



Al-Khor Island

Investigating Coastal Exploitation in Bronze Age Qatar

edited by
Robert Carter & Robert Killick



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First published in 2010 by Moonrise Press, Ludlow

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ISBN 978-0-9539561-2-8

A catalogue record for this book is available from the British Library

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Acknowledgements

THE QATAR ARCHAEOLOGY PROJECT was a joint initiative supported by the Department of Archaeology, University of Birmingham, and the National Council for Culture, Arts & Heritage, State of Qatar. It was formed in 1999 with a remit to conduct research into the archaeology and heritage of Qatar. It carried out a single season of work, in spring 2000.

The project owed its existence to the initial support provided by Shaikh Sa’ud bin Mohammed bin ‘Ali Al-Thani, former Chairman of the نCCAھ, and I would also like to thank the staff of the Department of Museums & Archaeology at the time, Mr Mohammed Jasim Al-Khulaifi, Director, and Mr Abdulla Al-Khulaifi, Head of Antiquities, for their encouragement and assistance.

Mrs Frances Gillespie, Project Coordinator, was the driving force behind establishing the project and the success of her energetic fund-raising campaign can be measured by the list of supporters that follows below.

Mr David Wright, British Ambassador to the State of Qatar, provided both personal encouragement and practical support to the project, particularly in allowing access to the embassy’s media facilities.

The Qatar Archaeology Project was generously funded by the following companies whose support, in the form of financial donations and help-in-kind, is most gratefully acknowledged: Arco Qatar Inc, Chevron Overseas Petroleum Qatar Ltd, Commercial

Bank of Qatar, Doha Bank Ltd, Gulf Housing & Construction, International Freight Services, Maersk Oil Qatar AS, Mobil Oil Qatar Inc, Occidental Petroleum of Qatar Ltd, Oryx Publishing & Advertising Co, Pencol International, Pennzoil Qatar Inc, Petrotec, PricewaterhouseCoopers, Qatar Airways, Qatar Liquefied Gas Company Ltd, Qatar National Bank, RasGas, Gulf Agency Qatar, The British Council, The Centre for GIS - State of Qatar.

In addition, the National Council for Culture, Arts & Heritage provided workmen and local transport, as well as meeting some of the local subsistence costs.

The staff in 2000 were: Daniel Barrett (Technical Director), Simon Buteux (Archaeologist), Robert Carter (Research Director), Frances Gillespie (Project Coordinator), Richard Cuttler (Archaeologist), Cassian Hall (Archaeologist), Alison Hicks (Field Director), Loretta Nikolic (IT Consultant), Howell Roberts (Archaeologist), Paula Wallace (Media Relations & Finds Officer), Steven Wilkes (Remote Sensing Specialist), and Jonathan Williams (Archaeologist). We were ably assisted by the following colleagues from the Department of Archaeology: Ali Al Mennai, Ahmed Al Subei’i, Badr Al-Tamimi, Faisal Al-Na’imi and Hamad Al-Hajari.

I would also like to thank all the volunteers, particularly Mr Raymond Sculley, for giving so generously of their time.

Robert Killick, 15 January 2009

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HOWELL ROBERTS & JONATHAN WILLIAMS

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1. Introduction

THE CLIMATE AND geography of Qatar have rarely been conducive to human occupation, and certainly not to permanent settlement. Average temperature between June and September exceeds 55°C; annual rainfall is minimal, at less than 100 mm per annum (Sanlaville 2000: fig. 1.1) and falls in short intense downpours; there are no year-round water sources; and the poor soils of the stony flat interior has little to offer would-be settlers. There is no tradition of oasis agriculture, with farms using pumped groundwater only appearing in the 1950s (1979: 79). From the eighteenth century AD onwards, a few settlements clung to the coast, but these looked outward for their survival, to maritime trade and the rich harvest of pearls and fish, rather than to the hinterland. Only in the Neolithic Period, particularly in the fifth and sixth millennia BC when the climate was wetter and kinder than today, is there earlier evidence for significant and widespread exploitation of the Qatar peninsula by human populations (Parker et al. 2006: 251; Potts 1990: 38–40). Between these two temporal extremes, the Late Stone Age and the Late Islamic era, Qatar and its archaeology is poorly documented. Nevertheless, archaeologists should not ignore what scant evidence there is. Qatar, like other countries in the region, is surging ahead with infrastructure and development projects, funded by revenues from offshore gas that have turned it into one of the richest countries in the world. Inevitably, this development is remodelling the ancient landscape, and removing the faint imprints of the past.

For the early second millennium BC, the intended focus of our fieldwork in the year 2000, the traces are indeed slight. An archaeological survey of Qatar



FIGURE 1 The Gulf and neighbouring countries



FIGURE 2 Aerial photograph of Khor al-Shaiq Bay (courtesy of the Centre for Geographic Information Systems, State of Qatar)



FIGURE 3 Panorama of Al-Khor Island. looking southwest from the mainland



FIGURE 4 Panorama of Al-Khor Island., looking northwest, with the end of the modern causeway on the left

carried out in 1973, under the direction of Beatrice de Cardi, recorded material of this date at only one site, the Ras Abaruk oasis, on the west side of the Qatar peninsula, where a few sherds tentatively identified as ‘Barbar ware’ of the Early Dilmun Period were found at a depth of 1.15–1.50 m below surface, although there were no associated occupation layers (Smith 1978b: 31–3).

The Mission Archéologique Française à Qatar subsequently found pottery of the same period on the eastern coast of Qatar (Tixier 1982: 79). Here, a beach on the east side of a small low-lying island in Al-Khor Bay (labelled Khor Ile by the French and Bin Ghanim Island on the national maps of Qatar) yielded two Early Dilmun ridged pots, and stone-lined pits and hearths of later second millennium date (Edens 1999: 71–2). In an inlet on the southwest side of the same island, a dye-processing area associated with Kassite or post-Kassite pottery (late second to early first millennium BC) was excavated. Scatters of Early Dilmun pottery were also noted along the adjacent coast of the mainland, along with a significant cluster of Neolithic campsites and funerary remains, some

with Ubaid pottery, ca. 6 km to the west of the island (Inizan 1988: 55–98; Midant-Reynes 1985).

The two locations with Early Dilmun pottery, the Ras Abaruk oasis and Khor Ile, currently offer the only opportunities to investigate the archaeology of Qatar in the early second millennium BC and to examine what role, if any, the country played in the Bronze Age trade of the Arabian Gulf. Consequently, both locations were visited prior to selecting one for further excavation. Ras Abaruk posed a number of problems that suggested further work would be very hit-and-miss. The oasis covers a large area and there are no visible archaeological materials on the surface. The tentatively identified Bronze Age pottery lay over one metre below the surface. Consequently, it would have required an exhaustive sampling programme of the oasis just to determine if there were any archaeological remains that would merit further investigation. It also lies on the west coast of Qatar, off the main sailing route from Bahrain to the Lower Gulf, so that there is no reason to suspect that this part of the coast was significantly exploited in the second millennium BC. On the other hand, it had been shown by the French Mission’s work that there was pottery of

this date at Khor Ile, as well as archaeological features lying just under the modern-day beach horizon, and so this area (given the Anglicized name of Al-Khor Island in this report) was chosen for further investigation by the Qatar Archaeological Project.

In addition to the expected finds from the early second millennium BC, the project uncovered equally significant evidence for occupation during the Kassite or post-Kassite Period, the Sasanian Period and the Late Islamic Period, as well as traces of the Neolithic. Together, these discoveries offer a snapshot which may be used to typify the occupation of the coastal deserts of Eastern Arabia through time.

AL-KHOR ISLAND

The island itself lies on the east coast of Qatar, in a sheltered location inside Khor Al-Shaqq bay. Qal’at al-Bahrain, the ancient capital of Dilmun, lies 120 km to the northwest in a direct line (or 165 km following the coast of Qatar). To the south, the mainland of the UAE is a further 200 km down the coast by sea and Abu Dhabi some 317 km across open water. The

bay of Khor al-Shaqq is 2.2 by 6.5 km wide, with a 750 m wide channel on the south side connecting it to the open sea. Al-Khor Island lies in the eastern part of the bay, separated from the mainland to the northeast by 420 m of shallow water. To the south, across 470 m of water, a narrow promontory provides a bulwark against the open sea. There is a recent narrow causeway on the south side. Today, mangroves fringe the island to the east and southeast, indicating the nearby presence of fresh water, though there is no water on the island itself.

Al-Khor Island covers an area of 1.67 sq km. It comprises limestone outcroppings (maximum height 8.5 m) surrounded and intersected by low, flat beach-rock platforms. The beach-rock platforms are covered by an unconsolidated beach deposit characteristic of an inter-tidal environment (sand and cerithid shells). Although man-made features (such as cairns and stone alignments) are found on the higher limestone outcrops, archaeological features are concentrated on the flat areas fringing the limestone outcrops. Visible features are built on and dug into the beach deposit overlying the beach-rock.

Island survey

A digital topographical map of the island was made. This served as the basis for the Geographical Information System which was constructed and used during the excavations. Across the island, 339 man-made features were identified and plotted on to the GIS. The actual number present on this island is greater. Some features lie too deep to be detectable by survey or surface stripping, while in other parts of the island stone rubble and overburden obscure earlier material. Many features were ephemeral, such as upright stones or patches of ash, and probably represent a single activity of short duration such as an overnight camp. The survey suggested two areas on the island would replay further investigation: a stretch of coastline on the eastern side (designated AK1), previously investigated by the French mission as Khor Ile Nord, and a promontory on the western side (designated AK2) where areas of stone rubble and pottery sherds were present. The Kassite period dye-processing area excavated by the French mission (designated Khor Ile Sud; see Edens 1999) was not investigated further. The results of excavations at AK1 and AK2 are reported on in the following chapters.

DIGITAL RECORDING

The excavations at Al-Khor were recorded digitally, including all plans, notes and photographs. In the field, an external, pen-based monitor connected to a laptop computer (which in turn could be connected to a total station) was used for planning. The monitor used reflective light, becoming brighter in direct sunlight. Overheating of the laptop was a constant problem as well as power consumption. Penmap software was used on the laptop to map and plan contexts and features.

Excavation notes were recorded digitally using proprietary graphics tablets with handwriting recognition software. Customised forms allowed the data to be shipped into the site database. However, the handwriting recognition needed constant correction.

Photographs were taken with digital cameras (3.1 and 3.3 megapixels). All photographs in this volume are digital and, as might be expected, cannot be compared qualitatively with those taken either with film cameras or with current digital cameras.

The main objective of using a digital recording system was to have an integrated, relatively error-free data set by the end of the project which could then be used for analysis, interpretation and publication. The system worked quite well, given the technical limitations at the time. The delay between the completion of the project and publication was due to other factors.

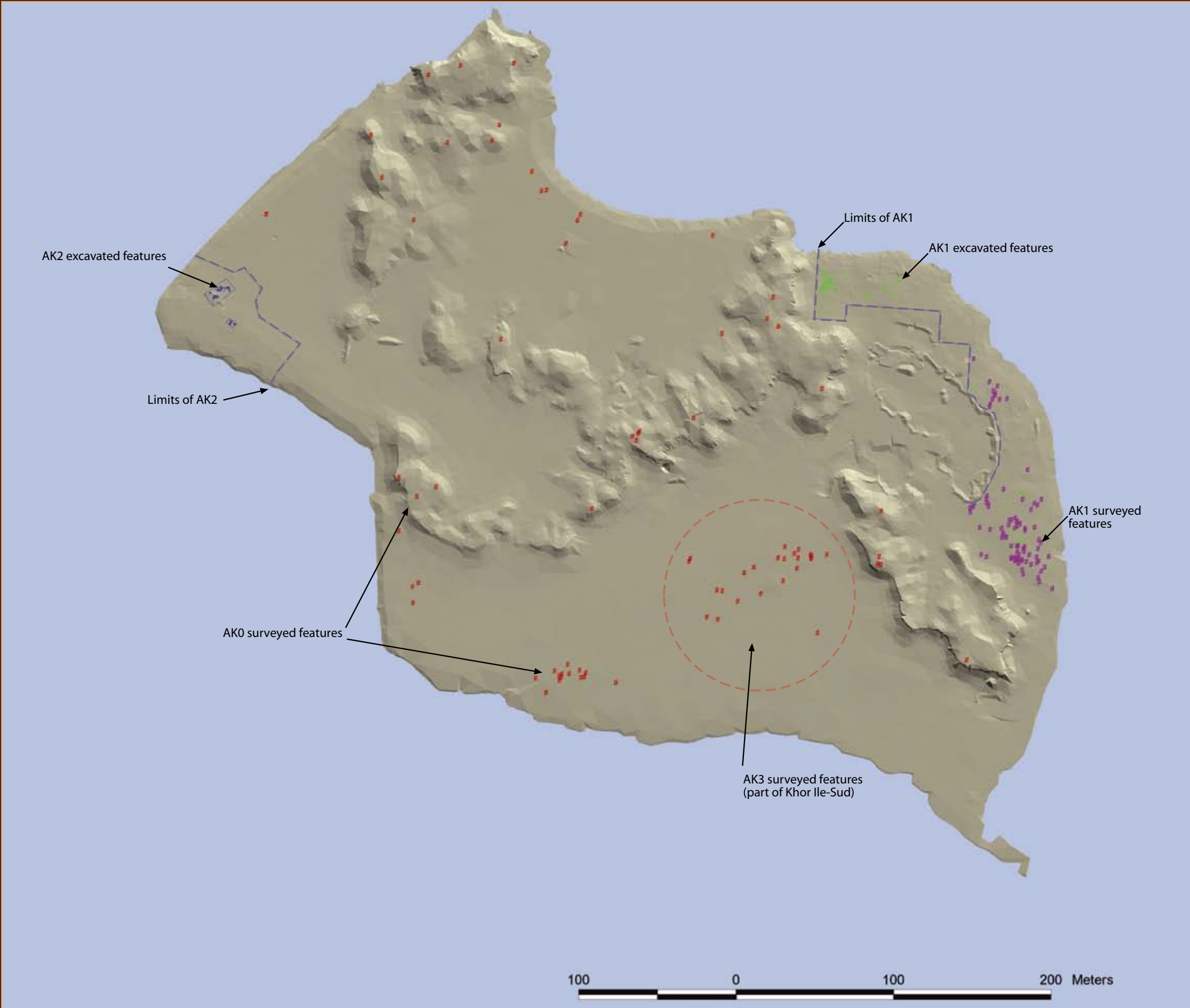


FIGURE 5 Al-Khor Island, with location of surveyed and excavated areas



FIGURE 6 AK1 clearance and excavation



FIGURE 7 AK2 stone structures

ROBERT KILLICK & ROBERT CARTER

2. Survey & Excavation

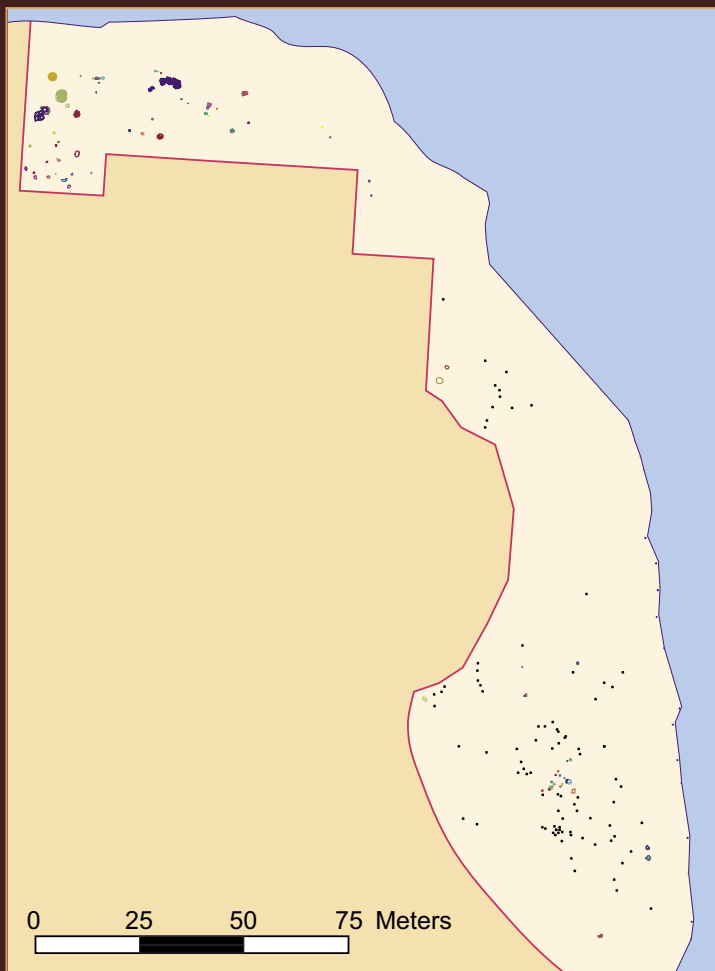


FIGURE 8 AK1 beach area showing distribution of surveyed and excavated features

THE PROGRAMME OF excavation and survey at Al-Khor Island comprised: mapping the entire island to produce a digital base map; survey and plotting of all man-made features on the island; stripping of surface sand and excavation of twenty-two selected features around a bay on the eastern side (AK1, also known as Khor Ile Nord); excavation of the largest visible structure on a promontory on the western side (AK2); and systematic pottery sampling across that same area.

THE SITE OF AK1/KHOR ILE NORD

A 220 m stretch of coastline on the eastern edge of the island was stripped of top sand for a distance of 17–40 m from the sea. This exposed approximately 6,500 sq m of beach. A total of 196 features were recorded in this area, of which twenty two were excavated. Full details are given in the catalogue.

Most of the recorded features were stake- or post-holes, represented by single or multiple sub-vertical stones lying within a cut (98 examples), or ashy patches indicative of *in situ* but probably single-episode burning (57 examples). Although some ashy patches and post-holes were identified in the northern half of AK1, and may have been related to the excavated hearths and sunken structures, most of these small features were located to the south. It is probable that even more would have been identified here if a greater depth of sand overburden had been removed; a sample 10 × 10 m area cleared to a greater depth revealed an additional twenty-four features, giving an average approximate concentration of one every 4 sq m. By contrast, most of the stone-lined pits and hearths

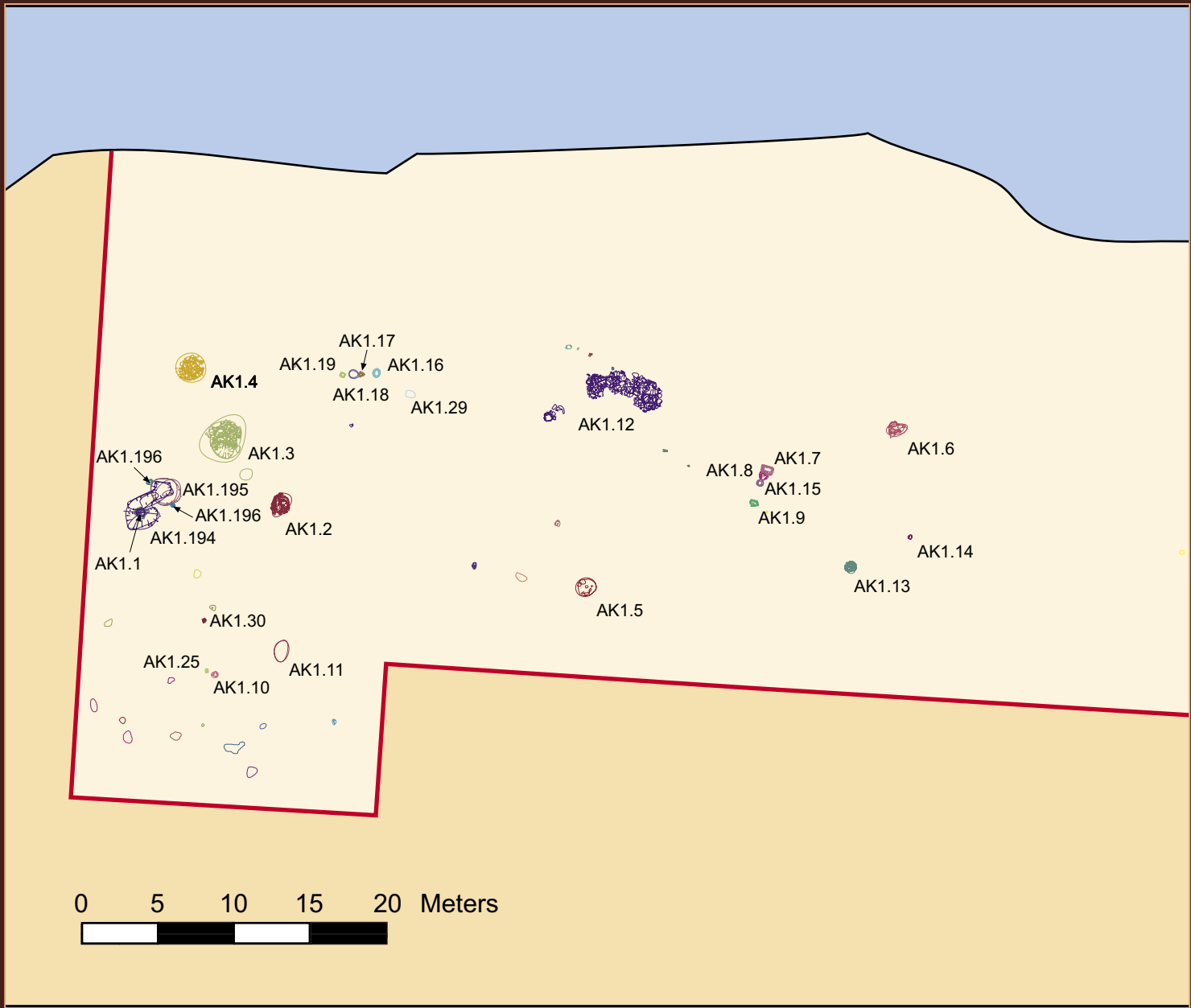


FIGURE 9 Excavated features at northern end of AK1

were confined to the northern half. To the south, only four significant features were identified: three were arrangements of sub-vertical stones thought to represent hearths (AK1.96–8) and the fourth was a raised stone-built structure which may have been the remnants of a cairn (AK1.100).
The more substantial features divide into stone-lined pits and hearths. There were five large pits with

a maximum diameter of over 2 m carefully lined with close-fitting stones. No associated artefacts were found and the dating relies on the Islamic period Carbon 14 determination from the French excavation. Most contained layers of oyster shell which had clearly been placed there deliberately. Their function is unknown, but it is possible that pearl oysters were deposited within and left to open. The lined pit may

Feature type	Feature number (AK1.1-197)	Total
Large stone-lined pits (+2m)	3, 4, 12, 31, 192	5
Stone-lined pits	6	6
Unlined pits	5, 11, 30	3
Rectangular / subrectangular stone-lined hearths	1, 7, 9, 98, 190, 191	6
Circular stone-lined hearths	2, 8, 13, 96	4
Stone-lined hearth (other)	17, 93, 97, 102, 174,	5
Small unlined hearths	14, 15, 16, 86, 99,	5
Ash patches	18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 32, 35, 37, 42, 43, 44, 50, 51, 52, 68, 76, 78, 79, 84, 87, 92, 95, 124, 125, 126, 127, 131, 132, 133, 136, 137, 138, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 172, 176, 182, 183, 184, 185, 187, 188, 189,	57
Post holes	10, 29, 33, 34, 36, 38, 39, 40, 41, 45, 46, 47, 48, 49, 53, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 69, 70, 71, 72, 73, 74, 75, 77, 80, 81, 82, 83, 85, 88, 89, 90, 91, 94, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 128, 129, 130, 134, 135, 139, 140, 142, 143, 144, 145, 146, 147, 148, 151, 152, 153, 154, 155, 156, 157, 158, 159, 171, 175, 177, 178, 179, 180, 181, 186, 196, 197	98
Other/unknown	100, 101, 141, 149, 150, 173, 195	7
	TOTAL	196

TABLE 1 Frequency and type of features from AK1

have prevented any loss of pearls when the process was complete. Although recent local pearling practice has been to open oysters at sea, it is know that certain communities on the Iranian coast would bring them to shore and expose them, searching for pearls after they had died and opened.
There were fifteen examples of stone-lined hearths. Some were rectangular, one was triangular, and others were circular/subcircular. There were few associated finds. One of the circular hearths (AK1.2) was lined with Kassite pottery as well as flat stones. Another contained several medium-sized notched stones at the bottom (Figure 17b). These are too large for net weights, but too small for anchor stones, and may have been pearl-diver’s weights; it is unclear why they had been placed in the hearth. These hearths were concentrated in the northern part of AK1.

