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Exchange networks of the Early Bronze Age Gulf: The imported ceramics from Kalba 4 (United Arab Emirates)

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Abstract

Imported ceramics from Early Bronze Age contexts in southeast Arabia illustrate a complex multidirectional network of material and social interactions at this time. Significant socioeconomic changes that occurred in the Hafit (3200–2800 B.C.) and Umm an-Nar (2800–2000 B.C.) periods have been linked to external demand for copper, which is argued to have stimulated a change in subsistence patterns. Similarly, disruption to long-distance exchange networks by external factors has been cited as driving change at the end of the Umm an-Nar period. Archaeological evidence from the region suggests a shift in the direction of exchange from Mesopotamia to the Indus occurred around the middle of the third millennium B.C. However, a recent analysis of Mesopotamian historical sources has highlighted the scale of state-organised textile production for export to the lower Gulf in the later third millennium B.C. The site of Kalba 4 has a stratified sequence of occupation deposits dating from the Umm an-Nar and Iron Age (1300–300 B.C.). In this study, a typological analysis of imported ceramics is used to locate the Kalba in the chronological framework of the region and discuss the changing networks of long-distance exchange that were operating. The imported pottery at Kalba 4 indicates that the inhabitants of the site were exchanging goods with a range of polities, including southern Mesopotamia, the Indus Valley (Meluhha), southeast Iran (Marhashi) and Bahrain (Dilmun). A significant quantity of Late Akkadian ceramics at the site suggests it became an important location for Mesopotamian trade at this time.

KEYWORDS

Arabia, Bronze Age, ceramics, exchange, Gulf trade, Kalba, Umm an-Nar

1 | INTRODUCTION

The distinctive cairn tombs of the Hafit period were first dated by the ceramic vessels they contained, which have clear parallels with examples from Mesopotamia excavated from contexts dated from the Jemdat Nasr period to the later Early Dynastic period (Potts, 1986a, 1993a, p. 183). Chemical analysis of these grave goods shows conclusively that the vessels were manufactured in Mesopotamia, and then transported to Arabia (Méry & Schneider, 1996). Small quantities of copper-bronze objects recovered from Hafit tombs may indicate the beginning of the local metallurgical industry (Potts, 1993a, p. 183), possibly with its origins in technically more advanced areas of Iran (Cleuziou & Méry, 2002, p. 282). Compositional and isotopic analyses of 14 metal artefacts from Jemdat Nasr contexts in Mesopotamian suggest that 21% of them were made of Omani copper (Begemann et al., 2010). The earliest textual mention of Mesopotamian importing copper from the Gulf is in Archaic texts (c. 3200–2900 B.C.); the sign DILMUN occurs in association with textiles, suggesting economic

ties between Dilmun and Babylonia (Englund, 1983; Laursen & Steinkeller, 2017, pp. 13, 14, 21). In the Early Dynastic period, Archaic texts from Ur contain the sign for Dilmun as a component in several personal names, it occurs in three lexical lists from Abu Salabikh and in at least five names of professions.

A range of socioeconomic and technological developments in the early third millennium B.C. culminate in the emergence of the Umm an-Nar (UAN) culture around 2800 B.C. For the first time, permanently settled communities develop, with an economy based on date palm-focused agricultural oasis settlements (al-Jahwari, 2009). As in the preceding Hafit period the region exhibits distinctive architectural and funerary traditions. UAN settlements often contain large circular mudbrick towers (Cleuziou, 1989a, 1989b; Frifelt, 1976; Potts, 1990), and circular collective tombs built of ashlar blocks are common in the later stages (e.g., Frifelt, 1991; McSweeney et al., 2008). External contacts in the Neolithic must account for the introduction of domesticated sheep, goats and cattle, as these animals were never known in the wild in the southeast (SE) Arabia (Uerpmann & Uerpmann, 1996). Likewise, the introduction of cultigens in the Early Bronze Age (EBA) indicates ongoing contact between SE Arabia and its neighbours; staple cereal crops, such as wheat and barley, originated in the Near East (Zohary & Hopf, 2000) and were supplemented by pea and lentil, also of Near Eastern origin (Boivin et al., 2009, p. 266). In addition, the technology required for the irrigation of oasis agriculture and new craft technologies, such as pottery production and metal working, likely originated in Iran, Mesopotamia or southern Arabia (Cleuziou, 2002, p. 201; Cleuziou & Tosi, 2007, p. 151; Potts, 2005). Local and long-distance exchange in the UAN period occurred in a wide variety of artefact types (Figure 1). Ceramics from the most ubiquitous type of imported artefact found on sites along the Gulf, and a range of pottery from Mesopotamia, south-eastern Iran and the Indus region are recorded at coastal sites as well as inland. Other imported artefacts include carnelian beads, ivory artefacts and softstone vessels (Eddisford, 2020; Eddisford, in press).

Discussions of long-distance exchange have tended to focus on the shifting intensity and direction of exchanges and the way in which external cultural and economic influences relate to internal shifts in the political economy in SE Arabia. The development of the Hafit and UAN cultures has been linked to external demand for copper, which is argued to have increased

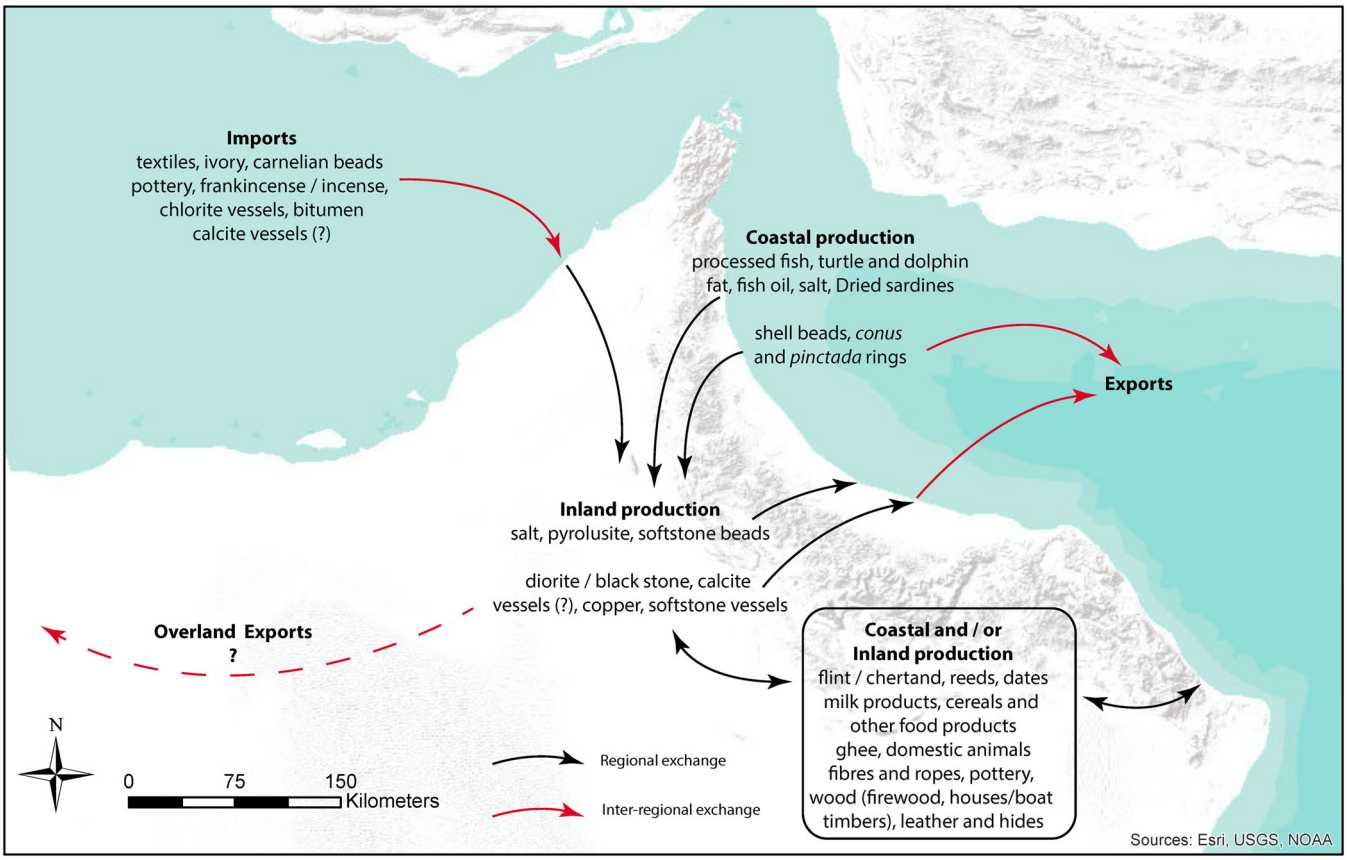

FIGURE 1 Schematic depiction of internal and external trade in southeast Arabia (based on Cleuziou, 2007, p. 255, tab. 2.1)

specialisation by offering opportunities for subsistence away from cultivation or herding and thereby stimulated a change in subsistence patterns (Cleuziou, 1996, p. 159; Cleuziou & Tosi, 2007, p. 66; Laursen & Steinkeller, 2017, p. 14). Similarly, the disruption to long-distance exchange networks by external factors has been cited as an important factor in changes that occur at the end of the UAN period (Carter, 2003a; Magee, 2014, p. 124).

Examination of historic sources (Larusen & Steinkeller, 2017; Leemans, 1950; Oppenheim, 1954; Steinkeller, 2013) and archaeological evidence (Boivin et al., 2009; Carter, 2003a; Cleuziou & Méry, 2002; During Caspers, 1992; Edens, 1992; Frenez, 2019; Possehl, 2002, pp. 215–236; Potts, 1993b; Weisgerber, 1986) has produced a relatively substantial literature on the Bronze Age trade in the Gulf. There is a general agreement that the archaeological evidence suggests that the interaction between SE Arabia and Mesopotamia intensified at the beginning of the EBA. Textual evidence suggests this trade was mediated via Dilmun (Boivin et al., 2009; Cleuziou & Méry, 2002; Edens, 1992), a polity that at this time probably incorporated areas of mainland Saudi Arabia as well as Bahrain. In the second half of the third millennium, there is less agreement between the historical and archaeological sources. Drawing on the historical record it is generally argued that exchange increased throughout the UAN period and that by the Akkadian period direct exchange between SE Arabia and Mesopotamian occurred (Boivin et al., 2009; Edens, 1992; Frenez, 2019; Laursen & Steinkeller, 2017, pp. 44, 90; Vogt, 1996). This contact is well illustrated by Sargon of Akkad's (2334–2279 B.C.) famous boast that the boats of 'Dilmun, Magan and Meluhha' were moored at his docks (Van De Mieroop, 2004, p. 63). Similarly Ur III period tablets from Ur name a specific trader who travelled to Magan, 'the country of mines', to trade wool garments, oil and leather items for copper (Oppenheim, 1954, pp. 13–15). It has therefore been suggested that coastal societies in Oman were heavily dependent on trade in the second half of the third millennium B.C. (Cleuziou, 1996; Cleuziou & Tosi, 1994, 2007). However, the archaeological evidence of exchange with Mesopotamia in the second half of the third millennium is notably lacking. At Hili 8 Mesopotamian ceramics are rare in Period 2 IIc2 and IId, making up only 0.5% of the total assemblage, and in Period IIe Mesopotamian imports are absent (Cleuziou & Méry, 2002: tab. 3). This led the excavators to conclude that Mesopotamian ceramics disappear from the pottery inventory of SE Arabia around 2600 B.C. and occur rarely after this time (Cleuziou & Méry, 2002; Méry & Schneider, 1996, p. 83).

