Specifications: Average density with a compact structure, a gritty feel and a pitted irregular fracture.

Parallels and Dating: 11th – 13th century. The class occurs at Kush from Phase E-06 onwards, although it is most abundant in the last two Phases. The class has not been noted at al-Mataf indicating that it had gone out of circulation before the 14th century when that site was established. If so, then there are only five stratified sherds in the Kush sequence from the period when the class was in circulation and these fall between Phases E-06 – E-08 dated to between the 11th – early 12th centuries (Kennet, 2004: 40-41, table 3). What appears to be the same class is also described as being one of the most common elements distributed across the surface of the ruined medieval port at Kish (Whitehouse, 1976: 147), which was founded after the mid-11th century, but achieved its greatest period of prosperity through the 12th century and again after some interruption in the later 13th century (Whitehouse, 1983: 330). The relative scarcity of MGPAINT.1 in the assemblage from Siraf in the British Museum might indicate that the class achieved only limited circulation during the 11th century during the last significant period of occupation at Siraf (Whitehouse, 1983: 329).

Origin: The general similarities between the MGPAINT.1 fabric and that associated with two coarse ware classes from Bahrain; LIME and a ware that Williamson named ‘Ali Ware’, indicate that MGPAINT.1 may also have been manufactured in Bahrain.

Class Code: MGPAINT.2

Class Name: Manganese Purple Underglaze-Painted Ware, Group 2

Types: None

Illustration: Plate 116

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Mostly medium-sized open bowls with a squared foot ring and a rim that is usually simple and straight with a rounded lip. The vessels have a shiny translucent yellowish-green tinted glaze on the interior with thick (2 - 5mm) slightly diffuse manganese purple painted lines with the spaces between in-filled with turquoise-blue or purple splashes.

Decorative motifs include simple radiating lines and horizontal bands below the rim. The fabric is fine grained and bright cream in colour with occasional grit elements.

COLOUR	
Colour	Pale yellow
Core	2.5Y 8/4
Margin	Same as core
Surface	Same as core

Integrity: Coherent, well-defined and distinctive class that appears to be from a single place of origin.

Vessel Forms: Small to medium sized open bowls with curved flaring sides, simple rims, and a low squared foot ring. The class also includes a series of small vessels with a narrow mouth and a slight carination below the rim.

Surface Treatment: Interior and upper exterior covered with a clear or slightly opaque shiny, yellow or green tinted glaze with obvious crazing. Decoration consists of simple diffuse manganese purple lines filled with turquoise-blue or washes of the same manganese purple as the principal lines. The overall decorative concept is similar to MGPAINT.1, accept that the purple is lighter and is completely integrated within the glaze.

Fabric: Hard but slightly brittle and porous consistently oxidised cream coloured fabric with a fine biscuit like structure, with occasional small coarse inclusions that include grains of rolled quartz and red mineral elements that appear either intact or as voids with a brown discoloured surrounding matrix.

INCLUSIONS		
	1	2
Colour	Discoloured void	opaque white
Size	≤0.2mm	≤0.5mm
Shape	sub-rounded	well rounded
Freq.	1-3%	occasional
Sorting	fair	very good
ID	Burnt out mineral?	rolled quartz

Specifications: Average to low density with a compact crumbly and somewhat porous structure, a gritty feel and an irregular fracture.

Parallels and Dating: 17th – 19th century. This is the same as MGP.2 in the Williamson Collection and MGPAINT.2 from Ras al-Khaimah (Kennet, 2004: 40-41). A large group of MGPAINT.2 sherds were recovered from Area 74 on Hulaylah together with a range of other ceramics that are absent from the stratified sequence at al-Mataf, indicating a date later then the early 17th century when al-Mataf was abandoned (Kennet, 2004: 41).

Origin: Southern Iran?

Class Code: UGP.BW

Class Name: Blue and White Underglaze-Painted Ware

Types: None

Illustration: Plate 117

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Mostly small to medium sized open bowls with a squared foot ring and a simple, gently everted or flanged rim with a rounded lip. Closed forms are also represented. Interior of bowls and exterior of jars are covered with a white slip and a cloudy glaze with dark cobalt blue, black or occasionally turquoise underglaze-painted decoration. The fabric is rather mixed but mostly it is fine and compact with no significant visible inclusions and is fired to cream, buff or orange.

COLOUR		
Colour	Pink	Pale yellow
Core	7.5YR 7/4	2.5Y 8/3
Margin	Same as core	Same as core
Surface	Same as core	Same as core

Integrity: General concepts of glazing, decoration and type are consistent but the fabric and specific decorative schemes vary and are clearly derive from a large number of different sources.

Vessel Forms: Small to medium sized open bowls with curved flaring sides, simple straight or flanged rims and heavy bases with a high narrow rounded foot ring or a raised flat base with a turned central depression.

Surface Treatment: Interior of bowls and exterior of jars covered with a white slip and a cloudy glazed with painted decoration predominantly in black and cobalt-blue or turquoise. Patterns consist either of a radial arrangement, often contained within formal registers, or a bisection of the surface into zones filled with repetitive devices such as dots or cross hatching.

Fabric: Hard, compact, well levigated and consistently oxidised to cream, buff or orange. Generally the fabric contains some occasional mixed coarse inclusions but these vary widely in nature and frequency across the sample.

Inclusions: Varied.

Specifications: Average density with a compact structure, a smooth feel and a clean slightly irregular fracture.

Parallels and Dating: 14th – 17th century or later. This is the same as UGP.BW in the Williamson Collection (Priestman, 2005a: 266-67). Underglaze-painted ware appears to have been widely manufactured and there are many different styles, some of which are distinctive a readily recognisable. At al-Mataf, underglaze-painted ware represents almost half of the glazed ware assemblage, however, most of the material was too badly degraded to recognise specific styles. In both the occupation and mosque sequences at al-Mataf, the frequency of underglaze-painted ware increased significantly in Phases II and III suggesting a major increase in circulation during the 15th/early 16th centuries (Kennet, 2004: table 7), after which the class continues to predominate as the principle Islamic glazed ware into the early modern era.

Origin: Southern Iran?

Class Code: UGP.TB

Class Name: Turquoise & Black Underglaze-Painted Ware

Types: None

Illustration: Plate 118

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Mostly small to medium sized open bowls with a squared foot ring and a simple, gently everted or flanged rim with a rounded lip. Closed forms are also represented. Interior of bowls and exterior of jars are covered with a white slip, black painted decoration and a bright turquoise glaze. The fabric is rather mixed but mostly it is fine and compact with no significant visible inclusions and is fired to cream, buff or orange.

COLOUR		
Colour	Pink	Pale yellow
Core	7.5YR 7/4	2.5Y 8/3
Margin	Same as core	Same as core
Surface	Same as core	Same as core

Integrity: General concepts of glazing, decoration and type are consistent but the fabric and specific decorative schemes vary and are clearly derive from a large number of different sources.

Vessel Forms: Generally small to medium sized open bowls with curved flaring sides, simple straight or flanged rims and heavy bases with a high narrow rounded foot ring or a raised flat base with a turned central depression.

Surface Treatment: Interior of bowls and exterior of jars covered with a white slip, black painted decoration and a turquoise glaze. Patterns consist either of a radial arrangement, often contained within formal registers, or a bisection of the surface into zones filled with repetitive devices such as dots or cross hatching.

Fabric: Hard, compact, well levigated and consistently oxidised to cream, buff or orange. Generally the fabric contains some occasional mixed coarse inclusions but these vary widely in nature and frequency across the sample.

Inclusions: Varied.

Specifications: Average density with a compact structure, a smooth feel and a clean slightly irregular fracture.

Parallels and Dating: 14th – 17th century of later. See discussion of UGP.BW 'Parallels and dating' above.

Origin: Southern Iran?

Class Code: UGP.CB

Class Name: Crude Black Underglaze-Painted Ware

Types: None

Illustration: Plate 119

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Medium-sized, thick-walled bowls with heavy foot rings, simple, gently everted or folded rims and obvious stacking marks on the interior. The interiors are covered with a transparent or green tinted glossy glaze with bold black underglaze-painted decoration. In most cases the glaze has completely worn away leaving only the black decoration standing slightly proud of the body. The bowls tend to be roughly finished giving the body a coarse appearance although actually the fabric is fine.

COLOUR	
Colour	Light brown/ very pale brown
Core	7.5YR 6/4
Margin	10YR 7/3-4
Surface	Same as margin

Integrity: Very coherent and distinctive class, easily distinguishable from the other underglaze-painted ware classes.

Vessel Forms: Generally small to medium sized open bowls with curved flaring sides, simple straight or flanged rims and heavy bases with a high narrow rounded foot ring or a raised flat base with a turned central depression.

Surface Treatment: Distinctive, broad black-lined motifs including most commonly a simple radial design comprised of six spokes emanating from the centre of the vessel which are joined by a band below the rim to form what looks like a cartwheel. Another common motif is a flower design. Closer to the rim the designs can become more complex and include lattice or scrolled in-fillings.

Fabric: The fabric displays some variation but generally it is fired to a light brown in the core and a very pale brown in the margin. It has a hard sandy composition, a smooth fracture and a fine gritty feel. The only coarse elements are occasional mixed sandy grains and small infrequent voids.

Inclusions: Occasional mixed sandy grits and voids.

Specifications: Average density with a compact structure, a smooth feel and a clean slightly irregular fracture.

Parallels and Dating: 14th – 17th century of later. Equivalent to UGP.TTB in the Williamson Collection (Priestman, 2005a: 267) but the title has been changed as the previous one was inaccurate. For dating see discussion of UGP.BW 'Parallels and dating' above.

Origin: Southern Iran?

Class Code: UGP

Class Name: Underglaze-Painted Ware

Types: None

Illustration: None

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Small to medium sized open bowls with simple straight or flanged rims and high narrow foot rings or flat bases. Interiors and upper exteriors are covered with a white slip with painted decoration mostly utilising black, blue and turquoise and covered with a clear glaze. The most common colour schemes for underglaze-painted wares is blue and black on white (UGP.BW) and black under a turquoise glaze (UGP.TB), but this category is used to capture other more varied colour schemes that do not fall within these groupings. The fabric tends to be hard, compact fairly coarse and fired to oxidised tones of cream, buff, orange or brick-red.

COLOUR		
Colour	Pink	Pale yellow
Core	7.5YR 7/4	2.5Y 8/3
Margin	Same as core	Same as core
Surface	Same as core	Same as core

Integrity: General concepts of glazing, decoration and type are consistent but the fabric, specific decorative schemes and glaze quality vary extensively and there are clearly multiple centres of production covering an extended chronological period.

Vessel Forms: Mostly small to medium sized open bowls with curved flaring sides, simple straight or flanged rims and heavy bases with a high narrow rounded foot ring or a raised flat base with a turned central depression. Also some closed vessels.

Surface Treatment: Interiors of bowls and exteriors of jars covered with a white slip, painted decoration and a clear glaze. Patterns consisting either of a radial arrangement, often contained within formal registers, or a bisection of the surface into zones filled with repetitive devices such as dots or cross hatching.

Fabric: Hard, compact, well levigated and consistently oxidised to cream, buff, orange or red. The fabric generally contains some occasional mixed coarse inclusions but these vary widely in nature and frequency across the sample.

Inclusions: Varied.

Specifications: Average density with a compact structure, a smooth feel and a clean slightly irregular fracture.

Parallels and Dating: 14th – 17th century of later. See discussion of UGP.BW 'Parallels and dating' above.

Origin: Southern Iran?

Late Monochrome Glazed Wares

Class Code: MONO.LG1

Class Name: Late Monochrome Green Glazed Ware, Group 1

Types: BR34-43, BB21-23

Illustration: Plate 120

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Light buff-brown or cream coloured fabric with varying levels of coarse inclusions including most often fairly coarse crushed reddish platy grits. Interior and upper exterior surfaces are covered with a dark bottle-green or turquoise-blue glaze that is generally heavily degraded.

COLOUR			
Colour	Pale yellow	Very pale brown	Pink
Core	2.5Y 8/3	10YR 8/3	7.5YR 7/4
Margin	Same as core	Same as core	Same as core
Surface	Same as core	Same as core	Same as core

Integrity: The class is well represented in the assemblage from Siraf and appears to be a local production specific to the area. Certain variation occurs in the composition of the fabric and quality of firing (see below). This can most likely be accounted for by deliberate variations in the regime of clay preparation within a single workshop environment.

Vessel Forms: Wide range of bowl forms with distinctive everted or fattened rims. Vessel sizes ranging from small to large. Shapes include bowls with curved flaring sides and basin types with wide bases and upright sides. Bases include flat types and others on a crudely turned ring.

Surface Treatment: Interior surfaces glazed with a monochrome green or turquoise glazed that steps over the exterior and stops below the rim. Glazed tend to be badly degraded and sometimes preserved only as a white or yellow trace on the surface. Exteriors of some types have a shallow covetto, ridged or incised bands, or simple incised wavy lines. Some of the larger basin types (BR34-35) have distinctive 'handles' consisting of a narrow strip of clay applied to the side and rim.

Fabric: Made from clay that is crudely wedged leaving structural voids visible in the matrix. The fabric is fired to oxidised tones of light-buff or cream and the fabric varies significantly in hardness and level of vitrification from hard and reasonably compact to soft porous and very crumbly. Cream coloured tones appear to be linked to the fabric's softer condition. Most sherds contain frequent coarse inclusions of two main types: crushed platy red or dark-brown grits and soft rounded buff-coloured lumps that appear to have partially dissolved into the surrounding matrix. Some sherds contain only one of these two elements and some no coarse inclusions at all. There is some correlation between smaller vessels with fewer or no inclusions and larger vessels with more frequent and larger inclusions, but this is not always consistent. Perhaps a more important determining variable is vessel form. Certain vessel forms display very few coarse inclusions across the full size range, while others always appear to have a grit temper. These impressions would need to be further tested in order to reach a clear conclusion. The class provides an interesting test case for looking at the potential range of internal variation within what appears to be a single production tradition.

INCLUSIONS		
	1	2
Colour	Red/brown	Cream/buff
Size	≤2mm	≤3mm
Shape	Sub-angular	Well-rounded
Freq.	0-7%	0-3%
Sorting	poor	good
ID	Crushed stony flakes	Non-weathered clay parent material?

Specifications: Either average density with a compact structure, a rough feel and an irregular fracture or low density with a soft porous structure, a rough feel and an irregular fracture.

Parallels and Dating: 14th – 17th century. There are no known external parallels for this distinctive class. Clearly it fits well within the widespread post-Sgraffiato monochrome glazed tradition, which seems to encompass much of the Islamic word from East Africa to Pakistan (Priestman, Kennet & Petrie, 2007; Priestman, 2010b). At Siraf the major concentration of the class occurs at Site E. Ceramic finds from Site E indicate a construction date for the building within the 14th century (Whitehouse, 1972: 84-85).

Origin: Siraf, Kangan?

Class Code: MONO.LG2

Class Name: Late Monochrome Green Glazed Ware, Group 2

Types: BR43-45, BB24

Illustration: Plate 121

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, fairly compact, orange-buff or reddish-orange coloured fabric with numerous coarse red grits and some softer rounded buff inclusions. Vessels are all open bowls with simple flaring rims and flat bases. Both interior and exterior surfaces are covered with a white slip and a monochrome green glaze that is weathered and degraded.

COLOUR		
Colour	Reddish-yellow	Reddish-yellow
Core	7.5YR 7/6	5YR 6/6
Margin	Same as core	Same as core
Surface	Same as core	Same as core

Integrity: Coherent well defined class. Similar to MONO.LG1 and quite possibly part of the same production tradition, but with certain consistent differences including the orange or red firing

fabric, glazing on both the interior and exterior, and the particular way that the glaze degrades (see below).

Vessel Forms: Medium sized open bowls with gently curved flaring sides and simple everted rims. Bases are flat, slightly concave and generally set up on a slight pedestal. The underside can be turned flat with wire cutting marks still visible or have a shallow incised ring. Interiors usually have a shallow turned ring delimiting the floor/wall interface.

Surface Treatment: Interior and exterior covered with a white slip and a monochrome green glaze that continues over the base. Where only a trace of the glaze is left, the surface appears light yellow, turquoise or white. Where the glaze remains thicker, it often turns dark brown and murky and with a strong opalescent sheen. Originally the colour appears to have been dark green.

Fabric: Fairly hard and somewhat brittle consistently oxidised buff-orange or reddish-orange coloured fabric with numerous coarse inclusions. Inclusions consist of crushed reddish platy grits and softer, rounded buff coloured elements. As with MONO.LG1, the fabric appears crudely wedged, though in all examples the sintering is advanced producing reasonable matrix fusion.

INCLUSIONS		
	1	2
Colour	Red/brown	Cream/buff
Size	≤3mm	≤2mm
Shape	Sub-angular	Well-rounded
Freq.	7%	1-3%
Sorting	Poor	Good
ID	Crushed stony flakes	Non-weathered clay parent material?

Specifications: Average density with compact granular structure, a rough feel and hackly fracture.

Parallels and Dating: 14th – 17th century. There are no known external parallels for this class. As with MONO.LG1 the class fits within the post-Sgraffiato monochrome glazed tradition of the 14th centuries and later (see above).

Origin: Siraf, Kangan?

Class Code: KHUNJ

Class Name: Khunj/Bahla Ware

Types: None

Illustration: Plate 122

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: The fabric is extremely dense and well-levigated with a sub-conchoidal fracture and a fine structure. At times it can be confused with stoneware. Most pieces are fired to a light grey or reddish yellow. Both interior and exterior surfaces are covered with a green or greenish-brown glaze with distinctive irregular orange patches.

COLOUR		
Colour	Reddish yellow	Reddish grey
Core	5YR 6/6	2.5Y 6.5/1
Margin	Same as core	Same as core
Surface	Same as core	Same as core

Integrity: Very consistent and distinctive class.

Vessel Forms: Mostly medium-sized bowls with simple rims and a distinctive slightly projecting foot with a turned recess in the underside and hollow at the top of the foot. The class also includes jar types with small, horizontally aligned, 'butterfly' handles attached to the shoulder.

Surface Treatment: Both the interior and exterior are covered with a glossy monochrome glaze. The glaze tends to be quite thin and to range in colour from a deep bottle green through to dark brown. Those pieces that have a brown glaze tend to have a distinctive freckled appearance with darker dots in the glaze, but these do not show up in the green versions of the glaze. The glaze tends to cover both the interior and exterior coming right down to the bottom of the foot and inside the well of the foot on bowls.

Fabric: Hard, compact and extremely dense, finely levigated fabric fired to orange or grey. Often both colours are represented on the same vessel, especially with predominantly reduced pieces, which tend to have distinctive red patches of oxidisation on the surface that show up clearly through the glaze.

Inclusions: Very fine white flecks only visible where the fabric is oxidised orange.

Specifications: High density with a compact structure, a fine gritty feel and an irregular or sub-conchoidal fracture.

Parallels and Dating: 15th – 17th century. The class is well represented in the sequence at al-Mataf from Phase III of the Mosque and Occupation areas dated to the 15th/early 16th century. Considerable quantities of the class occur through the rest of the stratified sequence (Kennet,

2004: 43, tables 7-8). KHUNJ probably went out of circulation before the 19th century as it did not occur in Trench 1 (Level IV) in Ras al-Khaimah, which has been dated to the 19th/20th centuries (Hansman, 1985: 17).

Origin: The provenance of Khunj/Bahla Ware is complicated. Williamson is reported to have identified evidence for the production of the class from the site of Khunj/Kung near Bandar-i Lengeh in southern Iran (Hansman, 1985: 52-3, fig. 12: i-p, pl. V: t, u, w). However, there are no wasters for this class represented amongst the surface survey finds from Khunj that Williamson collected (Priestman & Kennet, 2002; Priestman, 2003; 2005a). Elsewhere three misfired pieces are represented amongst the finds that Stein collected from the same site housed at the Peabody Museum in Harvard (registration numbers 36-91-60/4978-4979). At the same time, very similar looking pottery (or the same pottery?) is found widely distributed in Oman and this is generally attributed to the important ceramic production centre of Bahla (Whitcomb, 1975: 129; Priestman, 2008: 277-78, pl. 12). Further archaeological research is required to establish the precise relationship between the products of these two widely separated areas of production.

Class Code: SPECLE.1

Class Name: Speckled Glaze Ware - Cream Fabric Blue/Green Glaze

Types: None

Illustration: None

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Monochrome green or blue glazed vessels with a hard, compact, but slightly crumbly very pale brown (10YR 8/3) fabric that ranges from very to fairly coarse. Vessels are covered with a deep bottle green through to turquoise-blue coloured glaze with a distinctive speckled and putted glaze surface. The glaze tends to cover both the interior and exterior of jars, and interior and upper rim exterior of bowls. Bowls also have pronounced stacking marks on the interior.

COLOUR	
Colour	Pale Yellow
Core	2.5Y 8/3
Margin	Same as core
Surface	Same as core

Integrity: Distinctive easily recognisable class.

Vessel Forms: Mostly relatively thick-walled bowls with a crudely turned base and a flange rim. Some closed vessel types are also represented.

Surface Treatment: Covered with a monochrome turquoise-blue or green coloured glaze with a distinctive speckled appearance caused by a combination of streaky black flecks within the glaze, and the tendency of the glaze to blister and puddle showing up darker where it concentrates and lighter when it is thin.

Fabric: Hard compact, well-levigated, slightly crumbly fabric with no visible inclusions other than occasional buff coloured elements that sometime burn out and leave a coating around a void. The fabric is oxidised through the core and fired to a consistent buff or brown.

INCLUSIONS	
	1
Colour	Buff
Size	≤1mm
Shape	Well rounded
Freq.	≤3%
Sorting	Fair
ID	Lime stone?

Specifications: High to average density with a compact structure, a gritty feel and an irregular fracture.

Parallels and Dating: 14th – 17th century. The class is equivalent to PERSIA.2 in the Williamson Collection and PERSIA from al-Mataf (Priestman, 2005: 270-71; Kennet, 2004: 42). This type of pottery is well represented in the sequence at al-Mataf from Phase II - REC dated to between the 14th – 17th centuries (Kennet, 2004: 42). There is no indication of any decrease in the frequency of the class towards the end of the sequence suggesting that it may have continued in circulation into the post al-Mataf period. The main form represented is equivalent to Kennet's Types 101 and 104 (Kennet, 2004: fig. 11).