Dating of AK1 Features

AK1 was stripped of its thin uppermost deposit in order to expose sub-surface features. During this process, all surface artefacts were picked up. These mainly comprised small sherds of pottery, though flints and a fragment of a bronze bowl were also found (Figure 17a).
A ceramic typology was developed based on the pottery from al-Khor (see Chapter 3). It was possible to date several of the pottery types by comparing them with reference material from the National Museum

of Qatar collections as well as material examined at other sites in Qatar and elsewhere. Identifiable ceramics present at AK1 included Barbar ware, Kassite pottery, Sasanian pottery, and various kinds of Late Islamic pottery. Islamic pottery included the well-known Julfar ware, manufactured in the Northern United Emirates from the fourteenth century onwards. Glazed pottery was not found, though the French Mission has reported its presence (Edens 1999: 71).
Of the various ceramics, Barbar, Sasanian and Late Islamic pottery were the most common. The surface occurrences of the different pottery types were plotted on a plan (see Figure XXX). This showed Barbar ware to be concentrated in the northern part of AK1, the region with the highest frequency of stone-lined hearths. Islamic material was found mainly in the central and southern areas, but also in the northern part. Sasanian pottery was evenly distributed.

THE SITE OF AK2

The remains of stone-built structures were noticed on a promontory on the western edge of the island, together with a dense area of pottery sherds covering a triangular area approximately 180 × 140 × 80 m. Structural remains were concentrated in the western half, at the tip of the promontory, and included rectangular hearths similar to those on AK1 and the remains of several larger structures. Further features were visible



AK1.3 Stone-lined pit



AK1.7 & 8 Hearths



AK1.13 Hearth



AK1.10 Post hole



AK1.9 Hearth

FIGURE 10 Typical features found in AK1

Feature type	Feature number (AK2. 501 onwards)	Total
Circular stone structure	516	1
Walling	501, 517, 518, 550,	4
Large stone-lined pits (+2m)	520(?)	1
Stone-lined pits	529, 530,	2
Unlined pits		
Rectangular / subrectangular stone-lined hearths	528	1
Circular stone-lined hearths	519	1
Stone-lined hearth (other)	524, 525,	2
Small unlined hearths	531	1
Ash patches	502, 503, 504, 505, 506, 510, 511, 534, 547, 548, 549, 551,	12
Post holes	512, 513, 514, 515, 536, 537, 538, 539, 541, 542, 543, 546, 552	13
Groups of aligned stones	509, 520, 521, 522, 523, 527, 532, 535, 540, 544,	10
	TOTAL	48

TABLE 2 Frequency and type of features from AK2

extending across a broad area of the AK2 peninsula, some clearly evident, such as ashy patches and vertical stones probably representing sunken structures, hearths and post-holes, and others, such as small mounds of rubble and stone concentrations, more tenuous. In fact, the rubbly nature of this part of the island made it difficult to distinguish the features. The more significant ones included a single large sunken structure (AK2.520), possible hearths (AK2.524-5, 528-30) and some miscellaneous smaller sunken features (AK2.521-3, 526-7).

Excavation in area AK2 focused upon a closely related group of stone-built structures and associated hearths and layers. These exhibited several phases of use and re-use. The area within and around a large circular structure (AK2.516) showed evidence of having been utilized repeatedly for a variety of functions. External features included a large number of post holes and isolated deposits of ash and charcoal.

Phase 1: A circular hut

AK2.516 was a large circular stone structure. It had been constructed partly by digging out the natural ground surface. The construction cut was clearly visible with an estimated diameter of 4.40 m and a depth of 0.72 m. A substantial circular wall was then built within the cut. The inner face of this wall was obscured by later slippage which was not removed for fear of precipitating further collapse. Up to six courses of the wall remained, made up of large flat irregular slabs of beach rock (measuring approx. 0.70 x 0.61 x 0.10 m) lying horizontally. A small section of the wall had been faced on the inside with large overlapping vertical slabs of stone. Together these formed a wall typically 0.70–80 m in width and 0.65–75 m in height.

Inside the hut was a thick initial deposit of yellow-brown silty sand up to 0.24 m deep with lenses of wind-blown sand representing occupation deposit. It included numerous small lenses of grey ash and silt, with fish bone and shell. The only internal feature was a circular pit with a tapered narrow concave base in the centre of the room (AK2.532; diam. 0.72 m, depth 0.51 m). This had two distinct fills: a lower one of pale yellowish sand and an upper one of dark grey sand.

A shallow cut dug through the top of this layer (AK2.531; diam. 0.58 m, depth 0.14 m) was filled with a single deposit of mid grey silty sand containing a single angular stone. This feature is interpreted as a temporary hearth. Sealing the hearth was a second occupation deposit of mid to dark yellow brown weakly cemented silty sand (17 cm deep). It contained three potsherds, a fragment of copper, fish bone and some broken shell. It is not clear if at this stage the structure was still being used as a dwelling or simply as a temporary shelter or windbreak for cooking.

To the north of the hut were two interconnecting arcs of walling made up of large slabs of beach rock set on end which may have served as shelters and windbreaks (AK2.517 and 518). These were contemporary with the hut and may have been constructed together. The stones had been set in small shallow scoops in the sand. The internal deposits were difficult to differentiate, but after the removal of a top layer of brown sand on the eastern side of AK2.517, three distinct circular areas of ash were noted. A circular patch of ash was also present in AK2.518. These burnt areas suggest that the two structures sheltered fires within the interior, protecting them from a north easterly wind.

Deposits of loose brown sand sealed the fills of both areas of walling, overlain by a spread of loose stone

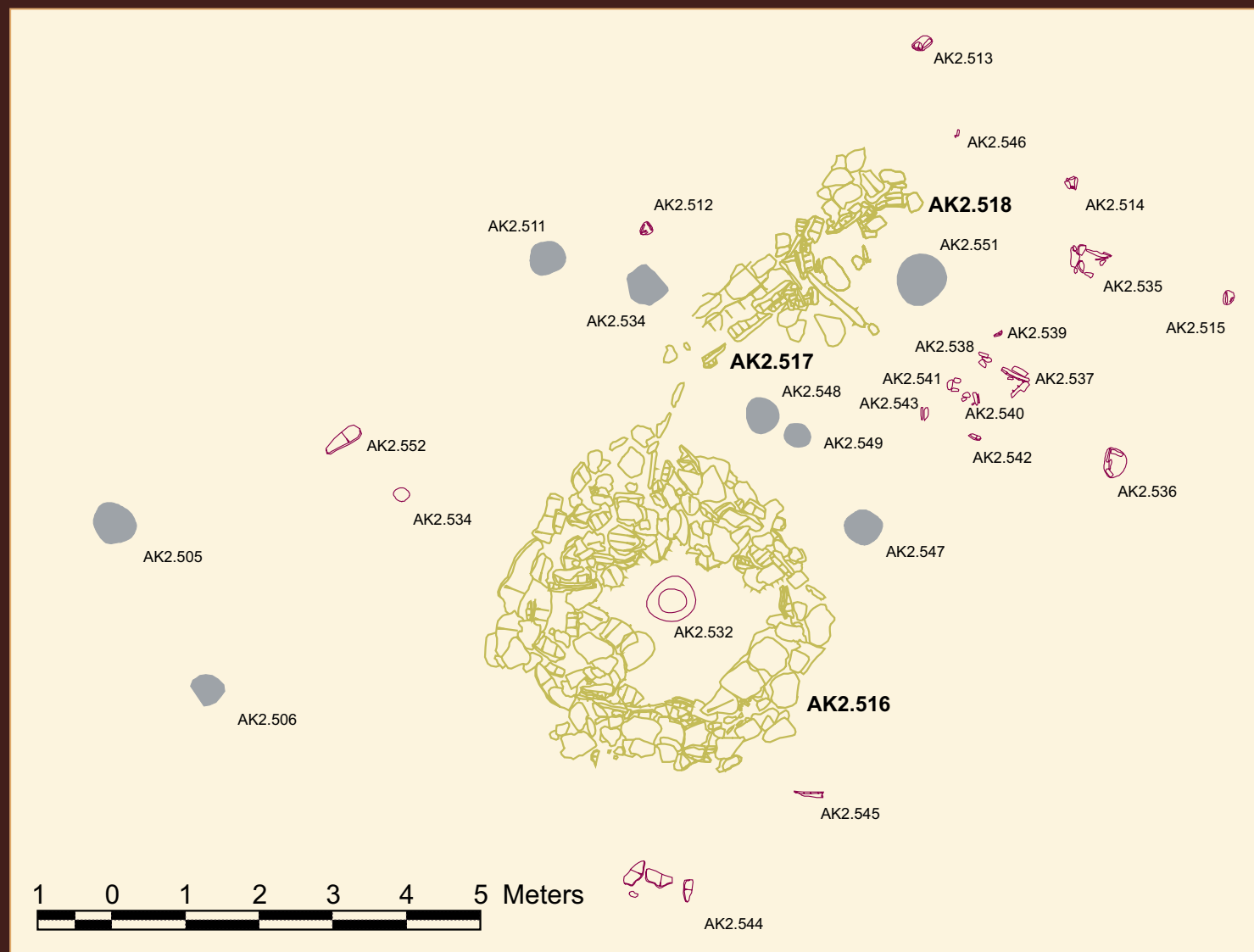


FIGURE 11 Circular hut and nearby features in AK2



FIGURE 12 AK2.516



FIGURE 13 AK2.517



FIGURE 14 AK2.532

FIGURE 15 Burial AK2.533 and wall AK2.550 lying above the circular hut



FIGURE 16 Burial AK2.533



rubble. These deposits relate to the demolition and collapse of the two windbreaks.

The hut is difficult to date as there was little diagnostic material. Some associated sherds may be Parthian or Partho-Sasanian in date. If so, this would agree with the identifiable Sasanian pottery picked up in the pottery survey and which probably belongs to the early Sasanian period, the first half of the first millennium AD, according to comparisons with pottery from Khatt and Kush in Ras al-Khaimah, UAE (see Chapter 3).

Phase 2: A pre-Islamic burial

The poorly-preserved remains of a human skeleton (AK2.533) were found within the post-collapse remains of the circular hut. All surviving bones were either broken or crushed and exceptionally fragile. Only the lower part of the torso, the pelvic area, the upper part of the legs (as far as the knee) and some elements of the right arm survived. The body lay in a flexed position on its left side with the torso slightly elevated. The torso was aligned east to west, and the femurs approximately north to south. The skeleton had been disturbed, possibly by animals. Some human bone recovered from other disturbed contexts might also derive from this

same skeleton. A broken piece of arm bone (possibly the right ulna) exhibited both distortion and new bone growth, suggesting a healed fracture. The skeleton was partially covered by an irregular deposit of angular stones overlying its northern edge

Phase 3: Later shelters

Overlying part of the burial was a stretch of walling of irregular stone slabs 1.6 m in length (AK2.550). Between one and three courses survived. It is interpreted as a windbreak which re-used part of the stone tumble of the collapsed hut. A second short stretch of walling (AK2.501) may have served a similar function. Synthetic material found within this latter wall dates it to the modern era.

Dating of AK2

Although some Late Islamic Julfar ware was noted, the surface pottery consisted almost entirely of Sasanian pottery. The occupation appeared to be more intensive than on AK1, with more densely concentrated remains. A controlled pick-up of surface sherds was conducted using a grid of 2x2 m squares. The resulting distribution maps of pottery types showed that the Sasanian material was widely but thickly scattered, concentrated especially at the base of natural slopes and depressions. It was



FIGURE 17 Finds from Al-Khor Island (all scales approximate)

- a. Find no. 1.60. Rim of a copper/bronze bowl with engraved lines below the rim. Probably Sasanian in date, when such bowls were common.
- b. Find no. 305.2. Two notched stones, probably crude weights, found at the bottom of hearth AK1.2. Perhaps net weights or crude pearl-divers' weights, they cannot be dated, but do not resemble other examples from the recent Islamic period.
- c. Find no. 1500.7. Pierced stone weight, probably a fishing weight, from the surface crust of AK2.
- d. Find no. 304.10. Copper fragment from the overburden of AK2.
- e. Find no. 1500.18. Lead pellet from the surface of AK2.
- f. Find no. 3000.5. Worked flint from the surface of AK2.
- g. Find no. 1.126. Flint artefact from the surface of AK1.

therefore clear that much of this material had moved down-slope, perhaps on account of exposure to the elements on this part of the island, and/or through long-term human activity. Islamic pottery was more concentrated, clustered in the southwestern part of AK2. It appears that there was a small and localised occupation of the site during the Late Islamic period, the pottery of which suggests a date between the eighteenth and nineteenth centuries AD. No Barbar pottery was

identified, though some small eroded sherds could theoretically belong to that horizon; isolated sherds of Kassite pottery were also found on the surface, with more being recovered from excavation.

Pottery associated with the hut dwelling indicate that it probably dates to the Kassite or post-Kassite period, as do comparisons with features excavated 20 km to the south at Wusail (Konishi 1995; Nayeem 1998: 137–40).

ROBERT CARTER

3. The Pottery of al-Khor Island

THE POTTERY was recorded in a relational database (Microsoft Access) which was then incorporated into the project database (Foxpro). Key fields included Ware, according to a type series devised by the author (see below), quantitative measures (Number of Sherds, Rim EVE, Base EVE), locational data (Site, Context) and qualitative data (Colour, Paint, Slip etc.). Individual records consisted of a single sherd or a group of sherds of the same ware found in the same context. Thus, a record never contained pottery of different types or from different contexts.

Controlled pick-ups of the surface ceramics on AK1 and AK2 were conducted. On AK1, where the quantity of pottery was relatively low, it was possible to record the individual locations of most of the sherds. On AK2 the density of the scatter was much higher, so the surface pottery was collected in 2 × 2 m squares with the help of volunteers. This allowed the different distributions of each type of pottery to be plotted. No controlled pick-up was conducted at the Kassite dye-production site (AK3, Khor Ile Sud) or over the rocky core of the island, though some stray sherds were picked up and given the site code AK0.

WARE TYPOLOGY AND DATING

Eleven types of pottery were defined, according to differences in the clay fabric and inclusions, colour, and surface treatment. Table 3 gives short descriptions of each. Not all are easily dated, but it is possible to apply chronological labels to most of them. These are Early

Dilmun (aka Barbar), Kassite (aka Middle Dilmun or Late Bronze Age), Sasanian and Late Islamic. The rest were included in the category 'Uncertain'. Dating was based partly on comparative work with published material, partly on the spatial associations of each type, and partly on the author's previous studies of pottery of the Gulf, particularly his work with the Abu Dhabi Islands Archaeological Survey.

Early Dilmun Pottery

The limited range of Early Dilmun ceramics indicates occupation some time between ca. 2000 and 1750 BC, mainly at AK1.

Barbar Ware (QAP Ware 1): Figure 18

Barbar Ware is a well-known and easily-recognised type of pottery, named after the type site of Barbar, Bahrain, and associated with the Early Dilmun Period. The best bodies of published material with which to compare this pottery are found at the North City Wall of Qal'at al-Bahrain (Højlund & Andersen 1994) and the settlement at Saar (Carter 2005). Key characteristics include a reddish fabric with quartz sand and lime inclusions, sometimes exploded, and the presence of a ridged or rippled outer surface ('red ridged ware'). When found in very small or eroded pieces it can be confused with other varieties, probably also made on Bahrain (see QAP Ware 7 below). Largely on the basis of the absence of chain-ridged sherds, which were not found by QAP and are not reported by the French expedition, the likely date range is ca. 2000–1750 BC. According to the sequence at the North City

Code	Common name(s)	Date	Slip	Glaze	Paint	Incised	Other surface features	thickness	manuf	Hardness		Colours	Temper/ Inclusions/ Voids	Other details
1	Barbar Ware	Early Dilmun	red, red-brown	No	No	No	low rounded ridges	0.4-1cm	H	medium		red-brown, sometimes cream surface, sometimes grey core	freq quartz sand; mod to freq lime, sometimes exploded; mod or freq small irregular or linear voids	brittle, laminar texture
6	Coarse Vegetal Temper	Kassite	No	No	No	No	sometimes bitumen int	1-1.9cm	?	medium or soft		pale green, buff; sometimes dark grey core	many linear voids: coarse veg. temper. Occ. exploded lime, up to 1mm	
16	Sand and Vegetal Temper	Kassite	No	No	No	sometimes	impressed cordon	1.1-1.4	W & H	medium		pale green; pale red-brown, greenish core	mod to freq quartz sand; occ to mod lime, sometimes exploded	
2	Clinky	Sasanian	occ. brown or grey ext.	No	No	No	smoothed ext	0.4-0.7cm	?	hard		red-brown, usually grey core; sometimes all grey	none visible; or occ to mod flat grits, usually black	glossy conchoidal break
4	LISV	Sasanian	No	No	No	yes		0.8-1.3cm	W	hard		red-brown, grey, purplish	sometimes flat red-brown or black grits, 0.5-3mm; sometimes mod white particles (lime?)	glossy conchoidal break. Similar to or same as Clinky Fabric
3	Julfar Ware	Late Islamic	sometimes cream, sometimes red-brown, sometimes grey	No	red, purplish, black, dark brown	v. occasionally	lugs, cordons	ca. 0.3-1cm	H	medium or soft		red-brown, sometimes grey core; sometimes dark grey	freq. subangular flat grits, usually 0.5-4 mm; mod or freq white subrounded grits (shell or lime) 0.5-3mm; irregular and linear voids	variable size and quantity of flat grits and white inclusions.
5	Fine Ware with Quartz Sand	Late Islamic	No	No	No	sometimes		0.4-0.6	W	medium		buff or pale red-brown, sometimes greenish, sometimes purplish; often layered	occ to mod. quartz sand, mod. fine white particles	Slightly heterogeneous category. Chiefly Islamic but may contain some Kassite sherds (can have fine veg. temper?) and Sasanian elements (can resemble Clinky).
11	Fine Black Sandy	Late Islamic	?	No	No	No		0.6	W	hard		dark grey, greenish core	freq small white inclusions	brittle abrasive overfired ware, comparatively fine. Occurs in Abu Dhabi islands in Islamic contexts.
17	Coarse Grey-Brown Sandy Ware	Late Islamic	No	No	No	No		0.7	?	soft		pale brown	mod to freq coarse quartz sand; occ. large white or grey incl., lime or shell	
7	Medium Red Ware with Quartz Sand	Uncertain	No	No	No	No		0.3-0.5	?	medium		pale red-brown or pink, sometimes cream surface	mod. quartz sand; occ. fine lime	Some certainly Kassite, others maybe Islamic. Resembles Barbar but has smoother texture and less voids, and has different distribution.
19	Large Flat Grit Ware	Uncertain	No	No	No	yes		1.5	?	medium-hard		pink-orange, pinkish cream ext	mod to freq flat red and grey grits, 0.5-2mm; occ. lime, up to 4mm	Islamic or Sasanian

TABLE 3 Descriptions of Wares

Wall of Qala’at al-Bahrain, chain-ridges (Højlund and Andersen’s Types B55A and B55B) are almost entirely found from Periods Ia to the start of Period IIb at around 2000 bc (Højlund & Andersen 1994: 139–41, figs. 388 and 395). A *terminus ante quem* is provided by excavations at Saar which suggest that Barbar Ware persists until after the end of the sequence at the North

City Wall, until as late as 1750 bc (Carter 2005: 277). Unpublished radiocarbon dates taken by the French team support this dating to the first centuries of the 2nd millennium bc, implying a date in the later part of the range: according to Edens (1999: 71), three dates place the Early Dilmun occupation of AKI (Khor Ile Nord) in the 18th–17th centuries bc.

Apart from body sherds, only one base (Figure 18.1) and no rims were recovered during the QAP excavations. Two diagnostic sherds from the French expedition were relocated and drawn. These include a cooking pot rim from ‘Ile de Khor, Surf V7’ (Figure 18.2), comparable to Højlund and Andersen’s Type B16 (Højlund & Andersen 1994: figs. 128–31) and Saar type S1 (Carter

2005: 238–9), found throughout the City II period. The other was a body sherd with diagonal ridges descending from a horizontal ridge (Figure 18.3), equating to Højlund and Andersen’s Type B59 (Højlund & Andersen 1994: fig. 190–1). Nayeem also publishes a photograph of two typical medium-sized Dilmun jars (Nayeem 1998: 198, fig. 6). All the Early Dilmun pottery which was observed appeared to from medium-sized portable jars and cooking pots.

Kassite or Post-Kassite Pottery

Kassite/post-Kassite pottery was widely distributed over the island, well beyond the concentrations around the dye-production site at AK3 (Khor Ile Sud). According to Edens (1999: 80–2) the assemblage there dates to Failaka Period 4, especially Failaka 4A, equating to Qala’at al-Bahrain Period IIIb. This would give a range of ca. 1400–1100 bc (Højlund & Andersen 1997: fig. 29), though there are also strong parallels with QB Period IIIc, as acknowledged by Edens (1999: 82, note 3), which would allow a date into the first two centuries of the first millennium bc (see below).

Two varieties of Kassite or post-Kassite pottery were identified during this study, both distinguished by their vegetal temper (Ware 6, Ware 16). A third variety probably includes both Kassite and Late Islamic material which could not be distinguished (Ware 7, Medium Red Ware, see below). The ceramic parallels for Wares 6 and 16 suggest that they have more in common with the post-Kassite Period IIIc phase at Qala’at al-Bahrain (ca. 1100–800 bc) rather than Period IIIb. The calibrated radiocarbon dates from Khor Ile Sud are equivocal (Edens 1999: table 1 and p. 80). Two of them, on shell (*Thais savigny*), fit the earlier range better, calibrating to a broad slice of the second millennium bc, which includes Edens’s date of Qala’at al-Bahrain Period IIIb. The other one, however, on another species of shell (*Circe callipyga*), fits the later post-Kassite range, calibrating to 1160–500 bc at 2 sigma.

Coarse Vegetal Temper (QAP Ware 6): Figure 19.1–2

This variety was greenish buff and sometimes lined with bitumen. At Khor Ile Sud it would have been classified as Fabric 1 (Edens 1999: 75). Diagnostic sherds are limited to two rims (Figure 19.1–2), both from the same firepit at AKI (AKI.13), where they had been used to wedge lining stones. Their shape compares best to light brown and greenish ware vessels from the post-Kassite Qala’at al-Bahrain Period IIIc (Højlund & Andersen 1994: figs. 776–8, 823, 825), and the French Phase IVb at the same site, also equivalent to the post-Kassite Period (Kervran *et al.* 2005: fig. 34: 4; fig. 35: 11).