Beginning around 2300 B.C. Indus artefacts begin to be found in relatively large numbers at sites in SE Arabia (Eddisford, 2020; Eddisford, in press; Frenez, 2019; Vogt, 1996, p. 127). Indus influences are present at both coastal and inland sites and on sites of all sizes, regardless of rank or location (Cattani et al., 2019; Frenez et al., 2016; Tosi, 1993, p. 374). In the second half of the third millennium, it has been argued that the Indus Civilisation emerged as the primary actor in fostering trade exchanges and cultural interactions with the UAN communities (Frenez, 2019, p. 19). Large black slipped jars (BSJ) of Indus origin are common on later third millennium sites, possibly indicating that liquids were being imported in significant quantities (Méry, 2000, p. 222, fig. 136). Recent excavations have suggested the pervasive presence of Indus merchants and craftspeople who were well integrated into local communities and the local economy. Evidence to support this argument includes the presence of Indus cooking pots and by inference Indus cuisine and cultural styles and Indus style items produced in local materials, which suggest that Indus craftsmen were working in the region (Cattani et al., 2019; Frenez et al., 2016).

While there is strong evidence for a period of increased aridity in Arabia around 2200 B.C. (Parker et al., 2006), the effect this may have had on society in the late UAN period is less clear. Analysis of the UAN occupation at RJ-2 suggests a gradual aggregation of the households, and an increase in economic specialisation and hierarchy in this period (Azzarà, 2009). Intensification of inequalities may have occurred in Late UAN and alongside increasing population density, and this may also have had a significant impact on society (Azzarà & De Rorre, 2018). The Late UAN corresponds to Phase 4 of the chronological sequence of UAN tombs at Hili; this phase represents a significant change in funerary customs at the site with the cessation of UAN tomb construction and the introduction of pit-burials (McSweeney et al., 2008, p. 10). The inland site of Bat also seems to undergo significant changes in the Late UAN, with towers that had been in use since the Hafit period falling out of use and possibly the Settlement Slope area of the site being occupied more intensely (Swerida, 2018, p. 12; Swerida & Thornton, 2019; Thornton & Ghazal, 2016, p. 200). Explanations of the changes witnessed in the Late UAN have often focused on the degree to which exchange and exogenous forces affected SE Arabia at this time. Magee (2014, pp. 124–125) suggests that the emergence of inequalities within society in the Late UAN, possibly to the degree that kingship became established, resulted in the inhabitants of SE Arabia adopting a more nomadic lifestyle in response to the tensions created by permanent settlement. Magee sees external influences, in the form of the Ur III state's attempts to influence political structures in SE Arabia, and the increasing amount of visible social markers of prestige, such as imported textiles, as playing a key role in promoting increasingly entrenched hierarchies.

2 | THE CHRONOLOGY OF THE UAN PERIOD

Establishing a reliable chronology for the EBA in SE Arabia has been hampered by the fact that much of the excavated data comes from collective tombs, which were used over long periods and were often robbed or disturbed

after they fell out of use. Deeply stratified sites are rare in SE Arabia, although they do occur, for example at Hili 8, Kalba 4, Tell Abraq and possibly Nub Ziba, although none have been published in their entirety. Where deeply stratified sites do exist they are almost exclusively associated with tower structures that have very complicated life histories with extensive re-deposition of early deposits, making their stratigraphy hard to reconstruct. The only published stratified sequence for the period comes from the site of Hili 8 (Cleuziou, 1989a, 1989b). The early third millennium B.C. dates for the Hili 8 sequence have been questioned, as has the assertion that sedentary date-palm-based agriculture was well established across SE Arabia at this early date (al-Jahwari, 2012; Deadman, 2017, pp. 332, 365–375; Potts, 1997, pp. 66 and 67). Despite these concerns, the Hili 8 sequence remains the most reliable chronology for the EBA, providing a relatively reliable pottery sequence for the period. In this article, I divide the UAN period into three sub-periods (Early, Middle and Late) as summarised in Table 1. This chronological framework follows the Hili 8 sequence but incorporates data from more recent analyses and excavations (e.g., Azzarà & De Rorre, 2018; Eddisford, 2020; Swerida et al., 2021; Thornton & Ghazal, 2016, p. 193, tab. 9.2).

TABLE 1 Umm an-Nar (UAN) chronology used in my analysis

	Hili sequence	Date range
Early UAN	IIa–IIc1	c. 2800–2500 B.C.
Middle UAN	IIc2–IIe	c. 2500–2200 B.C.
Late UAN	IIf–IIg	c. 2200–2000 B.C.

3 | KALBA 4

The site of Kalba 4 is located on the east coast of the United Arab Emirates, within the Emirate of Sharjah (Figure 2). The site consists of a small mound that measured approximately 50 m in diameter that stands no more than two and a half metres above the level of the surrounding fields (Schwall & Jasim, 2020; Schwall et al., 2021, p. 35, fig. 1). Despite its unimposing appearance a considerable depth of stratified archaeological deposits survive at the site; away from the central tower, these deposits are deeply buried below thick alluvial deposits. The site was excavated in the 1990s by a team from UCL, under the direction of Carl Philips (Carter, 1997; Eddisford & Phillips, 2009). More recently archaeological investigation of the site has been undertaken by a

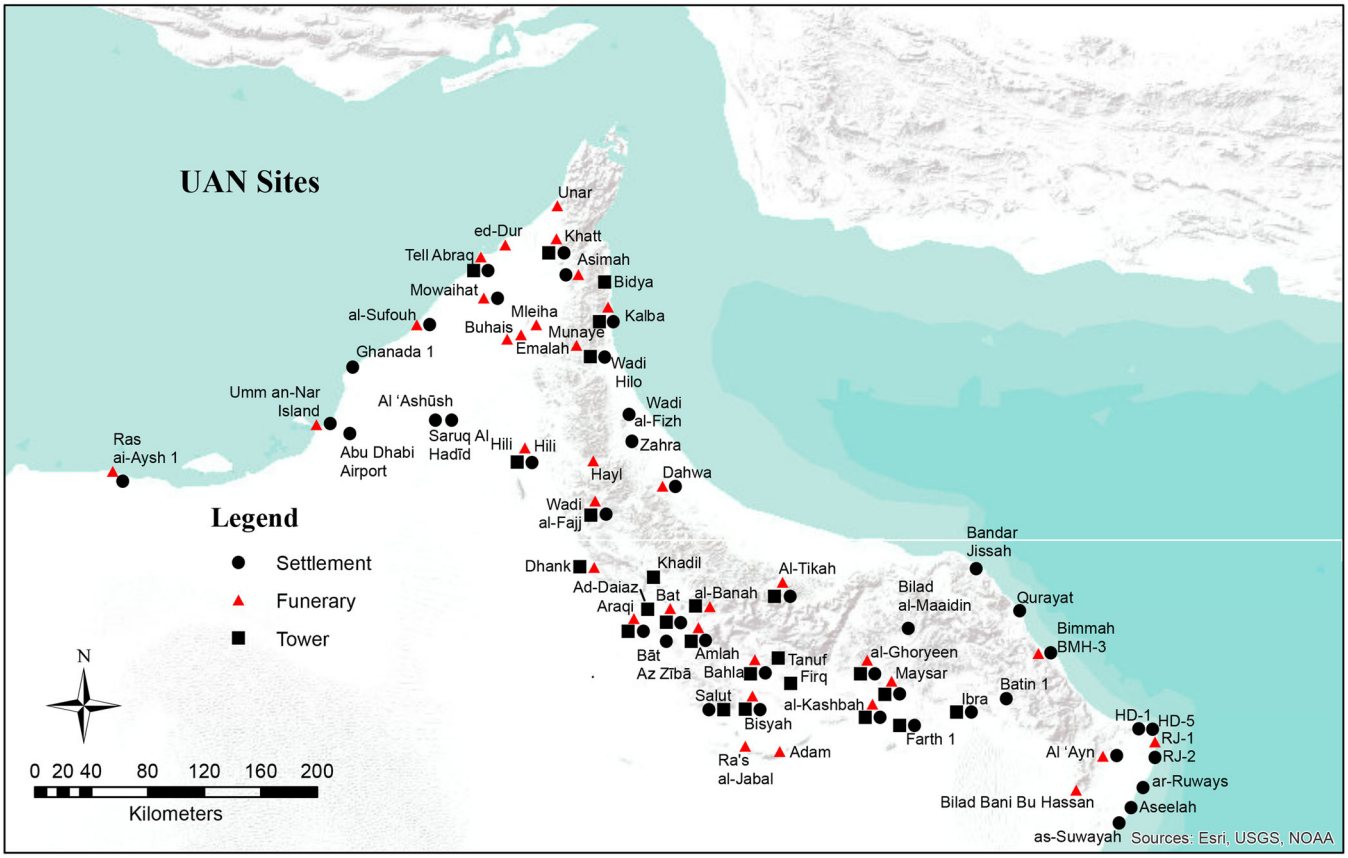

FIGURE 2 Map showing Umm an-Nar Sites in southeast Arabia

joint project from the Institute of Oriental and European Archaeology, the Austrian Academy of Sciences and the Sharjah Archaeology Authority (Schwall & Jasim, 2020; Schwall et al., 2021, in press). The stratigraphy of the site was complex and the depth of deposits acted as a restraint on the extent of the excavations, particularly for the earliest phases of occupation. However, a sequence of architectural phases from the Bronze Age and the Iron Age periods were exposed. It appears that the earliest building was an EBA mudbrick tower and subsequent architectural developments took place around this central core. An almost complete plan of the tower was exposed, despite the uppermost parts having been eroded. However, the depth of the later deposits around the outside of the tower made excavation of the surfaces contemporary with the earliest phase of occupation difficult. Occupation at the site in the later Bronze Age and the Iron Age appears to have continued to be focused on the mudbrick tower and surrounding ditches and platforms (Eddisford & Phillips, 2009).

The coastline near Kalba 4 consists of dense mangroves that are rich in a variety of fauna, including fish, shellfish and birds; inland, the plain is covered by an abundance of trees, mainly acacias. This environmental diversity has economic potential for foraging activities, with the availability of marine molluscs, fishing, hunting and herding. Along the coast, the freshwater level rises nearer to the surface as it comes up against the denser saline seawater; in combination with fine silt deposited by wadis, this has enabled the establishment of an extensive area of cultivation based on well irrigation that was in use by at least the mid-third millennium B.C. One of the regions' major wadis, the Wadi Ham, runs close to the site and provides access to a mineral-rich hinterland. Finally, proximity to the coast and safe harbourage provides Kalba with maritime links to the wider world.

A circular cairn tomb, Kalba 2, was located inland of the cultivated area of Kalba and just south of the main course of the Wadi Ham. The Kalba 2 tomb contained a complete pottery vessel of Mesopotamian origin and of Early Dynastic II or III period date. The tomb also contained a small cylindrical softstone vessel of probable Iranian origin and contemporary date (David & Phillips, 2008; Eddisford & Phillips, 2009). Further inland the hinterland of Kalba 4 includes a contemporary UAN tomb at Munaye (Phillips, 1997) and a mining/smelting site at Hilo (Kutterer, 2013; Kutterer & Jasim, 2009; Kutterer et al., 2013).

4 | THE CERAMIC ASSEMBLAGE FROM KALBA 4

The pottery assemblage from the excavations at Kalba 4 consists of approximately 12,000 diagnostic sherds (defined as rim sherds, bases and decorated sherds). During the excavation it was considered impractical to study in detail all the ceramic sherds excavated; therefore, a sampling strategy was implemented in which all diagnostic sherds were retained and nondiagnostic sherds (defined as undecorated body sherds) were excluded from further analysis. However, the body sherds of some unusual or foreign fabrics were also retained. Despite the fact that not all sherds were kept, a comprehensive sample of pottery types and fabrics were retained from all excavated contexts.

The majority of the pottery assemblage from Kalba 4 is of Wadi Suq, Late Bronze Age and Iron Age dates as the majority of excavated deposits relate to these periods. An assemblage of ceramic sherds from EBA deposits consisted of 320 sherds (Eddisford & Phillips, 2009). However, a larger assemblage of third-millennium pottery occurs as a residual component in later deposits. The quantity of residual material is typical of multi-period tells and is a result of the site's long occupation, with the earliest deposits being disturbed by a wide variety of later intrusions. The fact this pottery is not in a primary context potentially reduces the value of the material; nevertheless, this residual assemblage can be identified by comparison to published material. It, therefore, represents an important record of the relationship between the inhabitants of the site and their neighbours in the Bronze Age.