Origin: The class has been referred to elsewhere as 'Persian imitation celadon' or 'Persian Blue Specked Ware' (Hansman, 1985: 52; Kennet, 2004: 42) with the assumption that its source is likely – as with a lot of the glazed pottery in circulation within the Persian Gulf – to be in southern Iran. This possibility has not been tested. What is striking to note is that the same class actually appears to be even more prevalent in assemblages dated from the 14th century onwards in East Africa such as at Shanga (Horton, 1996b: 293, fig. 218) or Gedi (Kirkman, 1963: 47-48, fig. 13: n-o). There is also a close visual correspondence between the fabric of SPECLE.2 and Yemeni Yellow, raising the possibility that this pottery originates in South Arabia. Given the clear differences in fabric between SPECLE.1 and SPECLE.2, there may well be multiple centres of production for what appears to be at least a superficially similar class.

Class Code: SPECLE.2

Class Name: Speckled Glaze Ware - Red Fabric, Mixed Colour Glaze

Types: None

Illustration: Plate 123

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Monochrome glazed vessels with a hard, compact, but slightly crumbly fabric that is reddish-yellow in the core and lighter pink in the margin. Vessels are covered with a monochrome glaze which appears in a variety of colours including green, blue, turquoise or mauve. The glaze generally has a distinctive mottled appearance and covers both the interior and exterior of jars, and interior and upper rim exterior of bowls. Bowls also have pronounced stacking marks on the interior.

COLOUR	
Colour	Reddish-yellow, pink
Core	2.5YR 6/6
Margin	7.5YR 7/4
Surface	Same as margin

Integrity: Distinctive easily recognisable class.

Vessel Forms: Mostly relatively thick-walled bowls with a crudely turned base and a flange rim. Some closed vessel types are also represented.

Surface Treatment: Covered with a monochrome glaze coloured green, blue, turquoise or mauve. Often the colour of the glaze differs quite extensively between the exterior and interior surfaces. The glaze has a distinctive speckled appearance caused by a combination of streaky black flecks within the glaze and the tendency of the glaze to blister and puddle showing up darker where it concentrates a lighter when it is thin.

Fabric: Hard compact, well-levigated, slightly crumbly fabric fired to yellowish-red in the core and lighter pink in the margin. Inclusions in the fabric include rounded buff patches or voids.

INCLUSIONS	
	1
Colour	Buff
Size	≤1mm
Shape	Well rounded
Freq.	≤3%
Sorting	Fair
ID	Lime stone?

Specifications: High to average density with a compact structure, a gritty feel and an irregular fracture.

Parallels and Dating: 14th – 17th century. See SPECLE.1 'Parallels and dating' above.

Origin: South Arabia? See SPECLE.1 'Origin' above.

Class Code: MONTUR

Class Name: Monochrome Turquoise Glazed Ware

Types: BR32

Illustration: Plate 124

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard, finely levigated, buff-orange coloured fabric with occasional coarse inclusions. Vessels are mostly small or medium sized open bowls with a thick, opaque turquoise blue glaze covering the interior only. Variations on this include vessels with the glaze covering both in the interior and exterior and some closed vessel forms. Some bowls have distinctive 'chattering' marks low down on the exterior.

COLOUR	
Colour	Very pale brown
Core	10YR 8/4
Margin	Same as core
Surface	Same as core

Integrity: Coherent, well defined group.

Vessel Forms: Small or medium sized bowls with various rim forms including one with a distinctive curved flange and triangular section lip. Bases include a heavy squared foot ring type or a raised flat base with a turned central recess.

Surface Treatment: Mostly interior surfaces only covered with a thick, opaque turquoise-blue glaze which turns pale when degradation. Some vessel, especially smaller bowls have both interior and exterior surfaces covered. One closed vessels has a chain-ridge around the waist and glaze covering both exterior and interior surfaces.

Fabric: Hard, finely levigated, consistently oxidised, buff-orange coloured fabric with a fine powdery structure and occasional coarse inclusions consisting of large red grits discoloured voids.

INCLUSIONS		
	1	2
Colour	Red	Discoloured void
Size	≤2mm	≤1mm
Shape	rounded	Well rounded
Freq.	Occasional	Occasional
Sorting	Fair	Good
ID	Red stony grit	Burnt out mineral?

Specifications: Average density with a compact structure, a gritty feel and a fine irregular fracture.

Parallels and Dating: 14th – 17th century. The class occurs in the assemblage from Siraf and there are no known parallels for the material elsewhere. Nevertheless, the class can be seen as part of the post-Sgraffiato monochrome glazed tradition of the 14th centuries and later (see MONO.LG1 above). There is also a clear association between this class and some of the underglaze-painted pottery of the same period, although in the case the pottery lacks decoration.

Origin: Southern Iran.

Other Late Glazed Wares

Class Code: YEMEN

Class Name: Yemeni Yellow

Types: None defined

Illustration: Plate 125

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Open bowls with a simple or everted rim, a flat base and relatively thick walls. The interior and rim exterior is covered with a bright yellow glaze and decorated with simple hanging loops in brown or sometimes green. The glaze and painted decoration in generally badly degraded leaving a powdery surface. The fabric tends to be a strong red with a blocky, slightly brittle structure.

COLOUR	
Colour	Reddish-yellow
Core	5YR 7/8
Margin	Same as core
Surface	Same as core

Integrity: Coherent well-defined class.

Surface Treatment: Interior and rim exterior covered with a bright yellow glaze with simple hanging loops painted with brown or sometimes dark green.

Vessel Forms: Mostly medium sized open bowls with a simple or a flange rim and a turned flat base.

Fabric: Fine, hard, reddish-yellow fabric with a blocky, slightly brittle structure. The fabric contains only occasional coarse inclusions, namely small white flecks, small linear voids and fine mica that is only visible on the surface.

Specifications: Average density with a compact structure, a gritty feel and a fine irregular fracture.

Parallels and Dating: 13th – early 14th century. Kennet provides the following information about the dating and distribution of the class (2004: 53): "*This class is known as 'mustard' in Yemen (Hardy-Guilbert & Rougeulle 1997: 173-4, fig. 1: 6-9) and 'black-on-yellow' in East Africa (Horton 1996: 291). It appears to be distinct from, and earlier than, Zabidi 'yellow salad' (Mason & Keall 1988: 454, fig. 3e; Ciuk & Keall 1996: pl. 95/47: d-g). Keall has however found YEMEN in contexts from the Zabid citadel dated to his 'Islam 4' period (1150 to 1350) - although the dating is based on an arbitrary periodisation and is not certain (Ciuk & Keall 1996: 4-5, pl. 95/45h). It also occurs at Kilwa in levels of the 14th century and earlier (Chittick 1974: 304), and at Manda in levels datable to the late 13th to 14th century (Chittick 1984: 81-82, fig. 39). In fact Horton has pointed out that it occurs at virtually every late 13th and 14thcentury site on the East African coast (Horton 1996b: 291). At Shanga its arrival is dated to about 1250 and it circulated for about a century (ibid.). At Quseir al-Qadim in Egypt it was called 'mustard ware' and is dated to the 13th century (Whitcomb & Johnson 1979: 106, pls. 37: e g, f; 41: c; 42: b, etc.; 1982: 137-8, pl. 37). There is some evidence that the class was manufactured in Yemen, (Doe 1963: 153)*" (Kennet, 2004: 53).

Origin: Yemen.

Class Code: REDYEL

Class Name: Red Yellow Ware

Types: BR31

Illustration: Plate 126

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: The class has a fine, soft, slightly porous fabric which is covered with a clear glaze which appears bright yellow with a light black speckling over exposed areas. The vessels, which are all bowls, are covered on the interior and/or exterior with a dark red slip,

which has been cut through in champlevé style leaving bright yellow lines sharply contrasted against the dark red background. A second version of the same class uses the same device but has a transparent, turquoise-tinted glaze that shows up bright turquoise against the body and black over the slip. Where one surface has been slipped and decorated, the other is generally left plain and appears either bright yellow or turquoise. The glaze has an even soft gloss without crazing and generally covers both the interior and exterior stopping just before the foot.

COLOUR	
Colour	Pale yellow
Core	2.5Y 8/4
Margin	Same as core
Surface	Same as core

Integrity: Coherent and very distinctive class.

Vessel Forms: Small to medium sized open bowls with flared slightly curving sides and a simple rim or a rim with a beaked flange profile.

Surface Treatment: Interior and upper exterior covered with a dark red slip which has been cut through to reveal the bright cream coloured body below. Cut away decoration consists of meandering radial lines or more often a series of regularly spaced bands of 'tear-drop' shaped gouges filling the interior. Interior and exterior surfaces are covered with a clear or bright turquoise tined glaze.

Fabric: Finely levigated, soft, slightly porous, light-yellow earthenware with no visible inclusions and a chalky texture.

Specifications: Low density with a compact but porous structure, a smooth feel and fine fracture.

Inclusions: Generally none.

Parallels and Dating: 17th – 20th century. This is the same as REDYEL in the Williamson Collection (Priestman, 2005a: 271-72, pl. 128) and REDYEL from Ras al-Khaimah (Kennet, 2004: 44). The class is absent from both the Kush and al-Mataf sequences indicating that it belongs to the post al-Mataf 17th – 20th century period (Kennet, 2004: 44).

Origin: Southern Iran?

Class Code: UGP.BG

Class Name: Brown and Green Underglaze Painted Ware

Types: None defined

Illustration: Plate 127

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Hard pink-bodied bowls covered over the interior and exterior with a thin, glossy, transparent greenish-yellow glaze and decorated with splashes of green or brown combined with more crisp lines applied as painted decoration. Many of the vessels have a distinctive sharp angle at the interior of the floor. The angle between the wall and base on the exterior is often chamfered and the base itself has a rough uneven surface and is also glazed.

COLOUR		
Colour	Reddish yellow	Light brown
Core	5YR 7-6/6	7.5YR 6/3
Margin	Same as core	Same as core
Surface	Same as core	Same as core

Integrity: Distinctive and coherent class.

Surface Treatment: Extensive diffuse green and brown splashed zones combined with sharp brown trailed decoration applied with a brush.

Vessel Forms: Small open bowls with a simple, gently everted or folded rim and an uneven flat base or a low squared foot ring.

Fabric: Very fine, compact, evenly oxidised orange earthenware with a hard, slightly brittle, uneven fracture and an extremely fine grainy composition with occasional, angular sandy grits and a number of small, mostly elongated voids.

INCLUSIONS	
	1
Colour	Mixed or opaque white
Size	<0.5mm
Shape	Angular
Freq.	≤1%
Sorting	Fair
ID	Sandy grains, mostly quartz

Specifications: Average density with a compact structure, a gritty feel and a fine irregular fracture.

Parallels and Dating: 17th – 20th century. Equivalent to SPL.L in the Williamson Collection (Priestman, 2005a: 272) but title has been changed as the previous categorisation was inaccurate. The class has not been noted at al-Mataf (Kennet, 2004) and while the material bears some resemblance to the Splashed Glazed Ware tradition of the 9th century, the quality of the glaze, the in-glaze colours, the forms and the fabric all indicate that this is a much later production most likely related to the 17th – 20th century period.

Origin: Southern Iran.

Other Glazed Objects

Class Code: GT

Class Name: Glazed Tiles

Types: None

Illustration: Plate 127

Clay: Earthenware **Production**: Moulded

Defining Characteristics: Assorted glazed tile fragments with hard oxidised cream or light orange coloured fabrics. Top surfaces are covered with a thick opaque glaze that can be monochrome, or a combination of glaze colours or underglaze painted. Tiles are moulded. Most appear to be rectangular or square.

COLOUR		
Colour	Very pale brown	Light brown
Core	10YR 8/2	7.5YR 6/4
Margin	Same as core	Same as core
Surface	Same as core	Same as core

Integrity: Coherent functional category but disparate in terms of fabric composition, glaze type and form.

Vessel Forms: Large thick bodied square or oblong tiles. Also some more complex forms such as star shapes tiles.

Surface Treatment: Top surfaces and sometimes sides are covered with a thick opaque glaze that can be monochrome coloured, mostly turquoise, or composed of different glaze colours, for example purple and white or purple and turquoise. Some tiles also have decoration moulded in relief.

Fabric: The body tends to be hard compact and reasonably well levigated with few visible inclusions and fired to consistent oxidised cream or light orange-brown.

Specifications: Average density with a compact structure, a gritty feel and a fine irregular fracture.

Inclusions: Generally none apart from some voids.

Parallels and Dating: Various.

Origin: Various.

Class Code: KD.1-4

Class Name: Kiln Debris, Groups 1-4

Types: None

Clay: Earthenware **Production**: Wheel-made/handmade

Defining Characteristics:

KD.1 – Trivets or crow's-feet. Small star shaped objects with three spurs. These can be simple and rounded at the ends of have little down-turned spikes. Trivets are used as spaces to prevent glazed bowls or dishes becoming stuck to one another during firing. Where they are used they leave scars on the vessel interior.

KD.2 – Kiln bars. Straight or often curved bars with a round section that thin to a point at the end. Used for stacking glazed vessels during firing.

KD.3 – Clinker. Vitrified residue that accumulates on the inside of kilns. Can be difficult to distinguish from the remains of glass working or metal production.

KD.4 – Wasters. Heavily melted and disfigured vessels, vessels fused together or otherwise damaged during firing. Such material can at times be difficult to distinguish from firing 'seconds' (e.g. pots damaged during firing that were still sold on and not immediately discarded. The find context and other contextual details are often important in accurately identifying true waster material.

Integrity: Coherent functional categories but disparate in terms of fabric composition and origin.

Surface Treatment: None.

Parallels and Dating: Various.

Origin: Various.

Non-Identified Glazed Wares

Class Code: GW.N-ID

Class Name: Non-Identified Glazed Wares

Types: None

Clay: Earthenware **Production**: Wheel-made

Defining Characteristics: Assorted glazed ware sherds that cannot be allocated to any particular class. Mostly these are one-off pieces with well preserved surfaces.

Integrity: Assorted.

Vessel Forms: Various.

Surface Treatment: Various glazed.

Fabric: Various.

Parallels and Dating: Not known.

Origin: Not known.

Stoneware Storage Vessels

Class Code: STONE.BLU

Class Name: Green Glazed Stoneware Jars with Blue Highlights

Types: None

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Small or medium sized jars with a rounded globular body, a short, straight, slightly everted rim and characteristic handles attached at the shoulder. These take the form of a flattened strip applied in a narrow loop with a vertically aligned hole passing through the centre. Other incomplete handles appear to belong to other different types but all are distinct from the standard 'butterfly handle' represented on Tang period DUSUN, CHANG ewers and later dated classes. Other characteristics include a hard, grit-tempered, light grey or yellow-buff coloured stoneware body and a thin greyish or yellowish-green coloured glaze covering the exterior and rim interior. The glaze invariably has brown freckles caused by the inclusions within the clay reacting with the glaze as well as scattered patches of light duck-egg blue with a powdery appearance forming on surface.

COLOUR		
Colour	Grey	Grey/Greyish brown
Core	N 6/0	N 6/0
Margin	Same as core	10YR 5/2 (inner)
Surface	Same as core	Same as margin

Coherence: Just three sherds for the class represented within the assemblage from Siraf. In all examples the fabric and glaze appear consistent while typologically each piece is different.

Vessel Forms: Typically a small or medium sized jar with a globular body and a short, straight, slightly everted rim with vertically aligned handles attached at the shoulder. Handles are formed from strip folded over in a tight loop with a narrow hole passing through the centre.

Surface Treatment: Exterior and surfaces and the rim interior are covered with a thin, light greenish-grey coloured glaze with no crazing and regular brown freckles produced by iron bearing inclusions within the clay. In addition the glaze has scattered patches of light white or duck-egg blue forming as a skin on the surface. Apart from the glaze the surfaces are plain.
Fabric: Hard, compact, fully vitrified stoneware fired to a light grey sometimes turning to yellowish-buff through the core and inner margin. The fabric contains frequent black or brown iron-bearing inclusions.

Specifications: High density with a compact structure, a fine gritty feel and a clean sub-conchoidal fracture.

INCLUSIONS	
	1
Colour	Black/brown
Size	≤2mm
Shape	Sub-rounded
Freq.	2-5%
Sorting	Poor
ID	Iron bearing grit

Parallels and Dating: 7th century or early 8th century. The two most distinctive features of the class associated with the class – vertically aligned handles and the light-blue mottling on the surface – are both characteristics associated with pottery of the Sui or Early Tang periods roughly dating to the 7th century or early 8th century (Krahl, pers. comm. 2009). If this identification is correct, the three sherds of STONE.BLU from Siraf may well represent the earliest dated Chinese pottery known from a western Indian Ocean. A date within the 7th century is significant in terms of the origins of maritime trade contact developing between the port of Siraf and East Asia.

Origin: China, region unknown.

Class Code: STONE.BG1

Class Name: Black Glazed Stoneware Storage Jars, Group 1

Types: JR2, JB2, H2

Clay: Stoneware **Production**: Handmade

Defining Characteristics: Large handmade jars with irregular scraped surfaces, often leaving distinctive 'chattering' marks on the exterior. Exterior surfaces are covered with a dark-black iron glaze that can appear glossy and metallic or dull and grey. The fabric is hard, compact, fully-vitrified and fired to a dark reddish-purple turning to grey on the inner surface. The core contains thin yellow swirls and occasional varied coarse inclusions.

COLOUR	
Colour	Week red/Dark bluish grey
Core	10R 4/2
Margin	10B 4/1 (inner)
Surface	Same as inner margin

Integrity: Coherent and very distinctive class.

Vessel Forms: Large storage jars with a flat, slightly concave base, wide, flat, horizontally aligned 'butterfly' handles, and a short everted rim. The class is well represented in the assemblage from Siraf but few diagnostic sherds have been recovered so the rim type has not been precisely determined.

Surface Treatment: Surfaces are pitted and irregular with heavy scraping marks often leaving a distinctive 'chattering' effect on the exterior and unidirectional striation marks on the interior. Most vessels are glazed on the exterior with the glaze stopping at the base. IN a few cases the glaze covers both the interior and exterior surfaces. The glaze is a dark black iron-glaze, which can appear glossy and metallic or dull and grey. The thin quality of the glaze and the variations of lustre indicate that it may be a simply fly-ash glaze rather than a true applied surface finish.

Fabric: Hard, compact, fully-vitrified stoneware fired to a dark reddish purple in the core turning to grey towards the inner margin. The core has a marbled appearance with thin swirling layers of yellow and occasional varied coarse inclusions.

Inclusions: Occasional and varied.

Specifications: High density with a compact structure, a gritty feel and clean sub-conchoidal fracture.

Parallels and Dating: Mid-8th – Early 9th century. There are no known parallels for this pottery from East Asia. Identical pottery has been recovered from Level III at Sohar, where it has been dated by the excavators to the 5th century (Kervran, 2004: fig. 12: 24, pl. 22: 1-2). If this were correct it would represent the earliest dated Chinese pottery from a Middle Eastern context.

Actually the dating of the Sohar sequence is subject to controversy (Kennet, 2007: 99). Other pottery from Level III, particularly the presence of applique decorated TURQ.T indicates a date for these layers within the 8th century. At Siraf STONE.BG1 is amongst the earliest Far Eastern pottery to occur at the site. A significant concentration of the material occurs within the foundation platform of the Great Mosque, which numismatic evidence indicates was erected not earlier than AD c.803-04 (Whitehouse, 1973: 246-47, 251, pl. 18.2: c-d).

Origin: The class is certainly from East Asia though convincing parallels from that region have not yet been established.

Class Code: STONE.BG2

Class Name: Black Glazed Stoneware Storage Jars, Group 2

Types: JR2, H2

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Large handmade jars with rough uneven surfaces and a coarse, dark-grey, fully vitrified stoneware fabric with rounded, white, crystalline inclusions and a freckled dark green and brown glaze with large iron spots covering the exterior. Vessels all appear to be large storage jars with short, rounded, horizontally aligned 'butterfly handles' attached at the shoulder.

COLOUR	
Colour	Dark bluish grey
Core	5PB 4/1
Margin	Same as core
Surface	Same as core

Integrity: The class is represented by a small sample within the assemblage from Siraf. The material is distinctive and clearly differentiated from STONE.BG1 though the vessel type is similar.

Vessel Forms: Large storage jars with a rounded globular body, a short everted rim and short, thick, horizontally aligned 'buttery handles' attached at the shoulder.

Surface Treatment: Exterior surfaces covered with a simple freckled dark green and brown glaze with a pitted uneven surface and occasional large spots of iron erupting on the surface.

Fabric: Hard, compact, fully-vitrified, coarse, dark grey firing stoneware with numerous rounded crystalline inclusions and some fissures and voids through the matrix.

INCLUSIONS	
	1
Colour	White
Size	<0.1 – 1.5mm
Shape	Sub-rounded
Freq.	3%
Sorting	Good
ID	Quartz?

Specifications: High density with a compact structure, a gritty feel and a clean slightly irregular fracture.

Parallels and Dating: Mid-8th – early 9th century. There are no known parallels for this class, though general similarities with STONE.BG1 suggest that the material is most likely to be of similar date (see above).

Origin: East Asia.

Class Code: DUSUN

Class Name: Dusun Green Glazed Stoneware Storage Vessels

Types: BR6, JR3-4, JB2, H2

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Heavy, thick-walled vessels covered on the interior and exterior above the base, with a thin, uneven, finely crazed, olive-green glaze with a tendency to puddle and slip. The fabric tends to be a light coloured stoneware but the precise composition varies extensively. Several distinctive vessel categories occur including a large storage jar with a distinctive unglazed vertical collar rim, and a series of round section 'butterfly' handles attached to the shoulder (JR3). Other types include a small or medium sized version of the jar with a rolled and everted rim (JR4) and also a robust flat-bottomed basin with steep sides and an unglazed 'T' shaped rim fired to a rusty reddish-brown (BR6).