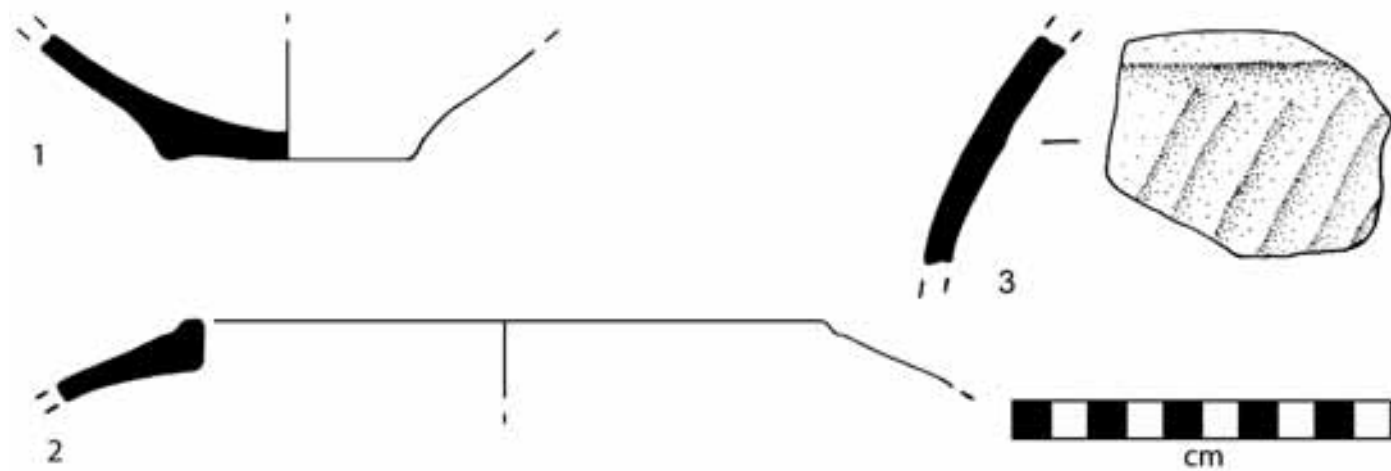


Figure 18 Barbar Ware

Fig. 18	Sherd no.	Ware	Common Name	Details	Comments
1	AK1.212.9.1	1	Barbar Ware	colour: red-brown	very eroded jar base
2		1	Barbar Ware	colour: red-brown ridge around	'Ile de Khor Barbar'
3		1	Barbar Ware	colour: red-brown ridged	'Ile de Khor Barbar'

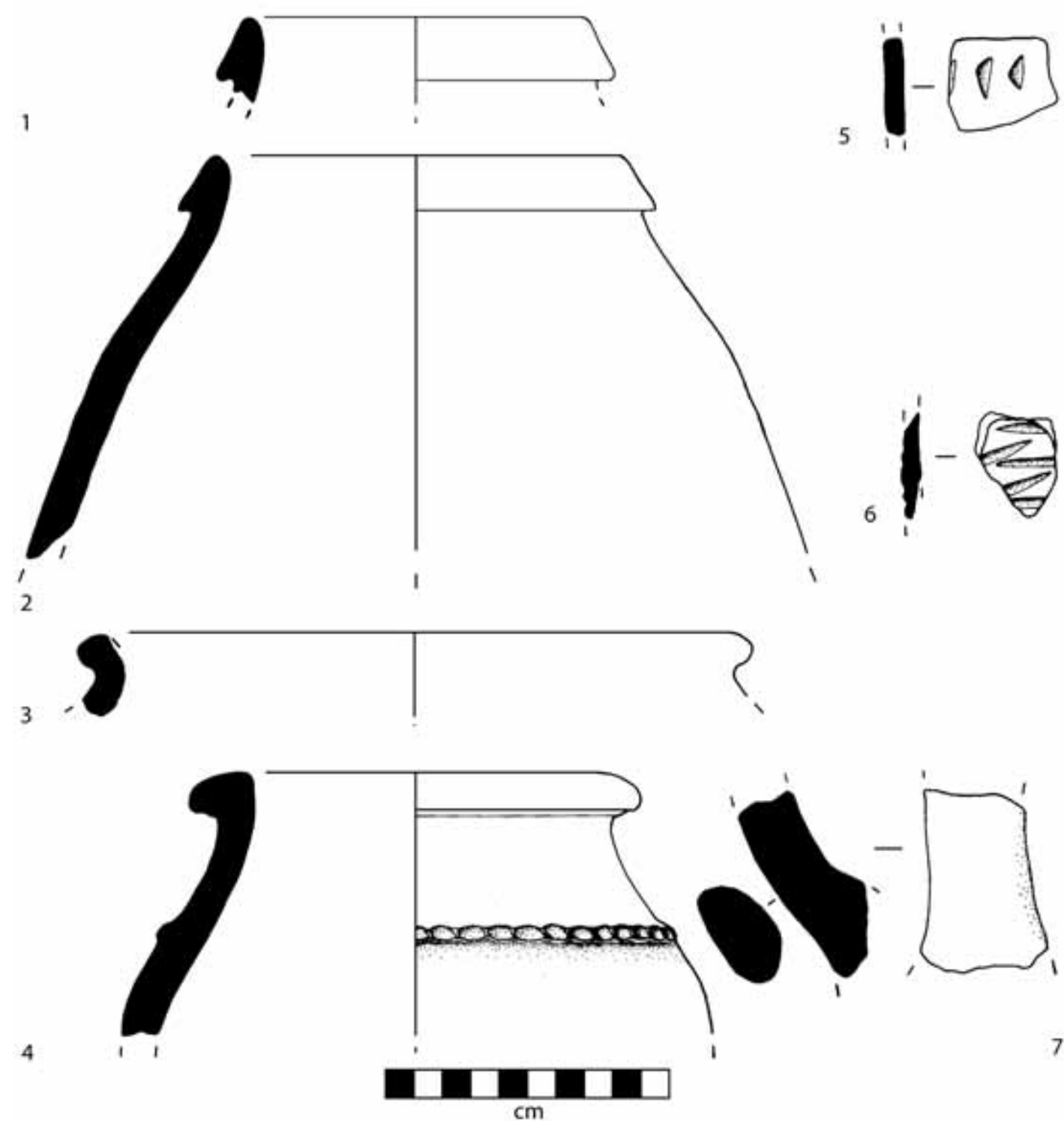
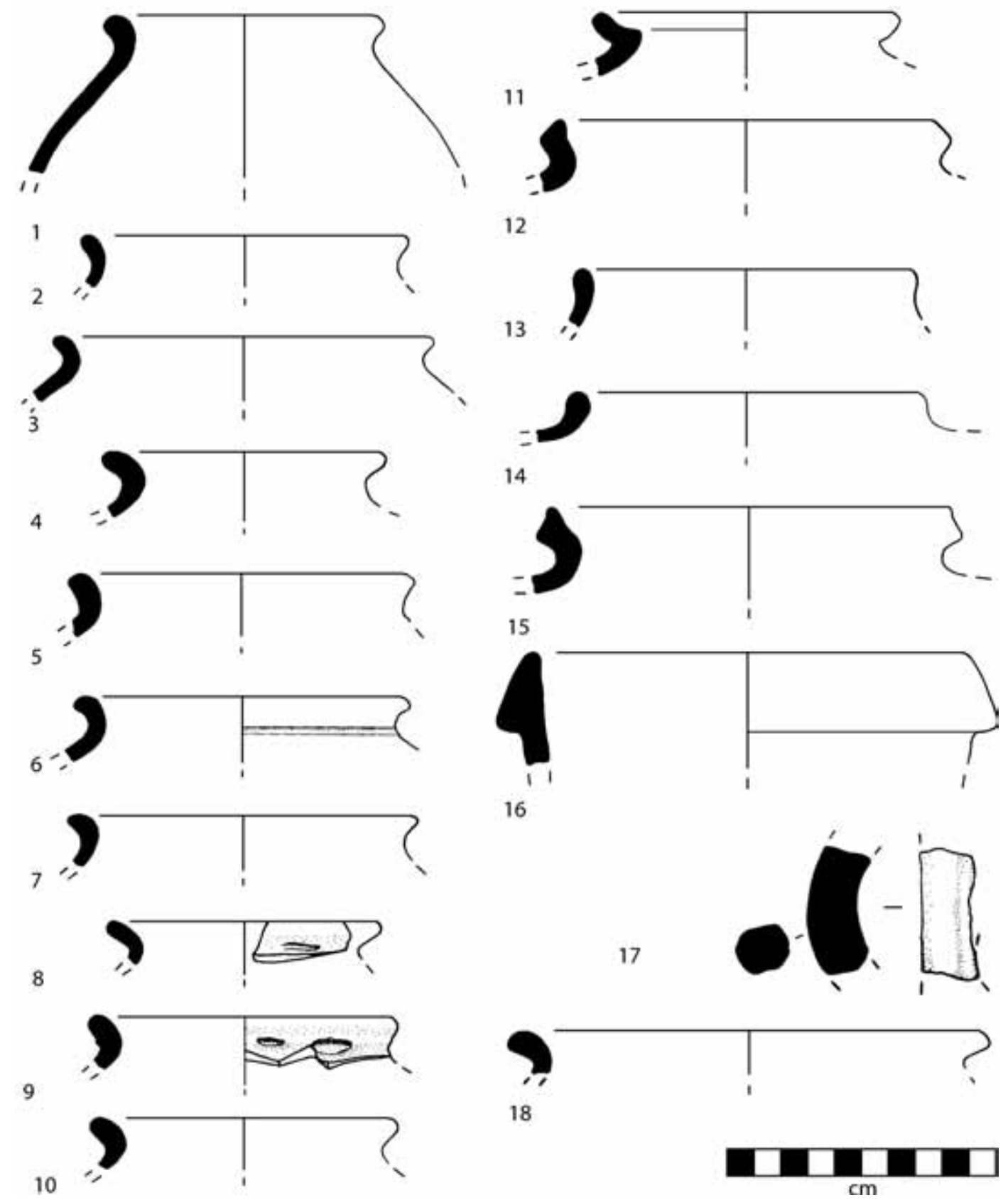


FIGURE 19 (opposite) Kassite Pottery

Fig. 19	Sherd no.	Ware	Common Name	Details	Comments
1	AK1.225.2.1	6	Coarse Vegetal Temper	colour: greenish manuf: w?	slip: black (bitumen?) Crumbly. More of same vessel in same context.
2	AK1.231.5.1	6	Coarse Vegetal Temper	colour: buff manuf: ?	slip: black ext? bitumen Same vessel as AK1.225.2.1
3	AK2.1179.1.2	16	Sand and Vegetal Temper	colour: pale green manuf: ?	
4	AK2.1500.4.1	16	Sand and Vegetal Temper	colour: pale green manuf: h & w?	impressed cordon Slab join at bottom, but interior of rim looks wheelmade
5	AK2.1279.1.1	16	Sand and Vegetal Temper	colour: green	incised parallel marks
6	AK2.1278.1.2	16	Sand and Vegetal Temper	colour: green manuf: ?	incised wedges/ zigzag Eroded
7	AK2.1287.1.1	16	Sand and Vegetal Temper	colour: green manuf: h	

FIGURE 20 Sasanian Pottery (Clinky)

Fig. 20	Sherd no.	Ware	Common Name	Details	Comments
1	AK2.3000.1.1	2	Clinky	colour: red-brown manuf: h?	
2	AK2.1145.1.2	2	Clinky	colour: red red-brown manuf: ? slip: grey	
3	AK2.1144.1.1	2	Clinky	colour: red-brown manuf: h	
4	AK2.1291.1.2	2	Clinky	colour: red red-brown manuf: h?	
5	AK2.1107.1.1	2	Clinky	colour: red-brown manuf: h slip: grey	
6	AK2.1166.1.1	2	Clinky	colour: red red-brown manuf: w? slip: grey-green incised line/ridges at neck	
7	AK2.1158.1.1	2	Clinky	colour: red-grey manuf: ?	almost looks wheelmade
8	AK2.1291.1.3	2	Clinky	colour: red red-brown manuf: h? slip: grey-brown? incised dash at neck	same vessel as 1291.1.1?
9	AK2.1291.1.1	2	Clinky	colour: red red-brown manuf: h? slip: grey-brown? 2 incised dashes at neck	
10	AK2.1294.1.2	2	Clinky	colour: red red-brown manuf: h?	
11	AK2.1017.1.1	2	Clinky	colour: red red-brown manuf: w?	
12	AK2.1163.1.1	2	Clinky	colour: red-brown manuf: ?	same vessel as 1248.1.1 probably, Grittier variant of Ware 2
13	AK2.1166.1.2	2	Clinky	colour: grey-brown manuf: ?	grittier variant of Ware 2
14	AK2.1294.1.1	2	Clinky	colour: red red-brown manuf: h?	
15	AK2.1248.1.1	2	Clinky	colour: red-brown manuf: ?	gritter variant, cf. AK2.1179.1.1
16	AK2.1179.1.1	2	Clinky	colour: red-brown manuf: w	grittier variant of Ware 2
17	AK2.1500.5.1	2	Clinky	colour: black manuf: h	
18	AK1.1.63.1	2	Clinky	colour: pale red-brown, pale grey core manuf: w? slip: grey-brown	looks wheelmade, but definitely Ware 2



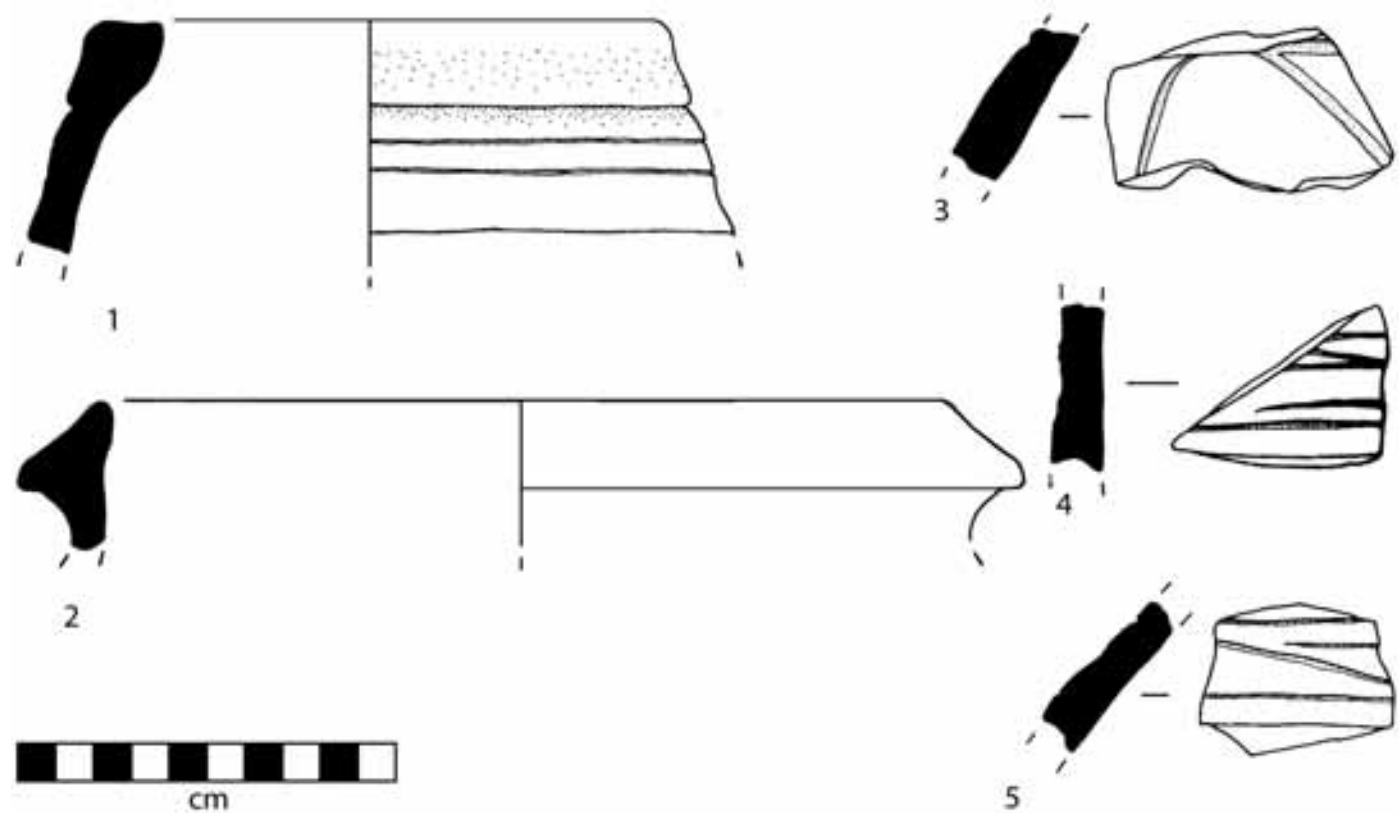


FIGURE 21 Sasanian Pottery (LISV)

Fig. 21	Sherd no.	Ware	Common Name	Details	Comments
1	AK2.3000.2.1	4	LISV	colour: dark grey, purplish brown core manuf: w? incised horizontal lines	Excellent parallel at Hulayla: Kennet 94 fig. 11: 16 = 3rd-7thc.
2	AK1.1.129.1	4	LISV	colour: grey manuf: ?	can't tell if W or H
3	AK1.1.11.1	4	LISV	colour: grey, purplish-grey core, paler grey-brown ext manuf: w other: incised large wavy horizontal line below horizontal groove (at neck?)	
4	AK0.2012.1.1	4	LISV	colour: dark grey, dark red-brown core manuf: hw incised lines	wheel-made, but slab join at bottom; fits with 1127.1.2
5	AK2.1127.1.2	4	LISV	colour: dark grey, dark red-brown core manuf: ? incised lines ext.	fits with 2012.1.1. Break has slab join, but sherd poss. wheelmade

Sand and Vegetal Temper (QAP Ware 16): Figure 19.3–7

The other variety was also greenish, sometimes tending to pale red-brown, with quartz sand and lime in the fabric as well as the vegetal temper. It would probably have equated to Edens' Fabric 3 (Edens 1999: 75). It tended to be found in association with Ware 6. Sherds included an unusual rim from above the semi-subterranean circular hut structure at AK2 (Figure 19.4). This is without obvious parallels, though a similar cordon on a shoulder is found in greenish ware at Qalāat al-Bahrain Period IIIc, along with handles similar to Figure 19.7 (Højlund & Andersen 1994: figs. 863–5). Handles, incised pottery and notched cordons are also seen in the French excavations at Qalāat al-Bahrain, and date to Phase IVb, equivalent to the post-Kassite Period (Kervran *et al.* 2005: fig. 35: 9, fig. 36: 6).

Sasanian Pottery

The abundance of a simple but distinctive ware with a limited repertoire of small jar forms testifies to occupation during the Late Sasanian period (5th–6th century AD), mainly on AK2 but also on AK1. This, known as 'Clinky' in other parts of the Gulf, was the commonest type of pottery collected from the island. It was accompanied by a related variety used for larger vessels.

Clinky (QAP Ware 2): Figure 20

This type was overwhelmingly dominant on AK2 and was the third most common after Barbar and Kassite pottery on AK1 (see below). It was named and is most fully defined by Kennet at Kush (Kennet 2004: 62; Kennet 2002: 157–8), and by Priestman (2005: 174). It is hard-fired, dense, brittle and reddish, sometime greyish or with a grey core, and is used for a limited range of small jars (Figure 20). Sometimes it appears to have been slipped, and there are rare incised marks. This type may continue into the Early Islamic Period but it is largely associated with Period I at Kush (Late Sasanian, 5th–6th century) (Kennet 2004: 15, table 3). It may have been made in southern Iran (Kennet 2002: 154).

Nearly all the jars had very simple everted rims (Figure 20.1–10), comparable to Kush Type 81 (Kennet 2004: fig. 35: K4813; Kennet 2002 fig. 4: top). Some had simple incised decoration on the neck (Figure 20.8–9). Another rim form is troughed on the upper or inner side (Figure 20.11). This is also included by Kennet as Type 81 (Kennet 2004: fig. 35: K4811; Kennet 2002: fig. 4: 2nd from top). A third rim form with a triangular cross-section (Figure 20.15) compares to Kennet's Type 86 (Kennet 2004: fig. 35: 4856). As

well as these types, a handle was found (Figure 20.17), also characteristic of the Clinky material at Kush (Kennet 2004: fig. 35: K4853 and Type 87; Kennet 2002: fig. 4: bottom). One larger rim was found (Figure 20.16). This does not have parallels at Kush and might have been better classified as Ware 4 (LISV), which shares the same fabric (see below). All the diagnostic sherds in Clinky/Ware 2 were from AK2, except one simple everted rim from AK1 (Figure 20.18).

LISV (QAP Ware 4): Figure 21

LISV refers to 'Large Incised Vessels', a term given by Kennet to a wide category of hard-fired incised vats and storage jars dating from the 5th–6th century to the Early Islamic period (Kennet 2004: 58). At al-Khor the fabric is the same as that of Clinky Ware. Very little well-dated Sasanian material is published, but the LISV from published Early Islamic sites does not show these rim forms (e.g. Bilad Qadim, Hulayla Area D, Sohar). This tentatively implies a late Sasanian date rather than an Islamic one. A specific parallel for the jar rim on Figure 21.1 can be found in Ras al-Khaimah (Kennet 2004: fig. 31, second from top), but this is a surface sherd from Jazirat al-Hulayla rather than stratified material.

Late Islamic Pottery

The Islamic pottery from the island is recent, though not the latest manifestation of the pre-oil ceramic assemblage characteristic of the Gulf region. It is most likely to date to the 18th and/or 19th centuries, without significant evidence for occupation in the late 19th and early 20th centuries.

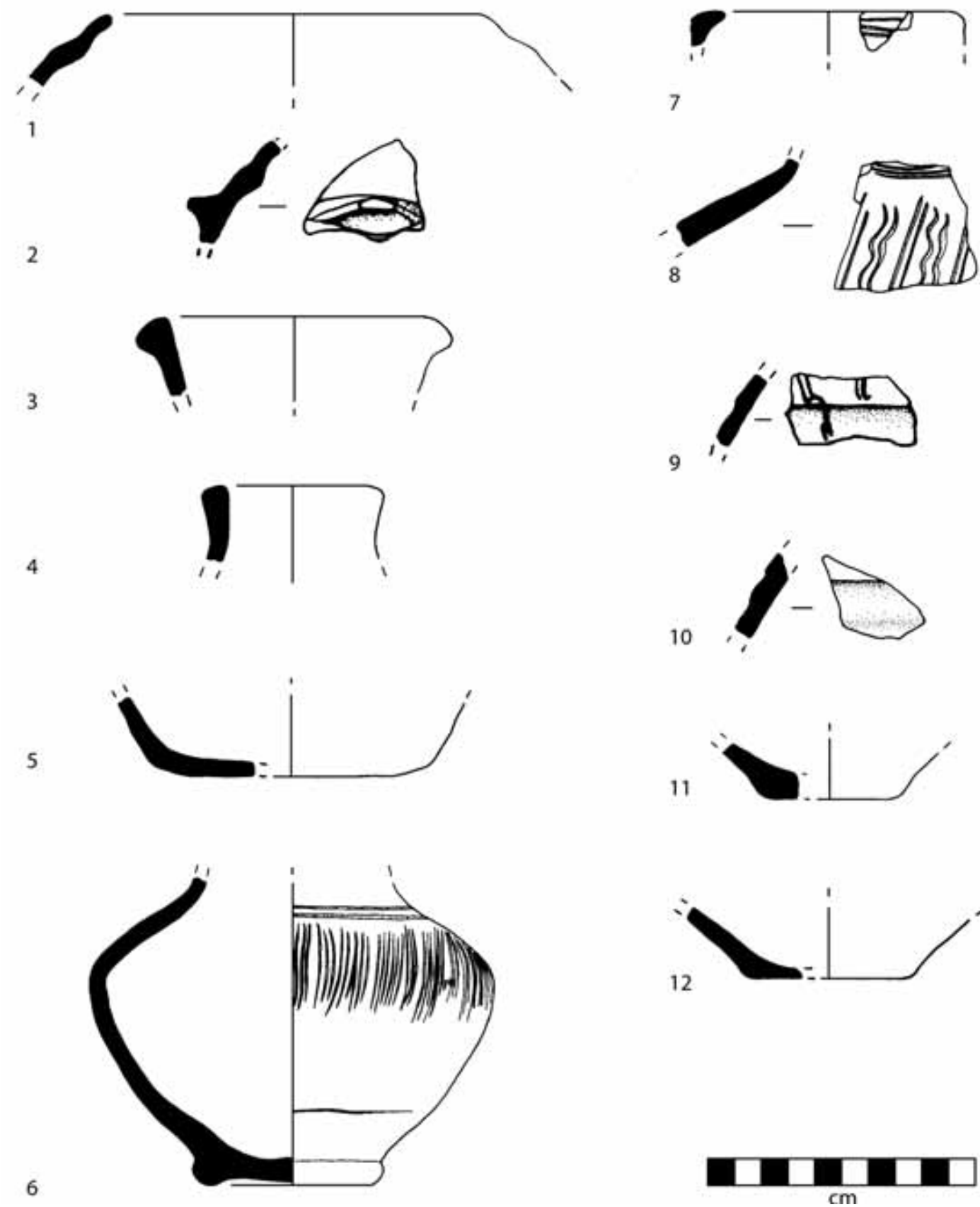
Julfar Ware (QAP Ware 3): Figure 22.1–5

Julfar Ware (Figure 22.1–5) is a distinctive and widespread type of pottery, manufactured in the Shimal region of Ras al-Khaimah adjacent to the ancient port of Julfar, and found in increasing quantities in the Gulf from as early as the eleventh century onwards (Kennet 2004: 53–6). A distinctive variety of cooking pot with lugs and an S-shaped rim occurs throughout the coastal region between Ras al-Khaimah and Qatar. This type is found at AK2 (Figure 22.1–2), and is known elsewhere in Qatar, at Ras Abaruk Site 5 and Huwailah (Garlake 1978a: fig. 2: 53; Garlake 1978b: fig. 2: 7–9).