5 | CLASSIFICATION OF THE ASSEMBLAGE

The pottery assemblage was initially classified by fabric types, using the visual and low-power microscopic examination. Description and classification of the eight fabric types were made by colour and description of the inclusions (Table 2), and the fabric categories defined for the Kalba 4 assemblage follow those defined by Sophie Méry in her analysis of the EBA pottery of the SE Arabia (Méry, 2000, pp. 66 and 67). The locally produced pottery and the imported ceramics are relatively easy to distinguish from the coarser grit and vegetal tempered wares that define domestic production in the Middle and Late Bronze Age and Iron Age periods. Fabric types based on visual examination alone do not necessarily indicate the area of manufacture; for example, red Indus and SE Iranian fabrics can look similar to locally produced vessels, and micaceous inclusions are not limited to vessels of Indus origin. Therefore a range of observations, including rim form and decoration, have been used to identify reliable comparanda for the Kalba 4 assemblage.

6 | LOCAL CERAMICS FROM KALBA 4

6.1 | Fine red ware and sandy ware (FRW and SAN)

Fine Red Ware and Sandy Ware fabrics identified at Kalba 4 can be compared in fabric, form and decoration to the

TABLE 2 Pottery fabric codes used to categorise the Kalba 4 assemblage

Fabric type	Code	Description	Probable origin	Méry (2000) code
Fine Red Ware	FRW	Hard, well-fired, mid orange fine fabric with no visible inclusions. Occasionally fired mid-yellow-brown. Vessels often with an external slip that ranges from red or orange to brown in colour. Painted decoration ranges in colour from black to brown or purple brown	Oman, UAE	Ra1
Sandy Ware	SAN	Mid orange to grey sandy fabric. Fine wares similar to FRW but with occasional sand temper	Oman, UAE	Ra2
Ridged Ware 1	RW1	Hard sandy red fabric with moderate grit and white inclusions	Common on Early Bronze Age (EBA) sites in SE Arabia, recorded in Bahrain and Iran	-
Ridged Ware 2	RW2	Similar to RW1 but finer dark grey to brown fabric with occasional sand inclusions	Common EBA sites in SE Arabia, recorded in Bahrain and Iran	-
Beige Ware	BEO	Green to light brown fabric sometimes with a pinkish core. Moderate sand inclusions, occasional small grits and vegetal temper	Mesopotamia	Bs1
Micaceous	MIC	Slightly sandy red fabric with frequent mica inclusions. Often with internal and external black to black-brown slip. Occasional internal red slip. Occasionally with grey reduced core	Indus Valley region	Rm1
Fine Grey Ware	FGW	Well-fired fine grey fabric with few inclusions. Often with black painted or incised decoration	Iran/Baluchistan	Ga1
Yellow Gritted Ware	YGW	Red to orange-red fabric with yellow exploded grits	Bahrain	-
Other	OTH	Other fabric types are described individually	-	-

black on red wares from other EBA sites in the region and can be dated to the second half of the third millennium B.C. (Eddisford & Phillips, 2009). Petrographic and chemical analysis of the ceramic assemblage from Hili indicates that although produced from different clay sources both sandy and fine red wares were produced somewhere in the mountains of the Oman Peninsula (Blackman et al., 1989, p. 72). Although these fabric types are associated with an indigenous pottery industry, the form and decoration of this Omani pottery draw on the stylistic traditions of SE Iran and strongly suggest an exchange of both ideas as well as craftspeople (Potts, 2005).

6.2 | Ridgeware fabrics (RW1 and RW2)

Ridgeware fabrics RW1 and RW2 are associated with large vessels, probably storage jars, with hooked or curled rims and parallel or meandering ridges applied to the exterior. Some of the meandering ridges are decorated with a snake motif. These vessels can be compared to Qala'at al-Bahrain Type U8 (Højlund & Andersen, 1994: 114, figs. 301 and 311). Similar vessels are found at sites across SE Arabia, published examples including finds from Arabia Wadi Far 1 (Hastings et al., 1975, fig. 10.ff) and Tell Abraq (Potts, 1990, figs. 12.1, 12.3, 28.1). Similar snake decoration is known from the sites of UAN (Frifelt, 1971, fig. 7; Frifelt, 1975, p. 365) and Tepe Yahya (Lamberg-Karlovsky, 1970, fig. 28.Q–28.S). The origin of these vessels is not clear; however, they may be produced within SE Arabia. Some of the vessels in ridgeware fabrics are slab built with moulded bases, possibly indicating local technological traditions being influenced by Indus imports such as black slipped jars (Højlund & Andersen, 1994, p. 115).

7 | IMPORTED CERAMICS FROM KALBA 4

7.1 | Beige fabrics (BE1 and BE2)

Beige fabrics are green to light brown, sometimes with a pinkish core, with moderate sand inclusions, occasionally some sherds have small grits and vegetal temper. This fabric is significantly different from locally produced UAN wares and both typological similarities, and the analysis of similar fabrics from other sites (Méry, 2000; Méry & Schneider, 1996), indicate these ceramics were produced in Mesopotamia. A range of vessels in beige fabrics occur in the Kalba assemblage (Figures 3–8), consisting predominantly of medium to large vessels with restricted necks. This vessel form would be well suited to the transportation and storage of imported products, and no doubt attest to the trade of otherwise archaeologically 'invisible' goods (Crawford, 1973).

Two Mesopotamian sherds come from excavated deposits dated to the EBA (see below), the remainder of the Mesopotamian assemblage was recovered as residual material in later contexts. There are very few sherds from Kalba 4 with Mesopotamian Early Dynastic parallels (Figure 3); however, several of these are comparable to forms found at UAN Island, suggesting that both sites were involved in overlapping exchange networks in the early UAN period. The limited number of Mesopotamian sherds from this early period may suggest that there was a limited degree of contact between this area and Kalba 4. However, the fact that no deposits of this period were excavated at the site means the true extent of these early contacts is hard to quantify; significant early occupation deposits may exist below later UAN occupation layers.

The lack of Mesopotamian imports dating to the middle UAN period agrees with a picture seen across SE Arabia in this period despite the textual evidence from Mesopotamia, which suggests there is the greatest direct contact between Magan and Mesopotamia at this time.

At Kalba 4 there may be stratigraphic reasons for the lack of middle UAN material but seems less likely given the abundance of Mesopotamian imports that date to the late third millennium that were recovered as residual material in later deposits.

The majority of imported Mesopotamian ceramics from Kalba 4 find parallels in material from late third-millennium contexts in Mesopotamia, the Mesopotamian trading outpost on Failaka Tell F6 and early levels at Qala'at al-Bahrain (Figures 4–6). From the EBA levels and in residual contexts, a distinctive ribbed rim form is at the earliest late Akkadian in date (Figures 7, 3–6 and 13, 2), and in Gulf contexts much more likely to be of Ur III date. This distinctive form is known from Period 1 at Tell F6 (2200–2100 B.C.) and is commonest at Qala'at al-Bahrain in Period Ib (c. 2150 B.C.). These large storage jars with ridged rims would have been well suited for transport. A similar vessel with a ridged rim (Figure 6, 2) corresponds to an imported Mesopotamian vessel known from Early Type burial mounds in Bahrain (c. 2250–2050 B.C.) and finds later Akkadian and Ur II parallels in Mesopotamia (Laursen, 2011). Distinctive body sherds include examples with ridges and combed decoration (Figure 4, 11–14) that finds parallels in Mesopotamia, Failaka Tell F6 and Qala'at al-Bahrain.

7.2 | Mesopotamian ceramics with Early Dynastic parallels

See Figure 3 and Table 3.

7.3 | Mesopotamian ceramics with late third millennium parallels

See Figures 4–6 and Tables 4–6.

7.4 | Mesopotamian ceramics with second millennium parallels

See Figure 7 and Table 7.

7.5 | Mesopotamian ceramics with no clear comparanda

A number of vessels in the beige fabric have no clear parallels or are too generic in the form to make definitive associations with other excavated examples. These sherds are illustrated to allow the entirety of the assemblage to be assessed. Some of these sherds probably post-date the EBA and have some similarities to material from the later phases at Failaka Tell F6 (Højlund & Abu-Laban, 2016).

8 | MICACEOUS FABRIC (MIC) AND OTHER INDUS FORMS

A range of vessels in a micaceous fabric (Figures 9 and 10) find parallels in Harrapan assemblages dating to the second half of the third millennium B.C. The most common form of the vessel in the micaceous fabric are large black slipped jars with hooked rims and moulded bases (Figure 10, 4–8). These amphora-like vessels are designed for the maritime transportation of liquids and are common on Indus sites (Méry, 2000, p. 221, fig. 135) and have been found in potters' workshops at Harappa (Wright, 1991, p. 80). The similarities in form and decoration between this vessel type in SE Arabia and the Indus have been confirmed by similarities at a chemical level (Méry, 2000, pp. 230–235; 243, fig. 156).

Other vessels in a micaceous fabric included open bowls with rounded toped rims (Figure 10, 1–3), which

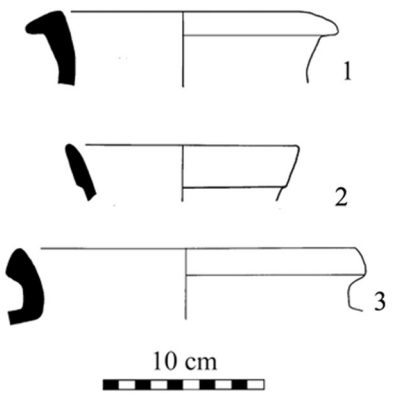

FIGURE 3 Mesopotamian ceramics with Early Dynastic parallels

TABLE 3 Mesopotamian ceramics with early dynastic parallels

Fig no.	Locus no.	Fabric	Description	Comparanda	Dating
1	(8.014)	BEO	Rim sherd with a distinctive triangular profile in a hard pale green-brown fabric occasional large circular voids.	Hili 8 (Cleuziou, 1989a: pl. 22.1)	Hili Period Ia
				Tell Asmar and Tell Agrab (Potts, 1986a, p. 163, fig. 6.2)	EDI
				Khafajah (Potts, 1986a, p. 163, fig. 6.2)	EDI/EDII
				Tell Razuk type 7b (Potts, 1986a, p. 163, fig. 6.3)	EDI/EDII
				Umm an Nar Island Band rim Jars (Frifelt, 1995, p. 50, fig. 55.J, 123)	Umm an Nar Island Period 1
2	(1.009)	BEO	Rim sherd with a notched band rim in a reddish brown fabric occasional fine sand, micaceous inclusions	Abu Salabikh (Moon, 1987, fig. 564, 570, 617)	EDII/EDIII
				Eastern Province Foreign Ceramics Type 1 (Piesinger, 1983, fig. 150)	EDI/EDII
				Umm an-Nar Island Bevelled rim jars (Frifelt, 1995, p. 129)	Umm an Nar Island Period 0/1
3	(33.007)	BEO		Eastern Province Foreign Ceramics Type 6 (Piesinger, 1983, fig. 152)	EDI/EDIII