COLOUR		
Colour	Grey	Very pale brown
Core	N 4-5/1	10YR 7/4
Margin	Same as core	Same as core
Surface	Same as core	Same as core

Coherence: The class displays extensive variation in fabric composition and firing, glaze colour and glaze quality. The material is clearly derived from more than one production centre but is part of a consistent production tradition.

Vessel Forms: The most typical form is a large barrel shaped jar with a flat base and a straight collar neck and several short, thick, horizontally aligned 'butterfly' handles around the shoulder (JR3). Other types include small and medium sized versions of a similar jar with short horizontal 'butterfly' handles attached at the shoulder and a rolled and everted rim (JR4). There is also a large, thick-walled open basin with a flat base, steep near straight sides, short flattened 'butterfly' handles attached below the rim and a 'T' shaped rim that is sometimes turned at a slight inward angle (BR6).

Surface Treatment: Interior and exterior surfaces are covered with a patchy dark to light olive-green coloured glaze which stops at the rim and before the base. The glaze is finely crazed and has a strong tendency to puddle and slip sometimes leaving portions of the body bare. Where the body is exposed it can appear a sandy-buff or rusty reddish-brown. A few vessels have marks inscribed into the body before glazing.

Fabric: Hard, compact mostly grey or buff coloured fabric with occasional coarse grit inclusions and different levels of sintering from fully to partially vitrified. In its partially vitrified form the fabric appears buff or orange.

Inclusions: Occasional varied coarse inclusions.

Specifications: High density with a compact structure, a fine gritty feel and an irregular, sub-conchoidal fracture.

Parallels and Dating: Mid-8th – 11th century. This is the same as DUSUN in the Williamson Collection (Priestman, 2005a: 304, pl. 169). This is the most common category of East Asian pottery from Siraf and amongst the earliest to arrive at the site. DUSUN jars and bowls have been recovered from the fill of the Great Mosque foundation platform dated to before AD c.803-04 as well as from below a floor associated with an 8th century building in use before the foundation platform was established (Whitehouse, 1973: 244-46). As durable storage containers, DUSUN vessels have the potential to remain in circulation long after their initial period of production. At Siraf the class appears to drop off in frequency during the 11th century, though a few vessels may have continued to be used beyond their main period of production (Whitehouse, 1973: 251). The most common DUSUN vessel type is the large storage jar (JR3), examples of which have been discovered being used as transport containers for stacks of Changsha bowls from the Belitung wreck discovered off the coast of Indonesia (Guy, 2001-02: 15, 19). Transport vessels with strap handles and a simple green ash glaze are part of a long lived tradition in China extending from at least the Eastern Jin period (i.e. 4th – 5th century AD) (for an early example see Lam, 1986: 132-33, cat. 21 from Tomb 10 at Xine, Shaoguan) to about the 12th century. Within this long range, there may be particular features that allow one to distinguish between the products of different periods.

Origin: Guangdong and Fujian provinces, South China. The class was manufactured at a number of kilns within Guangdong and Fujian provinces close to the ports of South China (Krahl, 2010a: 199).

Class Code: MTB.1

Class Name: 'Martaban' Black Glazed Stoneware Storage Jars, Group1

Types: None defined

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Small to medium sized globular jars with a coarse grey, black-grit tempered stoneware body covered over the exterior with a finely crazed, patchy, dark olive-green or black iron-glaze, which is often badly degraded leaving only speckles of glaze or no glaze at all.

COLOUR		
Colour	L. bluish grey, L. greenish grey	L. bluish grey, light grey
Core	5PB 7/1	5PB 7/1
Margin	Same as core	Same as core
Surface	10Y 7/1	5Y 7/1

Integrity: Although the term 'Martaban' can be applied to a much broader and fairly ill-defined tradition of black glazed storage jars produced widely in East Asia over several centuries, MTB.1 is a specific class with consistent and distinctive characteristics.

Surface Treatment: Interior surfaces are plain while exteriors are covered dark brown or black glaze. Surfaces are generally otherwise plain though some pieces have incised lines. There are also a few pieces with embossed characters or with appliqué decoration.

Vessel Forms: Small to medium sized jars with rolled rims, short necks, a globular body, a flat or concave base and a series of small horizontally aligned 'butterfly' handles attached at the shoulder.

Fabric: Fully-vitrified, light-grey stoneware with high levels of coarse inclusions including poorly-sorted, sub-rounded black elements and occasional large rounded translucent grains.

INCLUSIONS		
	1	2
Colour	Black	Translucent white
Size	<0.5 - 4mm	1 - 4mm
Shape	Sub-rounded	Rounded
Freq.	7 - 10%	<1%
Sorting	Poor	Fair
ID	Hard black grit	Translucent grit

Specifications: Dense and vitrified with a rough feel and a clean sub-conchoidal fracture.

Parallels and Dating: 14th – 17th century. The class occurs at al-Mataf from Phase II of the Mosque sequence, suggesting that it came into circulation within the Persian Gulf region from the 14th century and continued as late at the early 17th century when the site was abandoned (Kennet, 2004: 50, table 7).

Origin: Southeast Asia.

Class Code: MTB.2

Class Name: 'Martaban' Black Glazed Stoneware Storage Jars, Group 2

Types: None defined

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Coarse grey stoneware jars with a black glaze similar to MTB.1 with a number of key distinctions. The jars appear to fall predominantly within the larger size range and to have a concave base. Other key differences include the fabric, which has less coarse inclusions. Interior and exterior surfaces are covered with a thin iron-wash. Exterior surfaces are also covered with an iron-glaze, which is often degraded and can be worn away all together, though not as frequently as MTB.1.

COLOUR		
Colour	Grey, light grey	Light olive grey, light grey
Core	N 4-5/1	5Y 6/2
Margin	Same as core	Same as core
Surface	5Y 7/2	5Y 7/2

Integrity: Although the term 'Martaban' can be applied to a much broader and fairly ill-defined tradition of black glazed storage jars produced widely in East Asia over several centuries, MTB.2 is a specific class with consistent and distinctive characteristics.

Surface Treatment: Interior and exterior surfaces are covered with a thin iron-wash which leaves a streaky or blotchy effect on exposed surfaces. Exterior surfaces are also covered with an iron-glaze which stops before the base and appears variegated in colour with patches of dark olive-green, brown, very dark brown and creamy grey.

Vessel Forms: Small to medium sized jars with rolled rims, short necks, a globular body, a concave base and a series of small horizontally aligned 'butterfly' handles attached at the shoulder.

Fabric: Fully vitrified, fine, grey stoneware with only very occasional coarse inclusions.

INCLUSIONS		
	1	2
Colour	Black	Translucent white
Size	≤0.5mm	0.5 - 1.5mm
Shape	Rounded	Sub-rounded
Freq.	<1%	<1%
Sorting	Good	Good
ID	Black grit	White grit

Specifications: Dense and vitrified with a rough feel and a clean sub-conchoidal fracture.

Parallels and Dating: 14th – 17th century. The class may have a similar date range to MTB.1, although it appears to correspond closely to the description of BSTONE, a few sherds of which occur at al-Mataf between Phase II - III of the Mosque sequence and Period III of the Occupation area, which are dated slightly more narrowly to between the 14th - 16th centuries (Kennet, 2004: 50, tables 7-8).

Origin: Southeast Asia.

Painted Stoneware

Class Code: CHANG

Class Name: Changsha Ware

Types: BR1-2, BB1-2, JR1, JB1, H1, SP1-2

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Glazed and painted stoneware with a hard, compact, sandy grey, yellow or orange fabric. Vessels occur in a restricted range of forms, either medium sized open bowls or low jars with a fine spout and handle. Exterior surfaces of jars and interiors and upper exteriors of bowls are generally covered with a lighter slip and a transparent greenish-yellow tinted glaze. Bowls are also decorated with brown, green and occasionally blue painted floral or abstract decoration. Jars are decorated with patches of brown and detailed floral mouldings floated on the surface.

COLOUR			
Colour	Grey	Pale yellow	Light reddish brown
Core	N 6/1	2.5Y 7/3	5YR 6/4
Margin	Same as core	Same as core	Same as core
Surface	Same as core	Same as core	Same as core

Integrity: Coherent and very distinctive.

Vessel Forms: Two main types are represented within the class, an open bowl and a spouted jar. Some variation occurs within each of these. Typically bowls are medium sized with curved walls and a simple or gently everted rim. The base is a thick with a fairly crudely turned foot ring with a square outer edge and a chamfered inner face. Another base type occurs with a wide, low, flat foot ring with a small turned central depression. Jars have a wide flat base that angles back in slightly at the wall junction. The shoulders curve back in gently to a sharp angle at the neck. The neck can be straight or curved and the lip is sharply everted. Jars are provided with a short rounded or facetted sided spout with a short looped strap handle on the opposing side formed from three thin coils joined in a strip.

Surface Treatment: Exteriors of jars and the interior and part of the exterior of bowls are generally covered with a lighter coloured slip and a transparent, yellow tinted glaze with a soft glossy surface a fine non-distinct crazing. Interiors of bowls have painted decoration applied in dynamic strokes in brown, green and occasionally blue. Segments of the rim of bowls are often dipped in brown pigment. On jars the main form of decoration is finely detailed moulded floral elements floated onto the surface and painted in brown pigment. A few pieces appear to have been slipped and glazed but otherwise left plain.

Fabric: Hard, compact, sandy textured, light-grey, buff-yellow or orange stoneware with occasional, fine red or black grits and some voids. The fabric is hard-fired but ranges from being partially vitrified to well sintered; it could therefore be classified either as a high-fired earthenware or a low-fired stoneware.

INCLUSIONS	
	1
Colour	Black/red
Size	≤1mm
Shape	rounded
Freq.	occasional
Sorting	Fair
ID	Partially voided red or black grit

Specifications: High density with a compact structure, a rough feel and a sub-conchoidal fracture.

Parallels and Dating: Mid-8th – 9th century. This is the same a CHANG in the Williamson Collection (Priestman, 2005a: 307, pl. 168). Although excavations have taken place at the main production site for Changsha Ware in Hunan Province, these do not appear to provide clear evidence for any significant changes in the temporal development of the industry (Mak, 1998). Within the Chinese ceramic literature, all products of Changsha are presented together from the mid-8th century up to the collapse of the Tang dynasty at the beginning of the 10th century. At Siraf, some evidence is available to support a possible developmental transition within the industry. Painted CHANG bowls are amongst the earliest Chinese pottery to occur in the sequence at Siraf. Large quantities of pieces come from the fill of the Great Mosque foundation

platform, which was completed after AD 803-04. Pieces from the foundation platform fill include both brown and green painted bowls with portions of the rim dipped in brown. The assemblage also includes a bowl types that is generally smaller, which only has green painted decoration consisting of clusters of dots set at intervals around the rim (Whitehouse, 1973: 248-49, pl. 18.3: a-d). Whitehouse observes that the latter variant appears to go out of circulation earlier at Siraf than the bichrome painted version. A massive cargo of 56,500 Changsha bowls were recovered from the Belitung shipwreck off the coast of Indonesia, mostly likely dated from the AD 840s (Wilson & Flecker, 2010: 37). Green spotted Changsha appears to be absent from the Belitung cargo, perhaps reconfirming the idea that variant went out of circulation before the mid-9th century. The other major vessel type represented within the Changsha export assemblage is a wine-ewer with applied decoration (JR1, SP1-2, H1, JB1). At Siraf these do not appear within the assemblage until after the construction of the Great Mosque after AD 803-04, some time after the initial import of Changsha bowls in the mid-late 8th century (Whitehouse, 1973: 251-52). At what point during the early 9th century wine-ewers first came into circulation has not yet been established, but certainly by the AD 840s vessel identical to those from Siraf are well represented amongst the thousands of vessels contained within the Belitung cargo (Liu Yang, 2010: 157-58).

Origin: Changsha, Hunan Province, South China.

White Stoneware

Class Code: GWSG.1-2

Class Name: Green & White Splashed-Glazed Ware, Groups 1-2

Types: BR2-4, BB3

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Fine, dense, white stoneware covered on the interior and exterior with a white slip and clear, slightly opaque, white glaze with splashes of bright green occasionally combined with splashes of yellow. The glaze has a slight yellowish tint and shows up cream against the body. The green splashes are applied as spots or vertical streaks and have a tendency to run and diffuse at the edges. All vessels are open bowls or dishes with a squared foot ring and a simple rounded rim.

GWSG.1 – The sub-class includes all pieces with bluish-green coloured splashes, though some variation occurs in the tone of the pigment and some examples have a more yellowish-green hue. The most common decorative arrangement is for regularly arranged rows of spots. Some pieces also have vertical streaks. GWSG.1 also includes all examples with a combination of yellow and green splashes.

GWSG.2 – All pieces have very diffused, randomly arranged splashes of green. The green has a distinctive bright yellowish-hue and the glaze a particularly lustrous surface and relatively coarse crazing. In other respects the two sub-classes appear to be the same.

Colour: White throughout the core and margin.

Integrity: Coherent well-defined class. The class can at times be difficult to distinguish from imitations of the material, particularly those manufactured in a fine cream coloured fabric from Iraq (SPLASH.GW1). At the same time, there do appear to be a range of appreciable differences. In particular: the body tends to be harder and more compact; the glaze is better fitted and thus it tends to be better preserved; and, the splashed colour is brighter, slightly less diffuse and arranged more regularly, often in spots. In addition the glaze has a fine hairline crazing which appears to be diagnostic.

Vessel Forms: Small to medium sized open bowls and dishes with a squared and bevelled foot ring and simple rounded rims. Common rim types include one that is gently everted (BR3) and one that is straight (BR2). Dishes have a long straight or slightly everted flange.

Surface Treatment: Interior and exterior surfaces appear to be covered with a white slip that stops immediately before the foot. This is then covered over with a transparent, slightly yellow tinted glaze splashed with bright patches of green occasionally combined with yellow. The splashes are either arranged as a series of regularly laid out, closely spaced spots, or as vertical steaks. In either arrangement the spots of colour diffuse at the edges and run out into the glaze.

Fabric: Hard, compact, finely levigated cream or white coloured fabric with no visible inclusions and a fine 'chalky' quality that differentiates the body from porcelain. The fabric is fired to a high temperature and could be classified either as a white stoneware or high-fired earthenware.

Inclusions: None.

Specifications: Dense and compact with a hard, smooth feel and a clean sub-conchoidal fracture.

Parallels and Dating: Mid – late 9th century. This is the same class as GWSG in the Williamson Collection (Priestman, 2005a: 307-08). Lots of kilns produced small quantities of white ware with green splashes but rarely in the form of bowls. No large kilns have been discovered that specialised in the production of this material (Krahl, pers. comm. 2008). Within a Middle Eastern context, GWSG is fairly common, suggesting that it may have been produced largely as an export ware. Amongst the Belitung cargo there are a number of pieces of GWSG with diffuse, randomly arranged olive-green coloured splashes equivalent to GWSG.2 from Siraf (Hsieh Ming-liang 2010: fig. 117). GWSG.1 with regularly arranged bluish-green coloured spots does not occur within the Belitung cargo pointing towards the possibility of a slightly later date for this material or a different centre of production. A good parallel for what appears to be the most common form with a rolled rim comes from the Tang period tomb number 13 at the Sanmenxia Chemical Plant in Henan Province (Zhang Bai, 2008a: pl. 65).

Origin: Henan Province, North China.

Class Code: GYSG

Class Name: Green on Yellow Splashed-Glazed Ware

Types: None

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Fine, dense, white stoneware covered on the interior and exterior with a white slip and clear, glossy bright yellow glaze with diffuse splashes of green. The green splashes are applied as vertical streaks mostly on the interior and to a lesser extent on the exterior.

COLOUR		
Colour	Pink	L. yellowish brown
Core	7.5YR 7/4	2.5Y 6/3
Margin	Same as core	Same as core
Surface	Same as core	Same as core

Integrity: The class is represented by just two sherds in the assemblage from Siraf in the British Museum. Both are consistent but a larger sample would be required to determine the range of potential variation.

Vessel Forms: Medium sized open dishes with a wide gently curving flange and a rounded lip.

Surface Treatment: Interior and exterior surfaces covered with a white slip and a clear, glossy, bright yellow tinted glaze with diffuse splashes of green which turns darker where it mixes with the yellow.

Fabric: Hard, compact, finely levigated light-orange or buff-grey coloured fabric with no visible inclusions and a fine grainy structure.

Specifications: Dense and compact with a hard, smooth feel and a clean fracture.

Inclusions: None.

Parallels and Dating: Mid – late 9th century. There are no known parallels for this material either in the Middle East or China, however the obvious similarities with GWSG suggests that the two classes are most likely to share the same dating (see above).

Origin: North China.

Class Code: GM

Class Name: Green Glazed Moulded Ware

Types: BR5

Clay: Stoneware **Production**: Moulded

Defining Characteristics: Small thin-walled vessels with a pure white stoneware body, intricate moulded decoration and a glaze that is either coloured bright green, or is clear and slightly yellow tinted showing up cream against the body with splashes of green. The green splashes are applied as spots or vertical streaks and have a tendency to run, diffusing at the edges and puddling in areas of depression created by the moulded decoration.

Colour: White throughout the core and margin.

Integrity: Coherent and very distinctive.

Vessel Forms: Small, thin walled shallow open dishes generally with a simple rounded rim. Examples also exist of a rim with shallow notches or with indentations in the wall and a wavy profile.

Surface Treatment: Vessels are moulded with intricate relief decoration filling the interior. In addition the surfaces are covered with a clear glossy glaze. The glaze can be coloured monochrome green or transparent slightly yellow tinted white with green splashes applied as spots or vertical streaks.

Fabric: Hard, compact, finely levigated cream or white coloured fabric with no visible inclusions and a fine 'chalky' quality. The fabric is fired to a high temperature and could be classified either as a white stoneware or high-fired earthenware.

Inclusions: None.

Specifications: Dense and compact with a hard, smooth feel and a clean sub-conchoidal fracture.

Parallels and Dating: 10th century (Lio or Northern Song). The fabric and green splashed decoration on some pieces suggest similarities with GWSG though moulded vessels are believed to be generally later (Krahl, pers. comm. 2008). Green moulded ware does not occur within the Belitung cargo, which is most likely dated to the 840s.

Origin: North China.

Class Code: WWSL

Class Name: White Slipped Stoneware

Types: BR3, BB2, BB6

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Relatively thick-walled vessels, most typically medium-sized open bowls with a squared foot ring and a gently everted rim with several slight notches around the circumference and raised vertical ridges on the interior. Surfaces are covered with a white slip and a clear slightly yellow or green tinted glaze, which appears thick and opaque with very fine crazing and a soft even gloss. The body is a dense and compact with occasional black grit inclusions. It is fired to yellowish-white or sometimes pale grey.

COLOUR	
Colour	Pale yellowish white or Light greenish grey
Core	N 8/1
Margin	Same as core
Surface	Same as core

Integrity: Distinctive and coherent class.

Vessel Forms: Mostly small and medium sized open bowls relatively thick walls, a squared foot ring, curved sides and a gently everted rim with a rounded lip. The lip has several light depressions around the circumference accompanied by a low vertical rib running down the interior wall. As the vessels are fragmentary, it is not clear whether all vessels had this rib. Some other one-off types are also represented including a flat dish, a bowl with a flat base and a large thick walled basin with a sharply angled flange rim.

Surface Treatment: Interior and exterior surfaces are covered with a white slip, presumably to obscure the impurities within the body. This is then covered with a clear glaze that appears thick and slightly opaque. The glaze appears yellowish cream coloured over a white body or slightly green where the body is partially reduced. The glaze has very fine hairline crazing and a soft glossy surface where it is well preserved. All parts of the surface are covered apart from the foot.

Fabric: Hard, compact, finely levigated creamy-white or light grey coloured fabric with occasional small black inclusions. The fabric can either be fine and grainy or slightly glassy. The fabric is fired to a high temperature and could be classified either as a white stoneware or high-fired earthenware.

INCLUSIONS	
	1
Colour	Black
Size	≤1mm
Shape	Rounded
Freq.	Occasional
Sorting	Good
ID	Black grit, sometimes party burnt out

Specifications: Dense and compact with a hard, smooth feel and a clean sub-conchoidal fracture.

Parallels and Dating: Mid-9th – 10th century (late Tang or early Song period). This is the same as WWSL in the Williamson Collection (Priestman, 2005a: 287-88). The best known and highest quality slipped white wares were produced at the Gongxian kilns in the Gongyi area, Henan Province, together with a rarer version with cobalt blue painted decoration. A good parallel for the main form represented with raised internal ribs and slight notches in the rim comes from the Tang dynasty tomb of Beiyaowan excavated in 1992 in Gongyi city close to the main kiln production site (Zhang Bai 2008a: pl. 61). Inferior versions of slipped white ware were manufactured elsewhere within South China, though little is currently known about the major centres catering for the export demand.

Origin: Gongxian or elsewhere in southern China.

Class Code: CIZHOU

Class Name: Cizhou Ware

Types: None defined

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Medium-sized jars with a fine grainy white stoneware body and distinctive decoration consisting of elements painted in black with lines incised through to reveal the contrasting white body below. The background colour of the glaze is an opaque off-white.

Integrity: The class is represented by a single sherd from the Williamson Collection. A larger quantity of material would be required to determine the extent of potential variability within the class.

Surface Treatment: Covered with a clear off-white coloured glaze painted with washes of black that have been incised through to reveal the contracting white body below.

Vessel Forms: Closed jar forms.

Fabric: Hard, compact, off-white coloured stoneware with a fine, 'dry', grainy structure and occasional fine black inclusions.

Specifications: Dense and compact with a hard, smooth feel and a clean sub-conchoidal fracture.

Parallels and Dating: 14th century. Similar examples of black and white Cizhou jars come from the Shinan shipwreck cargo dated to AD 1323 (Anon. 2006: pl. 150).

Origin: Cizhou, southern China.

White Glazed Stoneware

Class Code: CREAM

Class Name: Opaque Cream Coloured Glazed Ware

Types: None

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Dishes and bowls with a hard, dark-red, gritty fabric and a thick, opaque, creamy-white or light-green coloured glaze covering both the interior and exterior down to the base of the foot. The glaze is generally coarsely crazed.