Also found at AK2 were simple vertical or slightly out-turned jar rims and necks (Figure 22.3–4). These are from pouring jars, well known in the Julfar al-Mataf and later assemblages. See Kennet's Julfar Types J2.1, and J2.1 (Kennet 2004: table 24 and fig. 22). The date range is very long but compatible with the date of the cooking pots: occurrences at Qalāat al-Bahrain show that Julfar pouring jars were already circulating by

Fig. 22	Sherd no.	Ware	Common Name	Details		Comments
1	AK2.1278.1.1	3	Julfar Ware	colour: red brown, grey ext. manuf: h	slip: pale red-brown	
2	AK2.1197.1.3	3	Julfar Ware	colour: red-brown int, grey ext. manuf: h	slip: pale pinkish brown ext.	Julfar lug, with bottom part of S-shaped rim
3	AK2.1202.1.1	3	Julfar Ware	colour: red-brown manuf: ?		
4	AK2.1277.1.1	3	Julfar Ware	colour: red-brown manuf: h	slip: grey int, ext	
5	AK1.6.1.1	3	Julfar Ware	colour: brown manuf: h	slip: brown int	
6	AK0.2003.1.1	5	Fine Ware with Quartz Sand	colour: cream manuf: w	comb-incised lines (3 prong)	
7	AK2.1274.1.2	5	Fine Ware with Quartz Sand	colour: pale green manuf: ?	parallel incised horizontal lines below rim	
8	AK2.1274.1.1	5	Fine Ware with Quartz Sand	colour: grey-green manuf: ?	incised pairs of wavy lines pairs of straight lines	
9	AK2.1279.1.4	5	Fine Ware with Quartz Sand	colour: grey-green manuf: ?	incised parallel wavy lines above carination	
10	AK2.1279.1.2	5	Fine Ware with Quartz Sand	colour: grey-green manuf: w?	ripples	
11	AK2.1193.1.1	5	Fine Ware with Quartz Sand	colour: cream manuf: ?		
12	AK1.1.118.1	5	Fine Ware with Quartz Sand	colour: red-brown, pale grey core manuf: ?		a lot of vegetal temper, so perhaps Kassite not Islamic

FIGURE 22 Late Islamic Pottery



the 12th–13th century (Frifelt 2001: fig. 160), while ethnographic examples in the National Museum of Ras al-Khaimah indicate usage well into the 20th century. These rims, along with the cooking pot rims and other Islamic pottery, are compatible with an occupation during the 18th and/or 19th centuries.

Fine Ware with Quartz Sand (QAP Ware 5): Figure 22.6–13

This variety of wheelmade pottery is somewhat variable in colour and may have been divisible into more than one type if larger sherds had been present. Colour varied from buff or greenish to red-brown. The darker examples were harder fired and oxidised, and sometimes resemble Ware 2 (Clinky Ware). It is feasible that some of these darker sherds may actually be a variety of Clinky and therefore Sasanian, though their spatial distribution on AK1 is similar to those of the other Islamic wares, e.g. Wares 3 and 7 on AK1 and to a lesser extent on AK2 (see below). Other examples of this category may conceivably be Kassite, comparable to Edens’ Fabric 4 (‘a hard dense tan to brown ware...mixed with chaff and grit temper, now very small in size and often seemingly lacking altogether’ (Edens 1999: 75)).

Despite these caveats, it has been assumed that sherds of this type are Late Islamic unless proven otherwise, in the light of the parallels given below. Unlike the colour and degree of firing, the range of forms and decoration is relatively homogeneous, consisting of small vessels with simple incised decoration. The most complete example is a small cream-coloured jar from outside the confines of AK1 and AK2 (Figure 22.6), with combed decoration made with a three-pronged instrument. A group of greenish examples from AK2 (Figure 22.7–9) also show incised decoration. Similar combed and incised decoration is found on sherds from Huwailah and Ras Abaruk Site 5 (Garlake 1978b: fig. 2 18–21; Garlake 1978a: fig. 2: 43–6), whose assemblages are considered by the collector to be 17th–19th century in date, and in the case of Huwailah, typical of the 18th century (Garlake 1978b: 178). There are some problems with these comparisons, given the identification of the Huwailah sherds as Ali Ware, which is typically pinkish buff or cream, while, as noted above, darker colours also occur in Ware 5.

Black Sandy Ware (QAP Ware 11): not illustrated

This rare type was identified in just one place (feature AK1.31). It is also known from the Abu Dhabi Islands, where it is also rare and appears to date to the Late Islamic Period.

Coarse Grey-Brown Sandy Ware (QAP Ware 17): not illustrated

Only body sherds of this distinctive type were identified, but it clearly equates to Kenner’s LIME category at Kush, a Late Islamic type which occurs at Julfar al-Mataf and is thought to have originated from Bahrain (Kenner 2004: 59). It occurs in the area between Bahrain and Ras al-Khaimah in the form of medium-sized or large jars with small handles and inturned rims (Larsen 1983: fig. 69: a–b; Carter 2003a: fig. 2: 7; Kenner 2004: fig. 31). It is also known from the Abu Dhabi Islands (Carter 2003a: table 9, Type 56). Its date ranges from the 14th/15th century (Kenner 2004: 59) up to the 18th century or later.

Uncertain

Two types were of uncertain date, one being either Late Islamic or Kassite (or a mixed category of both), the other being either Late Islamic or Sasanian.

Medium Red Ware with Quartz Sand (QAP Ware 7): Figure 23.1–2

This closely resembles Barbar Ware in its colour and its quartz sand and lime inclusions, but is denser, is never ridged in the same way and is more likely to have cream surfaces. The very close similarities suggest that Barbar and Ware 7 originated from the same clay sources somewhere in Bahrain. Fragmentary pieces are admittedly difficult to distinguish, but the distribution on both AK1 and AK2 coincides with that of more recognisable Kassite and Islamic pottery, suggesting that the majority of pieces were correctly separated from Barbar Ware. It is likely that Ware 7 contains both Kassite and Islamic examples, which cannot be distinguished when in small fragments and without stratigraphic information.

The only diagnostic sherds consisted of a neck with punctuate decoration, a large body sherd with an appliqué cordon and a string-cut base (Figure 23.1–3). The latter two are probably Kassite in date. An equivalent Islamic ware is common in the Abu Dhabi Islands where it is dated to the Late Islamic period (Carter 2003a: table 9, Type 15).¹ A Kassite equivalent would be Edens’ Fabric 2, ‘a red ware with round quartz temper’ (Edens 1999: 75).

¹ In the ADIAS (Abu Dhabi Islands Archaeological Survey) typology it would be classified either as Fabric 15 (Sandy Lime-tempered Ware), in the case of examples with very large lime inclusions, or as Fabric 52 (Dense Red Sandy Ware). The former seems to be later than the latter, and occurs into the late 19th or 20th century.

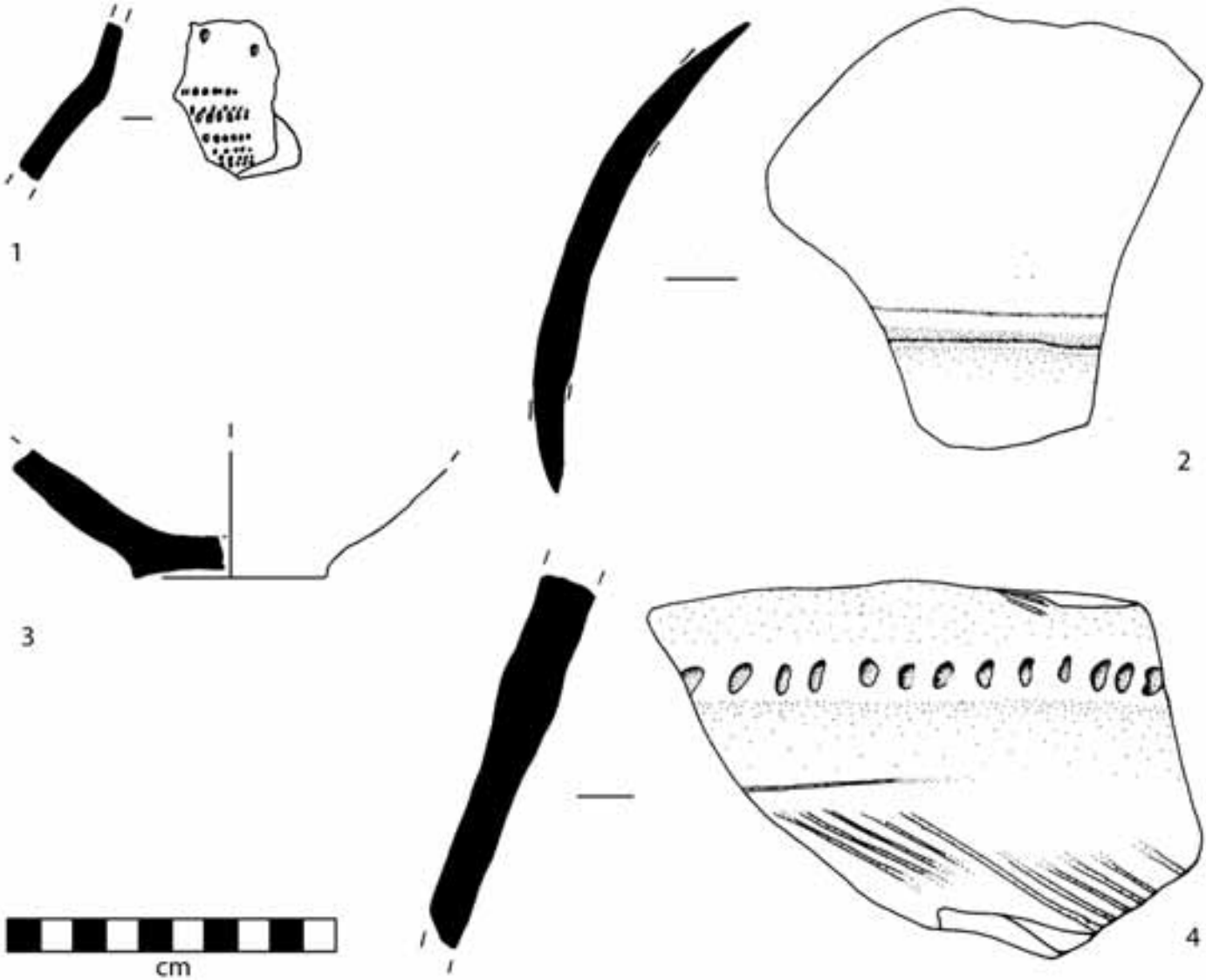


FIGURE 23 Pottery of Uncertain Date

Fig. 23	Sherd no.	Ware	Common Name	Details		Comments
1	AK2.1279.1.3	7	Medium Red Ware with Quartz Sand	colour: red-brown, greenish ext manuf: ?	comb-impressed(?) punctuate marks	quite coarse
2	AK2.1809.8.1	7	Medium Red Ware with Quartz Sand	colour: red-brown manuf: h?	slip: cream ext?	v. spalled sherd. 'Slip' might be from firing
3	AK2.1809.11.1	7	Medium Red Ware with Quartz Sand	colour: orange-brown, pale grey core, cream surfaces manuf: w	slip: cream? string-cut marks on base; bitumen stains int?	pale surface colour is either from slip or firing
4	AK2.3000.3.1	19	Large Flat Grit Ware	colour: red-brown, pale pinkish cream-brown ext. manuf: ?	indented cordon; incised diagonal lines below (and above?)	eroded

Large Flat Grit Ware (QAP Ware 19): Figure 23.3 This type of pottery was represented only by a handful of sherds from a large storage jar on the outskirts of AK2. The pale pinkish cream fabric contained large, flat angular grits comparable to those associated with the Julfar tradition of Ras al-Khaimah, though such inclusions are also found in earlier pottery from that area, and perhaps also in Iranian material. The vessel in question was incised, and may either have been Sasanian or perhaps Early Islamic, allied to Kenet’s LISV tradition, or Late Islamic.

FREQUENCY OF WARES AND OCCUPATION THROUGH TIME

If the quantities of sherds for each time period are added up for AK1, AK2 and AK0, combining both surface and excavated material (Tables 4–5), it immediately becomes apparent that Early Dilmun material is the most common pottery at AK1 (at 185 sherds, or 41%), but with significant quantities of Kassite, Sasanian and Islamic material also being present. Sasanian material is overwhelmingly dominant at AK2, with a significant overlying Late Islamic occupation. The Islamic occupation of AK2 is localised in space, as shown in the distributions of each ware (see below). The totals on Table 4–5 imply that the most intensive occupation on the island (excluding AK3/Khor Ile Sud) was actually during the Sasanian Period, by some distance, followed by the late Islamic Period. This is perhaps supported by the greater evidence for stratigraphy and structures at the largely Sasanian site of AK2, compared to AK1. However, AK3/Khor Ile Sud is not included in this crude assessment and Kassite exploitation of the island is likely to have been at least as significant as the Sasanian occupation. It is also possible that the Barbar presence is underestimated ceramically due to previous surface pick-ups by the French team at AK1/Khor Ile Nord. At AK2 the chronological profile is completely dominated by the Sasanian horizon (7,194 sherds, or 95% of the AK2 assemblage), with Islamic material being next in importance (312 sherds, or just 4%). Kassite material is present (63 sherds, or 1%), partly from excavated contexts, and probably underestimated if some of the Medium Red Ware is indeed Kassite (see below). The Early Dilmun presence is negligible. It should be noted that the representation of Sasanian material is heavily skewed by transformation processes which had broken the fragile and brittle pottery into very many tiny pieces, and also by the intensive collection strategy employed there. It is nonetheless by far the most

common pottery on the site. AK2 was not recorded by the French team, and it appears that the presence of immediately recognisable Late Islamic pottery on the surface, in particular Julfar Ware, masked the Sasanian presence and led them to discount it as a recent Islamic campsite or village.

SURFACE DISTRIBUTIONS

The distributions of the pottery of different dates is significant at both sites, and in some cases offers clues to the dating of the wares.

AK1 distributions

Figure 24 shows the distribution of wares of different date on AK1. They show that Barbar pottery is concentrated in the northern part of the site, while Islamic pottery is concentrated in the southern part. There is also a strong Sasanian presence, which was not noted by Edens, seen in the distributions of Clinky (Ware 2) and LISV (Ware 4), which mirror the disposition of the Barbar surface pottery. The Kassite presence is limited to the southern part of the site. Most of the features visible on AK1 are in the northern part of the site, implying that the cluster of stone-lined pits and hearths there are mostly likely to be associated with the Barbar and Sasanian occupations. In contrast, the Islamic campsite occupied a slightly different area. Edens described an Islamic site ‘immediately adjacent to the Barbar presence’ at Khor Ile Nord/AK1, which probably alludes to the southern concentrations of Islamic pottery and features. Regarding this phase, Edens states that bowl-shaped features lined with stones were associated with the Islamic occupation, one of which contained a layer of oyster shells beneath its ‘upper floor’ (Edens 1999: 71). One of these structures yielded a radiocarbon date indicating that it was in use at around 1400 AD, though the value is not given, nor the method of calibration, nor the material. 1400 AD would be at least three hundred years earlier than the date of the Late Islamic horizon indicated by the pottery. QAP excavated at least three and possibly four comparable structures: AK1.3, which also contained a layer of oyster shell beneath a stone lining; AK1.4, an adjacent similar feature with a partially disturbed stone lining and underlying layer of oyster shell; AK1.12, another large stone-lined feature with oyster shell beneath the lining; and AK1.31 in the south part of the site, contained only fragments of oyster shell. It seems likely that laying down a bed of oyster shell in a pit and then covering it with a layer of lining stones was a deliberate technique, perhaps for improving aeration or heat retention in firepits. Note that these structures did not show signs of burning, however.

Period	AK1	AK2	AK0	total
Early Dilmun	185	2		187
Kassite	99	63		162
Sasanian	76	7117	1	7194
Late Islamic	70	213	30	312
Uncertain	26	113		140

TABLE 4 Frequencies of pottery by Ware in surface and excavated contexts

Code	Common name	Period	AK1	AK2	AK0
1	Barbar	Early Dilmun	185	2	
6	Coarse Vegetal Temper	Kassite	89	10	
16	Sand and Vegetal Temper	Kassite	10	53	
2	Clinky	Sasanian	63	7112	
4	LISV	Sasanian	13	5	1
5	Fine Ware with Quartz Sand	Late Islamic	40	85	30
3	Julfar	Late Islamic	29	117	
11	Black Sandy	Late Islamic	1		
17	Coarse Grey-Brown Sandy	Late Islamic		10	
7	Medium Red Ware with Quartz Sand	Uncertain	26	110	
19	Large Flat Grit Ware	Uncertain		4	

TABLE 5 Frequencies of pottery by Period in surface and excavated contexts

AK2 distributions

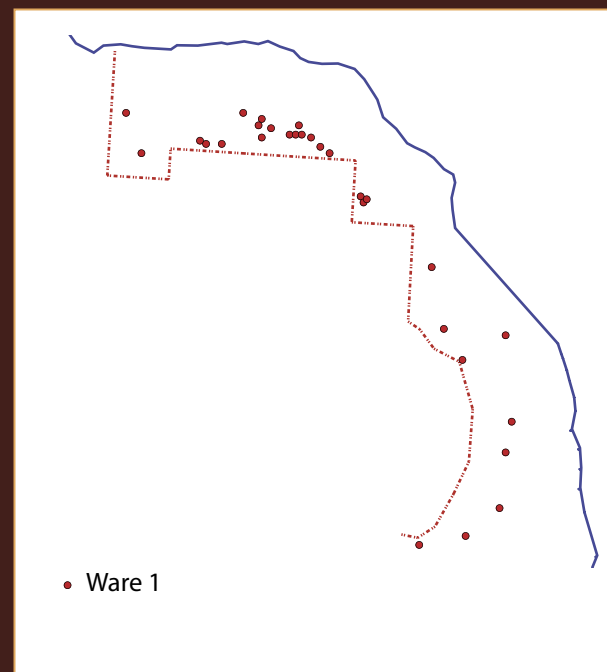
Barbar pottery is hardly represented on AK2 (just 2 sherds), but there were very large quantities of Sasanian pottery, with lesser amounts of Kassite and Late Islamic wares. The distributions (Figure 25) shed an interesting light on the taphonomic processes at work. The small, light sherds of highly fragmented Sasasian pottery have moved downhill from a low ridge which runs northwest-southeast down the centre of the site (the ridge probably being a combination of storm ridge and archaeological structures and strata). They are now concentrated in the linear depression to the north side of the ridge. The Kassite material has stayed close to the top of the ridge and has not moved into the depression, despite presumably having been on the site for nearly two millennia longer than the Sasanian pottery. This is likely to be because of the greater size of the sherds, which are almost invariably thicker and heavier than the Sasanian and Islamic sherds.

The Late Islamic pottery, which is in similarly-sized fragments to the Sasanian pottery, has retained a distribution on the south side of the ridge near its top, presumably at or close to where it was originally deposited.

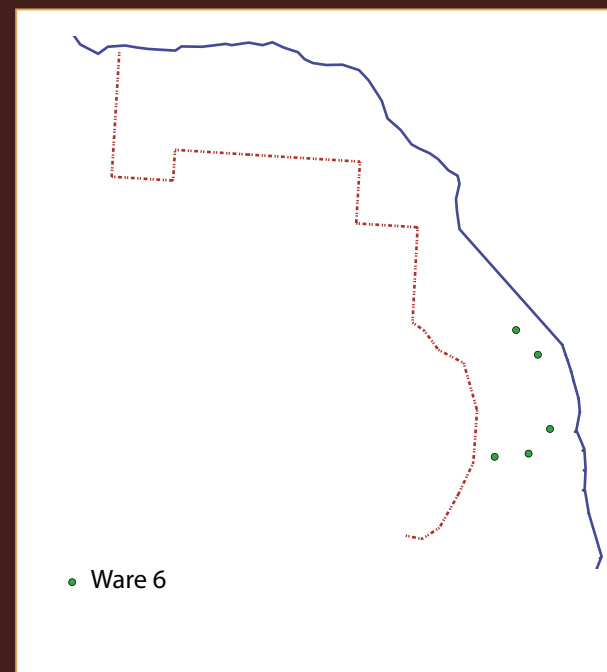
EXCAVATED POTTERY

Pottery from AK1

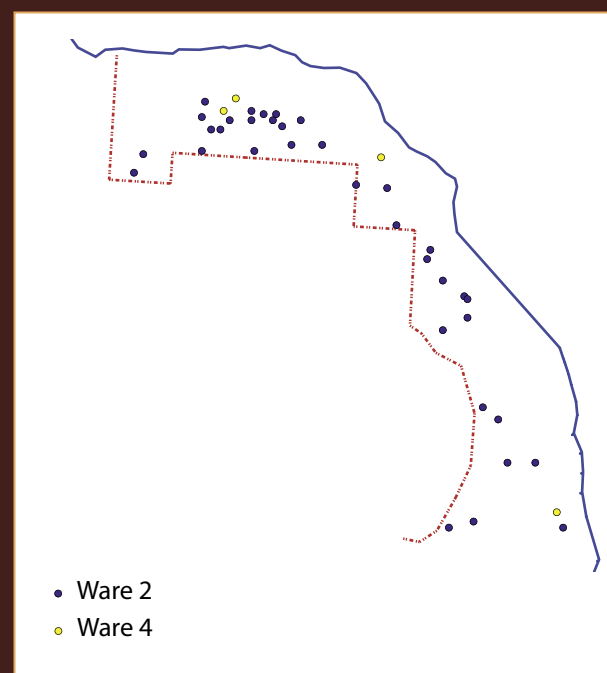
Surface crust and disturbed features Pottery was recovered from Context 1 (the crust scraped from the surface of AK1); Contexts 200 and 218 (more of the same crust in the trench surrounding and adjacent to Feature AK1.1); Context 300 (the same around Feature AK1.2); Context 312 (the same from the trench around Features AK1.7, AK1.8, AK1.9 and AK1.15) and Context 6 (a bulldozer spoil heap).