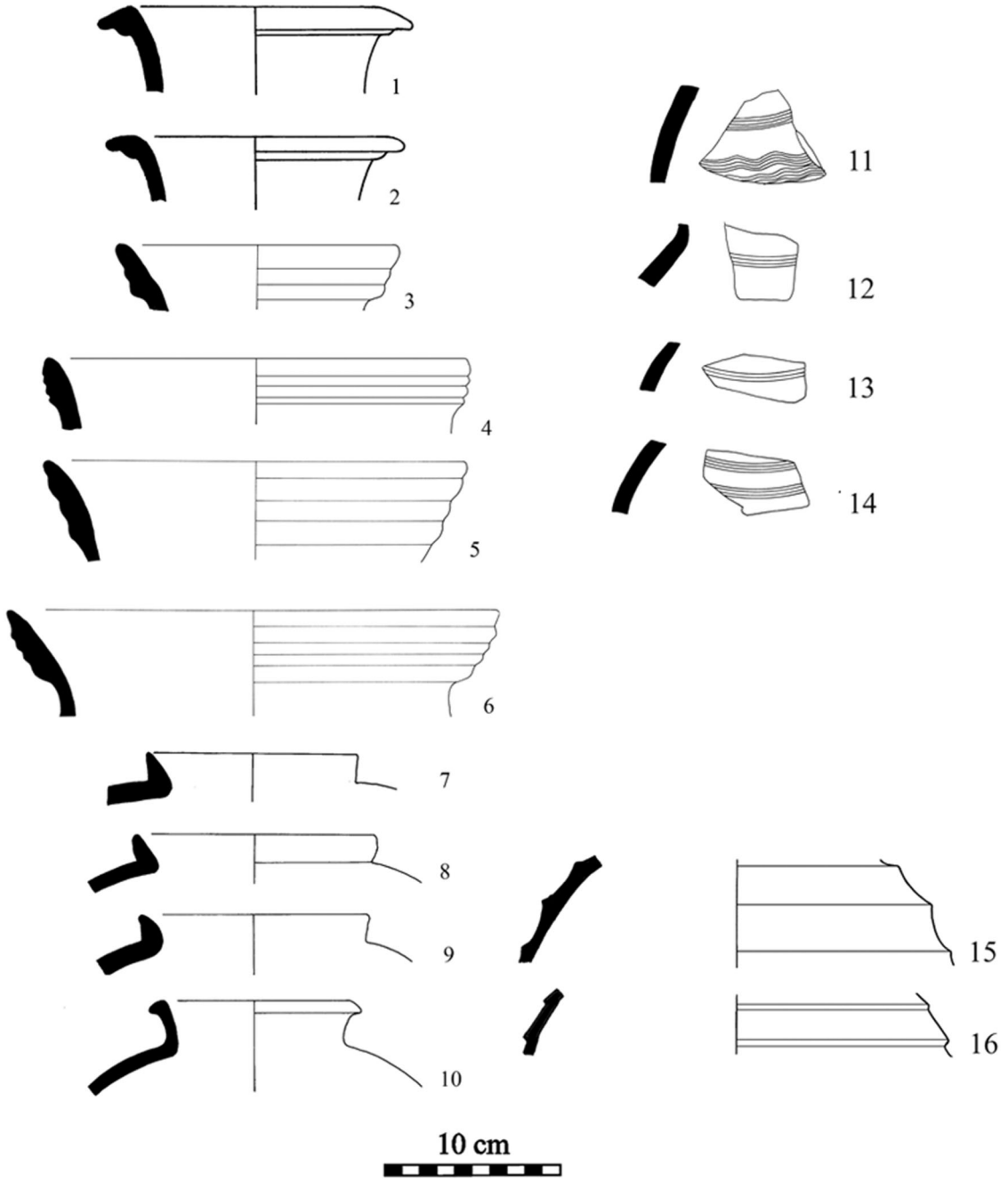

FIGURE 4 Mesopotamian ceramics with late third millennium parallels Plate 1

again are comparable to Indus forms. These open bowls, a large shallow plate (Figure 9, 9) and an Indus cooking pot (Figure 9,1) are all associated with culinary activities and may have influenced the local production of such forms. The bases of pedestal vessels (Figure 9, 7 and 8) are also typical of Indus vessels (Méry, 2000, p. 136, fig. 143; Possehl, 2002, p. 47, fig. 2.17; Wheeler, 1947) and suggest that Indus traditions of food presentation and possibly cooking were being utilised at Kalba.

9 | FINE GREY WARE FABRIC (FGW)

FGWs vessel from Kalba 4 (Figure 11) can be compared to similar incised vessels from Tomb A at Hili North (Méry, 2000, p. 209, fig. 128). A small painted jar biconical vessel with painted black chevron decoration (Figure 11, 3) is also comparable to vessels excavated in tombs at Hili (Méry, 2000, p. 192, fig. 129.6 –129.9). Painted body sherds in FGW

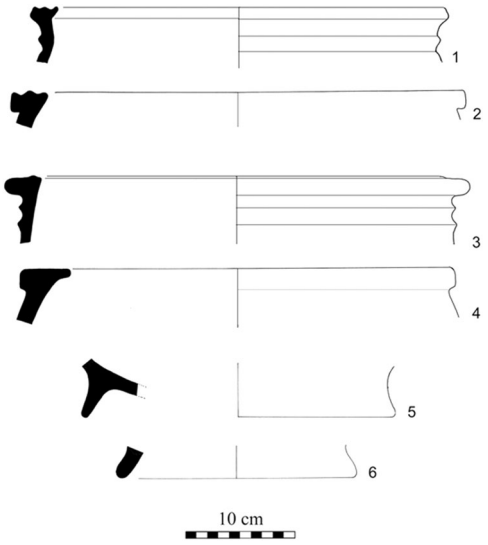

FIGURE 5 Mesopotamian ceramics with late third millennium parallels Plate 2

fabric include chevron and ladder motifs as well as a band of possible ibex (Figure 11, 8), which has clear parallels in a cylindrical vessel from Tomb B at Hili (Méry, 2000, p. 196, fig. 122.4).

Painted black on grey wares from Kalba 4 can be assigned to the Emir Grey Ware group (Fairservis, 1961, p. 86; Wright, 1985). Stylistically and compositionally both incised and painted FGW vessels from Hili have shown to be of eastern Iranian origin (Blackman et al., 1989, p. 73; Méry, 2000, pp. 199–317; Méry et al., 2012). Both forms of grey ware vessels occur in eastern Iran from the mid-third millennium B.C. (Thornton & Ghazal, 2016, p. 201) and are known from sites in SE Arabian dating to the second half of the third millennium B.C. (Eddisford, 2020, fig 5.10–11; Eddisford, in press).

Incised grey wares are often thought to date to the late third millennium B.C., based on their presence at Shahr-i Sokhta IV (Lamberg-Karlovsky & Tosi, 1973) and Bampur IV–VI (During Caspers, 1970), their absence in the Hili 8 sequence before Phase IIf, and their presence at Late UAN sites such as Tell Abraq. However more recent excavation in Pakistani Baluchistan and reanalysis of the Iranian material suggest that incised grey wares have a longer history, appearing in the first half of the third millennium B.C. (Thornton & Ghazal, 2016, pp. 203–204). This is unsurprising as the incised patterns are intended to be skeuomorphs of figurative style softstone vessels. In SE Arabia incised FGWs occur in Early UAN contexts only at UAN Island. However, this type of imported ceramic occurred in both settlement and funerary contexts in the middle and Late UAN periods.

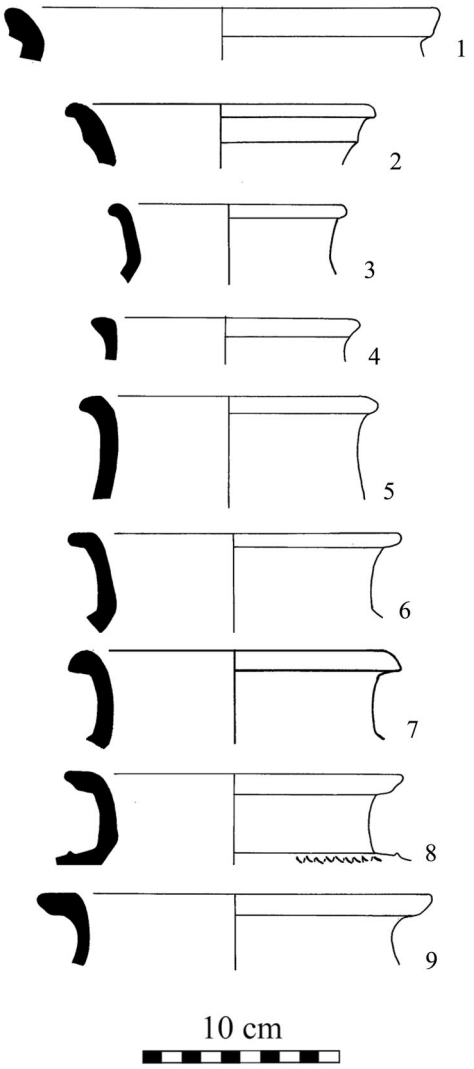

FIGURE 6 Mesopotamian ceramics with late third millennium parallels Plate 3

10 | YELLOW GRITTED WARE FABRIC (YGW) AND DILMUN FORMS

The Kalba 4 pottery assemblage contains a number of sherds in the YGW fabric, which is of Dilmun/Bahraini origin (Figure 12). Body sherds with parallel external ridges (Figure 12, 5–7) are from large spherical vessels dated to Periods I and II at Qala'at al-Bahrain (Højlund & Andersen, 1994, pp. 76–77, Type B2). The rim of a Dilmun jar (Figure 12, 1) and a highly burnished red body sherd (Figure 12, 1) are paralleled by complete vessels recovered from the Bronze Age burial mounds in Bahrain. A triangular rim with a sharp lower edge (Figure 12, 3) is similar to Qala'at al-Bahrain Type B4 (Højlund & Andersen, 1994, p. 78, fig. 114). A wider rim form with a convex top (Figure 12, 4 and 5) can be compared most closely to Qala'at al-Bahrain Type B18 (Højlund & Andersen, 1994, p. 82, fig.

TABLE 4 Mesopotamian ceramics with late third millennium parallels Plate 1

Fig no.	Locus no.	Fabric	Description	Comparanda	Dating
1	(13.026)	BEO	Hard pale green beige fabric	Højlund and Abu-Laban (2016, p. 97, figs. 133, 135, 137)	Failaka Tell F6 Period 1
2	(32.014)	BEO	Pale green brown fabric occasional sand inclusions	Højlund and Abu-Laban (2016, p. 97, figs. 133, 135, 137)	Failaka Tell F6 Period 1
3	(23.052)	BEO	Hard green beige fabric occasional sand inclusions	McCown and Haines (1967: pls 87.14 and 148.2)	Ur III levels at Nippur
				Højlund and Andersen (1994, p. 103, figs. 248–249; p. 143, figs. 416; p. 156, fig. 575) (Type M4)	Barbar Ia-IIa levels at Qala'at al-Bahrain
				Højlund and Abu-Laban (2016, p. 98, figs. 152–156)	Failaka Tell F6 Period 1
4	(17.043)	BEO	Hard green beige fabric occasional sand inclusions	See 3	
5	(22.107)	BEO	Hard green beige fabric occasional sand inclusions	See 3	
6	AreaC	BEO	Hard green beige fabric occasional sand inclusions	See 3	
7	(06.005)	BEO	Mid red brown fabric occasional fine sand inclusions	Højlund and Andersen, (1994, p. 103, fig. 245) (Type M3)	Qala'at al-Bahrain Periods Ia and Ib
				Gibson (1972, fig. 44)	Akkadian levels at Umm el-Jir
8	(45.001)	BEO	Mid green brown sandy fabric	See 5	
9	(36.003)	BEO	External black paint	Possibly the same as 5	
10	(07.059)	BEO	Rim sherd	Højlund and Andersen (1994, p. 102, fig. 240) (Type M1)	Qala'at al-Bahrain Period Ib
				Højlund and Abu-Laban (2016, p. 100, fig. 199; 97, fig. 141)	Failaka Tell F6 Period 1
				McCown and Haines (1967: pl.81.7)	Akkadian levels at Nippur
11	(32.102)	BEO	Fine combed decoration	Højlund and Andersen (1994, p. 109, figs. 281–283) (Type M26)	Qala'at al-Bahrain Periods Ib and IIa
				Højlund and Abu-Laban (2016, p. 102, figs. 230–234)	Failaka Tell F6 Period 1
				Steele et al. (2004, p. 233, fig. 6.54.16)	Akkadian levels at Tell Brak
				Weiss (1990, Abb. 17.5)	Leilan Ib
				Gibson (1972, p. 286)	Late Akkadian levels at Umm el-Jir
				Steve and Gasche (1971: Pl 2.40, Pl 3.6)	Ur III levels at Susa
12	(53.006)	BEO	Fine combed decoration	See 11	
13	(32.102)	BEO	Fine combed decoration	See 11	
14	(7.059)	BEO	Fine combed decoration	See 11	
15	(32.150)	BEO	Ridged body sherd. Pale yellow-brown fabric. vegetal inclusions	Højlund and Andersen (1994, p. 108, fig. 280) (Type M22)	Qala'at al-Bahrain Periods Ia and Ib
				Højlund and Abu-Laban (2016, p. 102, figs. 223–226)	Failaka Tell F6 Period 1
				McCown and Haines (1967: pl.81:9)	Akkadian and Ur III levels at Nippur
16	(7.108)	BEO	Pale green brown fabric. More vegetal inclusions.	See 15	