COLOUR	
Colour	Red
Core	2.5YR 6-7/6
Margin	Same as core
Surface	Same as core

Integrity: Coherent and distinctive class.

Surface Treatment: Interior and exterior surfaces covered with a thick opaque cream or lime-green coloured glaze.

Vessel Forms: Various open bowls & dishes with a simple or flanged rim and a cleanly turned foot ring.

Fabric: Very hard and dense, brick-red earthenware with an even, compact structure and some very fine, well-sorted grits.

INCLUSIONS	
	1
Colour	Red or black
Size	≤0.5mm
Shape	Sub-rounded
Freq.	1 - 2%
Sorting	Good
ID	Grog or grit

Specifications: High density with a compact structure, a rough feel and a fine, irregular fracture.

Parallels and Dating: 15th – 17th century. An identical class with an opaque, white or light-green glaze and a hard red body was recovered from above the abandonment level in Trench MA-2 at al-Mataf, which points to a post mid-17th century dating (Hansman, 1985: 34, pl. V: k, n, fig. 9: j-k). From later excavations at the same site, a number of sherds where recovered from Phase III of the Mosque indicating a somewhat earlier dating to between the late 15th to late 16th centuries (Kennet, 2004: 51, table 7).

Origin: Hansman suggests that the class may be from Southeast Asia or southern China (Hansman, 1985: 34). Fieldwork carried out in Myanmar in 2002 identified a number of sherds belonging to the class at the Twante kiln site and from the port sites along the Twante canal suggesting that the class may have been manufactured in Myanmar, although no actual production site has yet been located (Sasaki & Sasaki, 2002: 15).

Green Glazed Stoneware

Class Code: STONE.GU

Class Name: Guangdong Green Glazed Stoneware

Types: BB6

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Small to medium sized bowls and dishes with a solid turned bi-disc or flat concave foot and a simple rounded rim. One dish type has a wide flange rim. Vessels are glazed on the interior and exterior with the glaze stopping before the foot. Bowls also have three large unglazed square patches in the interior for stacking during firing. The glaze is glossy, coarsely crazed, has a slight tendency to puddle, and ranges in colour from light bluish to yellowish-green. The fabric is a coarse yellowish-buff or sometimes light grey coloured stoneware that contains some mixed coarse inclusions, mostly quartz grains and dark grey or reddish flecks and voids.

COLOUR		
Colour	Very pale brown	Grey
Core	10YR 8/3	10YR 5/1
Margin	Same as core	Same as core
Surface	Same as core	Same as core

Integrity: Reasonably distinctive class, particularly in the examples with a bi-disc base with square patches of glaze removed.

Vessel Forms: Small to medium sized open bowls and dishes with a simple rounded or a straight flange rim and a thick turned base. Bases are either flat and slightly concave, or more often of the bi-disc type with a chamfered outer edge, a slightly concave interior and a small flat circular depression in the centre.

Surface Treatment: Interior and exterior surfaces are covered with a coarsely crazed greenish-blue or yellowish-green coloured glaze that has a tendency to puddle. The glaze can stop at the base or continue over the base with three large roughly square patches freed for stacking during firing.

Fabric: Coarse low-fired stoneware fired to a yellowish-buff or sometimes light grey. The fabric is compact but fractures irregularly and contains varying levels of mixed coarse inclusions and voids. Common elements include larger quartz grains and small dark grey or reddish flecks which appear to diffuse into the matrix at the edges.

INCLUSIONS		
	1	2
Colour	Trans. white	Black/red
Size	≤1mm	≤0.5mm
Shape	Sub-rounded	Sub-rounded
Freq.	2-3%	Occ. – 3%
Sorting	Good	V. good
ID	Quartz	Dark flecks

Specifications: High density with a compact structure, a gritty feel and an irregular fracture.

Parallels and Dating: Early – mid-9th century. At least one example of a very closely comparable vessel with a bi-disc base a square patches of glaze freed from the foot was recovered from the cargo of the Belitung wreck, which is most likely datable to the 840s (Krahl, pers. comm. 2009). This vessel is typologically closely related to early straight sided conical YUE bowls with a bi-disc base dated to the same period (BR9A). Other examples have been recovered from excavations conducted within Guangdong Province (Lam, 1986: No. 95) and from Shenwancuu on Chilajiao Island in Hong Kong (Lam, 1986: 222-23, cat. 94: bottom right).

Origin: Guangdong, South China.

Class Code: YUE.1-4

Class Name: Yue Ware

Types: BR7, BR8A/B, BR9A/B, BR10, BB4A/B, BB5A/B, BB6-7, BB8A/B, BB35, OC1

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Generally small and medium sized bowls with thin walls and a subdued greenish-grey or yellow-green coloured glaze with a soft, even sheen. The glaze covers both the interior and exterior. Vessels were often stacked for firing and have scares on the base underside of within the vessel interior. The fabric is a fine, hard, compact, fully-vitrified pale grey or yellowish-grey coloured stoneware sometimes with fine black inclusions. Four sub-classes have been defined within the Yue Ware class. These are defined purely on the basis of typological grounds and are grouped according chronological criteria. There are no appreciable differences in glaze or fabric between the four groups, apart from certain examples where quality is defined at a type-specific level.

YUE.1

BR9A: Conical straight sided bowl with a rounded lip. The lip sometimes has slivers of brown where the glaze is particularly thin.
BB6: Flat bi-disk base with a small central concavity and spur marks around the edge of the foot.

YUE.2

BR8A: Bowls with four or five shallow vertical indentations in the exterior wall. Rims are gently lobed or plain and either slightly everted or straight.
OC16: Bowls with a well fitted glaze, simple wide-lined incised decoration in the interior and a high flared foot ring with spur marks on the bottom of the foot.
OC17: Box or openwork incense burner with a pointed thumb-knob on top.

YUE.3

BR7: Gently everted bowl rim.
BR9B: Straight bowl rim with a pointed lip or a slight curve in the wall.
BR10: Slightly closed bowl rim with strongly curving sides.
BB4A: Bowl base with a low, wide, squared foot ring with chamfered edges and a ring of closely spaced white teardrop shaped spur marks around the vessel interior and the bottom of the foot.
BB4B: Bowl base with a low, wide, squared foot ring with chamfered edges and spur marks around the bottom of the foot but not within the interior. BB4B vessels are often smaller than BB4A and include examples with a better fitted glaze.
BB5A: Bowl base with a tall, straight, pointed foot ring with a curved interior profile and spur marks on the bottom of the foot.
BB8: Bowl with a curved recessed base with spur marks around the edge of the recess.

YUE.4

BR8B: Lobed rimmed bowl with long, curving lobes and a straight or gently everted lip.
BB5B: Bowl base with a tall, straight, pointed foot ring with bar-shaped spur marks within the interior of the foot. The vessel interior also has an incised ring at the break of angle between the floor and wall.
BB7: Bowl with a curved recessed base, similar to BB8 but with a slight lip at the edge of the recess and bar-shaped spur marks within the foot.
BB35: Bowl base with a tall, flaring pointed foot ring, a curved interior profile and intricate fine-lined incised decoration.
OC1: Small cylindrical lidded box with a plain exterior or carved lotus petals with fine-lined incised decoration.

COLOUR		
Colour	Light bluish grey	Light grey
Core	5PB 7/1	10YR 7/2
Margin	Same as core	Same as core
Surface	Same as core	Same as core

Integrity: Some variation in glaze colour and quality but as a whole consistent and coherent.

Vessel Forms: Mostly small and medium sized open bowls with a straight or gently everted rim and various forms of foot (see above).

Surface Treatment: Interior and exterior surfaces are covered with a thin, pale greenish-grey or yellowish-green coloured glaze with a soft even sheen and no crazing. Further common forms of decoration include gently lobed rims, vertical indentations in the walls and fine-lined incised decoration cut into the body.

Fabric: Fine, hard and compact pale grey or yellow-grey coloured fabric with no visible inclusions or sometime very fine black flecks. There appears to be some variation in the fabric composition and quality but at least some of this may be attributed to differences in firing.

INCLUSIONS	
	1
Colour	Black
Size	≤0.1mm
Shape	Sub-angular
Freq.	0-3%
Sorting	v. good
ID	Black flecks

Specifications: High density with a compact structure, a smooth feel and a clean sub-conchoidal fracture.

Parallels and Dating: 9th – 10th century. Specific types within the Yue Ware tradition can be dated more closely.

YUE.1 - Early – mid-9th century. Conical bowls with a bi-disk base (BR9A, BB6) occur within the Belitung cargo most likely dated to the 840s, though they were first introduced somewhat earlier than this date before the adoption of the projecting foot ring.

YUE.2 - Mid-9th century. Bowls with vertical indentations in the wall and simple broad-lined incised decoration and a well fitted glaze (BR8A and OC16) find close parallels in the Yue Ware from the Belitung Cargo, which is most likely dated to the 840s.

YUE.3 - 9th century. The forms within YUE.3 are less closely dated but can generally be distinguished from later Yue Ware vessels of the 10th century (see below). Roughly made Yue Ware bowls with a ring of stacking spurs within the interior (BB4A) are similar to examples excavated from Ningbo within a context dated to AD c.806-20 (Lin Shimin, 1994: 144-45).

YUE.4 - 10th century. Bowls with bar-shaped stacking marks in the interior or the foot (BB5B, BB7, BB35) are generally dated to the 10th century and attributed to the Five Dynasties and Northern Song periods as are examples with fine-lined incised decoration (BB35, OC1). The Percival David Collection contains a base sherd of identical type to BB5B which is very rare in having a date inscription of AD 978 demonstrating the persistence of this form into the late 10th century (PDF.292). In the same collection there are examples of cylindrical lidded boxes of the same type as OC1 attributed to the 10th century, one of which has fine-lined incised decoration similar to that observed on a number of YUE.4 types (PDF.267).

Origin: Shanglinhu, Zhejiang Province, South China. The most famous centre for Yue Ware production was Shanglinhu in Zhejiang Province. However, 'Yue Ware' was widely copied within southern China and some pieces may be regional products from subsidiary kilns, particularly the very roughly made vessels with internal teardrop shaped spur marks (BB4A) which may have been manufactured elsewhere within Southern China.

Class Code: YAOZ

Class Name: Yaozhou Ware

Types: None.

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Thin-walled bowls with deep carved floral decoration filling the interior. The fabric is a hard, compact light grey porcelainous-stoneware body covered on the interior and exterior with a lighter slip and a subdued greenish-grey coloured glaze that puddles against the cleanly defined edges of carved and incised decoration. The glaze has a distinctive cloudy quality caused by fine bubbles within the matrix and no crazing.

COLOUR	
Colour	Grey/L. brownish grey
Core	10YR 6/1
Margin	10YR 6/2
Surface	Same as margin

Integrity: The class is represented by a single sherd from the assemblage from Siraf in the British Museum. A large sample would be required to determine the extent of potential variability within the class.

Vessel Forms: Thin-walled bowls or dishes with curved sides and mostly likely a shallow profile.

Surface Treatment: Interior surfaces are covered with intricate carved and incised decoration consisting of interlocking floral motifs covered with a greenish-grey coloured glaze that puddles within the recessed areas of the decoration.

Fabric: Hard, fine, compact porcelainous-stoneware fabric with no visible inclusions. Fired to a light grey and turning cream coloured in the margins where the surfaces appear to be covered with a lighter self-slip.

Inclusions: None.

Specifications: Average density with a fine, compact structure, a smooth soapy feel and a sub-conchoidal fracture.

Parallels and Dating: 11th century. Production of carved green glazed wares at the Yaozhou kilns is associated with the Northern Song Dynasty period.

Origin: Yaozhou, Shaanxi Province, North China.

Class Code: LQC

Class Name: Longquan Celadon

Types: BR11-19, BB9-12

Clay: Stoneware **Production**: Wheel-made/moulded

Defining Characteristics: Fine, hard, compact, pure porcelainous-stoneware body with a thick, soft, opaque green slip-glaze covering the whole of the interior and exterior apart from an unglazed zone on the foot or the base. The glaze colour and quality varies quite extensively and can include a range from light turquoise-green to dark olive-green or brown and from soft, glossy and non-crazed to thick, opaque and heavily crazed. Most sherds belong to small or medium sized open bowls with a squared foot ring and some form of carved decoration.

COLOUR	
Colour	Light greenish grey
Core	N 8/1
Margin	Same as core
Surface	Same as core

Integrity: Fairly extensive variation in glaze colour and quality but generally the class is consistent and distinctive.

Vessel Forms: Small or medium sized open bowls with straight, gently everted or sharply angled flange rims or larger dishes with heavy straight or beaked flange rims. Bases are mostly squared foot rings with several variations.

Surface Treatment: Interior and exterior surfaces are covered with a thick, glossy greenish-grey or darker yellowish-green coloured slip-glaze. The thick opaque quality and the perfect fit of the Longquan Celadon glaze is due to a combination of its correct maturation during firing (Leach, 1940: 127), the suspension effect of low-levels of ferrous oxide (1.5 - 3%) introduced into the glaze within a clay-slip (Cardew, 1973, 139), and the fact that the glaze was applied raw (without a pre-biscuit firing) as a slip-glaze (Wood, 1978: 18-20). Apart from the glaze, most vessels are decorated with carved or in some cases stamped or moulded decoration. Common carved elements include vertical flutings on the exterior or interior, interlocking 'lotus petal' designs on the exterior or more complex elements.

Fabric: Very fine, fully-vitrified porcelainous-stoneware with almost no visible inclusions, but some small voids and occasional small impurities (<0.5mm). The fabric is fired to a pure-white or more often a reduced light grey. Where the body is exposed on the vessel surface it appears bright red.

INCLUSIONS	
	1
Colour	Voids
Size	<0.5mm
Shape	Rounded
Freq.	≤3%
Sorting	Good
ID	Air pockets

Specifications: High density with a fine compact structure, a smooth feel and a clean sub-conchoidal fracture.

Parallels and Dating: Late 13th – 15th century. Specific types within the Longquan Celadon class can be dated more closely.

Origin: Longquan, Zhejiang Province, South China. The area where LQC was produced covers a large area and includes many hundreds of individual kilns. Attributing products to individual production sites remains problematic. Imitation LQC was also manufactured in other areas such as Guangdong (see GDC.1) and can difficult to differentiate.

Class Code: GDC.1

Class Name: Guangdong Celadon - Group 1

Types: None defined

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Very similar to LQC but the body is buff coloured and the glaze is a dark olive-green or brown. The inside floor of the vessel is often turned flat with a slight step between the floor and the wall. Most vessels have an unglazed stacking ring on the interior.

Colour: Buff-grey.

Integrity: Fairly consistent group, though it is not clear whether the fabric and glaze colour simply relate to firing conditions and quality of production or genuinely reflect an alternative provenance.

Surface Treatment: Covered with a dark olive-green or brown coloured glaze and sometimes carved with vertical fluting, lotus petals or other elements.

Vessel Forms: Small and medium sized open bowls mostly with simple rims and a squared foot ring.

Parallels and Dating: Late 13th – 15th century. The class is equivalent to GDC.3 in the Williamson Collection (Priestman, 2005a: 299-300, pl. 200). The class is stylistically closely related to LQC and it is therefore likely to share the same dating (see above).

Origin: Guangdong Province, southern China?

Class Code: GDC.2

Class Name: Guangdong Celadon - Group 2

Types: None defined

Clay: Porcelain **Production**: Wheel-made

Defining Characteristics: White porcelain body with a light yellowish green glaze. The glaze has a soft, even gloss and a glassy transparent quality. The only known vessel type associated within this is class is a thin-walled, small lotus bowl with simple incised petals on the exterior.

Colour: White.

Integrity: The class is represented by a single sherd in the Williamson Collection. A larger sample would be required to determine the extent of any potential variability within the class.

Surface Treatment: Covered with a glassy, light yellowish-green coloured glaze with a simple incised lotus petal design on the exterior.

Vessel Forms: Small thin-walled bowls with a simple rim.

Fabric: Fine porcelainous-stoneware fired to a light yellowish-grey.

Specifications: High density with a smooth feel and a sub-conchoidal fracture.

Parallels and Dating: 14th – 15th century.

Origin: Likely to have been produced either in the Fujian or Guangdong province (Krahl, pers. comm. 2003).

Class Code: JDC

Class Name: Jingdezhen Celadon

Types: None defined

Clay: Porcelain **Production**: Wheel-made

Defining Characteristics: Pure white porcelain body with a clear white glaze on the exterior and a fine green celadon glaze on the interior. The form is a dish with medium thick walls and broad carved decoration on the interior. The glaze tends to puddle in the carved incisions emphasising the decoration.

Colour: White.

Integrity: The class is represented by a single sherd in the Williamson Collection. A larger sample would be required to determine the extent of any potential variability within the class.

Surface Treatment: Exterior covered with a clear white glaze. Interior covered with a thick, glassy, bluish-green celadon with some coarse crazing. The interior also has decoration carved into the body which shows up darker where the glaze is thicker.

Vessel Forms: Shallow bowl or dish.

Fabric: Very fine, fully-vitrified, porcelainous-stoneware with almost no visible inclusions. The fabric is fired to a pure-white.

Specifications: High density with a smooth feel and a sub-conchoidal fracture.

Parallels and Dating: 15th – 16th century.

Origin: Jingdezhen.

Class Code: STONE.GRY

Class Name: Grey Glazed Stoneware

Types: BB2

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Fine-grained grey stoneware body that is usually re-oxidised orange around the foot. The glaze is transparent and is either plain or finely crazed with occasional black flecks showing through from the body. The glaze covers the interior and exterior, stopping 1 – 2.5cm before the foot. Most bowls have an unglazed stacking ring in the interior with traces of white alumina used ensure separation of the vessels from one another post-firing. The class was obviously mass-produced as it is very standardised and rather crudely made. The bases are thick and the foot rings are roughly turned with tooling marks left un-smoothed.

Colour: Light greenish grey.

Integrity: Coherent and readily recognisable.

Vessel Forms: Medium sized open bowls with a simple straight rounded rim, curving walls and a thick squared foot ring with chamfered edges or a wide, low foot ring.

Surface Treatment: Interior and exterior surfaces are covered with a clear, transparent grey glaze with a slightly greenish tinge. The glaze can be soft and matt with no crazing or shiny with crazing marks.

Fabric: Fine, very hard stoneware with occasional small black flecks, which appear infrequently in the broken section but are more numerous under the glaze. The fabric is generally fired to a reduced grey but is sometimes re-oxidised on exposed surfaces such as the foot ring or the interior unglazed stacking ring. Some pieces are lighter coloured through the core and appear closer to a porcelainous-stoneware.

INCLUSIONS	
	1
Colour	Black
Size	<0.5 - 1mm
Shape	Rounded
Freq.	Occasional
Sorting	Good
ID	Black grit

Specifications: High density with a compact structure, a rough feel and a sub-conchoidal fracture.

Parallels and Dating: 13th – mid-14th century. The same class has been identified at Luluyyah fort in Sharjah which has been dated to the 13th – early 14th century based on the LQC finds (Sasaki & Sasaki, 2001: pl. 7: centre row left & 2nd column centre row) and at site K103 (Old Hormuz) in the Minab area, which has produced an assemblage that is predominantly, although not exclusively dated to the late 13th – 14th century (Morgan, 1991: 70-71).

Origin: Most probably manufactured in South China, probably in Guangdong province, though there is also a slight possibility that it was produced in Vietnam (Guy, pers. comm. 2003).

Class Code: STONE.PLG

Class Name: Patchy Light Green Glazed Stoneware

Types: None

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Fine, slightly powdery, compact, buff coloured stoneware with a distinct glassy quality. Vessels are all medium sized fairly shallow open bowls with a thick raised concave base and a simple rounded lip. Interior and upper exterior surfaces are covered with a thin light yellowish-green glaze that has a strong tendency to puddle and slip. Within the interior, large squares are cut away from the glaze for stacking.

Colour: Pale yellowish white.

Integrity: Coherent and distinctive class.

Vessel Forms: Medium sized shallow open bowls with a heavy raised and turned concave foot, curved walls and a gently everted or up-turned rim with a rounded lip.

Surface Treatment: The interior surface and rim exterior is covered in a thin, patchy, light yellowish-green glaze with large squares cut away from the interior for stacking. Vessels often have a single shallow incised band running round the interior just below the lip.

Fabric: Fine, compact, buff coloured stoneware with a slightly crumbly composition and no visible inclusions. The matrix appears to be partially vitrified and to have a glassy quality.

Specifications: High density with a compact granular structure, a gritty feel and an irregular fracture.

Inclusions: None.

Parallels and Dating: Mid-8th – early 9th century. A quantity of STONE.PLG occurs within the foundation platform of the Great Mosque, which numismatic evidence indicates was completed not long after AD 803-04. Thereafter STONE.PLG becomes scare and appears to drop out of circulation (Whitehouse, 1973: 247-48, 251, pl. 18.2: a-b).

Origin: A production site for what appears to be the same distinctive class has recently been discovered at Tuan Chau on the Red River delta in northern Vietnam (Wisniewski, 2008; 2012). Examples from Siraf represent the furthest known western distribution for this class.

Class Code: STONE.BUR

Class Name: Burmese Green Glazed Stoneware

Types: BB2

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Hard, gritty, brownish-grey coloured stoneware body with a thick, coarsely crazed, dark bottle-green coloured glaze covering the interior and exterior and stopping inside the foot. The glaze has a tendency to puddle leaving thick pooled areas and areas where the glaze is nearly bare. Vessels are robustly built and large.

COLOUR	
Colour	Dark greyish brown
Core	10YR 4/2
Margin	Same as core
Surface	Same as core

Integrity: Distinctive and readily recognisable.

Vessel Forms: Heavy flanged rimmed bowls with a shallow recessed foot-well and simple rimmed bowls with a high tapered foot ring.

Surface Treatment: Interior and exterior surfaces are covered with a thick, coarsely crazed, dull greenish-grey coloured glaze which tends to slip and puddle. Surfaces are also decorated with carved motifs, mostly on the interior. Exteriors can also be fluted. Interior decoration includes horizontal bands, vertical grooves, paired grooves or fluting as well as free-flowing scrolls and arcs. The decoration can be placed either on or below the flange of the rim.