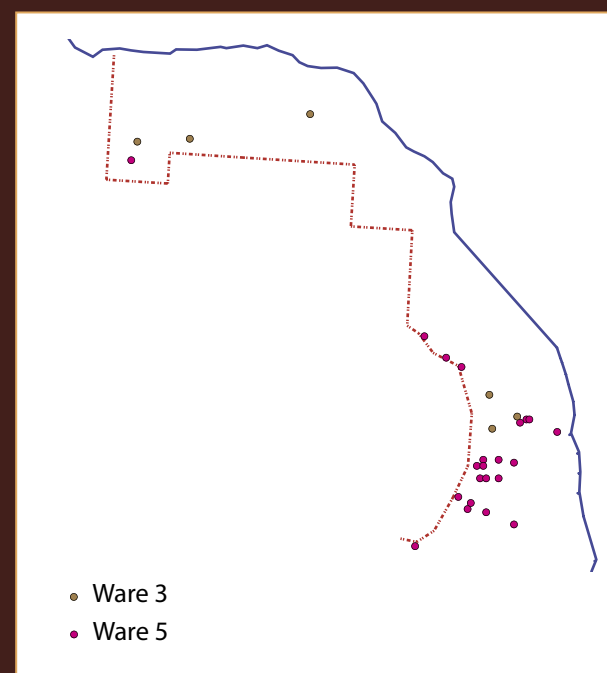
1. Surface distribution of Barbar pottery



2. Surface distribution of Kassite pottery

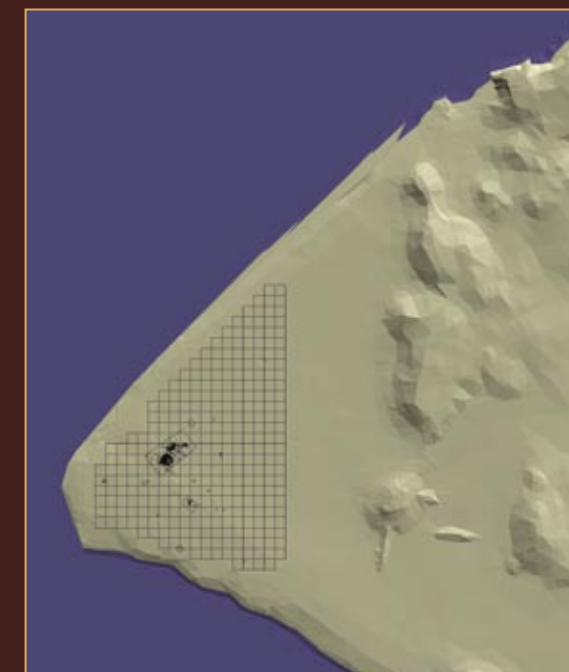


3. Surface distribution of Sasanian pottery

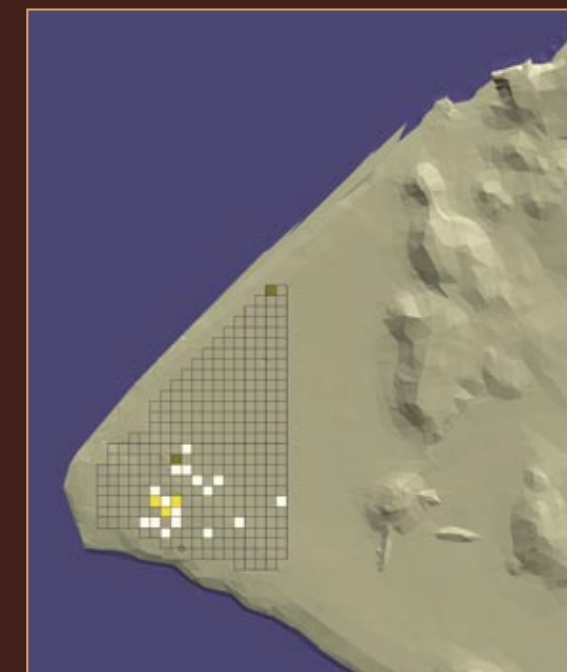


4. Surface distribution of Islamic pottery

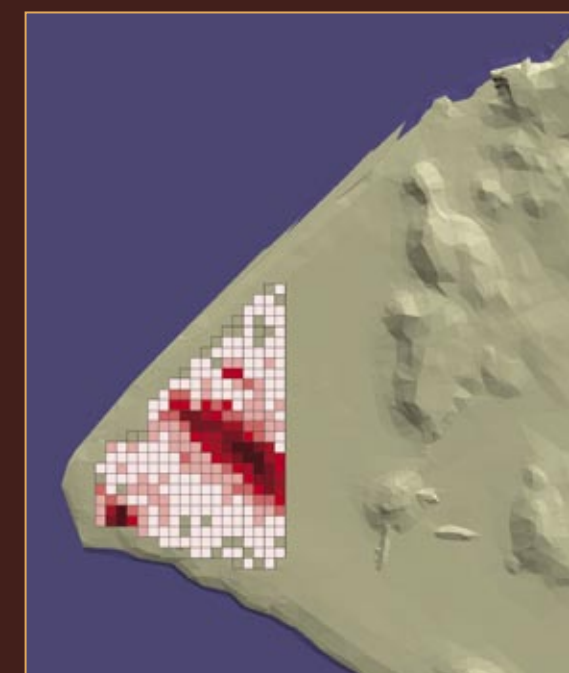
FIGURE 24 Surface distribution of wares at AK1



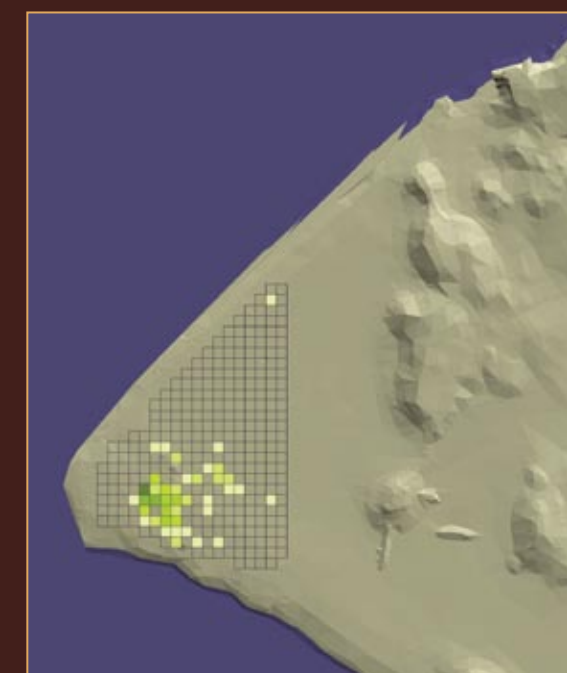
1. Location of features and pottery grid



2. Surface distribution of Kassite pottery (Ware 16)



3. Surface distribution of Sasanian pottery (Clinky, Ware 2)



4. Surface distribution of Islamic pottery (Julfar, Ware 3)

Figure 25 Surface distribution of wares at AK2

Contexts 1 and 6 yielded a predictable mixture of Barbar, Kassite, Sasanian (including Figure 20.17, Figure 21.2–3) and Islamic pottery (including Figure 22.5, 12). Only Barbar pottery was recovered from the material surrounding Features AK1.1, AK1.7, AK1.8, AK1.9 and AK1.15, offering an unreliable indication of their date. Feature AK1.2 had both Kassite and Sasanian pottery surrounding it.

Scree slope trench at north end of AK1
Context 15, a layer of sub-surface slope wash consisting of rubble and sand, contained a scatter of pottery of all periods.

Feature AK1.2
This circular stone-lined hearth contained exclusively Barbar pottery. This would imply an Early Dilmun date, except that Context 304, the deepest layer containing pottery, yielded an iron fish hook. This indicates a later use of the feature, probably during the Sasanian or Islamic occupations of the island.

Feature AK1.3
AK1.3, a large oval stone-lined feature, contained one Sasanian sherd and a handful of Late Islamic sherds. Note that a comparable structure in the south of the site (AK1.31) contained a Late Islamic sherd, while the French appear to have obtained a radiocarbon date in the Islamic period from a similar feature. This suggests that large (2.5–3 m diameter) dish-shaped, paved structures, often associated with a lining of pearl oysters, were a feature of the Late Islamic occupation, though of course they could have been re-used structures from earlier periods.

Feature AK1.4
AK1.4, another large stone-lined oval feature comparable to AK1.3 and AK1.31, contained a single Late Islamic sherd.

Feature AK1.9
This rectangular stone-lined hearth contained a single Barbar sherd of the Early Dilmun period.

Feature AK1.13
This circular firepit contained only Kassite pottery (including Figure 19.1–2), which had been used to brace the stone lining. Large sherds had become friable and broken into smaller pieces. The pottery implies only that the final usage dates to the Kassite Period or any time thereafter.

Feature AK1.16
Feature AK1.16, a shallow unlined firepit, contained a single Barbar sherd.

Feature AK1.17
Feature AK1.17 was either a very small triangular stone-lined firepit, or a post-hole in which the post had burnt. It contained a single Sasanian sherd.

Feature AK1.31
A shelly layer in Feature AK1.31, a large, shallow oval pit lined with flat stones, contained a single sherd in Fine Black Sandy Ware, which is believed to be Late Islamic.

Feature AK1.194
Feature AK1.194, a small stone-lined firepit, contained a small number of Barbar Ware sherds.

Feature AK1.195
Numerous sherds of Barbar Ware were found in Feature AK1.195, a large unlined pit. These are the only clearly *in situ* Early Dilmun Period deposits excavated by QAP. Pottery included an illustrated base (Figure 18.1) but no rims or other diagnostic sherds. The concentration of broken Barbar pottery within the pit suggests that it was in use during the Early Dilmun Period, probably as a rubbish pit but perhaps as a storage pit within which pots had been placed and eventually broken.

Pottery from AK2

Surface pick-up and surface crust
A significant amount of material was collected during the gridded surface pick-up, assigned to Contexts 1001–1312 (Table 18; and see above). This was overwhelmingly Sasanian in date but with a significant Late Islamic and to a lesser extent Kassite component. Pottery was also recovered from the surface crust above the excavated areas of AK2, namely Context 1500 above Features AK2.516, AK2.517 and AK2.518. Also discussed here are sherds picked up opportunistically from the attenuated pottery scatter surrounding AK2, which were outside the gridded area and the official boundary of the site, but which almost certainly originated from the occupations at AK2. These were assigned to Context 3000.

Diagnostic Sasanian material from the controlled pick-up, opportunistic grab samples and the surface crusts removed during excavation included numerous small jars and a handle in Clinky Ware (Figure 20.1–17) and sherds of one or more larger incised vessels in LISV (Figure 21.1, 5). Diagnostic material of the

Site	Context	Description	Feature	Ware	Common name	Date	no.
AK1	1	crust		1	Barbar Ware	Early Dilmun	52
AK1	1			6	Coarse Vegetal Temper	Kassite	6
AK1	1			2	Clinky	Sasanian	61
AK1	1			4	LISV	Sasanian	6
AK1	1			5	Fine Ware with Quartz Sand	Late Islamic	32
AK1	1			3	Julfar Ware	Late Islamic	19
AK1	1			7	Medium Red Ware with Quartz Sand	Uncertain	26
AK1	200	crust		1	Barbar Ware	Early Dilmun	8
AK1	218	crust		1	Barbar Ware	Early Dilmun	1
AK1	300	crust		2	Clinky	Sasanian	1
AK1	300			6	Coarse Vegetal Temper	Kassite	1
AK1	312	crust		1	Barbar Ware	Early Dilmun	3
AK1	6	spoil		1	Barbar Ware	Early Dilmun	6
AK1	6			3	Julfar Ware	Late Islamic	5
AK1	6			6	Coarse Vegetal Temper	Kassite	1

TABLE 6 Pottery from AK1, surface crust and disturbed contexts

Site	Context	Description	Feature	Ware	Common name	Date	no.
AK1	15	slope wash		1	Barbar Ware	Early Dilmun	1
AK1	15			16	Sand and Vegetal Temper	Kassite	1
AK1	15			4	LISV	Sasanian	6
AK1	15			3	Julfar Ware	Late Islamic	5
AK1	15			5	Fine Ware with Quartz Sand	Late Islamic	1

TABLE 7 Pottery from AK1, Context 15 (slope wash)

Site	Context	Description	Feature	Ware	Common name	Date	no.
AK1	301	windblown sand	AK1.2	1	Barbar Ware	Early Dilmun	2
AK1	302	ashy sand	AK1.2	1	Barbar Ware	Early Dilmun	1
AK1	303	sand and shell	AK1.2	1	Barbar Ware	Early Dilmun	1
AK1	304	sand and shell	AK1.2	1	Barbar Ware	Early Dilmun	9

TABLE 8 Pottery from Feature AK1.2

Site	Context	Description	Feature	Ware	Common name	Date	no.
AK1	11	shelly sand	AK1.3	2	Clinky	Sasanian	1
AK1	13	rubbly surface	AK1.3	5	Fine Ware with Quartz Sand	Late Islamic	4
AK1	17	stone lining	AK1.3	5	Fine Ware with Quartz Sand	Late Islamic	2

TABLE 9 Pottery from Feature AK1.3

Site	Context	Description	Feature	Ware	Common name	Date	no.
AK1	404	stone lining	AK1.4	5	Fine Ware with Quartz Sand	Late Islamic	1

TABLE 10 Pottery from Feature AK1.4

Site	Context	Description	Feature	Ware	Common name	Date	no.
AK1	311	blackened sand	AK1.9	1	Barbar Ware	Early Dilmun	1

TABLE 11 Pottery from Feature AK1.9

Site	Context	Description	Feature	Ware	Common name	Date	no.
AK1	215	ashy sand	AK1.13	6	Coarse Vegetal Temper	Kassite	24
AK1	225	ashy sand	AK1.13	6	Coarse Vegetal Temper	Kassite	30
AK1	231	collapsed lining	AK1.13	16	Sand and Vegetal Temper	Kassite	9
AK1	231		AK1.13	6	Coarse Vegetal Temper	Kassite	25
AK1	236	lining	AK1.13	6	Coarse Vegetal Temper	Kassite	2

TABLE 12 Pottery from AK1: Feature AK1.13

Site	Context	Description	Feature	Ware	Common name	Date	no.
AK1	329	burnt sand	AK1.16	1	Barbar Ware	Early Dilmun	1

TABLE 13 Pottery from Feature AK1.16

Site	Context	Description	Feature	Ware	Common name	Date	no.
AK1	324	sand with charcoal	AK1.17	4	LISV	Sasanian	1

TABLE 14 Pottery from Feature AK1.17

Site	Context	Description	Feature	Ware	Common name	Date	no.
AK1	432	sand and shell	AK1.31	11	Fine Black Sandy	Late Islamic	1

TABLE 15 Pottery from Feature AK1.31

Site	Context	Description	Feature	Ware	Common name	Date	no.
AK1	205	sand	AK1.194	1	Barbar Ware	Early Dilmun	4

TABLE 16 Pottery from Feature AK1.194

Site	Context	Description	Feature	Ware	Common name	Date	no.
AK1	212	sand, shell & ash	AK1.195	1	Barbar Ware	Early Dilmun	66
AK1	216	sand, shell & ash	AK1.195	1	Barbar Ware	Early Dilmun	29

TABLE 17 Pottery from Feature AK1.195

Site	Context	Description	Ware	Common name	Date	no.
AK2	1001-1312	surface	1	Barbar Ware	Early Dilmun	2
AK2	1001-1312		16	Sand and Vegetal Temper	Kassite	36
AK2	1001-1312		6	Coarse Vegetal Temper	Kassite	7
AK2	1001-1312		2	Clinky	Sasanian	7102
AK2	1001-1312		4	LISV	Sasanian	4
AK2	1001-1312		3	Julfar Ware	Late Islamic	117
AK2	1001-1312		5	Fine Ware with Quartz Sand	Late Islamic	85
AK2	1001-1312		7	Medium Red Ware with Quartz Sand	Uncertain	89
AK2	1001-1312	surface crust	17	Coarse Grey-Brown Sandy Ware	Late Islamic	10
AK2	1500		16	Sand and Vegetal Temper	Kassite	5
AK2	1500		2	Clinky	Sasanian	8
AK2	3000	surface	4	LISV	Sasanian	1
AK2	3000		19	Large Flat Grit Ware	Uncertain	4
AK2	3000		1	Clinky	Sasanian	1

TABLE 18 Pottery from the surface of AK2

Site	Context	Description	Feature	Ware	Common name	Date	no.
AK2	1510	loose sand over AK2.516-518	AK2.500	7	Medium Red Ware with Quartz Sand	Uncertain	15
AK2	1518	loose sand over & around AK2.517	AK2.517	16	Sand and Vegetal Temper	Kassite	1
AK2	1518		AK2.517	7	Medium Red Ware with Quartz Sand	Uncertain	2
AK2	1519	spit of loose sand within AK2.517	AK2.517	6	Coarse Vegetal Temper	Kassite	2
AK2	1533	loose sand over & around AK2.516	AK2.516	16	Sand and Vegetal Temper	Kassite	4
AK2	1533		AK2.516	7	Medium Red Ware with Quartz Sand	Uncertain	1
AK2	1804	wall collapse above AK2.516	AK2.501	16	Sand and Vegetal Temper	Kassite	2

TABLE 19 Pottery from upper levels of the AK2 excavations

Site	Context	Description	Feature	Ware	Common name	Date	no.
AK2	1808	upper fill of loose sand	AK2.516	2	Clinky	Sasanian	1
AK2	1809	occupation horizon within feature	AK2.516	7	Medium Red Ware with Quartz Sand	Uncertain	3
AK2	1815	partial collapse of retaining wall	AK2.516	16	Sand and Vegetal Temper	Kassite	4
AK2	1815		AK2.516	6	Coarse Vegetal Temper	Kassite	1
AK2	1819	fill of posthole inside feature	AK2.532	16	Sand and Vegetal Temper	Kassite	1

TABLE 20 Stratified pottery from Feature AK2.516

site	Context	area	Fabric	Common name(s)	Date	Sum
AK0	2003	AK0.1003	5	Fine Ware with Quartz Sand	Late Islamic	30
AK0	2012	AK0.1008	4	LISV	Sasanian	1

TABLE 21 Pottery from features outside AK1 and AK2

Late Islamic occupation, localised on the top and south side of the low ridge of the site, included Julfar Ware (Figure 22.1–4), Fine Ware With Quartz Sand (Figure 22.7–11). Medium Red Ware (Figure 23.1) was relatively common, and these small weathered sherds could be assigned either to the Kassite or the Late Islamic Period. Definite Kassite sherds were less well represented, but diagnostic sherds included a chain-ridged jar from Context 1500 (Figure 19.4), two incised body sherds from the controlled pick-up and part of a handle, all in Sand and Vegetal Temper (Ware 16) (Figure 19.5–7).

Stratified pottery from windblown sand in the upper part of the sequence
A series of windblown sand contexts and a collapsed wall were excavated above and abutting features AK2.516 (a semi-subterranean circular hut structure), AK2.517 and AK2.518 (both probable windbreaks). Four of them contained pottery, all of which was Kassite in date (Wares 6, Coarse Vegetal Temper, and 16, Sand and Vegetal Temper) or belonged to the Uncertain category which could be either Late Islamic or Kassite (Ware 7, Medium Red Ware with Quartz Sand).

Stratified pottery from Feature AK2.516
The pottery from stratified contexts within Feature AK2.516 is likely to be entirely of Kassite date. The single exception is a sherd of Sasanian pottery in an upper fill of wind-blown sand (Context 1808). A small number of sherds in Medium Red Ware may theoretically be

considered to be either Kassite or Islamic, but closer examination implies a Kassite attribution. These were found in an occupation deposit lying between earlier uses of the building and a later intrusive burial (Context 1809). They include an eroded body sherd from a rounded medium sized jar with an appliqué cordon, and a string-cut base (Figure 23.2–3). The base, in particular, indicates a Kassite rather than an Islamic date. Clear string-cutting marks are a consistent feature of pottery of the 2nd millennium BC of the Gulf and Mesopotamia, but not the Islamic Period. Specific examples of string-cut bases are known from Kassite contexts at Qala'at al-Bahrain Period IIIc (Højlund & Andersen 1994: 193). The body sherd with a cordon does not resemble any Islamic vessel shape known to this author.

Pottery from AK0
A few sherds were picked up elsewhere on the island. A fragmentary vessel in buff Fine Ware With Quartz Sand was recovered from a small semi-destroyed stone feature or cairn, Feature AK0.1002 (Figure 22.6). Its fabric, triple-pronged incised decoration and ring base can be compared to sherds from Ras Abaruk Site 5 and Huwailah, dated respectively to the 17th–19th century and 18th AD (Garlake 1978a: fig. 2: 42–5; Garlake 1978b: fig. 2: 20, 24–6).
The only other diagnostic sherd recovered beyond the bounds of AK1 and AK2 was a single piece of incised LISV (Figure 21.4) from a rock-shelter, Feature AK0.1008. Note that this sherd actually joined with one from AK2 (Figure 21.5), indicating that pottery had been moved



FIGURE 26 Pottery from AK1 and AK2 (all scales approx.)
a. Find 312.1: Ridged Barbar pottery from the surface crust of AK1 (Ware 1, Barbar Ware)
b. Find 231.5: Post-Kassite pottery re-used to line the side of firepit AK1.13 (Ware 6, Coarse Vegetal Temper)
c. Find 1500.1.4: Post-Kassite pottery from the surface crust of AK2 (Ware 16, Sand and Vegetal Temper)
d. Find 11.1: Incised Sasanian pottery from the surface of AK1 (Ware 4, LISV)
e. Find 1124.1.2: Incised Sasanian pottery from the surface of AK2 (Ware 4, LISV)
f. Find 1291.1.1: Sasanian pottery from the surface of AK2 (Ware 2, Clinky)
g. Find 1248.1.1: Sasanian pottery from the surface of AK2 (Ware 2, Clinky)
h. Find 3000.1.1: Sasanian pottery from the surface of AK2 (Ware 2, Clinky)



FIGURE 27 (Scale 1:2 approx.)
2003.1.1: Late Islamic incised jar from the surface next to
feature AK0.1003 (Ware 5, 'Fine Ware with quartz sand')

some distances across the island, presumably through human agency.

SUMMARY

The pottery from the island reveals four relatively well-defined occupation horizons:

1. Early Dilmun Period, cf. Qalā'at al-Bahrain IIb–c, ca. 2000–1750 BC;
2. Kassite Period, cf. Qalā'at al-Bahrain Period IIIb (ca. 1400–1100 BC); or, more likely, post-Kassite Period, cf. Qalā'at al-Bahrain Period IIIc, ca. 1100–800 BC;
3. Sasanian Period, probably Late Sasanian, ca. 400–600 AD; and
4. Late Islamic Period, ca. 1700–1900 AD.

Specific reasons can be found for the restriction of the occupation of the island to those times, revolving around fluctuations in interregional trade, Mesopotamian politics and the trajectory of the pearling industry. These are discussed fully in the conclusions to the volume.

Functionally, a little can be said regarding each assemblage. The Early Dilmun period assemblage consisted of medium sized jars and cooking pots. No larger vessels or specialised pottery was noted, and the ceramics are suggestive of a small temporary or seasonal settlement or campsite. The assemblage is comparable to collections found at similar small and ephemeral Dilmun-related sites, found in a chain between Bahrain and the northern UAE (Carter 2003b). See the conclusions for a more detailed discussion of these sites.

A more permanent or specialised occupation is implied for the Kassite occupation, which displays greater variety and includes large jars, as seen in numerous thick body sherds. This is reflected in the architecture excavated by Edens and the French at AK3/Khor Ile Sud, with its evidence for specialised dye production, and perhaps also by the presence of a hut structure at AK2, Feature AK2.516, which is likely to date to the Kassite Period.

The pottery of the Sasanian occupation includes both a reasonably high quantity of small portable jars (broken into the very abundant Ware 2 sherds) and a smaller amount of thick sherds (LISV) suggestive of the presence of one or more larger storage jars. The AK2 collection may be the assemblage of a small village or a regularly-visited campsite. No painted or glazed pottery was noted, suggesting a strictly functional assemblage. Unfortunately it was not possible to identify Sasanian structures on AK2 to clarify the nature of the occupation.

The same can be said to be true of the Islamic occupation. A small village or regular campsite existed at AK2, with some ephemeral activity on AK1. No glazed pottery was recovered by QAP from the island, though Edens notes 'heavily eroded and undatable glazed body sherds' from the Islamic area of AK1/Khor Ile Nord. Its complete absence from both AK1 and AK2 during the QAP fieldwork suggests both that it was rare, suggestive of a relatively impoverished occupation, and that it was selectively removed from the site during French operations.

It is unfortunate that the only reliably *in situ* Early Dilmun pottery deposit was found in a single pit, Feature AK1.195, which otherwise contained only shell, ash, charcoal and small fragments of bitumen. The simple and irregular construction of the pit implies that it was used only to dispose of midden material, e.g. rake-out from nearby hearths or scatters of domestic rubbish.

A second collection which may relate to the use of a structure was found in the semi-subterranean hut or pit structure on AK2, Feature AK2.516. Although highly fragmentary and incomplete, the sherds from within the structure are consistently Kassite in date. It should be noted, however that no pottery was associated with the earliest usage of the feature, so in theory it may have been constructed at an earlier time, i.e. the Early Dilmun Period. The almost complete lack of Barbar pottery on AK2 argues against this.

ROBERT CARTER

4. Discussion and Conclusions

THE STUDY OF AL-KHOR Island offers an opportunity to explore and characterise the coastal occupation of eastern Qatar, and by extension the whole desertic coastal and islands region stretching between the northern tip of Qatar and Dubai. Throughout most of its history this region has been a place of transit. It has never been empty of humans, however, but has hosted nomadic or semi-nomadic fisher-herders, as well as generations of mariners passing between the more populated areas of Eastern Arabia, i.e. Bahrain and the al-Hasa region on one side, and the northern Emirates on the other. Sometimes these boats were passing through as part of a longer journey, linking Mesopotamia with the Indian Ocean on maritime trade routes which ultimately reached as far as China and Africa.