TABLE 5 Mesopotamian ceramics with late third millennium parallels Plate 2

Fig no.	Locus no.	Fabric	Description	Comparanda	Dating
1	(01.003)	BEO	Rim sherd with ridged decoration	Højlund and Andersen (1994, p. 106, fig. 271) (Type M17)	Qala'at al-Bahrain Period 1b
				Højlund and Abu-Laban (2016, p. 101, figs. 215–217)	Failaka Tell F6 Period 1
				Gibson (1972, figs. 46.25 A)	Akkadian date at Umm el-Jir
2	(06.005)	BEO	Pale green brown fabric, occasional sand inclusions	See 1	
3	(53.066)	BEO	Pale green brown fabric, frequent vegetal inclusions	See 1	
4	(53.102)	BEO	Pale green brown fabric, moderate black and dark red sand inclusions and freq. vegetal inclusions	Højlund and Abu-Laban (2016, p. 101, fig. 214)	Failaka Tell F6 Period 1
5	(106.023)	BEO	Ring base	Højlund and Andersen (1994, p. 107, figs. 274–275) (Type M19)	Qala'at al-Bahrain Periods Ia and Ib
				Højlund and Abu-Laban (2016, p. 97, figs. 143 and 146)	Failaka Tell F6 Period 1
				Gibson (1972, pp. 274, 278, no.16, figs. 42 and 44)	Akkadian date at Umm el-Jir
6	(53.102)	BEO	Fragment of pedestal/ring base	See 5	

TABLE 6 Mesopotamian ceramics with late third millennium parallels Plate 3

Fig no.	Locus no.	Fabric	Description	Comparanda	Dating
1	(42.101)	BEO	Hard pale green beige fabric	Højlund and Abu-Laban (2016, p. 97, fig. 144)	Failaka Tell F6 Period 1
2	(42.016)	BEO	Pale green brown fabric occasional sand inclusions	Højlund and Abu-Laban (2016, p. 97, fig. 131)	Failaka Tell F6 Period 1
				Laursen (2011): Type 1	Early Type graves on Bahrain (c. 2250–2050 B.C.)
				See Laursen (2011, p. 38)	Late Akkadian to Ur III levels in Mesopotamia and at Susa
3	(03.001)	BEO	Hard green beige fabric occasional sand inclusions	Højlund and Abu-Laban (2016, p. 100, fig. 199)	Failaka Tell F6 Period 1
4	(24.060)	BEO	Hard green beige fabric occasional sand inclusions	Højlund and Abu-Laban (2016, p. 100, fig. 197)	Failaka Tell F6 Period 1
5	(33.050)	BEO	Hard green beige fabric occasional sand inclusions	Højlund and Abu-Laban (2016, p. 100, fig. 199)	Failaka Tell F6 Period 1
6	(03.001)	BEO	Hard green beige fabric occasional sand inclusions	Højlund and Abu-Laban (2016: 100, fig. 198)	Failaka Tell F6 Period 1
7	(53.108)	BEO	Mid red-brown fabric occasional fine sand inclusions	Højlund and Abu-Laban (2016, p. 97, fig. 141)	Failaka Tell F6 Period 1
8	(32.102)	BEO	Mid green-brown sandy fabric	Højlund and Abu-Laban (2016, p. 97, fig. 137)	Failaka Tell F6 Period 1
9	(03.001)	BEO	External black paint	Højlund and Abu-Laban (2016, p. 100, fig. 195)	Failaka Tell F6 Period 1

136). Both these forms are dated to Periods I and II at Qala'at al-Bahrain, but only occur in Period I in significant numbers.

11 | IMPORTED CERAMICS FROM THIRD MILLENNIUM CONTEXTS

The relatively small size of the assemblage of imported ceramics from third millennium contexts reflects the limited number of sealed third millennium contexts excavated. A Mesopotamian sherd recovered from the EBA levels has a distinctive ribbed rim form that is likely of late third millennium date (Figure 13, 2, see above). Incised and painted greywares were found in the limited third millennium contexts excavated (Figure 13, 3–7); although produced in Iran from the mid-third millennium, these vessels are most commonly found in later third millennium contexts in SE Arabia.

Indus forms include a black slipped jar with incised marks on its rim (Figure 13, 8), similar marks are known from imported and locally produced vessels in SE Arabia (Eddisford, 2020, pp. 206–211; Eddisford, in press). Weisgerber (1981, p. 198) describes these marks as 'housemarks' and suggests they could have been used to demonstrate ownership. Other Indus forms include the moulded bases of black slipped jars (Figure 13, 10 and 11) and bowls (Figure 13, 12 and 13) that are common on Indus sites and suggest an Indus influence on the preparation and consumption of foodstuffs.

12 | QUANTIFICATION OF THE IMPORTED CERAMICS

Quantification of the assemblage from Kalba 4 by fabric type is summarised in Table 13 based on all EBA sherds from all excavated contexts at the site, including body sherds. For the majority of the excavated contexts at the site, only diagnostic pottery sherds were kept; undecorated body sherds were often not recorded. However in a few contexts, the entire ceramic assemblage was retained, and this therefore may bias the quantification.

The assemblage can also be quantified using only diagnostic sherds; this is taken to mean rim sherds, bases and decorated body sherds, but excludes undecorated ones. The results of this quantification are presented in Table 14. Sherd counts can be misleading as estimates of whole vessels; large, low fired or thin-walled vessels are likely to produce more sherds for example (Rice, 1987, p. 291). Although quantification by diagnostic sherds may not give an entirely reliable minimum number of whole vessels, it is a more reliable figure and allows different types of vessels and fabric to be compared more reliably. This point can be illustrated by the fact there are relatively fewer Indus vessels (MIC fabric) when the assemblage is quantified by diagnostic sherds alone, probably because these large vessels produce a larger number of sherds. Biases in the quantified assemblage will likely still exist; however, for example, larger and more easily recognised forms (such as thick-walled micaceous Indus black slipped jars) may be overrepresented as they are likely to survive better and be more easily identified in an unsieved archaeological assemblage.

The chronology of the SE Iranian wares (FGW) and Indus wares (MIC) is not sufficiently fine-grained to date these wares any more closely than to the EBA period. However, the Mesopotamian wares (BEO) can be more reliably dated, as a result of a greater amount of excavated material from this region and more recent excavations, with better stratigraphic control, having been undertaken on sites with significant amounts of Mesopotamian material on them, such as at Qala'at al-Bahrain and Tell 6 on Failaka. The Mesopotamian wares from Kalba 4 have been presented chronologically above and are quantified by period, as shown in Table 15.

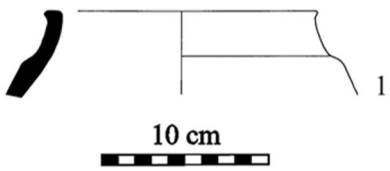

FIGURE 7 Mesopotamian ceramics with second millennium parallels

13 | EVIDENCE OF LATE THIRD MILLENNIUM MESOPOTAMIAN EXCHANGE NETWORKS IN THE GULF

13.1 | Documentary evidence

Radical changes in the exchange networks of the Gulf appear to have occurred following the advent of the

TABLE 7 Mesopotamian ceramics with second millennium parallels

Fig no.	Locus no.	Fabric	Description	Comparanda	Dating
1	(32.004)	BEO	Rim sherd	Ayyoub (1982, pp. 84–86)	Isin-Larsa/Old Babylonian date at Diyala
				Højlund (1987, figs. 206–218)	Isin-Larsa/Old Babylonian date at Failaka
				Potts (1990, fig. 73.4)	Isin-Larsa/Old Babylonian date at Tell Abraq

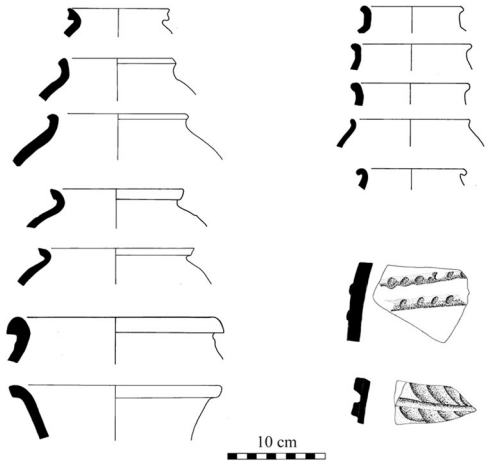

FIGURE 8 Mesopotamian ceramics with no Early Bronze Age clear comparanda

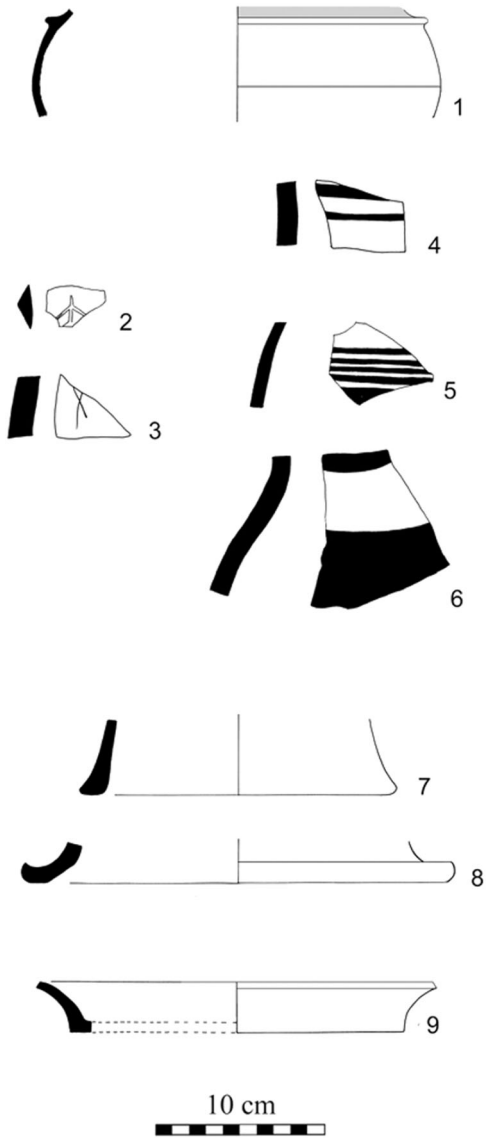

FIGURE 9 Indus forms Plate 1

Sargonic rulers and the establishment of the first fully fledged empire. Oppenheim (1954) highlighted the fact that the land of Magan does not appear in any documents predating the Akkadian period, and Oppenheim suggests that direct trade with Magan was established as part of a more general policy of aggressive expansion by the Akkadian empire. Laursen and Steinkeller argue that trade was of central political importance to the Sargonic empire; Sargonic territorial expansion allowed the rulers to establish 'the first international commercial highway' (2017, p. 31) linking the Euphrates valley with the Mediterranean to the west and the Indus to the east, via the Gulf. This is seen as a way of maximising profits for the rulers of Agade by cutting out middlemen, a conclusion that assumes very extensive Akkadian control of trade. This eastern expansion commenced with the capture of Gu'abba, Babylonia's main seaport during the second half of the third millennium B.C. (Laursen & Steinkeller, 2017, pp. 71–77); the location of this important site remains unknown.