Fabric: Coarse, gritty but densely-fired stoneware containing frequent small white grits and infrequent partially voided black grits. The fabric is fired to a dark reddish-grey. Although the fabric is fully-vitrified the matrix does not appear fully fused.

INCLUSIONS		
	1	2
Colour	White/grey	Black
Size	≤0.5mm	≤0.5mm
Shape	Rounded	Rounded
Freq.	5%	Occasional
Sorting	Good	Good
ID	Rolled quartz	Partially burnt out grit

Specifications: High density with a compact structure, a rough feel and an irregular fracture.

Parallels and Dating: 15th – 17th century. This is the same as STO.BUR in the Williamson Collection (Priestman, 2005a: 301-02, pl. 178). The potter compares closely with material found in Levels 1-3 from the Japanese excavations at Julfar (Sasaki & Sasaki, 2002). Petrographic analysis of this material looking at particle size sorting of quartz grains, rather than the more typical method of analysing the mineralogical suite, indicates that STONE.BUR matches samples collected from the recently identified major production centre at Twante on the Myanmar mainland (Sasaki & Sasaki, 2002).

Origin: Twante, Myanmar (Burma).

Class Code: STONE.THAI

Class Name: Thai Green Glazed Stoneware

Types: None defined

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Various bowl forms with a compact, buff-coloured stoneware fabric with fine black grit inclusions and a slightly coarse, grainy structure. The glaze is glossy, coarsely crazed, has a tendency to puddle. It ranges in colour from dark green to very light blue-green but always tends to be bright with a blue-green tinge. Most forms have glaze covering both the interior and exterior stopping at the base of the foot. One distinctive characteristic is a type of foot ring represented on some pieces with a depression in the centre where the vessels have been stacked on rings leaving a glassy black residue where they have been separated.

Colour: Buff or grey.

Integrity: Fabric and glaze are generally consistent but the class is somewhat generic and a variety of products from different sources may be included within the category.

Surface Treatment: Either plain or with carved decoration. Some vessels have fluted exteriors. Interior decoration includes both fluting and more intricate free-flowing designs.

Vessel Forms: Flanged or simple rimmed bowls and dished, with a low squared foot-ring or a tall pointed foot ring.

Fabric: Hard, grainy, buff or grey coloured stoneware containing occasional fine black grits and frequent very small voids. The fabric has a fine compact structure although the matrix does not appear to be fully fused.

INCLUSIONS		
	1	2
Colour	Black	Voids
Size	≤0.5mm	<0.5 - 1mm
Shape	Sub-rounded	Sub-rounded
Freq.	≤3%	<3 - 5%
Sorting	Fair	Poor
ID	Black grits	Air pockets

Specifications: High density with a compact structure, a gritty feel and a sub-conchoidal fracture.

Parallels and Dating: 15th – early 17th century. Examples with closely comparable greenish-blue tinted glaze of Thai origin can be found amongst the late 15th century cargo of a Chinese Junk wrecked off the Lena Shoal in the Philippines, in particular there are similar plain or incised flanged rim dishes and plain rimmed bowls with horizontal incised bands (Goddio, *et al*., 2002: pls. 288, 305-09).

Origin: Central Thailand.

Porcelain

Class Code: XING

Class Name: Xing Ware

Types: BR20-22, BR91, BB16, OC1

Clay: Porcelain **Production**: Wheel-made

Defining Characteristics: Pure white porcelain covered with a well-fitted clear white or slightly greyish-green tinted glaze with a soft, even sheen. The glaze is always non-crazed and covers the interior and exterior stopping over the base of the foot. The most characteristic vessel form is a small bowl with a narrow beaded rim (BR20) and a cleanly turned flat bi-disc foot (BB16).

Colour: White.

Integrity: Coherent well defined class, though can be difficult to distinguish from better quality white wares manufactured in South China.

Vessel Forms: Mostly small open bowls with a narrow beaded rim and a flat cleanly turned bi-disc foot. Other bowls have everted, gently closed or lobed rims. Another type is a delicately thrown and turned lidded box with a low squared foot ring.

Surface Treatment: Interior and exterior surfaces are covered with a clear, smooth, milky-white or greyish-green tinted glaze with no crazing. The glaze covers all surfaces apart from the base of the foot. Otherwise vessels are left plain.

Fabric: Hard, compact, fully vitrified pure white porcelain with no visible inclusions. The matrix appears glassy and has a clean sub-conchoidal fracture.

Specifications: High density with a compact fully vitrified structure, a smooth feel and a sub-conchoidal fracture.

Inclusions: None.

Parallels and Dating: 9th – 10th century. The highest quality white porcelain products of the period are associated with the Xing kilns in North China. One of the problems for identification purposes of Xing Ware is that copies of Xing-style products where produced in many other areas of the country. Also quality alone does not necessarily provide a reliable differential as poor quality products may also have been produced from some of the lesser kilns within the Xing area. XING is differentiated here on the conventional grounds of being more pure white and finely potted than other white porcelain products, but these criteria are not necessarily satisfactory.

Origin: Xing, Hebei Province, North China.

Class Code: WW

Class Name: White Ware

Types: BR20-22, BR93-94, BB2, BB13-16, OC1

Clay: Porcelain **Production**: Wheel-made

Defining Characteristics: Pure white or light grey porcelain covered with a clear green, yellow or blue tinted off-white glaze generally with a soft, even sheen. Most vessels are small open bowls with simple or rolled and beaded rims and cleanly turned bases. The glaze is generally non-crazed and covers the interior and exterior, including the rim, stopping just before the base.

Colour: White.

Integrity: All white porcelain but wide variation represented in terms of fabric quality, glaze colour and vessel forms. Clearly this generic class includes the products of many different centres of production and also a fairly broad chronological range. Unfortunately the accurate sub-division of the white porcelain assemblage remains extremely problematic as the normal

visual markers of colour, fabric quality, etc. appear to be heavily influenced by firing conditions. The individual types represented within the assemblage provide one aspect that can be used to obtain better chronological control, but they are of lesser value in determining provenance.

Vessel Forms: Mostly small open bowls with a rim that is simple and straight, slightly everted, everted and lobed or gently closed. Bases are cleanly turned and include various forms of foot ring.

Surface Treatment: Interior and exterior surfaces are covered with a clear white or more often green, yellow, blue or sometimes grey tinted off-white glaze. The glaze generally has no crazing, a soft even sheen and stops just before the foot. Apart from the glaze, most vessels are plain but some types have intricate carved and combed decoration cut into the body of the interior especially in the base of the interior floor.

Fabric: Hard, compact, fully vitrified pure white porcelain largely with no visible inclusions. The matrix appears glassy and has a clean sub-conchoidal fracture. Occasionally the fabric is fired to light grey.

Inclusions: Generally none.

Specifications: High density with a compact structure, a smooth feel and a sub-conchoidal fracture.

Parallels and Dating: 9^{th} – 12^{th} century.

Origin: China.

Class Code: CWW

Class Name: Carved White Ware

Types: BB13, BB15

Clay: Porcelain **Production**: Wheel-made

Defining Characteristics: Pure white porcelain covered with a clear white, blue or yellow tinted glaze generally with a soft, even sheen. Vessels are all small open bowls with a simple slightly everted pointed rim and a thick cleanly turned foot ring. The glaze is finely crazed and covers the interior and exterior, including the rim, stopping immediately before or at the bottom of the foot. The most distinctive feature of this class that distinguishes this category from other WW is the exteriors, which are carved with sharp edged flutings representing a crude lotus petal design.
Colour: White.

Integrity: Generally distinctive and consistent but some variation in glaze colour and quality.

Vessel Forms: Small open bowls with curved sides and a thick cleanly turned base with a low squared and chamfered or a high pointed foot ring.

Surface Treatment: Surfaces are covered with a clear white or more often blue or yellow tinted off-white glaze. The glaze can be finely crazed or non-crazed and has a soft even sheen where it is well preserved. The glaze covers both the interior and exterior, including the rim and stops immediately before or at the base of the foot. Foot ring interiors are unglazed and can turn light pink on the surface. Vessel exteriors are carved with a series of sharply defined vertical flutings forming a crude 'lotus petal' design which extends from the top of the foot ring to just before the lip.

Fabric: Hard, compact, fully vitrified pure white porcelain with no visible inclusions. The matrix appears glassy and has a clean sub-conchoidal fracture.

Inclusions: None.

Specifications: High density with a compact structure, a smooth feel and a sub-conchoidal fracture.

Parallels and Dating: 11th – 13th century. This is the same as WWG.2 in the Williamson Collection (Priestman, 2005a: 290-91, pl. 215) and CWW from Kush (Kennet, 2004: 48). The class is commonly referred to as 'Carved White Ware' and was manufactured possibly in Guangdong during the 11th – 13th centuries. A similar Northern Song example with swirling lotus petal design was recovered from the excavation of Zhuyuadun kiln site in Choozhou, Guangdong Province (Anon. 1985: pl. 25).

Origin: Guangdong Province, Southern China.

Class Code: QING

Class Name: Qingbai Ware

Types: BB13-15

Clay: Porcelain **Production**: Wheel-made

Defining Characteristics: Very fine, pure white porcelain body typically with a light, eggshell-blue glaze. The quality and colour of glaze varies quite extensively and includes examples with a fine, even gloss and others that are coarse and heavily crazed and a range of colours from gently tinted white to string 'duck-egg' blue. Forms are mostly small or medium sized bowls with a neatly turned foot ring often accompanied with delicate carved and combed decoration on the interior.

Colour: White

Integrity: Generally distinctive and consistent but some variation in glaze colour and quality.

Vessel Forms: Mostly small to medium sized bowls with curved sides, a thick base and a cleanly turned foot ring, either of a type that is high a pointed (BB14), low with an angled exterior and a short sharply cut interior (BB15) or low and rounded with a chamfer on both sides (BB13). Other vessel types represented within the class include tall narrow necked jars with flaring mouth, lidded boxes and conical spouted ewers.

Surface Treatment: Interior and exterior surfaces are covered with a shiny light blue tinted off-white glaze that can be even or finely crazed. On bowls the glaze can stop before the foot but more often continues over the foot with an unglazed stacking zone filling the whole or part of the interior foot well. Apart from the glaze, the majority of pieces have intricate abstract or floral motifs carved and combed into the body. Where the body has been carved the glaze puddles and darkens within the slight depressions left faintly highlighting the decoration. Type BB13 is consistently non-decorated apart from an incised band at the break of angle in the floor of the interior.

Fabric: Hard, compact, fully vitrified pure white porcelain with no visible inclusions. The matrix appears glassy and has a clean sub-conchoidal fracture.

Specifications: High density with a compact fully vitrified structure, a smooth feel and a sub-conchoidal fracture.

Inclusions: None.

Parallels and Dating: 11th – 13th century. This is equivalent to QING.1 in the Williamson Collection (Priestman, 2005a: 293). Extensive excavations have been undertaken between 1988 – 1999 at Hutian kiln site in Jingdezhen, the main site where Quingbai was manufactured. Amongst the wide range of ceramics recovered, there are good parallels for most of the types represented within the assemblage from sites in the western Indian Ocean (Anon. 2007). Similar Qingbai wares are also likely to have been manufactured within the wider region of southern China.

Origin: Hutian, Jiangxi Province, southern China.

Class Code: DEH

Class Name: Dehua White Ware

Types: BR23

Clay: Porcelain **Production**: Moulded

Defining Characteristics: Small, standardised bowl forms with a sugary white porcelain body and a clear white or grey glaze covering the interior and exterior but stopping before the base and rim. The exteriors can be plain or decorated in moulded relief. Two aspects of the form are particularly diagnostic: the rim, which is unglazed with a squared lip, and the base, which has a shallow well and a barely defined low rounded foot ring.

Colour: White

Integrity: Coherent and readily recognisable.

Vessel Forms: Small, near straight sided open bowls with a squared rim and a flat, a slightly concave base with a faintly defined rounded foot ring at the edge. Also some slightly larger bowls with flared open sides and the same base and rim features.

Surface Treatment: Interior and exterior surfaces are covered with a clear white or greyish-green tinted glaze which stops well above the base on the exterior and slightly before the rim on the interior. Exterior surfaces are either plain or decorated with simple moulded designs often including a straight horizontal band below the rim bisected by straight vertical lines, a zigzag line reminiscent or petals or other more complex scrolled motifs.

Fabric: Dense, fine-grained white porcelain with no visible inclusions. The fabric is fully vitrified with a distinctive sugary texture.

Specifications: High density with a compact fully vitrified structure, a smooth feel and a sub-conchoidal fracture.

Inclusions: None.

Parallels and Dating: 12th – 13th century. This is the same as DEH.1 in the Williamson Collection and DHM/DHP from Kush (Priestman, 2005a: 294, pl. 219; Kennet, 2004: 48-49). The class occurs in Phase E-10 at Kush providing a late 13th century dating (Kennet, 2004: table 3). The class is also well represented in the assemblage from K103 (Old Hormuz) on the Minab Plain, where other ceramics are primarily dated within the range of the 13th and 14th centuries (Morgan, 1991: 70-71). In China the class started to be manufactured in the Song period with output continuing into the Yuan dynasty. A good parallel for the straight sided vessel with moulded decoration comes from the Qudougong kiln site at Dehua (Zhang Bai, 2008b: pl. 160).

Origin: Dehua, Fujian Province, South China.

Class Code: CBW.1

Class Name: Chinese Blue and White - Group 1

Types: BR21, BB7

Clay: Porcelain **Production**: Wheel-made

Defining Characteristics: Small to medium sized open bowls made from a pure white porcelain with a glassy matrix and no visible inclusions. Interior and exterior surfaces are covered with a clear glossy white glaze that is often tinted slightly blue or green and which stops at the foot of the base. Interior and exterior surfaces are decorated with a mixture of complex floral motifs and purely decorative elements painted in strong, brightly blue cobalt pigment.

Colour: White

Integrity: Distinctive general class but wide variation in terms of decorative content, quality of glaze and blue pigment, etc.

Vessel Forms: Small or medium sized open bowls with simple gently everted rims and different types of foot ring including one that is high and straight sided and another that is low with a sloping outer face and a short vertical inner face.

Surface Treatment: Interior and exterior surfaces are covered with a clear white or light blue or green tinted glaze which stops at the base of the foot. Both interior and exterior surfaces are decorated with bright-blue cobalt painted decoration which varies somewhat in the intensity of colour and stability within the glaze. Decoration consists mostly of floral elements and patterned borders.

Fabric: Hard, compact, fully vitrified pure white porcelain with no visible inclusions. The matrix appears glassy.

Specifications: High density with a compact structure, a smooth feel and a sub-conchoidal fracture.

Inclusions: Generally none.

Parallels and Dating: Early 15th – early 17th century. The class can be sub-divided and accurately dated on the basis of its decorative content and other features, but the accurate implementation of such a classification on fragmentary material requires particular specialist knowledge which remains beyond the scope of the scheme presented here. Instead a generic division is imposed between CBW with bright blue and white decoration and other features that are characteristic of earlier dated material, and post-17th century CBW which often has an off-white glaze, simple dull-blue or black decoration, thicker more crudely finished vessel forms and unglazed stacking rings on the interior (CBW.2). There are also a range of specific decorative schemes that are frequently associated with the later material.

Origin: Jingdezhen, Jiangxi Province, Southern China.

Class Code: CBW.2

Class Name: Chinese Blue and White - Group 2

Types: BR24

Clay: Porcelain **Production**: Wheel-made

Defining Characteristics: Small to medium sized open bowls made from a white or light grey porcelain body with a glassy matrix and no visible inclusions. Interior and exterior surfaces are covered with a clear glossy blue or greyish-green tinted off-white glaze which stops at the foot

of the base and sometimes across a stacking zone within the interior. Interior and exterior surfaces are decorated with a light, slightly streaky blue or grey cobalt painted elements made up of sparse flowing floral or abstract patterns.

Colour: White or light grey.

Integrity: Reasonably consistent and distinctive. Further sub-divisions within the group may be possible on the basis of decorative content and other characteristics.

Vessel Forms: Small or medium sized open bowls with relatively thick walls, straight slightly squared rims and a high pointed or low squared foot ring.

Surface Treatment: Interior and exterior surfaces are covered with a blue or greyish-green tinted off-white glaze which stops at the base of the foot. Some vessels also have an unglazed ring within the interior for stacking during firing. Both interior and exterior surfaces are decorated with a light faded blue or dark grey designs painted in cobalt with a subtle streaky appearance. Decoration consists mostly of sparse floral or abstract swirls framed by straight bands.

Fabric: Hard, compact, fully vitrified pure white or grey porcelain with no visible inclusions. The matrix appears glassy.

Specifications: High density with a compact structure, a smooth feel and a sub-conchoidal fracture.

Inclusions: Generally none.

Parallels and Dating: 17th – 19th century. See discussion of the distinction between CBW.1 and CBW.2 above.

Origin: Jingdezhen, Jiangxi Province, Southern China.

Class Code: ENAM

Class Name: Enamelled Porcelain

Types: None defined

Clay: Porcelain **Production**: Wheel-made

Defining Characteristics: Fine, pure-white porcelain body covered with a clear white glaze which is over-painted with polychrome enamel decoration in red, yellow and green.

Colour: White.

Integrity: Coherent and distinctive decorative category.

Surface Treatment: The motifs are mostly floral. Some are very finely painted with detailed decoration including lattice-filled borders. Others are painted in a cruder style.

Vessel Forms: Small to medium sized bowls and cups.

Fabric: Very fine, fully vitrified, glassy white porcelain.

Specifications: High density with a smooth feel and a sub-conchoidal fracture.

Parallels and Dating: 16th century.

Origin: Jingdezhen.

Class Code: VBW

Class Name: Vietnamese Blue and White

Types: None defined

Clay: Porcelain **Production**: Wheel-made

Defining Characteristics: Opaque cream coloured glaze with simple decoration painted in dark-grey or black.

Colour: Off-white.

Integrity: The class has similar characteristics to CBW but is distinguished by the yellowish quality of the fabric and the opaque cream colour of the glaze and dark grey nature of the pigment used in decoration. Within the VBW there is potentially further variation indicative of production over an extended period.

Surface Treatment: Interior and exterior surfaces covered with an opaque cream coloured glaze with dark greyish-blue coloured painted decoration.

Vessel Forms: Small to medium sized open cups and bowls.

Fabric: Hard, compact, light yellow tinted porcelain with a slightly chalky quality.

Specifications: High density with a smooth feel and a sub-conchoidal fracture.

Parallels and Dating: 14th – 16th century.

Origin: Vietnam.

East Asian Non-Identified

Class Code: EAST.N-ID

Class Name: Non-Identified East Asian

Types: None

Clay: Stoneware/porcelain **Production**: Wheel-made

Defining Characteristics: Various stoneware and porcelain sherds mostly with patchy green or black iron glazes and different types of body, including coarse grit tempered stoneware and finer fabric pieces.

Integrity: Completely mixed and varied.

Vessel Forms: Various bowls and jars.

Surface Treatment: Different types of glaze including patchy greenish-grey and black iron glazes.

Fabric: Mixed stoneware and porcelain.

Parallels and Dating: Not known.

Origin: East Asia.

European

Class Code: CHIN

Class Name: European China

Types: None defined

Clay: Earthenware **Production**: Moulded

Defining Characteristics: Mould-made vessels manufactured with a hard white paste and either painted or transfer-printed with intricate patterns, mostly in cobalt blue and covered with a shiny transparent glaze.

Colour: White.

Integrity: Coherent and distinctive manufacturing technique but wide variation in the specific nature of products with no attempt made here to distinguish between them.

Surface Treatment: Complex patterns often closely imitating those found on Chinese Blue and White Porcelain.

Vessel Forms: Mostly plates and dishes.

Fabric: Dense white past with a chalky quality.

Specifications: Medium density with a compact structure, a smooth feel and a clean fracture.

Parallels and Dating: 18th – 20th century.

Origin: Europe.

Class Code: STONE.EU

Class Name: European Stoneware

Types: None defined

Clay: Stoneware **Production**: Wheel-made

Defining Characteristics: Cylindrical stoneware ink bottles with either a simple fly-ash glaze producing a lustrous dark brown surface on one side of the vessel, or a bright shiny yellow/orange speckled salt-glaze.

Colour: Grey.

Integrity: Characteristic vessel type but wide variation in the specific nature of products with no attempt made here to distinguish between them.

Surface Treatment: None apart from some examples that have a stamped manufacturer's mark on the shoulder or close to the base.

Vessel Forms: Tall cylindrical vessel with a short narrow neck and a flat base.

Fabric: Generally a grey stoneware with fine, well-sorted black flecks.

Specifications: High density with a compact structure, a smooth feel and a sub-conchoidal fracture.

Parallels and Dating: 17th – 19th century.

Origin: Europe.