This frequent but transient human presence is demonstrated by the fact that al-Khor Island, a tiny scrap of land measuring just 500 m across, and apparently without fresh water resources, showed evidence for occupation or significant exploitation during the Barbar Period, the Kassite Period, the Sasanian Period and the Late Islamic Period. It is also likely that the island was visited during the Neolithic Period. In all cases it is suggested that the usage of the island revolved around specific activities conducted by visiting groups, rather than settled occupation, namely: as a campsite for passing trading vessels in the Barbar Period; as a source of purple dye in the Kassite Period; as a campsite for pearling expeditions in the Sasanian Period; and as a fishing outpost of the pearling town of al-Khor during the Late Islamic Period.

Because of the multi-period occupation, the general lack of stratigraphy and the habit of re-using

older features, it proved difficult to derive models and motives from the archaeological data alone. These interpretations are therefore largely inferred from contextual information, i.e. the broader settlement histories, exploitation patterns and historical trajectories of the whole region. The exception is the Kassite Period, where Edens was able to put forward a convincing argument for specialised dye-production on the basis of his excavations at Khor Ile Sud.

THE OCCUPATIONS OF AL-KHOR ISLAND

The Neolithic

Definite evidence for the Neolithic occupation of the Al-Khor Island remains elusive. A small number of flints or other chipped stone were picked up from surface contexts (six pieces). Some of these appear to have been retouched, though expert examination would be required to confirm this. Unfortunately the presence of worked flint on the island is insufficient to confirm a Neolithic presence, as flint continued to be used well into the Bronze Age in the region.

It nonetheless seems likely that the Neolithic inhabitants of the bay visited the island. There is ample evidence for occupation of the bay area during the Neolithic period, namely the cluster of sites excavated by the French team at Khor M, Khor D, Khor FPP, Khor FB and an unnamed cemetery outcrop (Midant-Reynes 1985; Inizan 1988: 55ff; Inizan 1980). These are some 6 km to the west of the island, and some provided evidence for connections with Mesopotamia during the

late 6th/early 5th millennium, in the form of Ubaid pottery (Inizan 1988: 209; Inizan 1980: 58, 60, 91).

The Early Dilmun Period: Campsite or Merchants' Waystation?

The occupation during the early 2nd millennium BC is clearly indicated by the presence of Barbar pottery, almost exclusively on AKI. The nature of this occupation is hard to define in detail as it is represented almost entirely by pottery, but the occupation appears neither to have been permanent nor intensive. This is indicated by the relative paucity of pottery, comprising just 187 sherds from surface collection and excavation, and notwithstanding prior removals during the French investigations; the functional profile of the assemblage, which appears to have been restricted to portable jars and cooking pots; the absence of any kind of stratified occupation horizon;¹ and the absence of large or complex structures.

Regarding structures, the only definite example which could be related with any certainty to the Early Dilmun horizon was a simple unlined pit, probably a rubbish dump (AKI.195). Numerous other features may relate to the Early Dilmun occupation, including stone-lined firepits (see below), unstructured hearths and postholes, but this can not be proven because of the high incidence of re-use. Such instances are most graphically illustrated by the iron fish-hook in Feature AKI.2, a structure which contained only Barbar pottery and might therefore have been assumed to be Early Dilmun in date. It may of course have been built during the Early Dilmun Period, but was clearly re-used or disturbed at some later time.

For these reasons the Early Dilmun site at AKI should be defined as a temporary settlement or encampment, used by people with connections with Bahrain during the early 2nd millennium BC. Despite the scarcity of archaeological remains it can be firmly contextualised, because in all respects it is typical of a chain of small sites with Barbar pottery which run between Bahrain and the northern part of the UAE (Figure 28). These have been previously discussed by this author (Carter 2003), but a summary is merited here. These sites are characterised by:

- 1. The presence of moderate or small quantities of Barbar Ware;
- 2. A coastal location, typically on an island less than 20 km from the mainland, overlooking a sheltered bay;

¹ Edens refers to a 'weakly developed buried palaeosol' at Khor Ille Nord (AKI) but this was not observed by the British team.

- 3. The presence of remains indicative of ephemeral usage such as fire-pits;
- 4. The absence of habitation structures², middens of significant size or funerary structures;
- 5. The absence of recognisably local elements of material culture, which might indicate the presence of an indigenous population.

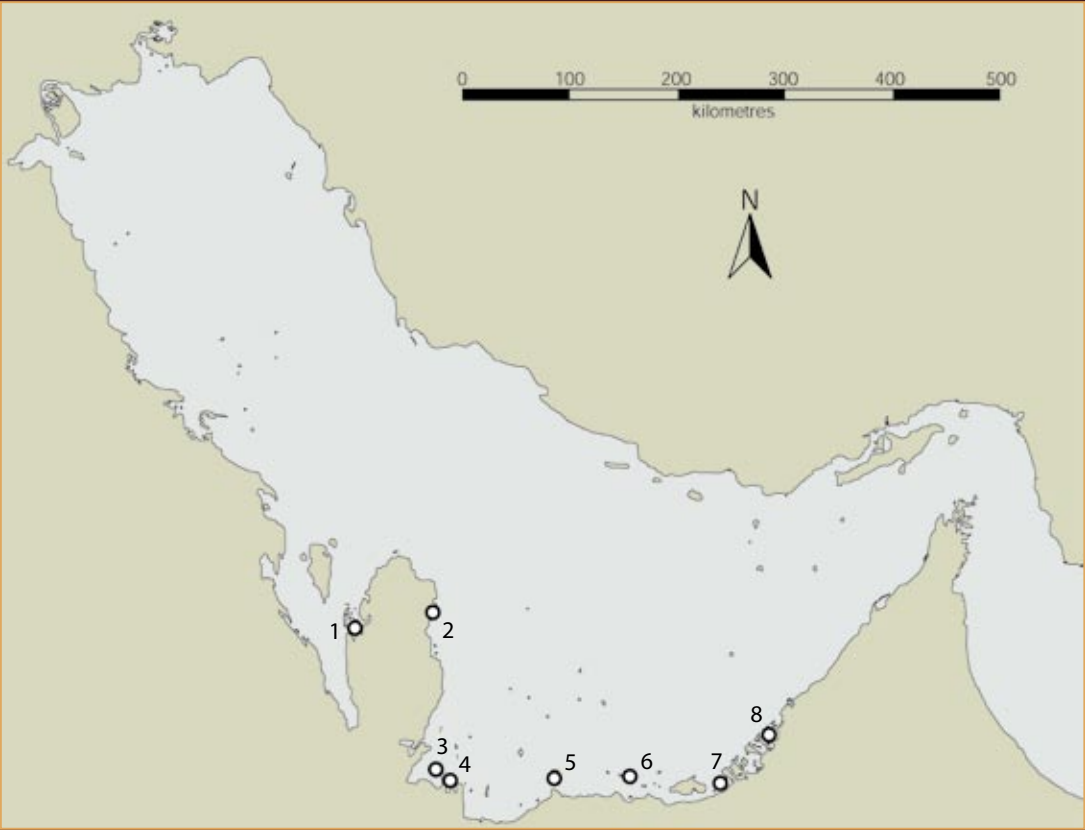
The sites, most of which have been identified by the Abu Dhabi Islands Archaeological Survey (ADIAS), are located between 50 and 100 km apart, and a series of radiocarbon dates taken by ADIAS from two of them, on the islands of Balghelam (BG-5/6) and Marawah (MR-9), both characterised by clusters of stone-lined hearths, yielded calibrated dates compatible with the Early Dilmun Period (Carter 2003: 127), along with other dates indicating occupations later in the 2nd millennium BC, the 1st millennium BC and the first centuries AD (see below). It has been argued that such sites represent the campsites of merchant ships travelling between Bahrain and Tell Abraq, a major settlement site on the border of Sharjah and Umm al-Quwain in the UAE (Carter 2003: 129). Tell Abraq was apparently the only significant settlement on the coast between Bahrain and the mouth of the Gulf. During the early 2nd millennium it functioned as a major staging post in the trade between the Late Harappan civilisation (based in Gujarat) and Dilmun (based in Bahrain, and with other trading partners in Mesopotamia and Iran), and to a lesser extent as an entrepôt (Carter 2001: 196). It is proposed that the string of small sites with Barbar pottery, including AKI, represent minor staging posts or way stations on the leg of the journey between the warehouses of Bahrain and the trading and reprovisioning centre at Tell Abraq. These sites may have been used as regular points to stop off, perhaps one day's representing legs of one day's sail, but may also have been visited only occasionally when fresh water or wood (from mangroves) was required, or when shelter was needed from bad weather.

Alternative scenarios may be envisaged. One is that AKI and similar sites represent the campsites of a local population which was in contact with Bahrain, either visiting directly or trading through other groups. This seems unlikely: apart from the sites with Barbar pottery, Qatar and the Abu Dhabi islands appear to have been otherwise uninhabited at this time. There are no sites or material culture assemblages associated with a local population anywhere between Bahrain and Ghanadha, 340 km east-southeast of al-Khor, unless one counts Barbar pottery and fire-pits. At Ghanadha

² Except possibly for a large unexcavated stone structure at the Sir Bani Yas site.

FIGURE 28 Sites between Bahrain and Dubai with Barbar pottery.

- 1. Bir Abaruk, Site 3a (Smith 1978b);
 - 2. al-Khor, AK1 (Edens 1999);
 - 3. Ghagha, Site K (King & Tonghini 1998: 130);
 - 4. al-Ufzayyah, Sites 1 and 2 (Carter 2003);
 - 5. Sir Bani Yas, Site 37 (Hellyer 1998: 68);
 - 6. Marawah, Sites MR-9, MR-12, MR-6.2 (Carter 2003);
 - 7. Rufayq, Site RU-2 and RU-5 (Carter 2003);
 - 8. Balghelam, Site BH5-6 (Carter 2003).
- The pottery from all these sites has been examined at first hand by the author, except that of Bir Abaruk.



and sites further east, the Barbar pottery is associated with elements of the local Wadi Suq assemblage, implying the presence of an indigenous coastal southeast Arabian population which did not extend as far as the Abu Dhabi islands region and Qatar. The effective depopulation of this region may have been enforced by increasing aridity, initiated by an abrupt hyper-arid event at around 2100 BC (Parker et al. 2004: 674). The region had supported local populations during the 3rd millennium BC, as demonstrated by finds at Jebel Dhannah 1 and 3, Ras al-Aysh 1 and Umm an-Nar island (Vogt et al. 1989: 53–7; Frifelt 1995), and especially during the Neolithic Period, for example on the islands of Dalma and Marawah (Beech et al. 2005; Beech et al. 2000), not to mention the Neolithic sites around al-Khor itself, discussed above. During the Neolithic, archaeological remains included stone-built structures, abundant lithics, grinding stones, fishing equipment, shell middens, and faunal remains and fish bones, while the 3rd millennium remains included funerary monuments at Ras al-Aysh and Jebel

Dhannah and extensive settlement remains and tombs at Umm an-Nar. Similar finds are not associated with any of the sites with Barbar pottery between Qatar and Ghanadha.

Another possibility is that the sites represent the campsites of visiting fishermen or pearl fishers from the Early Dilmun sphere. It would not necessarily be possible to distinguish such sites from those of passing merchant ships, though as noted above there is little in the way of evidence for fishing or other occupational debris, compared to earlier sites. Pearl fishing was probably practised by the inhabitants of Bahrain, as suggested by the presence of fourteen pearls at the Saar settlement, albeit unpierced (Moon 2005: 180). Most observers consider the 'fish-eyes' imported into Ur during the early 2nd millennium BC to be pearls, presumably from the Gulf (Oppenheim 1954: 7; Carter 2005: 143), though some have their doubts (Howard-Carter 1986).

The Kassite or Post-Kassite Period

Little can be said about the Kassite/post-Kassite occupation of AK1, though more can be inferred from the excavated features on AK2. Some of the AK1 features may date to the Kassite/post-Kassite period but this cannot be proven. The hearth which was lined with Kassite/post-Kassite pottery may date to that period or any subsequent one. Even the pottery itself may have been brought from elsewhere (i.e. AK3/Khor Ile Sud), the sherds having been chosen for their large size and thickness.

AK2.516–8, the semi-subterranean circular structure and associated features found at AK2, are likely to be of Kassite/post-Kassite date, and provide a rare insight into domestic structures in the region at that time. Such features have not, to the knowledge of this author, been found elsewhere, except at Wusail, on the coast just 20 km to the south (but see below for rectangular subterranean features at AK3/Khor Ile Sud). An unpublished report written for the Department of Museums and Antiquities by Professor Masatoshi Konishi, following a visit in 1995 to Qatari excavations at Wusail, reveals the existence of at least five subcircular semi-subterranean structures (Konishi 1995). These were described as ‘circular or semi rectangular-shaped pit dwellings, with vertical stone linings along the walls’. Three of them showed linear features extending from them in the same way that the windbreaks AK2.517 and AK2.518 lead off from the hut structure at AK2 (Konishi 1995). These comparisons suggest that the windbreak features leading off AK2.516 are an integral part of the pit dwelling. Konishi noted the presence of a bronze arrowhead, iron nails and ‘hard-baked potsherds [which] seemed rather late’, but prefers to date the features to the Bronze Age, noting the stratigraphic problems caused by sandy conditions and reoccupation (similar to the problems encountered at AK2). Photographs of the pit features and the arrowhead are given by Nayeem (1998: 137–40, figs. 20–4; 218, fig. 12). Significantly, an attached letter from T. Gotoh of Tokyo National Museum gives three radiocarbon dates obtained from shell at Wusail, though their stratigraphic associations are not stated. These are 3110 +/- 100 BP, 3590 +/- 110 BP and 3350 +/- 90 BP, which were calibrated to 1160 BC, 1640 BC and 1400 BC respectively. The dates from the Wusail structures therefore indicate occupation during the Kassite/post-Kassite Period, supporting the same date for the analogous structure at AK2, as also indicated by the pottery.

It seems probable that the excavated features at AK2 and Wusail are pit dwellings dating to the Kassite or post-Kassite Period. The advantage of such sunken

structures would be that the temperature would remain even and cool during hot weather. It is uncertain whether they should be regarded as evidence for the presence of a local population, albeit probably a fairly mobile one. Given that the origin of the Kassite/post-Kassite pottery on al-Khor Island is certainly Bahrain, they might equally be the domestic structures of visiting groups who spent part of the time each year on the east coast of Qatar.

Another site of probable Kassite or post-Kassite date in Qatar is found at Ras Abaruk (Site 6), on the west coast (Garlake 1978). This included rectangular structures and was interpreted as a fish-curing complex, and wrongly dated to the first millennium AD. A sherd decorated with a row of incised crescents between parallel lines and an open bowl with very thin walls and an inturned rim (cf. Højlund & Andersen 1994: figs. 728–9, 757; Højlund 1987: 77–9, Type 67), indicate a Kassite or post-Kassite date, as does the dominant fabric, described as pitted, ‘probably the result of the decay and disappearance of an organic temper’ and frequently coated on the inner side with ‘a black carbonised deposit’, actually bitumen (Garlake 1978: 143).

Reasons to visit the coast of Qatar may have included fishing, perhaps pearling and certainly the production of red-purple dye from shellfish. Edens convincingly characterised the site at AK3/Khor Ile Sud as a dye-production centre ultimately linked to Kassite rule in the Gulf, which was politically centred on Bahrain. A midden containing the remains of an estimated 2.9 million individual crushed shells of *Thais savigny* was found at Khor Ile Sud, along with large pottery vats, probably used to macerate the crushed molluscs (Edens 1999: 79). Also found were rectilinear stone-lined pit features ranging from 2 x 2 m to 6 x 2.5 m in size, as well as occupation debris consisting of ash, faunal debris, pottery and worked stone (Edens 1999: 72–4). Note that the rectilinear features excavated at Khor Ile Sud are of similar construction to the circular subterranean structures at AK2 and Wusail, being pits shored up with vertical slabs of beach-rock. It is not clear whether they too should be regarded as subterranean hut foundations, or as structures of specialist function.

Edens speculates that the dye-production could have been controlled by officials of the Kassite administration on Bahrain (Edens 1999: 84; Edens 1986: 215). He notes that red-purple dye could have been used in the production of coloured textiles, gifts of which by the king would have held profound symbolic importance in Babylonian politics and society (Edens 1994: 216–19). Thus, Khor Ile Sud may have directly

played a part in the legitimisation of Kassite rule of Babylonia and its dependencies.

Note, however, that the pottery from AK1 and AK2, as well as the published material from Khor Ile Sud (AK3) implies a later, post-Kassite rather than a Kassite date (cf. Period IIIc at Qal’at al-Bahrain), though this cannot be established with certainty. A post-Kassite date calls into question the link between the dye-production centre and the Kassite political economy, though not necessarily a connection with southern Mesopotamian elite markets. Edens himself observes that the need for legitimisation of royal rule was just as important, if not more so, during the rule of the unstable post-Kassite dynasties (Edens 1994: 218–19). It therefore remains possible that purple dye was produced on the island for royal (or at least elite) patrons in Mesopotamia.

It is more questionable whether dye production was directly controlled by officials from Babylonia or their representatives in Bahrain. It appears that Kassite control of Bahrain may have lapsed as early as the late 14th century BC (Potts 2006: 116). Thus, if dye was being extracted for the political elites or a more general market in Mesopotamia, it was probably under the control of independent producers, perhaps visitors from Bahrain, or even a local population. It is even possible that the dye was destined for Iranian markets rather than the post-Kassite sphere. There are faint indications that the region east of Bahrain was more closely connected with the Elamite economy, as suggested by a small amount of pottery from Tell Abraq which resembles Middle Elamite shapes, and a Middle Elamite cylinder seal from the same site (Potts 1992: 428–32; Potts 1990: 122–3). Potts speculates that there was an amicable division of influence in the Gulf between the Kassite rulers of Babylonia and the Elamite rulers of western Iran, with the Kassites controlling the western region, including Failaka and Bahrain, and the Elamites having a somewhat ill-defined sphere of influence in the Lower Gulf (Potts 2006: 199). Qatar would be on the border of these putative spheres of influence. Note however, that the Kassite/post-Kassite pottery of al-Khor island is comparable to ceramics from Bahrain, which itself indicates strong connections with Mesopotamia (Højlund & Andersen 1994: 476), implying that the people at al-Khor island were more economically integrated with the Mesopotamian sphere rather than the supposed Elamite one.³

³ A great deal more evidence and research is required before Potts’s suggested spheres of influence can be confirmed. Moreover, there is no reason why political spheres of influence should overlap with discrete distributions of material culture, though it could be argued that pottery and other finds could indicate prevailing patterns of trade

The Sasanian Period

The discovery of a Sasanian component, concentrated on AK2, was unexpected, and provides rare evidence for Sasanian occupation in coastal Eastern Arabia. Despite the fact that no features could be assigned with certainty to the period, on either AK1 or AK2, the quantity of pottery suggests either the presence of a small village or a regularly occupied camp-site at AK2, with possible use of firepits on AK1. In the absence of identifiable excavated remains, the activities of the inhabitants or visitors can only be inferred from the pottery and circumstantial evidence.

The pottery consists largely of small plain vessels, with a very small number of larger jars. The assemblage can be characterised as repetitive and impoverished: most of the vessels consist of small jars of the same form and fabric, and there is no sign of painted, glazed or fine wares. The fabrics suggest manufacture in Iran or the Lower Gulf, rather than Bahrain and the Central Gulf. This assemblage could be typical of the population of a small coastal village which did not make its own pottery, or of visitors from further afield, e.g. fishing or pearling expeditions from the Iranian coast or Lower Gulf.

Before we review the possible reasons for living on or visiting the island during the Sasanian Period, it must be stressed that the Arabian Gulf coast is poor in evidence for occupation at this time. In a recent and highly detailed study, Derek Kenner has reconsidered the dating of numerous sites which were hitherto considered to be Sasanian, and concluded that many of them are wrongly assigned or cannot be dated (Kenner 2007: 89, tables 1–2). In particular, according to Kenner, no Sasanian sites at all (apart from the ones identified in this study) are confirmed between Bahrain and Tell Abraq (Sharjah), a space of coastline measuring over 450 km as the crow flies (Kenner 2007 fig. 2). This is not due to lack of fieldwork: the Abu Dhabi Islands Archaeological Survey, latterly part of the Abu Dhabi Authority for Cultural Heritage, has conducted surveys of most of the islands and much of the coastline in the region. This author has examined much of the pottery collected during this fieldwork, and has identified no significant Sasanian assemblage, though Sasanian pottery may possibly have been present in small quantities among collections of other dates, implying very low-level occupation or occasional visitation. Possible exceptions are found in the western region of the Abu Dhabi Islands, adjacent to Qatar,

and economic interaction. Note that the small site of Shimal in Ras al-Khaimah, within the supposed Elamite sphere, produced pottery comparable to material from Failaka 3B–4A (Velde 1992: 96–7), implying connections with Mesopotamia, or at least Failaka or Bahrain.

the pottery of which has not been examined by this author. King & Tonghini report 1st–4th c. AD pottery (i.e. Parthian to Early Sasanian) on Ghagha and ‘other islands examined in this area’ (King & Tonghini 1998: 131), thus perhaps including al-Uffzayah, Yasat al-Ulya and Yasat al-Sufla. Kennet considers this western Abu Dhabi material to be earlier, dating to the 1st/2nd c. AD or before (Kennet 2007: 94), but some of the rims from Ghagha are compatible with a later Sasanian date and have good parallels at AK2 and Kush (see especially King & Tonghini 1998: fig. 3f, j–k; cf. Clinky/QAP Ware 2). Unfortunately no ware codes or site attributions accompany the illustrated material. The island of Dalma is reported to have sites dating to the 6th–7th c. AD (DA-7) and 5th–8th c. AD (DA-18) (King 1998: 56–7, 63), but this material has neither been published nor viewed by this author. Kennet discounts it, but it would be surprising if Dalma was not occupied at this time, given its historical role as a water source and seasonal centre. Another potentially Sasanian site has been claimed for the monastery on the island of Sir Bani Yas (SBY-9) (King 1997; Elders 2003), but this has now been unequivocally redated to the Early Islamic Period (Kennet 2007: 92; Carter 2008).

It therefore appears that the Sasanian occupation of eastern Qatar and the Abu Dhabi Islands region was slight, with only one confirmed site (AK2), the probability of another on Ghagha, and only the possibility of one on Dalma. There is no indication of a major Sasanian-period settlement, but it appears that the region was not entirely empty. It is possible that such an ephemeral presence relates to pearl-fishing activities, which were significant during the Sasanian Period, though other scenarios similar to those outlined for the Bronze Age could be suggested, including fishing expeditions from neighbouring regions; passing traders; or the presence of coastal communities who were highly mobile but nonetheless might be considered indigenous. Such mobile communities generally need to be within easy reach of a permanent settlement with which to interact in order to ensure economic survival, and the known centres on Bahrain and the northern Emirates are probably too distant to support mobile communities in the region in question. Specialised fishing and pearling communities became resident in the region only during and after the 18th century AD, when the booming international trade in pearls encouraged the foundation of permanent centres in previously uninhabitable areas, including Qatar (e.g. Doha, Zubara) and the Abu Dhabi Islands (Abu Dhabi) (Carter 2005).

The pearling scenario is supported by textual and archaeological evidence for pearl-fishing during the Sasanian Period, including state-sponsored pearling expeditions. Some consider that large-scale pearling began in the region during or shortly before the Sasanian Period (Williamson 1971–2: 29). While this may underestimate the scale of earlier pearl-fishing activities, the demand for pearls at the Sasanian royal court was certainly very high, and numerous sources detail the pearl-encrusted accoutrements and weaponry of the Sasanian monarchs (Carter 2005: 192; Simpson 2003: 67). Some of these pearls probably came from the Iranian side: it is thought that the Sasanian port town of Rishahr (Rev Ardashir) on the Bushehr Peninsula was a centre for the pearling trade (Williamson 1972: 106). The nearby island of Kharg is historically associated with pearls (Fiey 1979: 196), while a string of Sasanian sites with pearl oyster middens are found along the otherwise barren Iranian coast between Bandar e-Lengeh and Siraf (Williamson 1971–2: 29).