This dominance of exchange networks is expressed by Akkadian rulers as a divinely sanctioned dominance over the Lower and Upper Seas, which is best illustrated by Sargon of Akkad's famous claim that 'ships from or destined for Meluhha, Makkan and Telmun were moored in the harbour which was situated outside of his capital' (Oppenheim, 1954, p. 15). These claims are made alongside details of Sargon's military victories between the 'Upper' and the 'Lower' Seas and his having reached the 'Cedar Forest' and 'Silver Mountain', intended to emphasise his dominance over the entire known world. The Akkadian rulers were able to conquer and destroy the cities of Mari and Ebla (Aubet, 2013, p. 134) as well as conducted military campaigns in Syria, Anatolia, northern Mesopotamia, Elam (southwest Iran) and the Gulf (Potts, 1986b). However, this commercial expansion of the Akkadian sphere of influence often did not result in land being annexed to Babylonia, or the establishment of colonies, rather Babylonian strategy focused on controlling key nodal points on these networks by establishing military and commercial outposts. It is suggested that such outposts were located in Dilmun and possibly also at UAN Island. Control of this network was enforced by punitive military campaigns, which aimed to ensure the obedience of Akkad's vassals (Laursen & Steinkeller, 2017, pp. 31 and 32).

Written sources only mention two materials originating in Magan in this period, copper and gabbro/diorite. Documentation is scarce with only two mentions of copper, these seem to suggest this was being obtained directly from Magan, without middlemen such as Dilmun as in previous periods. There is a striking lack of any evidence of Mesopotamia's

TABLE 8 Ceramics in micaceous fabric Plate 1

Fig no.	Locus no.	Fabric	Description	Comparanda
1	(06.005)	MIC	Traces of external red and pale yellow slip. Indus cooking pot.	Mohenjo Daro type MD26 (Dales & Kenoyer, 1986, fig. 102) Makran Group K (Dales & Lipo, 1992, fig. 33) Indus cooking pots from Salut (Frenez et al., 2016, fig. 4b)
2	(08.014)	MIC	Body sherd with an incised symbol. Internal and external Black slip. BSJ.	Common on Indus sites, for example, Mohenjo Daro (Dales & Kenoyer, 1986, fig. 89–91)
3	(32.107)	MIC	Body sherd with an incised symbol. Possibly a BSJ	See 2
4	(08.014)	OTH	Deep red slip external and painted parallel black lines, hard red fabric with mod fine grit.	
5	(8.018)	SAN	Red slip and black painted decoration	
6	(7.087)	SAN	Red slip and black painted decoration	
7	(22.051)	OTH	Footed base. Fine orange-brown fabric, occasional white inclusions, external black slip.	Mohenjo Daro type MD57-59 (Dales & Kenoyer, 1986, fig. 102) Makran Group U (Dales & Lipo, 1992, fig. 33)
8	(22.023)	OTH	Footed base. Fine orange-brown fabric with occasional grit inclusions	Mohenjo Daro type MD57b (Dales & Kenoyer, 1986, fig. 102) Makran Group U (Dales & Lipo, 1992, fig. 33)
9	(7.095)	OTH	Shallow dish, external surface fired grey	Mohenjo Daro type MD50 (Dales & Kenoyer, 1986, fig. 102) Makran Group Q (Dales & Lipo, 1992, fig. 33)

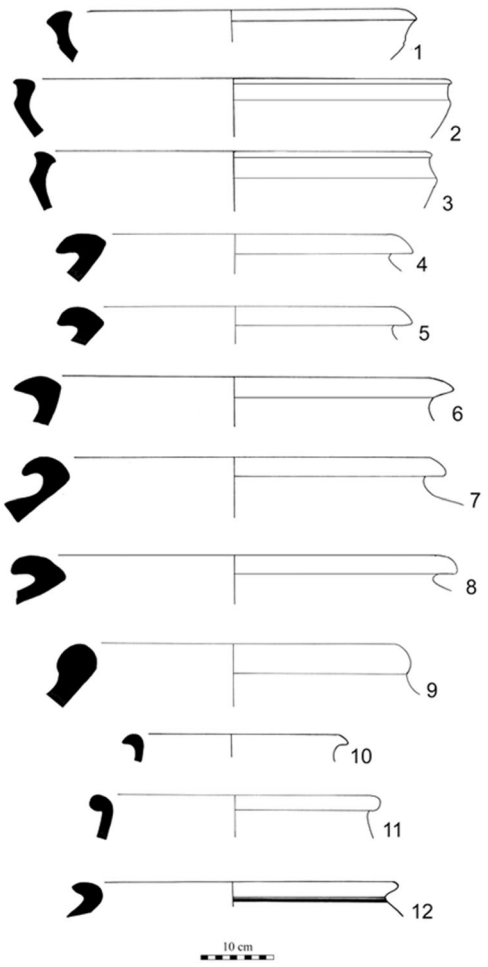

FIGURE 10 Indus forms Plate 2

exports in this period, although this may reflect the limited sources available. There is little doubt however that the centralised administrations of the Mesopotamian city-states were producing wool on a massive scale; one text details a state-administered herd of more than 50,000 sheep, another from Lagash records the transfer to Ur of eight shiploads of wool (Adams, 1974; see also Fish, 1934; Jacobsen, 1953; Waetzoldt, 1972). This scale of production, way beyond the volumes that could be consumed locally, suggests that significant quantities of wool were being traded outside Mesopotamia; Gu'abba and nearby townships were the centres of textile production with more than 10.000 workers recorded at one time during the Ur III period (Laursen & Steinkeller, 2017, pp. 75–78). The relatively low transport costs associated with maritime Gulf trade and a Mesopotamian desire for copper suggest at least some of this wool was being traded in SE Arabia (Adams, 1974, p. 247); the coastal location of large-scale textile production Gu'abba during the Ur III period strongly suggests that production was specifically orientated towards maritime export (Laursen & Steinkeller, 2017).

13.2 | Failaka tell F6

The oldest evidence of settlement identified on Failaka is a phase of occupation directly above sterile beach sand consisting of occupation deposits and a stone-built wall forming the corner of a probable

TABLE 9 Ceramics in micaceous fabric Plate 2

Fig no.	Locus no.	Fabric	Description	Comparanda
1	(06.005)	OTH	Slightly sandy mid yellow-brown fabric	Sutkagen Dor (Dales & Lipo, 1992, fig. 47) Mohenjo Daro type MD41, 44, 47, 48 (Dales & Kenoyer, 1986, p. 83 fig. 102)
2	(16.003)	OTH	Mid brown sandy fabric, occasional grit inclusions	Sutkagen Dor (Dales & Lipo, 1992, fig. 43.6) Lothal (Rao, 1985, fig. 49a,b) Mohenjo Daro (Dales & Kenoyer, 1986 fig. 53)
3	(07.053)	OTH	Red-brown fabric with grey core, occasional grit	See 2
4	AreaC	MIC	External black slip	Indus black slipped jar (Méry, 2000, p. 222, fig. 136) Harappa (Wright, 1991, p. 82, fig. 6.6c) Chanu Daro (Kenoyer, 1998, p. 232; Mackay, 1943: pl XXXV.2) Sutkagen Dor (Dales & Lipo, 1992, fig. 43.6)
5	AreaC	MIC	External black slip	Mohenjo Daro (Dales & Kenoyer, 1986, fig. 53)
6	(7.108)	MIC	External black slip	See 4
7	(17.072)	MIC	Internal and external black slip	See 4
8	(22.051)	MIC	Internal and external black slip	See 4
9	(23.052)	MIC	Rounded rim, few micaceous inclusions. External black slip	Umm an-Nar Island - Beaded rim jars (Frifelt, 1995, p. 129, fig. 178) Mohenjo Daro (Dales & Kenoyer, 1986, fig. 57)
10	(42.040)	OTH	Mid brown slightly sandy slightly micaceous fabric. External red slip.	
11	(07.057)	MIC	Rounded rim, few micaceous inclusions. External black slip	
12	(2.003)	OTH	Deep red slip internal and external. Back painted decoration.	

courtyard. The vast majority of the pottery was of Mesopotamian origin, with respect to the production method, ware, shape, as well as decoration and finish. There seems little reason to doubt the excavators' conclusion that this represents a Mesopotamian settlement (Højlund & Abu-Laban, 2016, pp. 251–252); this phase of occupation is securely dated to the Ur III period by a series of radiocarbon dates as well as clear comparanda of the pottery (Højlund & Abu-Laban, 2016, pp. 239–243). Six cuneiform inscribed cylinder seals were recovered from this early phase of occupation, all depicting a standard presentation scene indicating seal-owning officials of a lower-middle rank in the administrative hierarchy. In addition, one seal that belonged to a scribe was recovered. Clearly, there was a Mesopotamian administrative presence on the island of Failaka. This Mesopotamian settlement matches the textual evidence for Ur III period Mesopotamian commercial activities in the Gulf, which were controlled by a ministry of foreign trade which commanded a fleet of 'big boats' (*má-gal-gal*), also called 'Makkan boats' (*má-Mí-ganki*). The name indicates that the destination of these vessels, which sailed from the port of Gu'abba was the Makkan coast (Steinkeller, 2013, pp. 417–418; Laursen & Steinkeller, 2017).

The similarities between the Mesopotamian assemblage from Kalba 4 and that from Failaka Tell F6 and Qala'at al-Bahrain are summarised in Tables 4–6. The Beige Ware (BEO) from Kalba 4 is a green to light brown fabric sometimes with a pinkish core, with moderate sand inclusions; occasionally some sherds have small grits and vegetal temper. This matches the Mesopotamian pottery from Failaka Tell F6, which is described as being a very homogenous, hard-fired ware tempered with a little fine sand and light brownish, yellowish or greenish in colour. Some of the larger vessels at Tell F6 and some ring bases are tempered with chaff (Højlund & Abu-Laban, 2016, p. 93). At Qala'at al-Bahrain Mesopotamian pottery (which dates mostly to Periods Ia and Ib) is similarly described as light yellow to light green, sometimes