Class Group Images



Plate 1 HARLIM



Plate 2 HARLIM (Type LISV#)



Plate 3 FINLIM (Type LISV#)



Plate 4 REBROS



Plate 5 REBROS (Type LISV#)



Plate 6 CREAC



Plate 7 CREAC (Type LISV#)



Plate 8 ORGPIN



Plate 9 REGTEC



Plate 10 EGG.PI



Plate 11 WHITE.PI



Plate 12 WHITE.A



Plate 13 BUFF.I



Plate 14 BUFF.S



Plate 15 BUFF.P



Plate 16 SPORC



Plate 17 TORP.RG



Plate 18 TORP.S



Plate 19 TRC



Plate 20 HONEY



Plate 21 STAMP



Plate 22 RUST



Plate 23 FIBIC



Plate 24 HARC



Plate 25 EGG.M

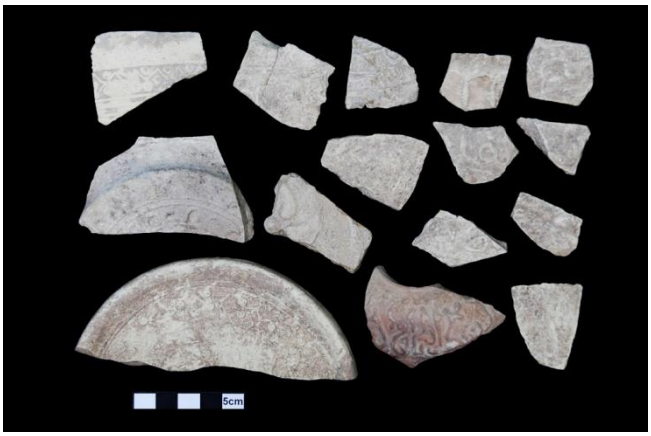


Plate 26 WHITE.M



Plate 27 MEW



Plate 28 MEW.MO



Plate 29 SLIP.R



Plate 30 SLIP.B



Plate 31 SLIP.TB



Plate 32 SLIP.PBR



Plate 33 FOPW.1



Plate 34 FOPW.2



Plate 35 CHAM



Plate 36 JULFAR

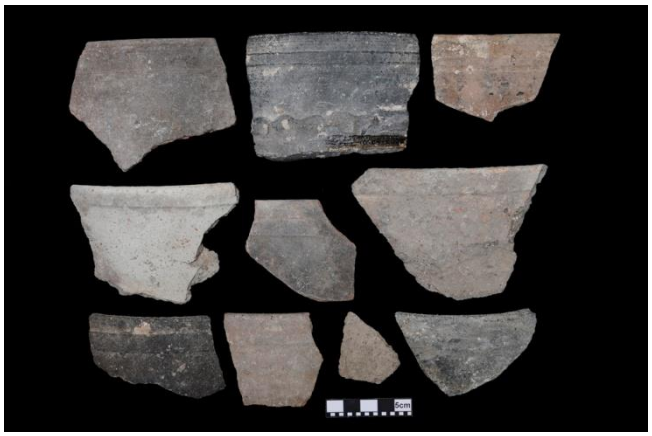


Plate 37 JULFAR (Type CP3)



Plate 38 JULFAR.PB



Plate 39 JULFAR.RW



Plate 40 HMPW.1



Plate 41 HMPW.2



Plate 42 HMPW.BST



Plate 43 HMPW.CC



Plate 44 HMPW.ORG



Plate 45 HMPW.RB



Plate 46 HMPW.SA



Plate 47 INC.M



Plate 48 HAGRIT



Plate 49 LIME



Plate 50 CHOC

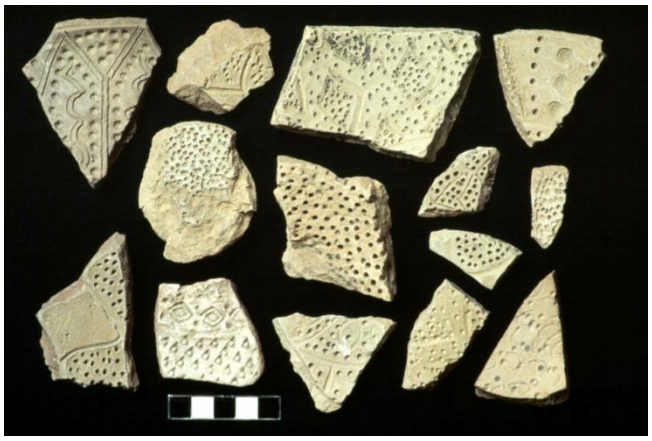


Plate 51 HMPW.RB



Plate 52 IRPW



Plate 53 IRPW.RC



Plate 54 HARMIC



Plate 55 BRISAN



Plate 56 SBBW



Plate 57 BUFRAB



Plate 58 LINVES



Plate 59 IRAB



Plate 60 EACOP



Plate 61 TURQ.YG

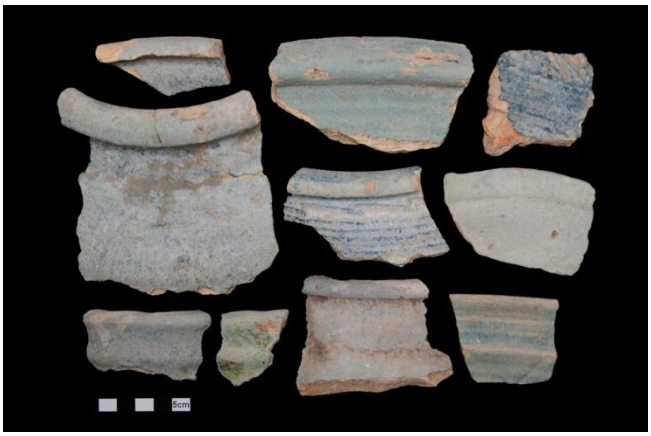


Plate 62 TURQ.T



Plate 63 TURQ.T (Types JR10 and OC2)



Plate 64 TURQ.T (Types JR5 and OC3)



Plate 65 TURQ.T (Type OC5A)



Plate 66 TURQ.T (Type OC5B)



Plate 67 GLAMO.Y

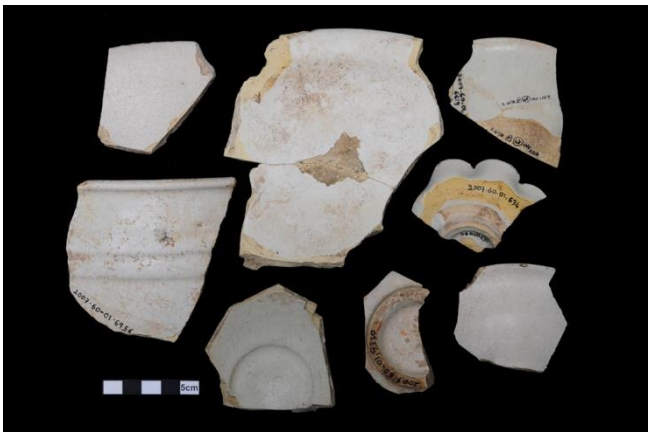


Plate 68 OPAQ.W



Plate 69 OPAQ.C



Plate 70 OPAQ.WC

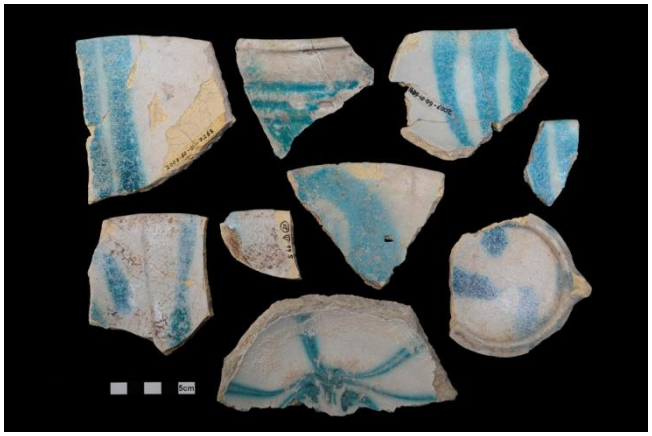


Plate 71 OPAQ.TS

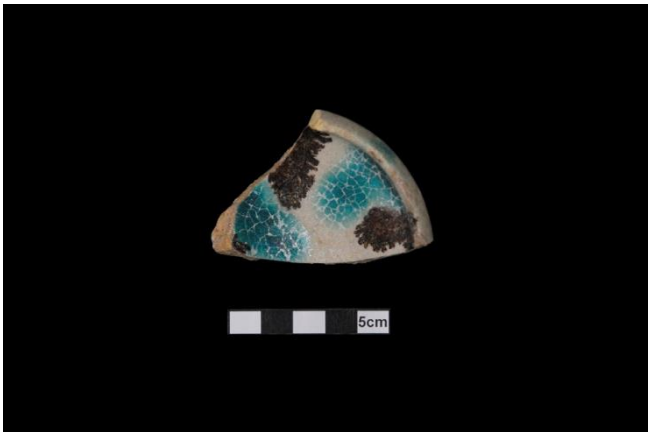


Plate 72 OPAQ.TSB



Plate 73 OPAQ.LG

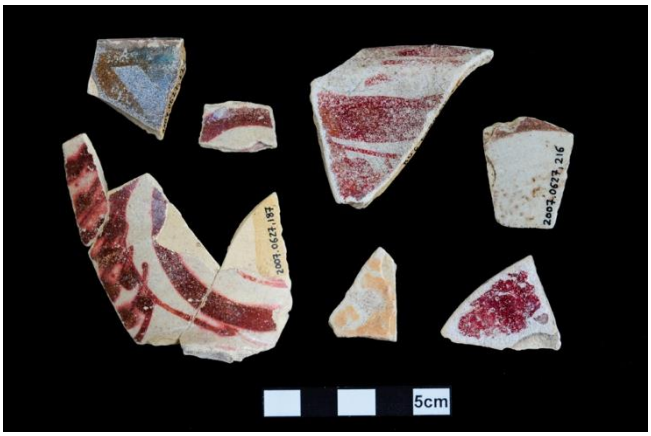


Plate 74 OPAQ.LR

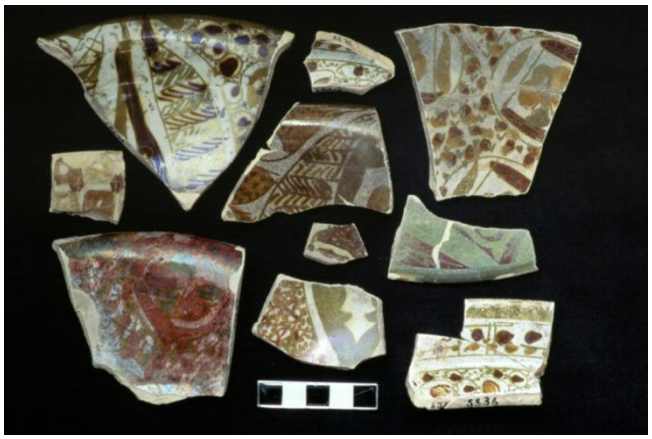


Plate 75 OPAQ.LP

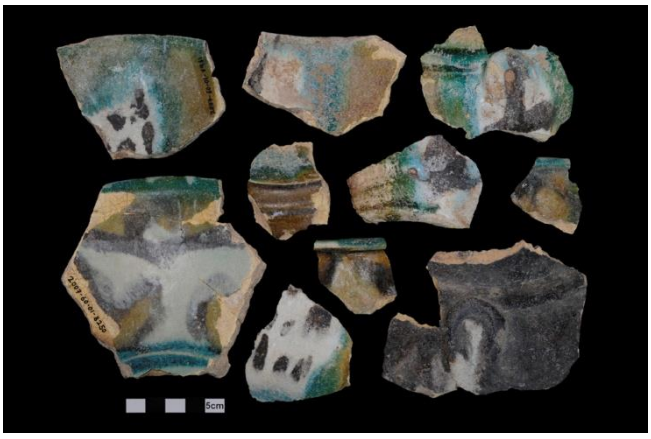


Plate 76 OPAQ.PS



Plate 77 OPAQ.T



Plate 78 OPAQ.B



Plate 79 OPAQ.BW



Plate 80 OPAQ.BT



Plate 81 OPAQ.CP

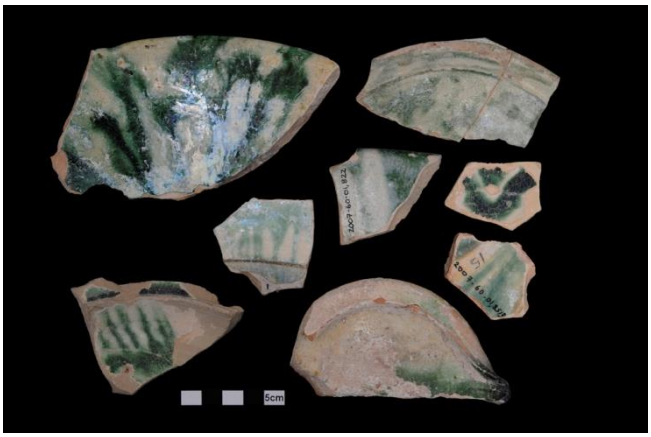


Plate 82 SPLASH.GW1



Plate 83 SPLASH.GW2



Plate 84 SPLASH.P1

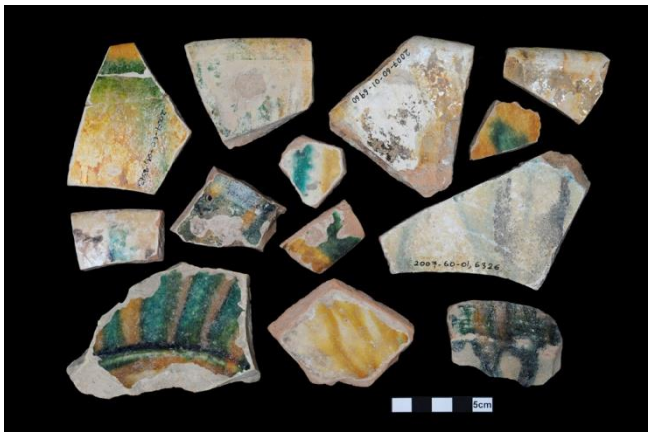


Plate 85 SPLASH.P2

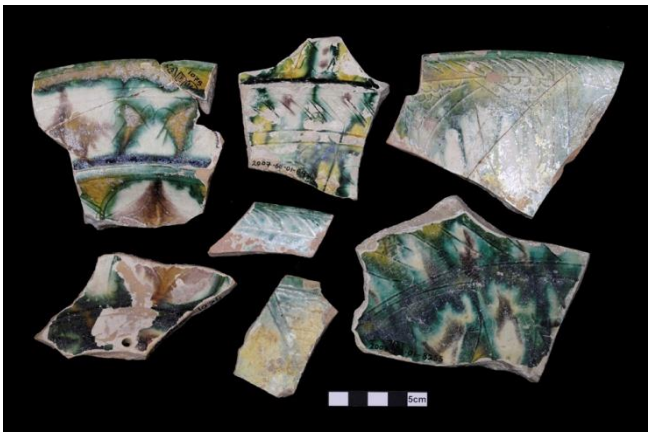


Plate 86 GRAF.EP1



Plate 87 GRAF.EP2

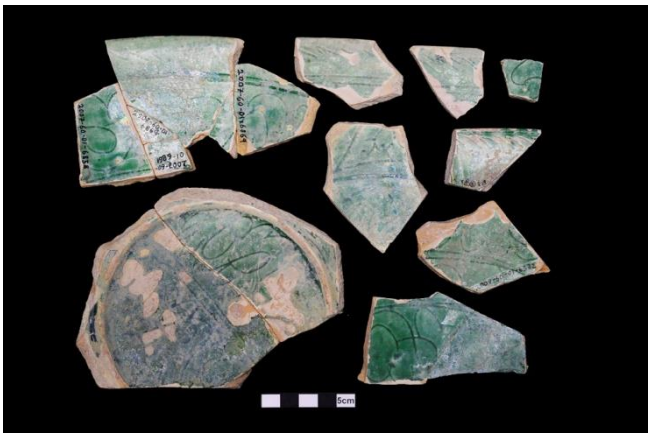


Plate 88 GRAF.EG

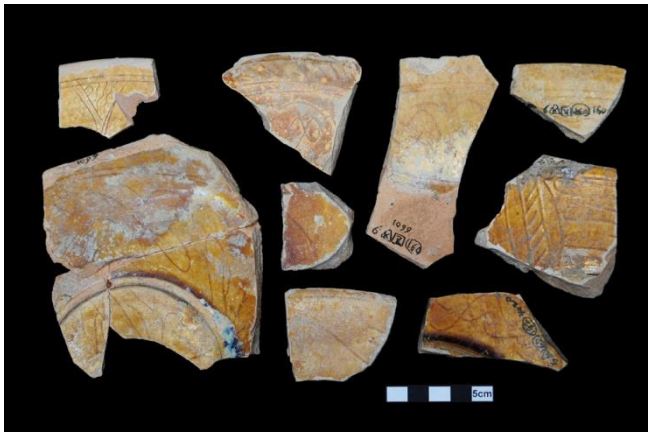


Plate 89 SPLASH.GW2



Plate 90 GRAF.TL

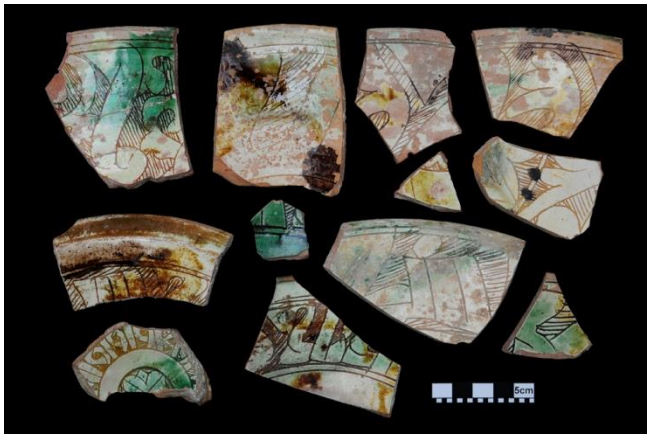


Plate 91 GRAF.H



Plate 92 CHAMP



Plate 93 GRAF.DI

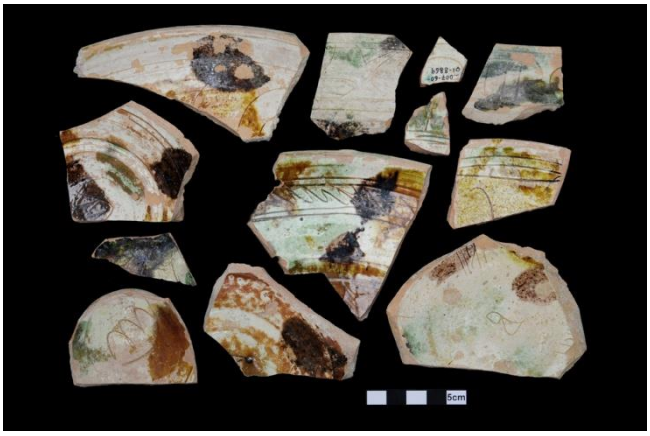


Plate 94 GRAF.LP



Plate 95 GRAF.GW



Plate 96 GRAF.GYB

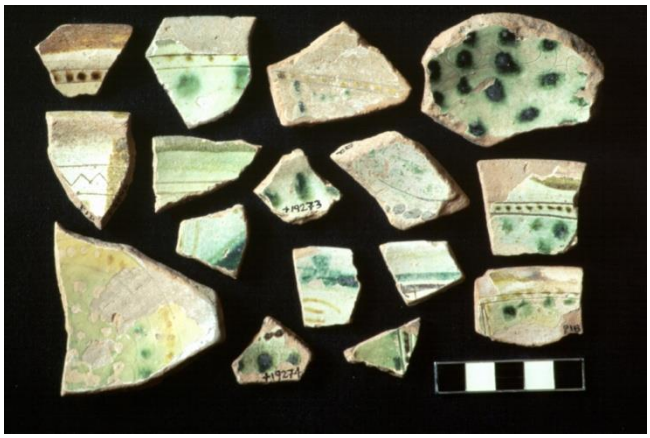


Plate 97 GRAF.S



Plate 98 GRAF.LG



Plate 99 GRAF.LY



Plate 100 GRAF.M



Plate 101 MONO.G

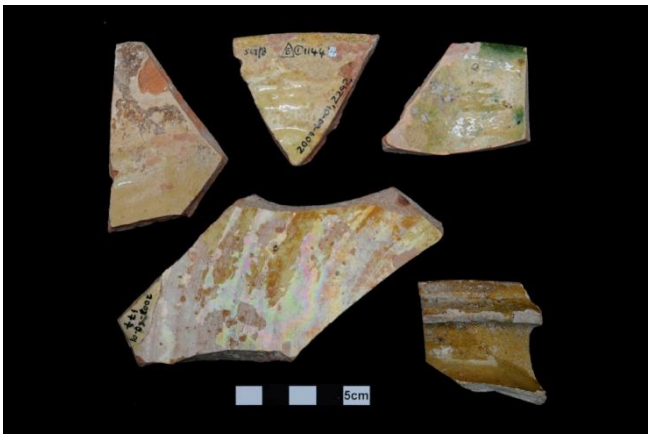


Plate 102 MONO.Y



Plate 103 SPW.BG



Plate 104 SPW.YB



Plate 105 SPW.BW



Plate 106 FRIT.L



Plate 107 FRIT.BL



Plate 108 FRIT.I

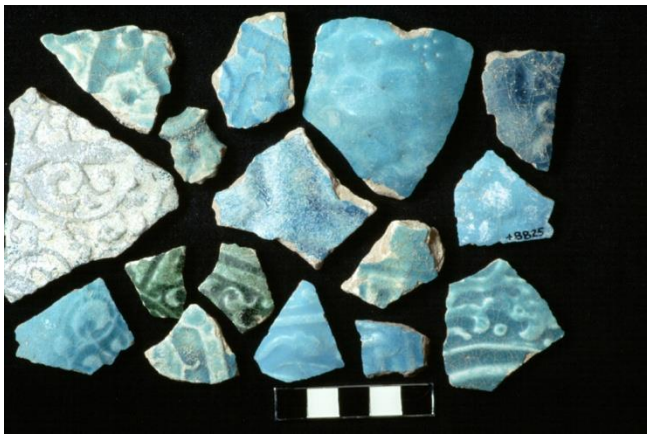


Plate 109 FRIT.M



Plate 110 FRIT.MIN



Plate 111 FRIT.BW



Plate 112 FRIT.TB



Plate 113 FRIT.GW



Plate 114 FRIT.I



Plate 115 MGPAINT.1



Plate 116 MGPAINT.2



Plate 117 UGP.BW



Plate 118 UGP.TB



Plate 119 UGP.CB



Plate 120 UGP.GB



Plate 121 MONO.LG1

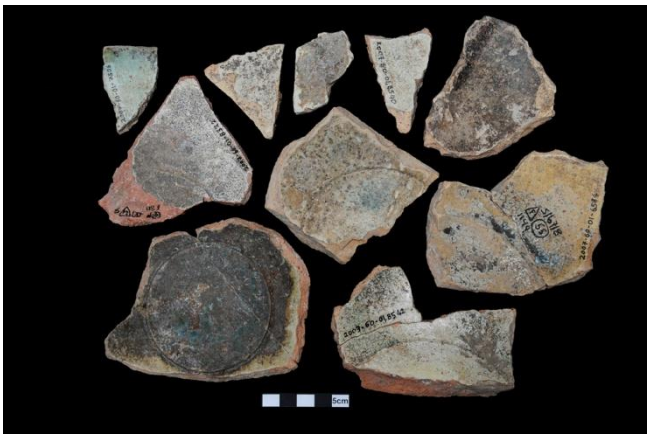


Plate 122 MONO.LG2



Plate 123 KHUNJ

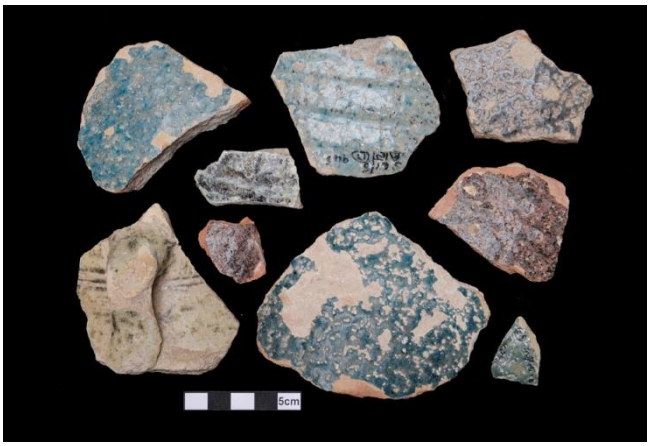


Plate 124 SPECLE.2



Plate 125 MONTUR

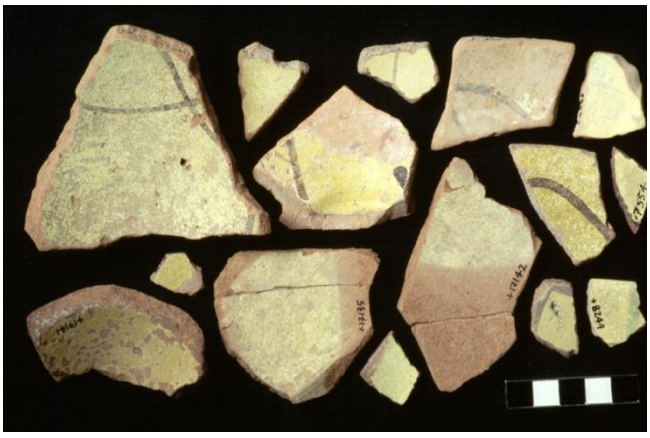


Plate 126 YEMEN



Plate 127 REDYEL



Plate 128 KD.1



Plate 129 KD.2



Plate 130 KD.3



Plate 131 KD.4



Plate 132 STONE.BLU



Plate 133 STONE.BG1



Plate 134 STONE.BG2



Plate 135 DUSUN



Plate 136 MTB.1



Plate 137 MTB.2



Plate 138 CHANG (Bowls)