There is equally good evidence for an active pearl-fishery on the Arabian coast. According to the Chronicle of Seért the Sasanian monarch Khusrau I (531–579 AD) tasked a Christian, Ezekiel, with leading a successful pearl-fishing expedition. This may be Bishop Ezekiel of Hagr (Hajar), a town on the Arabian side of the Gulf probably located in the al-Hasa oasis (Bin Seray 1997: 213), who held a synod in 576 AD (Bin Seray 1996: 321). The Babylonian Talmud (ca. 250–550 AD) recounts that pearls were brought to Meshmahig, the seat of another bishopric thought to be at modern Samahig on the island of Muharraq, Bahrain (Simpson 2003: 67). Bahrain and the adjacent mainland were therefore a focus of pearling activities, which were frequently associated with the Christian communities of the region (Carter forthcoming). Note, however, that according to Lorimer’s map the densest pearl banks are found off the north and east coasts of Qatar (Carter 2005: fig. 1). It seems highly likely that pearling expeditions ventured from Bahrain to the rich fisheries off Qatar, and AK2 may represent one of their encampments.

The Late Islamic Period

Identifiable archaeological remains dating to the Late Islamic period on the island are restricted to pottery scatters all over the island, but concentrated in a certain area of AK2. Numerous undatable or unexcavated structures may date to this occupation or earlier horizons, including fire-pits, post settings and unclassifiable stone structures showing through the surface of AK2. The large, shallow, dish-shaped stone-lined pits on AK1 may also belong to the Islamic

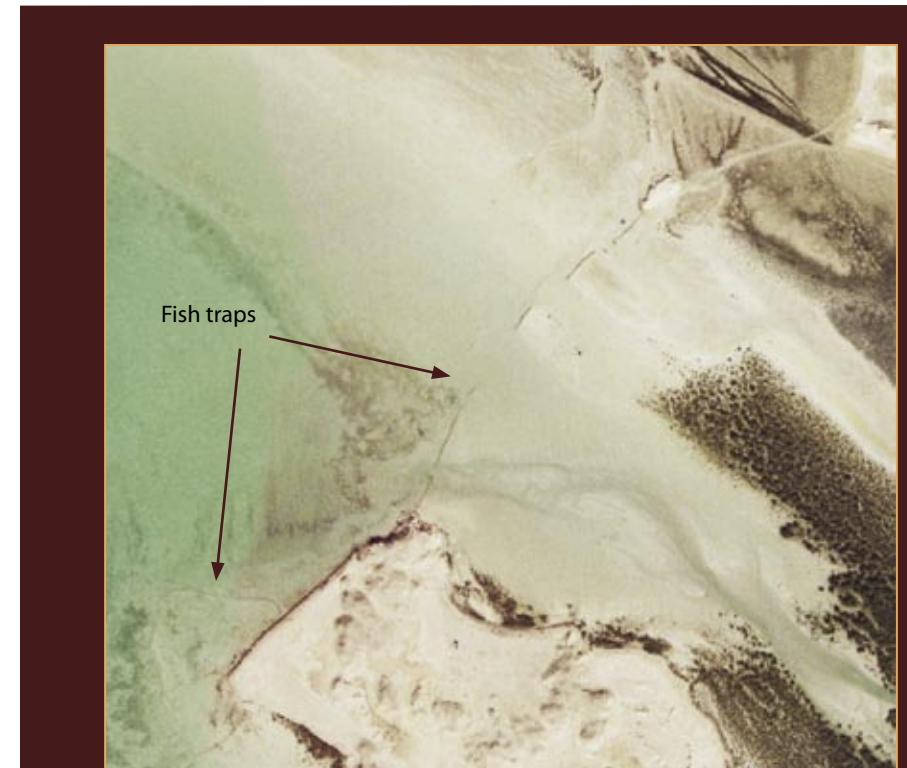


FIGURE 29 Fish traps at the north end of Al-Khor Island

Period (AK1.3, AK1.4, AK1.12, AK1.31), judging from an admittedly problematic radiocarbon date mentioned by Edens (1999: 71), and the presence of Late Islamic sherds in the fills of three of them (AK1.3, AK1.4, AK1.31). The function of these structures is uncertain, as is the significance of the presence of oyster shells beneath their stone lining.

Also of probable Late Islamic date is the row of stones enclosing the intertidal bay on the north side of the island, which is believed to have been a fish trap. This dating is assumed on the basis of its survival in an intertidal zone, and comparison with recent historical accounts of inshore fishing techniques. Sergeant mentions a kind of stone fish trap known as *maskar* in Qatar, but he does not describe it (Sergeant 1978: 155). However Beech & Al Shaiba refer to a kind of tidal trap known as *sikar*, which is stretched across narrow estuaries or gaps in lagoons. These are described as ‘a fence of nets linked by wooden posts’, though Beech & Al Shaiba also mention an example made of a wall of beach-rocks on the island of Marawah (Beech & Al Shaiba 2004: 10). Similar stone features are known from Ghagha and the Yasat islands, closer to al-Khor (Beech 2003: 294). *Sikar* and *maskar* share the same root and it appears that the devices described

by Sergeant and by Beech & al Shaiba are the same, with *maskar* being the preferred name in Qatar. More elaborate fish traps are known from Bahrain and the UAE, known as *haddrah* (also *hadrah* or *hadhra*). These were constructed using a fence of palm fronds or wooden stakes, braced by linear stone foundations (Sergeant 1968; Beech & Al Shaiba 2004: 9). As the tide fell, the fish were unable to escape the barrier. Unlike *maskar*, *haddrah* tended to be funnel shaped or incorporate an enclosure into which the fish were directed as the tide fell. In both, however, a barrier of stones, stakes or stakes braced by stones was used to trap fish on the ebb tide which could then be netted or speared.

The presence of the *maskar* fish-trap offers clues as to the reasons that the island was visited in recent centuries. During the winter, when it was too cold to dive for pearls, the inhabitants of the coastal towns, including al-Khor, either remained in their settlements and engaged in boat-building and fishing, or retired to nearby or more distant inland regions to graze their herds, which they also maintained (Montigny 1980: 132–3; Ferdinand 1993: 40). Those who stayed in the town or elsewhere on the coast would have gone fishing, as would any local bedouin. It is reported that in Qatar fishing parties comprising men, women and children would venture forth on foot to catch fish using a variety of means, including harpoons for shallow water fishing, poison, and fish traps made of palm fronds which would form a barrier at high tide and trap the fish as it ebbed (Graham 1978: 76; Hardy Guilbert 1998: 91). The island may also have been visited to collect wood from the mangroves, and perhaps also to provide fodder or pasture for the herds of the townspeople and the pastoral nomads of the region. Thus, members of the nearby settlement at al-Khor would have used the island to fish, perhaps sometimes camping at AK1 and AK2 during prolonged fishing or resource-gathering expeditions, and leaving archaeological remains, including pottery.

Such a use of al-Khor island would have been dependent on the settlement of the town of al-Khor, which in turn was founded in response to the pearling boom of the 18th to 20th centuries AD. The connection between coastal habitation and pearling is extremely strong for the east coast of Qatar during the Late Islamic Period. The one major resource of the region is the pearl fishery, the richest banks being located off the north and east coasts of Qatar and around the western islands of Abu Dhabi. Pearls were collected from the Gulf for millennia, since the Neolithic, and their fame had spread as far as the classical world by the last centuries BC (Carter 2005). It is unclear

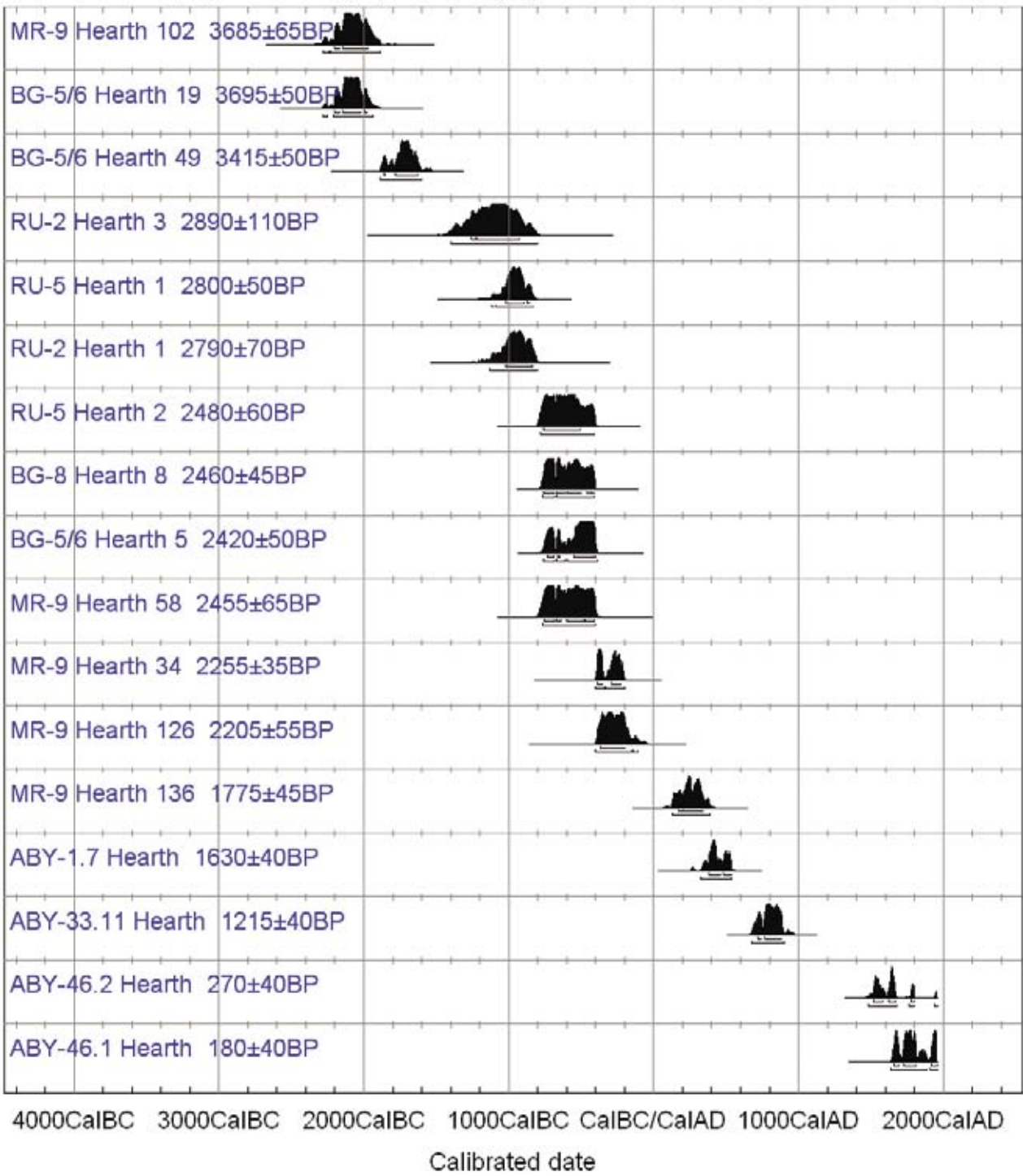


FIGURE 30 Radiocarbon dates from charcoal taken from stone-lined firepits and hearths on the islands of Marawah, Rufayq, Balghelam and Abu al-Abyadh, Abu Dhabi. Data derived from <http://www.adias-UAEcom/radiocarbon.html>

whether the rich banks off eastern Qatar and western Abu Dhabi were visited for pearling during the early centuries, or just the ones nearest centres of population, e.g. off the north coast of Bahrain. By the Sasanian Period, however, there is textual evidence for state-sponsored expeditions, and the first clear archaeological evidence for villages or regularly-visited campsites emerges in the region, namely the Sasanian remains at AK2, and perhaps some of the sites in western islands of Abu Dhabi identified by ADIAS. Pearls are specifically associated with Qatar by the 10th century AD, when al-Mas'udi (896–956) speaks of pearls in the waters off Qatar, Kharg, Oman and the Red Sea (al-Shamlan 2000: 34). It is not until much later that the expanding pearling industry caused a major change in the settlement patterns of the region. During the 18th and 19th centuries there was a soaring international demand for pearls in Europe, India and North America, coupled with the collapse of overexploited New World fisheries. The resulting boom stimulated the emergence of towns and smaller satellite settlements, especially along the coast of Qatar and around Abu Dhabi (Carter 2005: 182–3). This encouraged the settlement of tribal groups on the coast, explicitly to develop the opportunities offered by the pearl trade. The most obvious examples in Qatar are provided by the settlement of the al-Khalifa at Zubara and the al-Thani at Bida'a (Doha), but lesser-known towns such as Ruwayda, Huwaila, Wakra, Ruwais, Abu Dhuluf, Furaihah and al-Khor itself were also founded and settled by groups which were presumably pastoral nomadic in origin. Ferdinand states that, compared to other Gulf countries, Qatar had the greatest proportion of its inhabitants engaged in pearling at the start of the 20th century, at around 50% (Ferdinand 1993). This underestimates the extent of the participation of other communities in the Gulf, but the statement illustrates the importance of the practice.⁴

The inhabitants of the towns of al-Khor and nearby Dhakirah were al-Mahanda, a settled section of the Bani Hajir (Montigny 1980: 131; Johnstone & Wilkinson 1960: 445), a pastoral nomadic group of eastern Saudi Arabia.⁵ They, and sections of the

⁴ Examination of Lorimer's figures shows that 50% or more of the population of Ajman, Dubai and Abu Dhabi were engaged in pearl-fishing (Carter 2005: 154).

⁵ It is sometimes stated that the bedouin of Qatar did not engage in pearling, other than to be paid to guard the coastal settlements during the diving season when the townsmen were away (Montigny 1980: 135). The reality is far less clear. The pearl-fishing townspeople were by origin branches of the bedouin tribes, and presumably maintained kin links and affiliations. Qatar's leading pearling families in the 18th and 19th centuries included the al-Khalifa of Zubara (a branch of the Bani Utub) and the al-Thani themselves (of the Ma'adhid tribe), both groups originally of bedouin stock. It is

surrounding nomadic population, partook in the pearl fishery during the diving season, which ran from mid April to the beginning of October (Hardy-Guilbert 1998: 91). The exact time of settlement of al-Mahanda at al-Khor is not recorded in the western sources,⁶ though it appears that the town did not exist at the time the al-Khalifa settled Zubara in 1766 (Said Zahlan 1979: 14). In fact it is not until the 1760s that we have sound historical evidence for pearling towns anywhere in the region, when Huwailah is mentioned by Niebuhr along with Kattar, Jusofie (Ra's Yusufiyah, where the historic pearling towns of Ruwais and Abu Dhuluf are located) and Farahah (al-Furaihah).⁷ There is archaeological evidence, however, and single brief reference in Lorimer, that the town of Ruwayda existed prior to the foundation of Zubara (Lorimer 1908: 1515; De Cardi 1978: 187, Site 16a–b). Ruwayda is not mentioned by Niebuhr, and if this town escaped his notice, it is possible that al-Khor was also in existence. By the time of Lorimer's survey (i.e. the early 20th century) the town of al-Khor (Khor Shaqiq) was the third most important pearling settlement in Qatar, with 80 boats and 1,200 men employed in pearling, after Wakra (150 boats) and Doha itself (350 boats) (Lorimer 1915 Annexure 3: 2256–62).

It is possible that al-Khor Island had a more direct connection with pearling, in that vessels themselves

well known that sections of the bedouin Na'im partook in the dive (Ferdinand 1993: 41, 46), while the Ka'aban are described as bedouin by Lorimer, but some of them partook in the pearl fishery on Bahrain (Ferdinand 1993: 41).

⁶ It would be interesting to hear an account of their tribal origins and the foundation of al-Khor from the Mahanda themselves. An unpublished thesis by Montigny's may contain this kind of information, but it has not been seen by this author.

⁷ Niebuhr collected his information from English sea-captains prior to 1765 (Facey 1987: 204). At this time Huwailah was occupied by the al-Musallam sector of the Bani Khalid (Hardy-Guilbert 1980: 122), and was the principal town of Qatar before Zubara was founded in 1766. The ceramics recovered from the fort at Huwailah, excavated by the French team, suggested a date not earlier than the mid 18th century for the fort construction. Niebuhr describes Kattar as a port on the coast opposite Bahrain, rather than a region or peninsula. Whether he is mistaken here, or whether Kattar for a time referred to a specific settlement remains uncertain. Lazaro Luis's map of 1563 shows a city of Qatar (Cidade) while Yakut speaks of the village (qaryat) of Qatar in the 13th century (Hardy-Guilbert 1998: 89). If such a settlement exists, which is not impossible, it remains to be discovered. At the start of the 17th century, Teixeira states that Qatar was visited by boats from Bahrain, Julfar and 'Nihhelu' (Sinclair 1902: 176). It was described as 'a port of Arabia', perhaps implying the presence of a coastal settlement of sorts, but is not mentioned as place which harboured pearling vessels. At earlier times, during the Sasanian and Early Islamic Period, Qatar (Bet Qatraye in the records of the Church of the East) was used as a general term for the coast of eastern Arabia, with an unspecified border with the Mazun, the Oman Peninsula (Bin Seray 1996), rather in the way that al-Bahrain and al-Khatt were used in following centuries.

or pearling parties stopped off to camp at the island during the Late Islamic Period. It seems unlikely that the island would have been favoured as a mooring point for pearling boats, given the location of the town of al-Khor just 3 km away, but the pierced stones from AKI.2, which appear to be divers’ weights, may support this possibility.⁸ Note that AKI.2 contained an iron fish-hook, and its final use may therefore relate to the Late Islamic or the Sasanian occupation of the island, both of which are likely to be connected to pearling.

EXPLOITING THE COASTAL DESERTS OF THE ARABIAN GULF

Our excavations on the island underlined the difficult nature of coastal archaeology in the region, caused by the multiple re-use of sites and features for thousands of years. The stratigraphy of the sites is effectively non-existent, and the dating of the constituent parts is unreliable, even if pottery is associated or radiometric dates are obtained. Certain favourable coastal locations were regularly revisited for temporary occupation, effectively as campsites. The lack of prolonged occupation prevented the build-up of anthropogenic deposits, and thus did not allow the burial of structures and strata, while the low level of vegetation and bioturbation maintained stable or deflating land-surfaces. Except in times and places susceptible to sea-level fluctuation, the campsites were left fossilised. When the inhabitants left, whether a kin group of pastoralists or fishers, a lone herdsman or a crew of pearlers, the features remained at the surface unchanged, save for infilling with windblown and slumped material (perhaps containing older pottery from surface scatters). A returning group, perhaps revisiting regularly as part of an annual cycle, or opportunistically after a gap of years, centuries or even millennia, would have found a visible and recognisable pattern of infilled hearths, pits and perhaps other features. Any opportunity to clear out and re-use hearths and storage pits would have been taken, as it is less labour-intensive than digging and lining a new structure.

Such repetitive practices are suggested by the contents of some of the features at al-Khor, such as the Barbar pottery associated with an iron fish hook in feature AKI.2, the mixed pottery assemblage of feature AKI.3, and the fact that morphologically similar features contain pottery of completely different dates, e.g. AKI.2 and AKI.I3, both circular stone-lined firepits, which contained Early Dilmun and Kassite pottery respectively.

⁸ The traditional term for a diver’s weight was a ‘stone’, even if the weight was made of metal (Graham 1978: 163).

Radiometric confirmation of the repeated use of campsites over millennia has been obtained by ADIAS in the islands of Abu Dhabi. The east coast of Qatar is in the same ecological and geographical zone as the islands and coastline of Abu Dhabi emirate, and both share a similar historical trajectory. The whole area is characterised by very low rainfall, with low rocky and sandy shorelines and islands, interspersed with sabkha (salt flats), and backed by a flat desert landscape. The poor soils, sparseness of vegetation, low rainfall and lack of abundant groundwater (unlike, for example, Bahrain and the al-Hasa oasis) do not allow significant agriculture. Since the Neolithic, therefore, human occupation of this region has depended on a combination of marine resources and pasturage for herds of sheep, goat and camels and has been characterised by a high degree of mobility.⁹

A range of dates is available from sites in Abu Dhabi comprising clusters of comparable stone-lined firepits and stone hearth settings¹⁰ on the islands of Marawah, Balghelam, Rufayq and Abu al-Abyadh. Features from the sites of BG-5/6, BG-3, MR-9, RU-2, RU-5, ABY-1.7, ABY-33 and ABY-46 were carbon dated. Some of the hearths on MR-9 and BG-5/6 yielded dates compatible with the Early Dilmun horizon, which is congruent with Barbar pottery found at those sites. Other dates cover an extensive range which would include the post-Kassite and Sasanian Periods attested to at al-Khor, and also includes Iron Age dates of the middle and later first millennium BC, a period which has no ceramic manifestation on al-Khor island. (Carter 2003: 127, table 2; Hellyer & Beech 2001).

The chronological pattern derived from the clusters of firepits in the Abu Dhabi islands is similar to that derived from the pottery of al-Khor island. The three earliest dates all fall into the Early Dilmun Period. After a gap, a series of dates from Rufayq indicate occupation between 1400 BC and 800 BC (covering the Kassite and post-Kassite Period), tending towards the later two centuries of that range (the post-Kassite Period). A single date from Marawah (Hearth 136) is compatible with the Sasanian Period.

Of particular interest is the series of almost identical dates from Rufayq, Balghelam and Marawah which calibrate to between 800 and 400 BC (mid-late Iron II and Iron III Period) (Magee 1996: 249). This period is not represented in the ceramics of al-Khor. Neither is it present in the ceramics of the sampled firepit sites,

⁹ During the Neolithic, when it was wetter and there was increased vegetation cover and water supplies, cattle were also herded (Kallweit 2003).

¹⁰ During the Neolithic, when it was wetter and there was increased vegetation cover and water supplies, cattle were also herded (Kallweit 2003).

and indeed it is barely represented at all in the ceramic assemblages of the Abu Dhabi islands. Its radiometric representation on three different Abu Dhabi islands, however, implies that the region was exploited at this time by people carrying very little pottery. Such a ceramically invisible occupation may of course have occurred at al-Khor. Occupation continued at Marawah into the last centuries of the 1st millennium BC, another period which is not represented in the island’s assemblages. We can therefore conclude that the major occupation horizons of al-Khor Island are mirrored in the islands of Abu Dhabi, and moreover that occupation horizons exist there, and therefore potentially at al-Khor, which are not represented in the ceramic assemblages, particularly during the Iron Age and Hellenistic/Parthian Period.

We can also say that an occupation characterised by stone-lined firepits is typical of several periods all over the region (particularly the Early Dilmun, the post-Kassite, the Iron Age and the Sasanian Periods). This kind of occupation is, in truth, earlier still. Firepits, often lined with stone, were also characteristic of Neolithic occupation in Kuwait, Qatar and the UAE (Carter & Crawford 2003: 78; Carter & Crawford 2002: 4; Smith 1978a: 55–60; Inizan 1988: 91–3; Uerpmann et al. 2000: 229–30). At the other end of the chronological scale, anecdotal evidence suggests that stone-lined firepits were also used during the Late Islamic Period, and Late Islamic dates were obtained from hearths on Abu al-Abyadh. It is not clear that these should be described as fire-pits as they appear to have been above-ground, so the technology may have been different. The large dish-shaped stone-lined features with oyster layers may be examples of Late Islamic firepit technology, though evidence for burning, in the form of ash, charcoal and scorched stones was absent.

Finally, note that stone-lined firepits and stone hearth settings are merely the most visible remains of the kind of campsite occupation which is characteristic of the region between the Neolithic and the Late Islamic Periods. Also present at al-Khor were unstructured hearths and postholes, while other sites in the region also show wells, water-trapping features and midden remains. Postholes would have been for structures such as tents, huts and drying racks. Some features of these sites, including tents and palm frond huts (*barasti*, also known as *arish*) may have left no archaeological trace whatsoever.

CONCLUDING REMARKS

The investigations at al-Khor Island (bin Ghanim Island) revealed a history reaching back at least 4,000 years. It was probably never permanently inhabited, but rather was visited for specific reasons at different times. The pattern of exploitation is very similar to that seen in the islands of Abu Dhabi, and the two areas can be regarded as being parts of one greater region, sharing the same ecological characteristics and trajectories of human habitation. Its major resources were pasturage, fish, shellfish and pearls, and these, along with the need for transit between other regions of the Gulf, were the reasons that the region was visited. Pearling had a major impact on settlement patterns during the Later Islamic Period, but also attracted earlier visitors, particularly during the Sasanian Period.