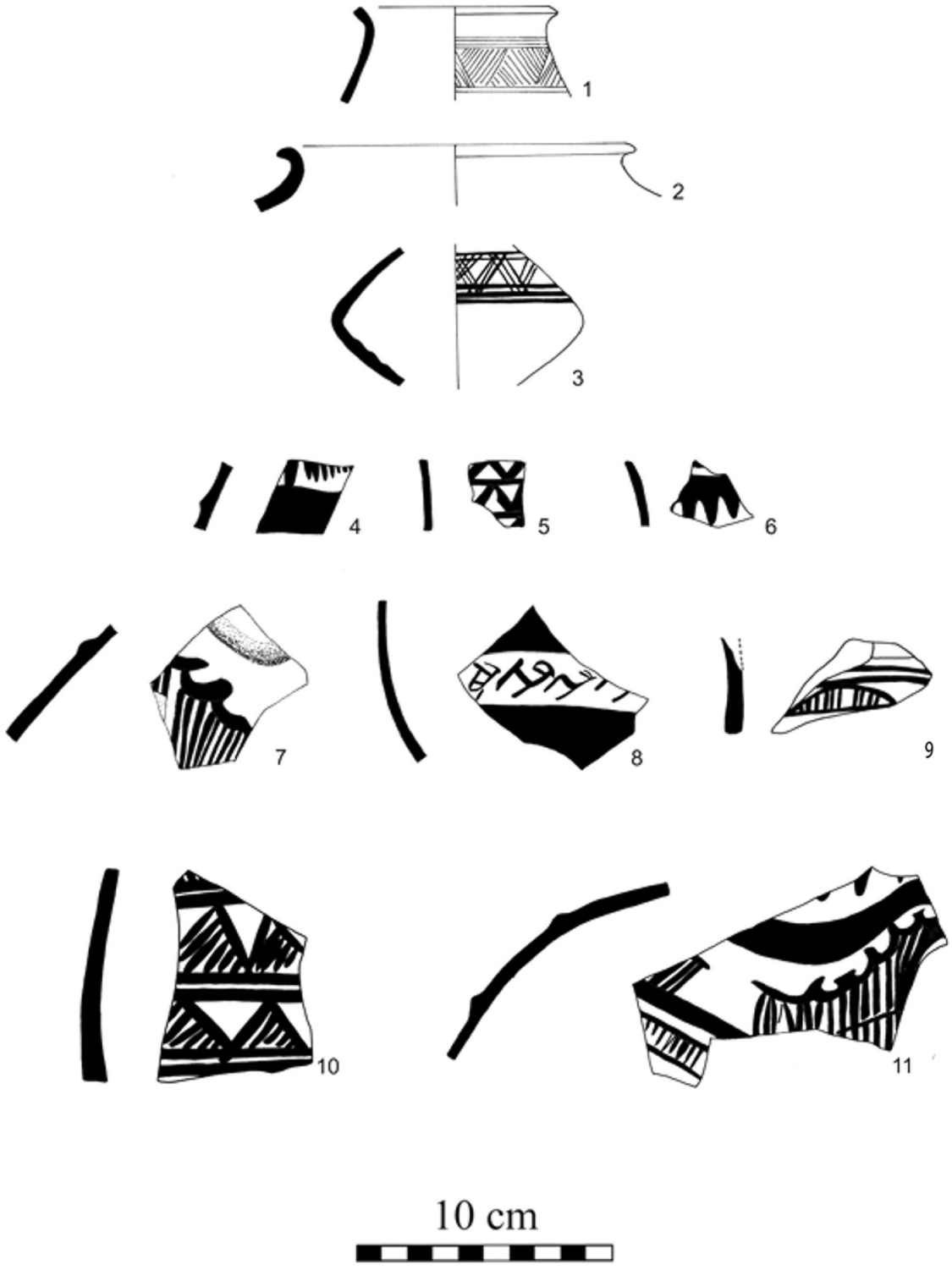

FIGURE 11 Ceramics in fine grey ware fabric

with a slightly reddish core. It is very rarely slipped and has some fine sand and mica temper; chaff tempering is seen only in the applied ring bases or in some of the large rimmed vessels (Højlund & Andersen, 1994) (Tables 7–15).

The Mesopotamian pottery at Tell F6 consists of a limited range of forms. The majority of the assemblage are relative small mouth jars with 'droopy rims' (Højlund & Abu-Laban, 2016, figs. 131–149), ribbed rims (Højlund & Abu-Laban, 2016, figs. 152–160), or plainer everted

TABLE 10 Ceramics in fine grey ware fabric

Fig no.	Locus no.	Fabric	Description	Comparanda
1	(7.104)	FGW	Incised decoration, chevron pattern	Méry (2000, p. 209, fig. 128) (Goblets: Type d)
2	(17.043)	FGW	Traces of black paint, sherd too small to see the pattern	Méry (2000, p. 192, fig. 129.4)
3	(15.001)	FGW	Biconical vessel with painted black decoration	Méry (2000, p. 192, fig. 129.6–129.9)
4	(7.100)	FGW	Black-painted decoration and external ridge	Méry (2000, pp. 199–317)
5	A003	FGW	Black painted decoration	See 4
6	(2.020)	FGW	Black painted decoration	See 4
7	(12.016)	FGW	Black painted decoration and external ridge	See 4
8	(2.015)	FGW	Black painted decoration with goat (?) motif	Méry (2000, p. 196, fig. 122.4)
9	(8.043)	FGW	Black painted decoration	See 4
10	(22.054)	FGW	Black painted decoration, chevron pattern	See 4
11	(93.033)	FGW	Black painted decoration and external ridge	See 4

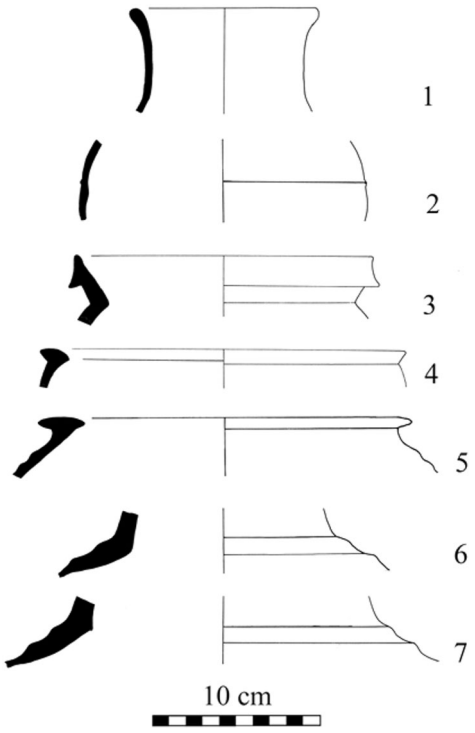

FIGURE 12 Ceramics in yellow gritted ware fabric

rims (Højlund & Abu-Laban, 2016, figs. 191–211); there are a few larger storage vessels (Højlund & Abu-Laban, 2016, figs. 147–151, 215–217) that may have been used to transport liquids in larger quantities; a number of bowls (Højlund & Abu-Laban, 2016, figs. 168–188); and pottery strainers, possibly for cheese making (Højlund & Abu-Laban, 2016, figs. 244–256). Stamped and inlaid grey ware ceramics with Mesopotamian and Elamite parallels (Højlund & Abu-Laban, 2016, p. 94) do not occur in SE Arabia and are likely to originate in Mesopotamian. There are few other imported sherds at Tell F6, one possible Indus sherd, one possible incised grey sherd but from undated context, four probably UAN sherds, and one possible Barbar body sherd. This suggests the exchange in ceramics at Tell F6 was very one-directional, with material travelling down from Mesopotamian but few ceramics travelling in the other direction. There are however beads and fragments of calcite and steatite vessels at Tell F6 that hint at some of the goods returning north (see also Laursen & Steinkeller, 2017, p. 57).

13.3 | Bahrain

Højlund and Abu-Laban (2016, p. 94) suggest there are few parallels between the F6 material and the Qala'at al-Bahrain assemblages from Periods Ia-Ib and IIa. They highlight the lack of jars with 'droopy rims' in Bahrain. However, there are similar ribbed rim jars and several types of bowls at both sites. They suggest this difference is either due to functional differences or slight chronological differences (which is possibly a less convincing argument given there is no chronological break between Periods Ia-Ib and IIa). At Kalba 4 there are relatively small mouth jars with 'droopy rims' and simpler rims, as well as rib necked jars and the larger types of jars that find parallels in the F6 material. Functionally these vessels would be associated with the transport and storage types of liquids or possibly loose goods such as grain. At Kalba 4 Mesopotamian bowls and strainers are noticeable absent; possibly in their place are a range of Indus bowls which may be fulfilling a similar purpose but suggest a different culinary tradition or form of cultural emulation/borrowing. The lack of strainers may also suggest that dairy products are being processed differently.

TABLE 11 Ceramics in yellow gritted ware fabric

Fig no.	Locus no.	Fabric	Description	Comparanda	Dating
1	(32.104)	OTH	Dilmun jar. Pale yellow-brown fabric, freq. white inclusions. Mid red brown slip internal and external/	Bahrain mound Group B (Højlund, 2007, pp. 95–116, 261) Tell Abraq (Potts, 2000: 121)	Late Third millennium B.C. Late UAN
2	(02.002)	OTH	Body sherd with a horizontal band.	See 1	
3	(34.018)	YGW	Interior orange-red slip. Exterior pale green white slip	Højlund and Andersen (1994, p. 78, fig. 114) (Type B4)	Periods I and II at Qala'at al-Bahrain
4	(07.001)	YGW	Dark red exterior slip	Højlund and Andersen (1994, p. 82, fig. 136) (Type B18)	Periods I and II at Qala'at al-Bahrain
5	Unstratified	YGW	Rim sherd with ridged decoration	Højlund and Andersen (1994, p. 82, fig. 137) (Type B18)	Periods I and II at Qala'at al-Bahrain Tell Abraq (Potts, 2000, p. 120)
6	(53.108)	YGW	Ridged neck of Barbar vessel	Højlund and Andersen (1994, pp. 76–77)	Periods I and II at Qala'at al-Bahrain
7	(53.063)	YGW	External pale-yellow slip and ridges	See 5	

Laursen (2009) identifies two horizons of Mesopotamian ceramics recovered from an extensive cemetery in the area of present-day Hamad Town in Bahrain. The earlier of these horizons is defined by a distinctive Mesopotamian vessel, defined as Type 1, which has a flaring rim with a characteristic double or triple rib. This type of vessel was only found in Early Type graves in Bahrain (c. 2250–2050 B.C.), which also contain UAN pottery (Laursen, 2009). Type 1 vessels occur at Qala'at al-Bahrain in the Period Ib layers and find comparanda in later Akkadian and Ur III period levels at sites in Mesopotamia and at Susa. Laursen (2009) argues that these vessels are evidence of the extensive trade relations between Mesopotamia and SE Arabia in the last centuries of the third millennium B.C. and suggests that the Ur III state played an important role in undertaking this trade. Type 1 vessels seem to be associated primarily with funerary contexts and must have had some significance for the inhabitants of the region. As well as occurring in graves in Bahrain this type of import is known from SE Arabian funerary contexts at Unar-2 (Carter, 2002, fig. 4/109), Munyai (Phillips, 1997, fig 2/1) and Hili Tomb N (al Tikriti & Méry, 2000). This type of vessel seems less common in settlements but occurs at Tell Abraq (Potts, 1993b, fig. 4/1) and in the assemblage from Kalba 4 (Figure 6, 2; Laursen, 2011, fig 5.11)

13.4 | Tell Abraq

Tell Abraq is the only other site in SE Arabia that may have a similar range of late Mesopotamian imported ceramics to that seen at Kalba 4. The ceramic assemblage from Tell Abraq has not been fully published; however, some general observations can be made. Both the tomb and the tower/settlement at Tell Abraq date to the late UAN period and are likely contemporary with the excavated levels at Kalba 4. Like Kalba 4, and in contrast to any other late UAN sites, Tell Abraq appears to have a relatively large and diverse Mesopotamian pottery (Potts, 1993b, figs. 3 and 4). This could be taken as an indication that both these sites are engaged in a late third millennium Mesopotamian exchange sphere, with Mesopotamian goods being brought, via Failaka, by a state-organised tall ship trading network. However, exchange patterns change dramatically at the start of the second millennium B.C.; Tell Abraq continues to be engaged in external trade networks as seen from the large amounts of Barbar material found on the site. Imports at Kalba 4 by contrast are rare, consisting of only a few Dilmun sherds and a single Mesopotamian sherd, despite the fact the site remains a large and important settlement.