Plate 139 CHANG (Ewers)

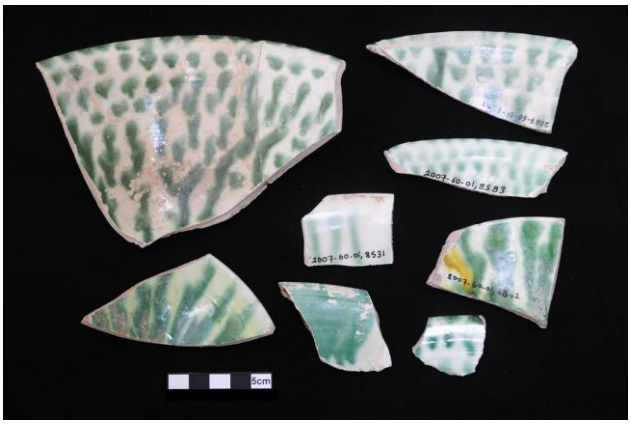


Plate 140 GWSG.1



Plate 141 GWSG.2



Plate 142 GYSG



Plate 143 GM



Plate 144 WWSL

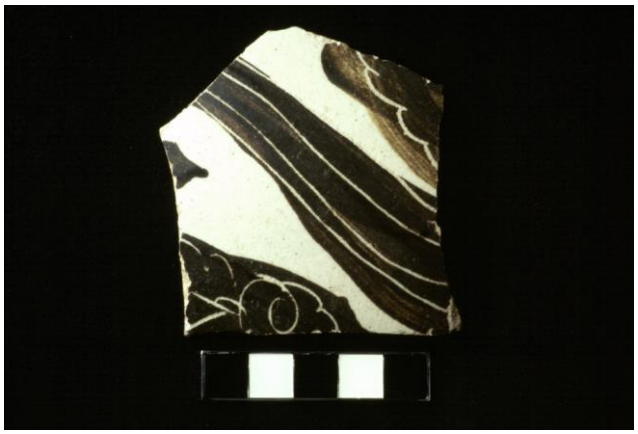


Plate 145 CIZHOU



Plate 146 CREAM

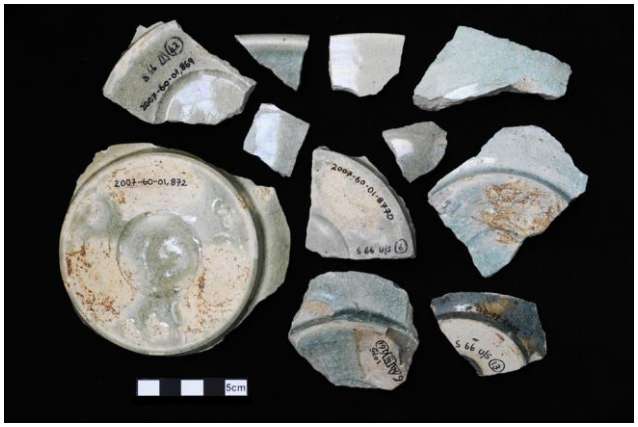


Plate 147 STONE.GU

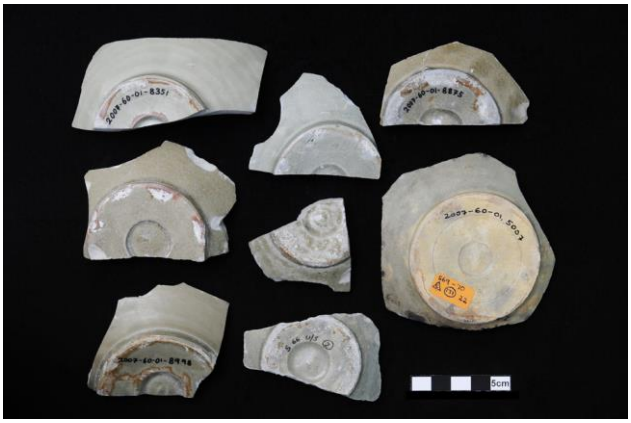


Plate 148 YUE.1 (BB6)



Plate 149 YUE.2 (BR8A)



Plate 150 YUE.2 (OC16)

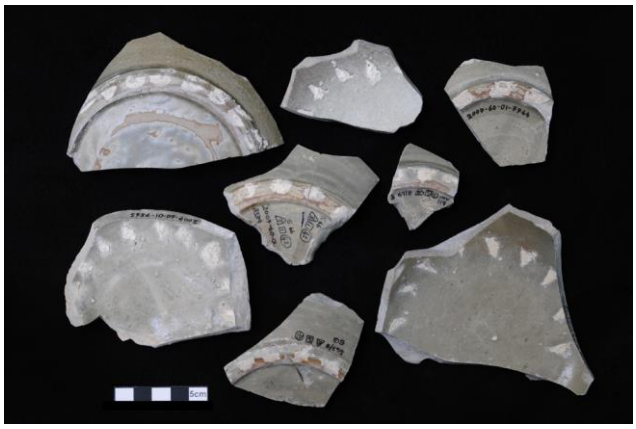


Plate 151 YUE.3 (BB4A)

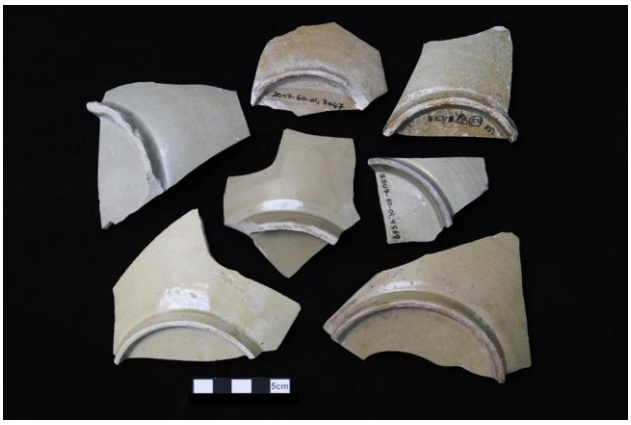


Plate 152 YUE.3 (BB5A)



Plate 153 YUE.3 (BB8)



Plate 154 YUE.4 (BB5B)



Plate 155 YUE.4 (BB7)

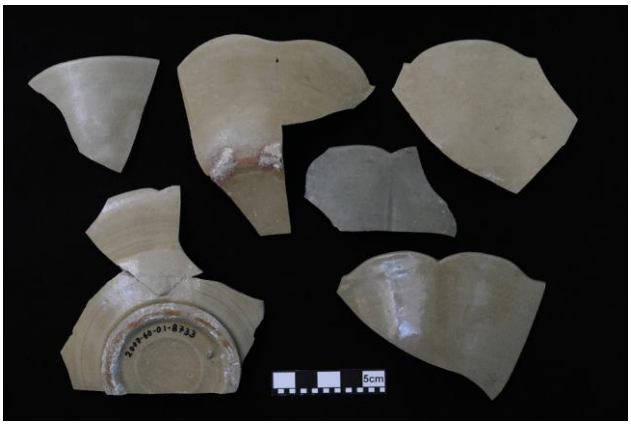


Plate 156 YUE.4 (BB8B)



Plate 157 YAOZ



Plate 158 LQC



Plate 159 GDC.1



Plate 160 GDC.2



Plate 161 JDC

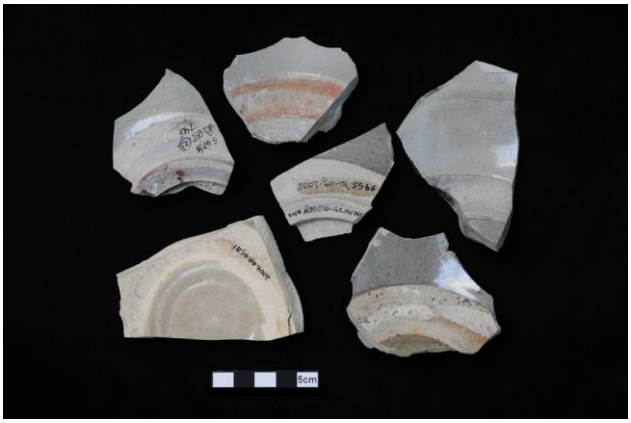


Plate 162 STONE.GRY

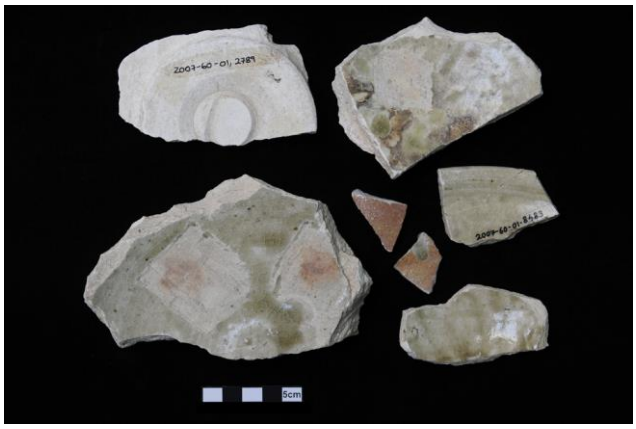


Plate 163 STONE.PLG



Plate 164 STONE.BUR



Plate 165 STONE.THAI



Plate 166 XING

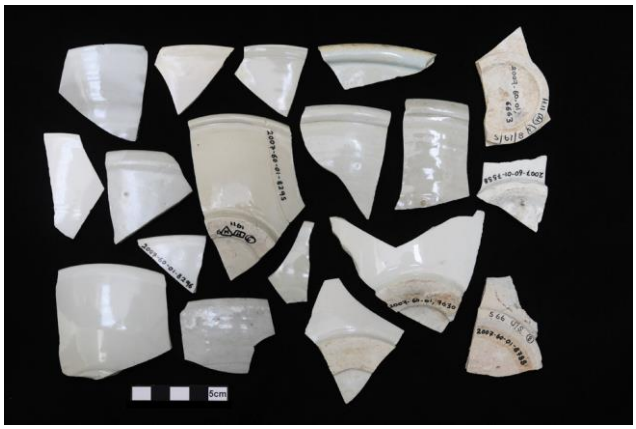


Plate 167 WW

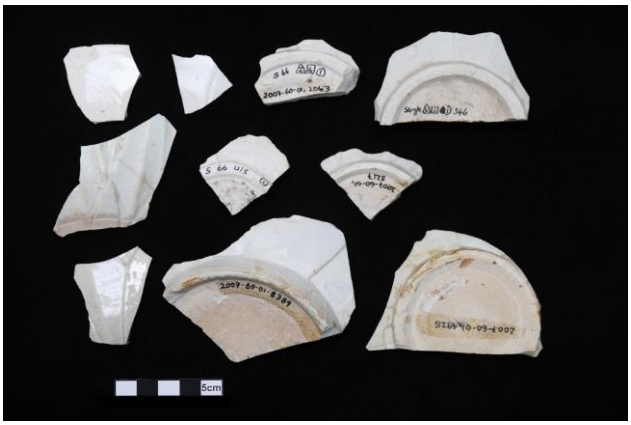


Plate 168 CWW

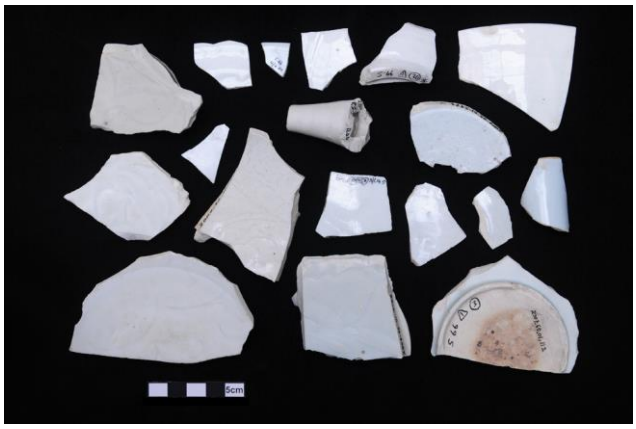


Plate 169 QING



Plate 170 DEHUA

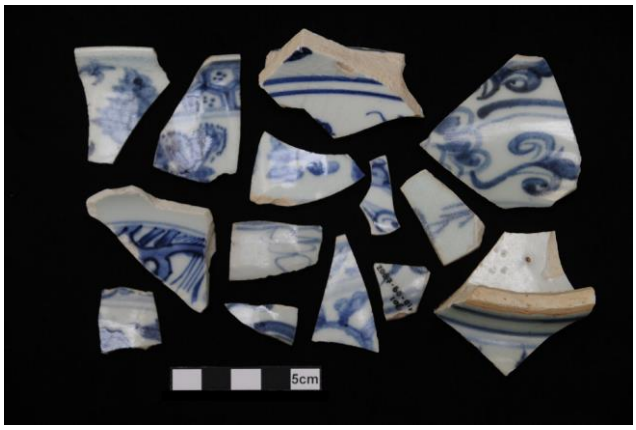


Plate 171 CBW.1

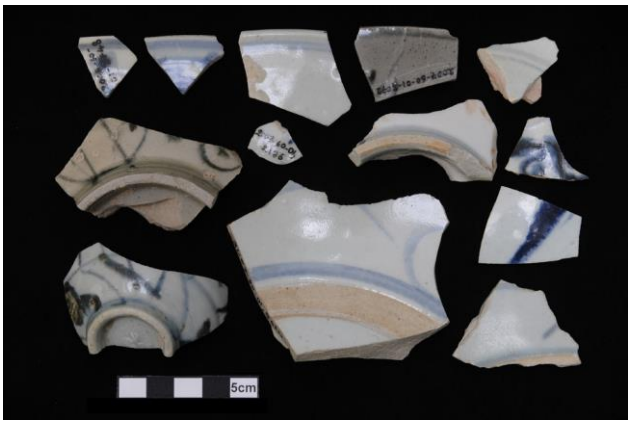


Plate 172 CBW.2



Plate 173 ENAM



Plate 174 VBW

Appendix II – Vessel Types

Bowl Rims

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
BR1	Siraf			CHANG	bowl	
BR2	Siraf			CHANG, GWSG, WWSL	bowl	
BR3	Siraf	Type 46		GWSG, WWSL, OPAQ#, SPLASH#, GRAF.E#, GRAF.TL	bowl	BR3 similar to BR50 but with a slightly more pronounced out-turning of the rim
BR4	Siraf			GWSG, GYSG	dish	
BR5	Siraf			GM	bowl	
BR6	Siraf			DUSUN	bowl	
BR7	Siraf			YUE.3	bowl	
BR8A	Siraf			YUE.2	bowl	
BR8B	Siraf			YUE.4	bowl	
BR9A	Siraf			YUE.1	bowl	
BR9B	Siraf			YUE.3	bowl	
BR10	Siraf			YUE.3	bowl	
BR11	Siraf		Williamson: LQC.1:02; LQC.3:04 (some)	LQC	dish or bowl	Open dish or bowl with a re-curved flange rim, a fluted interior and a plain exterior. Can be stacked on base or on rings.
BR12	Siraf		Williamson: LQC.1:03 (some); LQC.2:01 (some); LQC.2:03; LQC.2:11; LQC.3:04 (some)	LQC	bowl	Open bowl with a straight or re-curved flange rim, carved lotus petals on the exterior and a plain or incised decorated interior. Can be stacked on base or on rings. The type is closely related to BR113 but lacks applique fish.

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
BR13	Siraf		Williamson: LQC.2:01 (some)	LQC	bowl	Open hemispherical bowl with a pointed lip and standard lotus petals carved on the exterior. Stacked standing on foot.
BR14	Siraf		Williamson: LQC.2:02	LQC	dish	Open dish with a straight lobed flange and fluted interior and/or exterior walls.
BR15	Siraf		Williamson: LQC.1:03 (some)	LQC	dish or bowl	Open dish or bowl with a re-curved flange rim and a plain interior and exterior. Closely related to BR11 but lacking decoration.
BR16	Siraf		Williamson: LQC.2:13	LQC	bowl	Open hemispherical bowl with a straight or slightly everted lip and characteristic incised decoration on the exterior consisting of parallel bands but occasionally by short oblique lines.
BR17	Siraf		Williamson: LQC.3:01	LQC	bowl	Open hemispherical bowl with a straight or slightly everted lip, similar to BR16 but with plain or minimally decorated interior and exterior surfaces.
BR18	Siraf		Williamson: LQC.3:03	LQC	bowl	Open bowl with a gently everted and slightly lobed lip. The wall can be curved or slightly carinated and the surfaces can be plain or have the upper wall portion fluted.
BR19	Siraf		Williamson: LQC.3:05	LQC	bowl	Open hemispherical bowl with a gently everted lip, similar to BR16 but with moulded decoration on the interior characteristically with a wavy border along the top.
BR20	Siraf			XING, WW	bowl	
BR21	Siraf			CWW, WW, CBW	bowl	
BR22	Siraf			WW	bowl	
BR23	Siraf			DEHUA	bowl	

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
BR24	Siraf			CBW.F	bowl	
BR25	Siraf			TURQ.T	bowl	
BR26	Siraf			TURQ.T, BUFF.P	bowl	
BR27	Siraf			TURQ.T	bowl	
BR28	Siraf	Type 33	Williamson: ALK: 01 (some)	TURQ.T	bowl	may be the same as Type 33, consider merging the two?
BR29	Siraf	Type 72	Williamson: ALK: 12	TURQ.T	bowl	
BR30	Siraf		Williamson: ALK:13	TURQ.T	bowl	
BR31	Siraf	Types 26, 31, 104, 114		MGPAINT.1, REDYEL	bowl	
BR32	Siraf			MONTUR	bowl	
BR33	Siraf	Type 47		FRIT (Early), FRIT.L, FRIT.BL	bowl	
BR34	Siraf			MONO.LG1	bowl	
BR35	Siraf			MONO.LG1	bowl	
BR36	Siraf			MONO.LG1	bowl	
BR37	Siraf			MONO.LG1	bowl	
BR38	Siraf			MONO.LG1	bowl	
BR39	Siraf			MONO.LG1	bowl	
BR40	Siraf			MONO.LG1	bowl	
BR41	Siraf			MONO.LG1	bowl	
BR42	Siraf			MONO.LG1	bowl	
BR43	Siraf			MONO.LG1-2	bowl	
BR44	Siraf			MONO.LG2	bowl	Merged with BB45
BR46	Siraf			OPAQ#, SPLASH#	dish	
BR47	Siraf			OPAQ#	candlestick	
BR48	Siraf			OPAQ#	bowl	
BR49	Siraf			OPAQ#	bowl	
BR50	Siraf			OPAQ#, SPLASH#, GRAF.E#	bowl	BR50 similar to BR51 but with a slight out turning of the rim, less pronounced than BR3
BR51	Siraf			OPAQ#, SPLASH#, GRAF.E#	bowl	BR51 similar to BR50 but rim not everted
BR52	Siraf			OPAQ#	bowl	
BR53	Siraf			OPAQ#	bowl	BR53 similar to BR54 but with a shorter