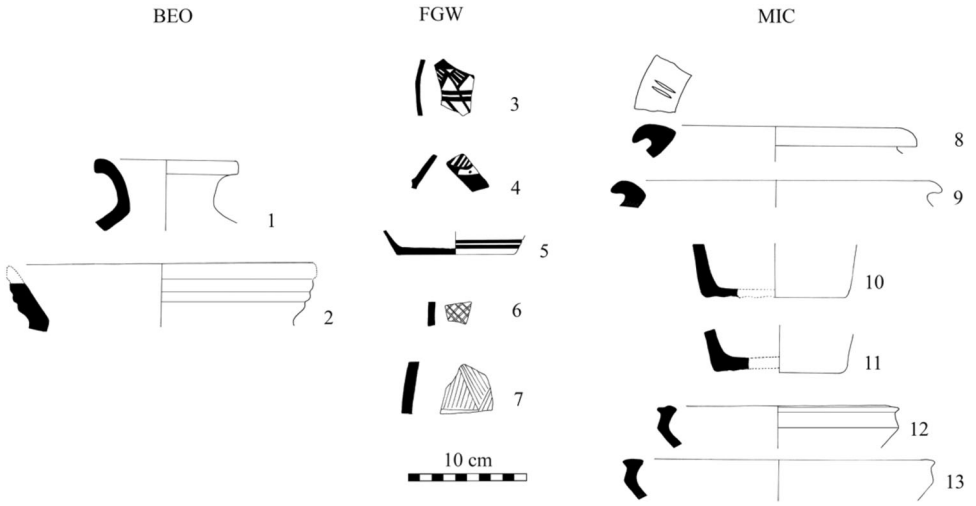

FIGURE 13 Imported ceramics from third millennium contexts

TABLE 12 Imported ceramics from third millennium contexts

Fig no.	Locus no.	Fabric	Description	Comparanda	Dating
1	(53.161)	BEO	Rim of short-necked jar with everted rim		
2	(53.161)	BEO	Rim with three ribs on the outer face and a low neck	See Figure 4.3	Late third millennium B.C.
3	(22.152)	FGW	Body sherd with black painted decoration	Méry (2000, pp. 199–317). See Figure 11.4	Second half of the third millennium B.C.
4	(53.161)	FGW	Body sherd with back painted decoration	See 3	Second half of the third millennium B.C.
5	22.144	FGW	Base decorated with parallel black painted lines	See 3	Second half of the third millennium B.C.
6	22.144	FGW	Body sherd with incised decoration	Hili 8 Phase IIf (Cleuziou, 1989a, p. 77) Umm an-Nar Island Period I (Frifelt, 1995)	Second half of the third millennium B.C.
7	(53.152)	FGW	Body sherd with incised decoration	See 6	Second half of the third millennium B.C.
8	(53.161)	MIC	Hooked rim with black external slip and two parallel lines carved into the rim of the vessel	Indus BSJ. See Figure 10.4	Mature Harappan; Incised rim
9	(34.025)	MIC	Hooked rim with external black slip	See 8	Mature Harappan
10	(22.106)	MIC	Moulded base with steep sides	Moulded base of BSJ	Mature Harappan
11	(53.152)	MIC	Moulded base with steep sides	See 10	Mature Harappan
12	(34.025)	OTH	Mid brown fabric, occasional grit and micaceous inclusions. Internal and external slightly red-brown slip	Common on Indus sites for example Mohenjo Daro (Dales & Kenoyer, 1986, fig. 89–91)	Mature Harappan
13	(34.025)	OTH	Fine slightly sandy pink-brown fabric	See 12	Mature Harappan

TABLE 13 Quantification of all sherds by fabric type (total sherd count 994)

	Fabric	Sherd count	Percentage
Local fabrics	FRW	323	32.5
	SAN	226	22.7
	RW1	150	15.1
	RW2	16	1.6
Total			71.9
Imported fabrics	BEO	85	8.6
	FGW	27	2.7
	MIC	85	8.6
	YGW	12	1.2
	OTH	70	7.0
Total			28.1

TABLE 14 Quantification of diagnostic sherds by fabric type (total sherd count 523)

	Fabric	Sherd count	Percentage
Local fabrics	FRW	168	32.1
	SAN	126	24.1
	RW1	103	19.7
	RW2	7	1.3
Total			77.2
Imported fabrics	BEO	60	11.5
	FGW	20	3.8
	MIC	15	2.9
	YGW	9	1.7
	OTH	15	2.9
Total			22.8

TABLE 15 Quantification of diagnostic Mesopotamian sherds by period

Period	Sherd Count	Percentage
Early dynastic	3	5.7
Akkadian	0	0.00
Ur III	31	58.5
Isin Larsa	1	1.9
Unclassified	18	34.0

14 | CONCLUSIONS

The imported pottery at Kalba 4 indicates that the inhabitants of the site were exchanging goods with a range of polities, including southern Mesopotamia, the Indus Valley (Meluhha), SE Iran (Marhashi) and Bahrain (Dilmun). A late third-millennium date for the excavated EBA levels at Kalba 4 is suggested by the presence of incised grey wares in the earliest excavated contexts and distinctive Mesopotamian wares that are dated to the last two centuries of the third millennium at Failaka Tell F6 and on Bahrain. This dating is supported by locally produced pottery that suggests an EBA occupation at Kalba 4 in the later third millennium B.C. (Eddisford & Phillips, 2009). A series of new radiocarbon dates from the site indicate significant UAN occupation in the last few centuries of the third millennium B.C. with occupation continuing in the Middle and Late Bronze Age (Schwall & Jasim, 2020; Schwall et al., in press).

Contacts across the Gulf with the polities of SE Iran are attested by a number of technological advances in the EBA, including in ceramic production and possibly date palm agriculture; stylistic similarities in ceramic form and decoration are also striking. The presence of incised and painted greywares at Kalba 4 attests to these interactions. However, the limited number of these vessels may suggest that locally produced ceramics, and later in the UAN local softstone vessels, were favoured over imports for use in funerary contexts.

Black slipped jars from the Indus are found across SE Arabia (Méry, 2000, p. 222, fig. 136), at both coastal and inland sights, suggesting a thriving long-distance trade. Their form is well suited for maritime transport, not unlike amphora in the classical period. The distribution of pottery attests to a trade in perishable materials that are otherwise archaeologically invisible. As well as black slipped jars, associated with transport, a number of Indus domestic forms more closely associated with food preparation and presentation are present in the Kalba 4 pottery assemblage. A large shallow plate and the bases of pedestal vessels are likely to be associated with the presentation or consumption of foodstuffs. These forms are paralleled at sites in both the Gulf (Méry, 2000, pp. 236–240) and the Indus region (Possehl, 2002). The presence of a range of domestic forms of pottery suggests Indus influences at a more pervasive level. However, it is clear that the entire range of Indus vessels does not occur at Kalba and the specific forms being adopted are associated mainly with new cuisine. This may suggest deliberate efforts by the local population to emulate Indus customs, or at least associate themselves with eastern exotic ideas and customs.

Dating of Indus ceramics is difficult due to the poor resolution of the excavated data in the region. Seven calibrated radiocarbon dates from the Mature Harappan levels at Mohenjo-Daro fall between 2650 and 2165 B.C. (Mughal, 1997, p. 34). At Harappa, radiocarbon dates place the Mature Harappan occupation in the second half of the third millennium B.C. Although some argue that the Mature Harappan phase was short-lived and ended by 2000 B.C. (Shaffer, 1991), the depth of Mature

Harappan occupation deposits stratigraphically above the latest dated deposits at Harappa suggests this phase continued into the early second millennium (Kenoyer, 1991, pp. 39–40). Coningham and Young's (2015, p. 177) recent reassessment of the Indus region agree with a Mature Harappan occupation dating from circa 2600 to 1900 B.C. It is not possible to refine the date of the Indus pottery found at Kalba 4 beyond the Mature Harappan horizon, giving it a broad UAN date.

The presence of a distinctive YGW Fabric and forms that find clear parallels in the Barbar assemblage on Qala'at al-Bahrain suggest that Kalba 4 was in contact with the Dilmun polity, at least during its formative period. As well as large, ridged jars that may have been used for transport, the presence of a highly burnished red Dilmun jar is interesting as these are normally associated with funerary assemblages in Bahrain. The limited evidence of contact between Bahrain and Kalba, which appears to tail off early in the second millennium can be contrasted with the assemblage from Tell Abraq where at least 665 pieces of Barbar red-ridged ware were recovered and shown through chemical composition to originate in the ceramic workshops at Saar on Bahrain (Barker, 2018, p. 144).

A significant proportion of the imported element of the ceramic assemblage from Kalba 4 is of Mesopotamian origin and dates to the last two centuries of the third millennium B.C. Generally, Mesopotamian ceramics are rare in late UAN contexts; however, the Kalba 4 assemblage suggests the site had a very different relationship with its northern neighbour than other contemporary sites. The late UAN assemblage from Kalba 4 finds clear parallels in material from the Mesopotamians' trading outpost on Failaka Tell F6 and early levels at Qala'at al-Bahrain. There is documentary evidence for large amounts of textiles being produced for export in state-organised operations in the Ur III period. In addition to textiles and wool, there were also liquids being transported down the Gulf in ceramic jars, possibly including perfumed oil (Laursen, 2011; Laursen & Steinkeller, 2017, p. 58). The presence of bitumen on the inside of some of the Mesopotamian jars is of interest and may have been used to waterproof the jars.

There is evidence of occupation in the Kalba region throughout the Early UAN period, as illustrated by Hafit cairns and the Kalba 2 tomb, however in the last two centuries of the third millennium B.C. long-distance exchange with Mesopotamia increased significantly. The evidence from Kalba 4 suggests that contact between Magan and Mesopotamia in the last two centuries of the third millennium is dominated by state-organised expeditions and that Kalba is an important port in this trade. Mesopotamian texts describe the large-scale state-organized production of woollen garments for export, as well as confirming SE Arabia as an important source of copper at this time. Archaeologically there is now evidence to support this documentary evidence, the late third millennium settlement at Failaka Tell F6 is almost certainly a Mesopotamian colony associated with this Gulf trade. The presence of Mesopotamian imports in Bahrain and a limited number of coastal sites in SE Arabia suggest that liquids were being imported alongside woollen garments. Possibly Kalba is the most easterly port the Mesopotamian tall ships called at; the site may have acted as a focal point for materials being brought down from the eastern side of the Hajar range. The Mesopotamian vessels that were still exchanged beyond Kalba 4 consist of a very restricted range of forms that are associated with funerary contexts in SE Arabia and occur in Early Type burial mounds in Bahrain (Eddisford, 2020, pp. 173–174, fig. 5.13; Laursen, 2011; Laursen & Steinkeller, 2017, p. 42–43, fig. 6).

The only site in SE Arabia with a similarly high percentage of Mesopotamian ceramics to Kalba 4 is UAN Island. This site is generally assumed to have a close relationship with Mesopotamia, to the degree that it is often characterised as a Mesopotamian trading outpost (Frifelt, 1995; Laursen & Steinkeller, 2017, p. 31). It is worth noting that UAN Island was likely abandoned by c. 2300 B.C. (Frifelt, 1995), and therefore predates the more intense late third millennium exchanges between Kalba 4 and Mesopotamia. Although Kalba was probably engaging directly with Mesopotamian state-organised mercantile expeditions, this does not necessarily mean that the political economy of SE Arabia must also have consisted of a centralised highly hierarchical structure as has been suggested (Laursen & Steinkeller, 2017; Reade, 2008). Rather the unique development trajectory of SE Arabia, which does not follow its northern neighbours towards statehood, suggests that internal social pressures and environmental constraints dictated an alternate picture of complexity (Eddisford, 2020; Eddisford, in press).

The evidence from Kalba 4 suggests that rather than disappearing from the ceramic repertoire in the late third millennium Mesopotamian ceramics may have become more restricted to a limited number of coastal sites. This could suggest that certain sites, or groups within SE Arabia, were beginning to monopolise exchange networks through their access to maritime connections. Changes in exchange networks in the Late UAN could be considered a precursor to the dramatic shifts in subsistence, mobility and material culture in the following Wadi Suq period. At Qala'at al-Bahrain ceramic evidence suggests contact with SE Arabia continued until the end of the third millennium. In the second millennium, Dilmun merchants appear to have taken control of the trade routes (Laursen, 2010, 2011) and evidence of Dilmun trading way-stations can be identified along the coast of SE Arabia (Carter, 2003b, p. 129). This development of Dilmun into a major trading power in the early second millennium B.C. coincides with an apparent cessation of direct trade between Mesopotamia and Magan. Magan is not

mentioned in cuneiform sources after the end of the Ur III period (c.2000 B.C), whereas references to Dilmun, and specifically its role in the acquisition of copper, become more common (Oppenheim, 1954, p. 15). It has therefore been suggested that there is a link between the end of the UAN culture, disruption or realignment of trade routes, and a decline in trade in SE Arabia in the second millennium B.C. (Boivin et al., 2009, p. 264; Carter, 1997, p. 96; Cleuziou, 1981).

In contrast to the evidence of close links between Tell Abraq and Dilmun in the early second millennium B.C. (Barker, 2018, p. 144) imported material at Kalba 4 becomes scarce at this time. The imported ceramics at Kalba 4 that could be associated with the second millennium B.C. occupation of the site consist of a single Mesopotamian sherd and seven Dilmun sherds. Despite the apparently more insular nature of the site, a significant occupation at Kalba continues throughout the Middle and Late Bronze Age, with large-scale construction projects undertaken to enlarge the central mudbrick tower and recut the ditches that surround it. The discussion of these changes is beyond the chronological scope of this article but will be the subject of a forthcoming article on the second millennium occupation of Kalba 4.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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