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
						section above the carination
BR54	Siraf			OPAQ#, GRAF.E#	bowl	BR54 similar to BR53 but with a longer section above the carination
BR55	Siraf			OPAQ.WC	bowl	
BR56	Siraf			OPAQ#	bowl	
BR57	Siraf			OPAQ#	bowl	
BR58	Siraf			OPAQ#	bowl	
BR59	Siraf			GRAF.EP1	dish	but just one example illustrated
BR60	Siraf			SPLASH.GW1	bowl	
BR61	Siraf	Type 28		GRAF (Late)	bowl	
BR62	Siraf	Type 36		GRAF.H	bowl	
BR63	Siraf			GRAF.H	bowl	
BR64	Siraf			GRAF (Late)	bowl	
BR65	Siraf	Type 35		GRAF (Late)	bowl	
BR66	Siraf			GRAF (Late)	bowl	
BR67A	New		Siraf: BR67	GRAF.H	bowl	
BR67B	New		Siraf: BR67	GRAF (Late)	bowl	
BR68	Siraf	Type 26		GRAF (Late)	bowl	
BR69	Siraf			GRAF.LP	bowl	
BR70	Siraf	Type 25		GRAF.LG, GRAF.LY	bowl	
BR71	Siraf			EACOP	cooking bowl	
BR72A	New		Siraf: BR72	CREAC, REBROS	open bowl	
BR72B	New		Siraf: BR72	CREAC, HARLIM, REBROS	open bowl	
BR73	Siraf			HARLIM, REBROS	open bowl	forms mixed, may ultimately require further sub-division
BR74	Siraf			HARLIM, REBROS	open bowl	forms mixed, may ultimately require further sub-division
BR75	Siraf			REBROS	closed bowl	
BR76	Siraf			REBROS	open bowl	forms mixed, may ultimately require further sub-division
BR77	Siraf			CREAC, HARLIM, REBROS	open bowl	
BR78	Siraf			HARLIM, REBROS	closed bowl	
BR79	Siraf			REBROS	closed bowl	requires further sub-division, includes one

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
						very diagnostic type
BR80	Siraf			CREAC, HARLIM	open bowl	requires some further refinement
BR81A	New		Siraf: BR81	CREAC, REBROS	closed bowl	Siraf types BR81 and JR49 amalgamated as these are the same
BR81B	New		Siraf: BR81	REBROS	closed bowl	type JR50 renamed as BR81B as this is a related variant of BR81A
BR82	Siraf			CREAC	closed bowl	
BR83	Siraf			CREAC	open bowl	
BR84	Siraf			CREAC	closed bowl	but just one example illustrated
BR85	Siraf			CREAC	closed bowl	
BR86	Siraf			CREAC	measuring cup	
BR87	Siraf			CREAC	open bowl	
BR88	Siraf			CREAC	dish	
BR89	Siraf			CREAC	dish	
BR90	Siraf			HARLIM	vat	BR90 is intermediary between standard vessel and LISV; largest vessels with ridge below rim (fig. 14: a) assigned to new LISV Type
BR91	Siraf			GLAMO.Y	bowl	
BR92	Siraf			GLAMO.Y	bowl	
BR93	Siraf			WW	bowl	
BR94	Siraf			WW.3	bowl	
BR95	New		Siraf: OO; ALK:02 (some)	TURQ.T	bowl	deep ribbing on interior, incised decoration on exterior
BR96	New		Williamson: ALK:15 (some)	TURQ.T	bowl	inward bevelled rim
BR97	New		Siraf: OO; ALK:11	TURQ.T	bowl	lid bowl
BR98	New		Siraf: OO	TURQ.T	bowl	
BR99	New		Williamson: ALK:27	TURQ.T	bowl	
BR100	New			TURQ.T	bowl	
BR101	New		Siraf: OO	LIME	bowl	
BR102	New		Siraf: OO	TURQ.T	bowl	
BR103	New		Siraf: OO	OPAQ*	dish	similar to BR56 but wider
BR104	New		Siraf: BR50 (some)	OPAQ#, GRAF.E#	bowl	similar to BR50 but with straight rather than

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
						curving sides
BR105	New			SPECLE#	bowl	
BR106	New			GRAF (Late)	bowl	similar to BR3 for Samarra horizon classes
BR107	New			GRAF (Late)	bowl	similar to BR50 for Samarra horizon classes
BR108	New			GRAF (Late)	bowl	
BR109	New			GRAF (Late)	bowl	
BR110	New			GRAF (Late)	bowl	
BR111	New	Type B1.1	Siraf: OO	JULFAR.RW	bowl	
BR112	New	Type B1.4 (some)		JULFAR.RW	bowl	
BR113	New		Williamson: LQC.1.01	LQC	bowl	Open bowl with a straight flange rim, carved lotus petals on the exterior and applique fish attached to the base interior. Stacked on foot. Closely related to BR12 but with the addition of applique fish.
BR114	New		Williamson: LQC.2:01 (some)	LQC	bowl	Closed bowl with upright sides, a straight pointed lip and standard lotus petals carved on the exterior.
BR115	New		Williamson: LQC.2:02 (some)	LQC	dish	Open dish with a straight flange. Both the flange and interior are carved with radial petals and fluting, otherwise similar to BR11.
BR116	New		Williamson: LQC.2:04	LQC	bowl	Small open bowl with scalloped rim and sides.
BR117	New		Williamson: LQC.2:10	LQC	bowl	Closed bowl with a high carination and carved lotus petals on the exterior.

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
BR118	New		Williamson: LQC.2:14	LQC	bowl	Closed bowl with upright sides, a straight pointed lip and characteristic carved decoration on the exterior consisting of horizontal bands with occasional short oblique lines crossing through. Same motif as occurs on BR16.
BR119	New		Williamson: LQC.2:07	LQC	dish	Small open dish with short curving sides and horizontal and vertical grooves intersecting on the exterior and vertical grooves on the interior. The rim in plain but slightly scalloped.
BR120	New		Williamson: LQC.3:08	LQC	bowl	Open hemispherical bowl with a simple rounded rim and incised decoration on the interior and exterior consisting of uniform thickness lines with an interlocking squared spiral border on the interior with characters below.
BR121	New	Type 25	Williamson: ALK:01 (some)	TURQ.T	bowl	Type 25 includes only straight rims with rounded lips, not pointed, incurved or flared types
BR122	New	Type 62	Williamson: ALK:03	TURQ.T	bowl	single illustrated example of Type 62 from Kush has a more upright pointed lip than ALK:03 from the Williamson Collection. Appears that the illustrated posture may be wrong, check if possible
BR123	New	Type 94	Williamson: ALK:10	TURQ.YG	bowl	two examples illustrated from Kush are different types, only 2nd example (K5525) taken as being representative
BR124	New	Type 101		FRIT.UGP, UGP	bowl	

Bowl Bases

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
BB1	Siraf			CHANG	bowl	
BB2	Siraf			CHANG, WWSL, WW, STONE.BUR, STONE.GRY	bowl	
BB3	Siraf			GWSG	bowl	Effectively the same as BB2 but with a wider circumference
BB4A	Siraf			YUE.3	bowl	
BB4B	Siraf			YUE.3	bowl	
BB5A	Siraf			YUE.3	bowl	
BB5B	Siraf			YUE.4	bowl	
BB6	Siraf			WWSL, STONE.GU, YUE.1	bowl	
BB7	Siraf			YUE.4, CBW.1	bowl	
BB8	Siraf			YUE.3	bowl	
BB9	Siraf		Williamson: LQC.1:01	LQC	bowl	Narrow straight foot ring stacked standing on foot. Identical to BB10 but associated exclusively with BR112 with applique fish.
BB10	Siraf		Williamson: LQC.2:15	LQC	bowl	Narrow straight foot ring stacked standing on foot. Identical to BB9 but lacks applique fish. Could be further sub-divided into very narrow and wider versions.
BB11	Siraf		Williamson: LQC.2:16	LQC	dish	Wide foot ring with sloping outer edge. Stacked standing on foot.
BB12	Siraf		Williamson: LQC.2:17; LQC.3:07	LQC	bowl	Small slightly rounded foot ring. Stacked standing on ring. Often thick and robust.
BB13	Siraf			CWW, WW	bowl	similar to BB4
BB14	Siraf			WW	bowl	tall and narrow
BB15	Siraf			CWW, WW	bowl	
BB16	Siraf			WW	bowl	
BB17	Siraf			DEHUA	bowl	

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
BB18	Siraf			MGPAINT.1	bowl	
BB19	Siraf			FRIT (Early), FRIT.L	bowl	
BB20	Siraf			FRIT (Late)	bowl	
BB21	Siraf			MONO.LG1	bowl	
BB22	Siraf			MONO.LG1	bowl	
BB23	Siraf			MONO.LG1	bowl	
BB24	Siraf			MONO.LG2	bowl	
BB25	Siraf			OPAQ#, SPLASH#, GRAF.E#, GRAF.TL	bowl	
BB26	Siraf			OPAQ#	bowl	
BB27	Siraf			OPAQ#, SPLASH#, GRAF.E#	bowl	
BB28	Siraf			OPAQ#	bowl	similar to BB28 but narrower
BB29	Siraf			OPAQ#	bowl	
BB30	Siraf			OPAQ#	bowl	similar to BB26 but wider ring
BB31	Siraf			SPLASH#, GRAF.E#	bowl	but just one example illustrated
BB32	Siraf			SPLASH#, GRAF.TL	bowl	
BB33	Siraf			GRAF (Late)	bowl	
BB34	Siraf			GRAF (Late)	bowl	
BB35	Siraf			YUE.4	bowl	
BB36	New		Siraf: OO	OPAQ#	bowl	occurs together with BR36
BB37	New		Williamson: LQC.3:06	LQC	dish	Wide foot ring with sloping outer edge. Stacked standing on ring.

Jar Rims

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
JR1	Siraf			CHANG	wine jar	
JR2	Siraf			STONE.BG1-2	storage jar	
JR3	Siraf			DUSUN	storage jar	
JR4	Siraf			DUSUN	storage jar	
JR5	Siraf		Williamson: ALK:31-32	TURQ.T	storage jar	type arbitrarily sub-divided in the W study
JR6A	New		Siraf: JR6	TURQ.T	jar	
JR6B	New		Siraf: OO	TURQ.T	jar	
JR7	Siraf			TURQ.T	jar	
JR8	Siraf		Williamson: ALK:26 (some)	TURQ.T	jar	
JR9	Siraf			TURQ.T	jar	
JR10	Siraf			TURQ.T	jar	exterior has deeply cut away decoration
JR11	Siraf			TURQ.T	jar	
JR12	Siraf	Type 64	Williamson: ALK:29-30	TURQ.YG	jar	type sub-divided in W study based on external projection, appears to be continuous variation between the two types
JR13	Siraf			TURQ.T	jar	poorly defined type, needs to be divided into a number of separate sub-categories.
JR14	Siraf			OPAQ#	jar	
JR15	Siraf			OPAQ#	jar	
JR16	Siraf			OPAQ#	jar	
JR17	Siraf			SPLASH#	jar	
JR18	Siraf			SPLASH.P2	jar	more narrowly defined than in Siraf study
JR20	Siraf	Type 105	Williamson: LIM: 01	LIME	storage jar	
JR21	Siraf			IRPW	jar	
JR22	Siraf			SBBW	cooking pot	
JR23	Siraf			HARMIC	jar	
JR24	Siraf			BUFRAB	cooking pot	
JR25	Siraf			BUFRAB	cooking pot	
JR26	Siraf			BUFRAB	jar	

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
JR27	Siraf			BUFRAB	cooking pot	
JR28	Siraf			BUFRAB	cooking pot	
JR29	Siraf			BUFRAB	cooking pot	
JR30	Siraf			IRAB	cooking pot	
JR31	Siraf			EACOP	cooking pot	
JR32	Siraf			EGG.PI	jar	associated with base types JB5 and JB6
JR33	Siraf	Type 67		EGG.PI	jar	
JR34	Siraf	Type 109		WHITE.PI	jar	some variation, may be possible to sub-divide further with larger sample
JR35	Siraf			WHITE.PI	jar	similar to Type 109 but pointed not rounded lip, requires better definition
JR36	Siraf			WHITE.PI	jar	
JR37	Siraf			WHITE.PI	jar	
JR38	Siraf			WHITE.PI	jar	
JR39	Siraf			WHITE.PI	jar	
JR40	Siraf			HAGRIT	jar	
JR41	Siraf			EGG.PI	jar	type reassigned from WHITE.PI in Siraf classification to EGG.PI; some variation need more examples
JR42A	New		Siraf: JR42	TORP.RG	torpedo jar	internally and externally projecting lip
JR42B	New		Siraf: JR42; Williamson: TRC.1: 0	TORP.RG	torpedo jar	near straight internal edge, slight lip on exterior
JR43	Siraf			HMPW.2	jar	
JR44	Siraf			JULFAR	storage jar	
JR45	Siraf			HARMIC	jar	
JR46	Siraf			HARMIC	jar	
JR47	Siraf			HARMIC	jar	
JR48	Siraf			LINVES	storage jar	
JR49	Siraf			REBROS	jar	
JR50	Siraf			REBROS	jar	
JR51	Siraf			CREAC, HARLIM, REBROS	jar	
JR52	Siraf			REBROS	jar	
JR53	Siraf			REBROS	jar	similar to JR52 but more narrow mouthed
JR54	Siraf			REBROS	jar	

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
JR55	Siraf			HARLIM, REBROS	jar	could be defined more tightly
JR56	Siraf			HARLIM, REBROS	jar	may require further sub-division
JR57	Siraf			HARLIM, REBROS	jar	
JR58	Siraf			CREAC, REBROS	jar	
JR59	Siraf			CREAC	vat	
JR60	Siraf			HARLIM	jar	
JR61	Siraf			HARLIM	jar	shape is fairly distinctive so could be good but only one example illustrated
JR62	Siraf			HARLIM	jar	
JR63	Siraf			HARLIM	jar	
JR64	Siraf		Williamson: FIN: 02 (some)	HARC	jar	
JR65	Siraf		Williamson: FIN: 01 (some)	HARC	jar	
JR66	Siraf			REGTEC	jar	
JR67	Siraf			REGTEC	jar	
JR68	New		Williamson: ALK:25	TURQ.T	jar	
JR69	New		Siraf: OO	TURQ.T	jar	thick everted rim with curved inner face
JR70	New		Siraf: OO; ALK:21 (some)	TURQ.T	jar	thick everted rim with slight indent in interior lip
JR71	New		Williamson: ALK:24	TURQ.T	jar	
JR72	New			BUFF.I	jar	
JR73	New			LINVES	storage jar	variant of JR48, more rounded with no pointed lip
JR74A	New			EGG.PI	jar	flattened sides with vertical impressed marks; associated with base type JB6
JR74B	New			EGG.PI	jar	flattened sides with plain surfaces; associated with base type JB6
JR75	New			EGG.PI	jar	similar to JR77 but with high shoulders and a longer neck; associated with base type JB11
JR76	New			EGG.PI	jar	similar to JR32 but with a pariform body; associated with base types JB6 and JB11
JR77	New			EGG.PI	jar	similar to JR75 but with a globular body and short neck; associated with base type JB11
JR78	New			EGG.PI	jar	flat base, angled shoulder; associated with JB7

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
JR79	New			EGG.PI	jar	previously assigned as a one-off WHITE.PI type in Siraf classification, thin walls suggest better affinity to EGG.PI
JR80	New			FIBIC	storage vessel	previously recorded as LISV12 in Siraf study but renamed JR80 here as this is not an LISV class
JR81	New		Siraf: OO	STONE.BLU	jar	
JR82	New			TURQ.T	jar	
JR83	New			TURQ.T	jar	similar to JR5 but with a shorter neck
JR84	New			TURQ.T	jar	similar to JR6A but with well defined channels below the rim and before the shoulder
JR85	New			GRAF (Late)	jar	narrow necked jar with a triangular rim
JR86	New		Williamson: LQC.2:05	LQC	jarlet	Small globular lidded jar with a short collar neck, fluted sides and a curved recessed base.
JR87	New	Type 74	Williamson: TOR.1-4: 01	TORP.S	torpedo jar	occurs in association with TORP.1-4

Jar Bases

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
JB1	Siraf			CHANG	wine jar	
JB2	Siraf			DUSUN, STONE.BG1	storage jar	
JB3	Siraf			TURQ.T	jar	
JB4	Siraf			SPLASH.P1, SPLASH.P2	jar	
JB5	Siraf			EGG.PI	jar	similar to JB6 but with a slight but defined indent inside the foot
JB6	Siraf			EGG.PI	jar	
JB7	Siraf			EGG.PI	jar	
JB8	Siraf			TORP.RG	torpedo jar	more specifically defined here than in Siraf study
JB9	New			TORP.S	torpedo jar	
JB10	New			TORP.S	torpedo jar	

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
JB11	New			EGG.PI	jar	

Cooking Pot Rims

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
CP1	Siraf			JULFAR.PB	cooking pot	
CP2	Siraf	Type CP1.1		JULFAR.PB	cooking pot	
CP3	Siraf			JULFAR	cooking pot	
CP4	Siraf	Type CP1.2		JULFAR	cooking pot	
CP5	Siraf			JULFAR	cooking pot	
CP6	Siraf			CHAM	cooking pot	
CP7	Siraf			CHAM	cooking pot	
CP8	Siraf		Williamson: CHM.1:02; CHM.2:02; CHM.3:02	CHAM	cooking pot	
CP9	New		Williamson: CHM.1:01; CHM.2:01; CHM.3:01; Siraf: OO	CHAM	cooking pot	
CP10	New		Williamson: CHM.1:03 (some); CHM.2:01 (some); Siraf: OO	CHAM	cooking pot	
CP11	New	Type CP6.1	Siraf: OO	JULFAR	cooking pot	

Storage Vessels

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
LISV1	Siraf			CREAC, HARLIM, REBROS, SPORC	storage vessel	perhaps create sub-division between smaller and larger vessels
LISV2	Siraf			REBROS	storage vessel	
LISV3A	New		Siraf: LISV3	HARLIM, REBROS	storage vessel	type sub-divided, LISV3A has an indent below the rim and squared outer rim face
LISV3B	New		Siraf: LISV3	HARLIM, REBROS	storage vessel	type sub-divided, LISV3B has a curved outer rim face
LISV4	Siraf			CREAC, HARLIM, REBROS	storage vessel	most good
LISV5	Siraf			CREAC	storage vessel	LISV5 and LISV6 similar, would be good to see more of these forms
LISV6	Siraf			CREAC, HARLIM	storage vessel	LISV5 and LISV6 similar, would be good to see more of these forms
LISV7	Siraf			HARLIM	storage vessel	
LISV8	Siraf			HARLIM	storage vessel	
LISV9	Siraf			HARLIM	storage vessel	
LISV10	Siraf			HARLIM	storage vessel	one piece may need to be stripped out
LISV11	Siraf			FINLIM	storage vessel	
LISV13	New			HARLIM	vat	closely related to BR90 but larger version and with ridge below rim exterior
LISV14	New			HARLIM	storage vessel	variant of LISV1 with less groove lines in the collar, defined on the basis of illustrations from Manda
LISV15	New			REBROS	storage vessel	similar to LISV10 but with shoulders and a narrower neck

Handles

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
H1	Siraf			CHANG	wine jar	
H2	Siraf			DUSUN, STONE.BG1-2	storage jar	
H3	Siraf			TURQ.T	storage jar	
H4	Siraf			EGG.PI	jar	delicate turban-shaped thumb-stop
H5	Siraf			WHITE.PI	jar	robust handle with turban-shaped thumb-stop
H6	Siraf			WHITE.PI	jar	thick circular section strap handle with applique decoration or paired twisted strands
H7	New			REBROS	jar	
H8	New			EGG.PI	jar	related to H4 but with a flat thumb stop with fine radiating impressions
H9	New			MONO.G	bowl	cow head shaped handle attached to standard bowl rim type BR70

Spouts

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
SP1	Siraf			CHANG	wine jar	faceted sides
SP2	Siraf			CHANG	wine jar	smooth sides
SP3	New			REBROS	jar	

Other Category

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
OC1	Siraf			YUE.4, WW	box	
OC2	Siraf			TURQ.T	storage jar	applique decorated body sherds to accompany JR5
OC3	Siraf			TURQ.T	jar	body sherds with cut away decoration to accompany JR10
OC4	Siraf	Type 61		TURQ.T, OPAQ#, SPLASH#	dish lamp	
OC5A	New		Siraf: OC5	TURQ.T	jar	thumb impressed chain-ridge
OC5B	New		Siraf: OC5	TURQ.T	jar	cut chain-ridge
OC6	Siraf			BUFRAB	cooking pot	body flange
OC7	Siraf			WHITE.PI	jar	ring-and-dot
OC8	Siraf			WHITE.PI	jar	comb-and-dot
OC9	Siraf	Types J2.1 and J2.3		JULFAR.RW	coffee pot	
OC10	Siraf			CHAM	incense burner	
OC11	Siraf		Siraf: OC11 and OO; Williamson: CHM.1:04	CHAM	lid	
OC12	Siraf			CREAC	dish lamp	
OC13	Siraf			CREAC	vessel	
OC14	Siraf			CREAC, HARLIM	pedestal	
OC15	Siraf			REGTEC	vessel	
OC16	Siraf			YUE.2	bowl	bowls with simple broad lined decoration
OC17	Siraf			YUE.2	lid	box or incense burner with pointed thumb pull
OC18	New		Siraf: ND	STAMP	jar	circular segmented stamp mark
OC19	New		Siraf: ND	HONEY	jar	finger impressed marks
OC20	New		Siraf: ND	RUST	jar	elongated broad comb incised loops
OC21	New		Siraf: OO	OPAQ*	vessel	footed vessel
OC22	New			OPAQ*	dish	body sherds associated with BR46
OC23	New			WHITE.PI	jar	fine combing drawn through with broad lines

Type	Source	Kush	Williamson/Siraf	Associated Class(es)	Form	Notes
OC24	New			TURQ.T	jar	incised decoration on exterior
OC25	New		Williamson: CHM.1:05; CHM.2:04; CHM.3:04	CHAM	platter	
OC26	New		Williamson: LQC.2:06	LQC	jar	Jar lid. Domed top with plain surfaces.
OC27	New			YUE.4	bowl	fine incised decoration as is found in association with BB35