The remains uncovered at al-Khor Island typify the kind of archaeology encountered in desertic coastal zones, not just in Qatar and Abu Dhabi but also in other coastal regions of the Gulf. Such an ephemeral, transient occupation of ecologically marginal zones is usually difficult to characterise and frequently impossible to date, but is a highly significant component of the archaeology of the region. Mobile communities, both coastal fisher-herders and inland pastoral nomads, were among the most important groups of the region, numerically, politically, historically and in terms of geographical and chronological extent. While much ink has been expended on ethnographic and historical studies of land-based pastoral nomads, insufficient attention has been paid to the coastal inhabitants of the region and their historical and archaeological signature. In fact, coastal living and seafaring has been and is still crucial to the way of life and identity of the inhabitants of the region. This reflected not only in the almost universal involvement of the population in the pearling industry, which is still in living memory, but also in more ancient seafaring exploits which remain in the popular imagination, whether they be memories of the great Arab seafarers who plied the Indian Ocean from Early Islamic times onwards, or the activities of the coastal tribes and sheikhs who struggled for control of pearling and shipping revenues during the last three centuries. It is hoped that the investigation of similar sites will continue, so that the heritage of the coastal peoples of the Gulf will continue to be unveiled.

5. Bibliography

- al-Shamlan, S. M. (2000), *Pearling in the Arabian Gulf: a Kuwaiti Memoir* (translated by Peter Clarke) (The London Centre for Arab Studies: London).
- Beech, M. (2003), 'The Development of Fishing in the UAE: a Zooarchaeological Perspective', in D. Potts, H. Al-Naboodah and P. Hellyer (eds.) *Archaeology of the United Arab Emirates. Proceedings of the First International Conference on the Archaeology of the UAE* (Trident Press Ltd.: London), 290-308.
- and Al Shaiba, N. (2004), 'Intertidal Archaeology on Marawah Island: New Evidence for Ancient Boat Mooring Sites', *Tribulus* 14/2: 8-16.
- Cuttler, R., Moscrop, D., Kallweit, H. and Martin, J. (2005), 'New evidence for the Neolithic settlement of Marawah Island, Abu Dhabi, United Arab Emirates', *Proceedings of the Seminar for Arabian Studies* 35: 37-56.
- Elders, J. and Shepherd, E. (2000), 'Reconsidering the 'Ubaid of the Southern Gulf: new results from excavations on Dalma Island, UAE', *Proceedings of the Seminar for Arabian Studies* 30: 41-7.
- Bin Seray, H. M. (1996), 'Christianity in East Arabia', *Aram* 8: 315-32.
- (1997), 'The Arabian Gulf in Syriac Sources', *New Arabian Studies* 4: 205-32.
- Carter, R. A. (2001), 'Saar and its external relations: new evidence for interaction between Bahrain and Gujarat during the early second millennium BC', *Arabian Archaeology and Epigraphy* 12: 183-201.
- (2003a), 'Part VIII. The Pottery of Jebel Dhanna', in G.R.D. King (ed.), *Sulphur, Camels and Gunpowder. The Sulphur Mines at Jebel Dhanna, Abu Dhabi, United Arab Emirates* (Zodiac Publishing: Dubai), 52-65.
- (2003b), 'Tracing Bronze Age Trade in the Gulf: Evidence for Way-stations of the Merchants of Dilmun between Bahrain and the Northern Emirates', in D. Potts, H. Al-Naboodah, and P. Hellyer (eds.), *Archaeology of the United Arab Emirates. Proceedings of the First International Conference on the Archaeology of the UAE* (Trident Press Ltd.: London), 124-31.
- (2005a), 'Chapter 6. Pottery Vessels: Typological Analysis', in R. Killick and J. Moon (eds.), *The Early Dilmun Settlement at Saar* (Archaeology International Ltd.: Ludlow), 235-77.
- (2005b), 'The History and Prehistory of Pearling in the Persian Gulf', *Journal of the Economic and Social History of the Orient* 48/2: 139-209.
- (2008), 'Christianity in the Gulf during the first centuries of Islam', *Arabian Archaeology and Epigraphy* 19: 71-108.
- and Crawford, H. E. W. (2002), 'The Kuwait/British Archaeological Expedition to as-Sabiyah: report on the third season's work', *Iraq* 64: 1-13.
- (2003), 'The Kuwait/British Archaeological Expedition to as-Sabiyah: report on the fourth season's work', *Iraq* 65: 77-90.
- De Cardi, B. (1978), *Qatar Archaeological Report: Excavations 1973* (Oxford University Press: Oxford).
- Edens, C. (1986), 'Bahrain and the Arabian Gulf during the second millennium B.C.: Urban crisis and colonialism', in Shaikha H. M. Al-Khalifa and M. Rice (eds.), *Bahrain Through the Ages: the Archaeology* (KPI: London), 195-216.
- Edens, C. (1994), 'Structure, Power and Legitimation in Kassite Babylonia', in G. Stein and M. Rothman (eds.), *Chiefdoms and Early States in the Near East: the Organizational Dynamics of Complexity* (Prehistory Press: Madison), 209-23.
- (1999), 'Khor Ile-Sud, Qatar: the archaeology of Late Bronze Age purple-dye production in the Arabian Gulf', *Iraq* LXI: 71-88.

Elders, J. (2003), ‘The Nestorians in the Gulf: Just Passing Through? Recent Discoveries on the Island of Sir Bani Yas, Abu Dhabi Emirate, UAE’, in D. Potts, H. Al-Naboodah and P. Hellyer (eds.) *Archaeology of the United Arab Emirates. Proceedings of the First International Conference on the Archaeology of the UAE* (Trident Press Ltd.: London), 230-6.

Facey, W. (1987), ‘The boat carvings at Jabal Jussasiyah, Northeast Qatar’, *Proceedings of the Seminar for Arabian Studies* 17: 199-222.

Ferdinand, K. (1993), *Bedouins of Qatar* (Thames and Hudson: London).

Fiey, J. M. (1979), *Communautés syriaques en Iran et Irak des origines à 1552* (Variorum Reprints: London).

Frifelt, K. (1995), *The island of Umm an-Nar. The third millennium settlement* (Aarhus University Press: Aarhus).

——(2001), *Islamic Remains in Bahrain* (Jutland Archaeological Society: Moesgaard).

Garlake, P. S. (1978a), ‘An Encampment of the seventeenth to nineteenth centuries on Ras Abaruk, Site 5’, in B. de Cardi (ed.), *Qatar Archaeological Report. Excavations 1973* (Oxford University Press: Oxford), 164-71.

——(1978b), ‘Fieldwork at al-Huwailah, Site 23’, in B. de Cardi (ed.), *Qatar Archaeological Report. Excavations 1973* (Oxford University Press: Oxford), 172-89.

——(1978c), ‘A fish-curing complex on Ras Abaruk, Site 6’, in B. de Cardi (ed.), *Qatar Archaeological Report. Excavations 1973* (Oxford University Press: Oxford), 136-46.

Graham, H. (1978), *Arabian Time Machine. Self-Portrait of an Oil State*, (Holmes and Meier Publishers: New York).

Hardy-Guilbert, C. (1980), ‘Recherches sur la Periode Islamique au Qatar’, in J. Tixier (ed.) *Mission Archéologique Francaise à Qatar, Tome 1* (State of Qatar, Ministry of Information: Doha), 111-27.

——(1998), ‘Villages côtiers abandonnés de Qatar’, in C. S. Phillips, D. T. Potts and S. Searight (eds.) *Arabia and its neighbours : essays on prehistorical and historical developments* (Brepols: Turnhout), 89-104.

Hellyer, P. (1998), *Hidden Riches. An Archaeological Introduction to the United Arab Emirates* (Union National Bank: Abu Dhabi).

——and Beech, M. (2001), ‘C14 dating of Iron Age hearths on the island of Rufayq, Abu Dhabi’, *Tribulus* 11/1: 21-3.

Højlund, F. and Andersen, H. H. (1994), *Qala’at al-Bahrain volume 1. The northern city wall and the Islamic fortress* (Aarhus University Press: Aarhus).

——(1997), *Qala’at al-Bahrain volume 2. The Central Monumental Buildings* (Aarhus University Press: Aarhus).

Howard-Carter, T. (1986), ‘Eyestones and Pearls’, in Shaikha H. M. Al-Khalifa and M. Rice (eds.), *Bahrain Through the Ages: the Archaeology* (KPI: London), 305-10.

Inizan, M.-L. (1980), ‘Premiers résultats des fouilles préhistoriques de la région de Khor’, in J. Tixier (ed.) *Mission Archéologique Francaise à Qatar, Tome 1* (State of Qatar, Ministry of Information: Doha), 51-97.

——(1988), *Préhistoire à Qatar: mission archéologique française à Qatar vol. 2* (CNRS: Paris).

Johnstone, T. M. and Wilkinson, J. C. (1960), ‘Some Geographical Aspects of Qatar’, *The Geographical Journal* 126/4: 442-50.

Kallweit, H. (2003), ‘Remarks on the Late Stone Age in the UAE’, in D. Potts, H. Al-Naboodah and P. Hellyer (eds.) *Archaeology of the United Arab Emirates. Proceedings of the First International Conference on the Archaeology of the UAE* (Trident Press Ltd.: London), 56-64.

Kennet, D. (2002), ‘Sasanian Pottery in Southern Iran and Eastern Arabia’, *Iran* 40: 153-62.

——(2004), *Sasanian and Islamic Pottery from Ras al-Khaimah. Classification, chronology and analysis of trade in the Western Indian Ocean* (Archaeopress: BAR International Series: Oxford).

——(2007), ‘The decline of eastern Arabia in the Sasanian Period’, *Arabian Archaeology and Epigraphy* 18: 86-122.

Kervran, M., Hiebert, F. T. and Rougeulle, A. (2005), *Qal’at al-Bahrain : a trading and military outpost : 3rd millennium B.C.-17th century A.D.* (Brepols: Turnhout).

King, G. R. D. (1997), ‘A Nestorian Monastic Settlement on the Island of Sir Bani Yas, Abu Dhabi: a Preliminary Report’, *Bulletin of the School of Oriental and African Studies, University of London* 60/2: 221-35.

——(1998), *The Abu Dhabi Islands Archaeological Survey. Season 1* (Trident Press: London).

——and Tonghini, C. (1998), ‘The western islands of Abu Dhabi Emirate. Notes on Ghagha’, in C. S. Phillips, D. T. Potts and S. Searight (eds.) *Arabia and its neighbours : essays on prehistorical and historical developments* (Brepols: Turnhout), 117-41.

Konishi, M. A. (1995), ‘A short comment on Ussail, Qatar’, (report submitted to Department of Museums and Antiquities, Ministry of Information and Culture, Doha).

Larsen, C. (1983), *Life and Land Use on the Bahrain Islands: The Geoarchaeology of an Ancient Society* (University of Chicago Press: Chicago).

Lorimer, J. G. (1908), *Gazetteer of the Persian Gulf, Oman and Central Arabia. Volume 2, Geographical and Statistical* (Calcutta).

——(1915), *Gazetteer of the Persian Gulf, Oman and Central Arabia. Volume 1, Historical* (Calcutta).

Magee, P. (1996), ‘The Chronology of the Southeast Arabian Iron Age’, *Arabian Archaeology and Epigraphy* 7: 240-52.

Midant-Reynes, B. (1985), ‘Un ensemble de sépultures en fosses sous cairn à Khor (Qatar): étude des rites funéraires’, *Paléorient* 11: 129-44.

Montigny, A. (1980), ‘Etude anthropologique au Qatar’, in J. Tixier (ed.) *Mission Archéologique Francaise à Qatar, Tome 1* (State of Qatar, Ministry of Information: Doha), 129-48.

Moon, J. (2005), ‘Chapter 5. Tools, weapons, utensils and ornaments’ in R. Killick and J. Moon (eds.), *The Early Dilmun Settlement at Saar* (Archaeology International Ltd.: Ludlow), 163-234.

Nayeem, M. A. (1998), *Qatar : prehistory and prohistory from the most ancient times (Ca. 1,000,000 to end of B.C. era)* (Hyderabad: Hyderabad).

Oppenheim, A. L. (1954), ‘The Seafaring Merchants of Ur’, *Journal of the American Oriental Society* 74: 6-17.

Orton, C., Tyers, P. and Vince, A. (1993), *Pottery in Archaeology* (Cambridge University Press: Cambridge).

Parker, A. G., Eckersly, L., Smith, M. M. et al. (2004), ‘Holocene vegetation dynamics in the northeastern Rub’ al-Khali desert, Arabian Peninsula: a phytolith, pollen and carbon isotope study’, *Journal of Quaternary Science* 19(7): 665-76.

Potts, D. T. (1990), *A Prehistoric Mound in the Emirate of Umm al-Qaiwain, UAE Excavations at Tell Abraq 1989* (Munksgaard: Copenhagen).

——(1992), ‘Rethinking some aspects of trade in the Arabian Gulf’, *World Archaeology* 24/3: 423-40.

——(2006), ‘Elamites and Kassites in the Persian Gulf’, *Journal of Near Eastern Studies* 65/2: 111-19.

Pike, J.G. (1979), ‘Water Resources and Agriculture in Qatar’, *Arabian Studies* V, 67ff.

Priestman, S. (2005), ‘Settlement and Ceramics in Southern Iran: An Analysis of the Sasanian and Islamic Periods in the Williamson Collection’ (PhD dissertation, Department of Archaeology, University of Durham, Durham).

Said, Zahlan R. (1979), *The Creation of Qatar.* (Routledge: London).

Sanlaville, P. (2000), ‘Environment and Development’, in M. Mundy & B. Musallam (eds.), *The Transformation of Nomadic Society in the Arab East*, (Cambridge: Cambridge University Press), 1-16.

Sergeant, R. B. (1978), ‘Historical Sketch of the Gulf in the Islamic Era from the Seventh to the Eighteenth Century AD’, in B. de Cardi (ed.), *Qatar Archaeological Report. Excavations 1973* (Oxford University Press: Oxford), 147-63.

——(1968), ‘Fisher-Folk and Fish-Traps in Bahrain’, *Bulletin of the School of Oriental and African Studies, University of London* 31/3: 486-514.

Simpson, S. J. (2003), ‘Sasanian beads: the evidence of art, texts and archaeology’, in I. Glover, H. Hughes-Brock and J. Henderson (eds.), *Ornaments from the Past. Bead Studies after Beck* (Bead Study Trust: London), 59-77.

Sinclair, W. F. (1902), *The Travels of Pedro Teixeira with his “Kings of Harmuz and extracts from his “Kings of Persia”* (translated and annotated by W. F. Sinclair) (W.F. Hakluyt Society: London).

Smith, G. H. (1978a), ‘Al-Da’asa, Site 46: an Arabian Neolithic Camp Site of the Fifth Millennium’, in B. de Cardi (ed.), *Qatar Archaeological Report. Excavations 1973* (Oxford University Press: Oxford), 53-79.

——(1978b), ‘Test Excavations at Bir Abaruk, Site 3’, in B. de Cardi (ed.), *Qatar Archaeological Report. Excavations 1973* (Oxford University Press: Oxford), 26-38.

Tixier, J. (1982), ‘The French Archaeological Mission to Qatar’, *Proceedings of the Society for Arabian Studies* 12, 79-80.

Uerpmann, H.-P., Uerpmann, M. and Jasim, S. A. (2000), ‘Stone Age nomadism in SE-Arabia - palaeo-economic considerations on the neolithic site of Al-Buhais 18 in the Emirate of Sharjah, UAE’, *Proceedings of the Seminar for Arabian Studies* 30: 229-34.

Velde, C. (1992), ‘Die spätbronzezeitliche und früheisenzeitliche Siedlung und ihre Keramik in Shimal/Ras al Khaimah (Vereinigte Arabische Emirate)’, PhD dissertation, Department of Georg-August Universität, Göttingen.

Vogt, B., Gockel, W., Hofbauer, H. and al-Haj, A. A. (1989), ‘The Coastal Survey in the Western Province of Abu Dhabi, 1983’, *Archaeology in the United Arab Emirates* V: 49-60.

Williamson, A. G. (1971-2), ‘Rishahr and the development of trade from the 3rd to the 7th centuries A.D. Chapter 5 in The Maritime Cities of the Persian Gulf and their Commercial Role from the 5th Century to 1507’, PhD dissertation, Department of Ashmolean Museum Archive, Oxford University, Oxford.

——(1972), ‘Persian Gulf Commerce in the Sassanian Period and the first two centuries of Islam’, *Bastan Chenasi va Honar-e Iran* 9-10: 97-109.

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6. Catalogue of Features

THIS IS A CATALOGUE, arranged by registration number, of all recorded features from the survey and excavation at Al-Khor Island. The catalogue is divided into four parts, reflecting the arbitrary division of the island into four areas for the purposes of excavation and survey: AK0 (features AK0.1000–1040); AK1 (features AK1.1–197); AK2 (features AK2.500–552); and AK3 (features AK3.1041–1075).

The catalogue entries are edited versions of the descriptions contained in the integrated site database. They are for the most part exactly as written by the members of the team during the survey and excavation, and their contribution is reflected in the joint authorship of this chapter.

Twenty-two features in AK1 were excavated. Of those that were surveyed but not excavated, about half were cleaned and fully described, and half plotted only as a single point and briefly noted.

Those features in AK1 excavated by the previous expedition (as the area designated Khor Ile-Nord) were planned and briefly described.

In AK2, ten out of fifty-two features recorded were excavated. Eleven of the rest were deemed to be significant enough to be plotted using simple outlines (AK2.520–530), while the rest were merely plotted as a single point. Since they were not cleaned, the exact nature and extent of most of the AK2 features could not be determined with precision.

In the catalogue, excavated features in AK1 and AK2 have an asterisk after the catalogue number (e.g. AK1.1*). Features that could be identified as excavated by the previous expedition are distinguished

by a hash (e.g. AK1.12#).

AK3 is where the main excavations of the previous expedition were carried out (as part of the site called Khor Ile-Sud). These excavations have been published by Edens (1999). The features in this area were mapped only as a single point, correlated as far as possible with the published data (see in particular Edens 1999: figs 2 and 3), and not investigated further.

AK0 designations represent all features which lay outside the AK1–3 areas. These were all mapped as a single point and briefly described. None were excavated.

All features in all areas were photographed.



AK1.1000



AK1.1001



AK1.1004



AK1.1005



AK1.1007



AK1.1008



AK1.1012



AK1.1016



AK1.1017



AK1.1018

FIGURE 31

AK0 FEATURES

AK0.1000 Stone cairn (1.8 × 2.0 m; ht. 0.90 m).

AK0.1001 Circular bowl-shaped depression (diam. 1.7 m).

AK0.1002 Single upright stone (l. 0.36 m; th. 0.10 m).

AK0.1003 Eroded stone cairn (diam. 2.0 m).

AK0.1004 Ring of heaped rocks and rubble (external diam. 3.05 m; internal diam. 1.45 m).

AK0.1005 Two upright stones, seemingly revetting the northern, downslope, side of a pit 2.0 m in diameter.

AK0.1006 Ovoid mound of smallish rocks (1.1 × 0.9 m).

AK0.1007 Roughly circular area cleared of loose rubble (diam. 1.2 m).

AK0.1008 Very roughly constructed walls of large boulders next to natural rock overhang (l. 2.6 m; max. ht. 1.0 m).

AK0.1009 Small circular depression (diam. 0.60 m; depth 0.15 m).

AK0.1010 Two upright stones aligned in a 'v'-shape.

AK0.1011 Nine visible stones laid in a ring, possibly lining a pit (diam. 0.9 m).

AK0.1012 Rectangular concrete building with one doorway and window (5.2 × 3.4 m; ht. 2.8 m) and an adjoining outhouse (3.2 × 2.2 m; ht. 1.8 m).

AK0.1013 Post hole with two large and five smaller stones et into an oval cut (0,19 × 0.20 m).

AK0.1014 Two upright stones (l. 0.15 and 0.09 m).

AK0.1015 Ring of approx. 15 stones lining a circular feature (internal diam. 2.75 m). Barely discernible.

AK0.1016 Post hole with three stones laid to form three sides of a rectangle (0.28 × 0.40 m).

AK0.1017 Spread of rocks (diam. 1.7 m).

AK0.1018 Rough circle of stones (external diam. 2.7 m; internal diam. 1.8 m).

AK0.1019 Sub-circular area with some burnt stones (diam. 1.3 m).



AK1.1024



AK1.1026



AK1.1028



AK1.1031



AK1.1032



AK1.1036



AK1.1037



AK1.1038

FIGURE 32

AK0.1020 Ovoid silty patch (0.7 × 0.8 m).

AK0.1021 Circle of stones (0.05–0.15 m) with some gravel and silt upcast, surrounding a central depression (external diam. 2.6 m; internal diam. 1.2 × 1.3 m). Possible burnt stones scattered to northwest of feature.

AK0.1022 Mound of stones (ht. 0.20 m; diam. 0.90 m).

AK0.1023 Sub-circular silty cleared area (diam. 1.3 m).

AK0.1024 Small mound of stones (diam. 0.9 m).

AK0.1025 Cleared ovoid patch (2.6 × 3.3 m).

AK0.1026 Sparse circle of stones enclosing a cleared patch of ground (diam. 1.5 m).

AK0.1027 Five visible stones set around the northern half of a pit (diam. 0.80 m).

AK0.1028 One upright stone surrounded by a scatter of large flat slabs.

AK0.1029 Three stones set within a circular depression (diam. 2.5 m). One *in situ* at north end and two disturbed or slipped large stones.

AK0.1030 Circular depression (diam. 1.5 m). Two fragments of burnt bone visible and some cerithids.

AK0.1031 Circular depression (diam. 1.5 m) to immediate east of AK0.1030. Fragment of burnt bone and a few cerithids. Small pile of stones at northern edge.

AK0.1032 Rectangular concrete pit half covered with wooden board, half with metal rods and wooden cross-members (2.2 × 1.2 × 0.44 m; depth 1.06 m). Modern hide for trapping falcons.

AK0.1033 Circular depression (diam. 1.4 m). Loose collection of stones in base.

AK0.1034 Circular depression (diam. 2.0 m).

AK0.1035 Mound of stones (1.5 × 2.25 m). Joins with 'L'-shaped arrangement of stones to east.

AK0.1036 Mound of stones (diam. 0.90 m), with some wider scattering.

AK0.1037 Large mound of stones (diam. 4.65 m). Mostly fragments of beach rock slabs.

AK0.1038 Ring of fourteen visible stones lining a roughly circular pit (1.25 × 1.45 m).

AK0.1039 Two, possibly three, upright stones.

AK0.1040 Circle of stones (diam. 0.8 m).

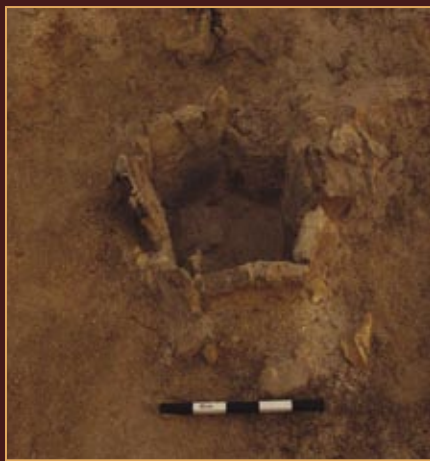
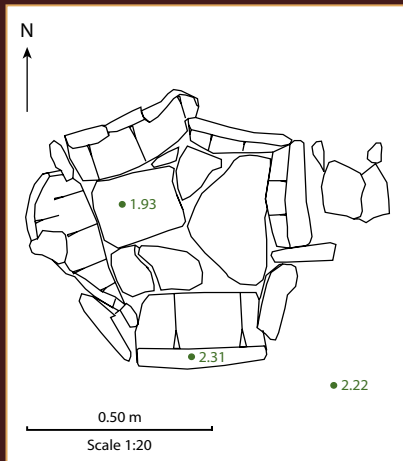


FIGURE 33 AK1.1 hearth

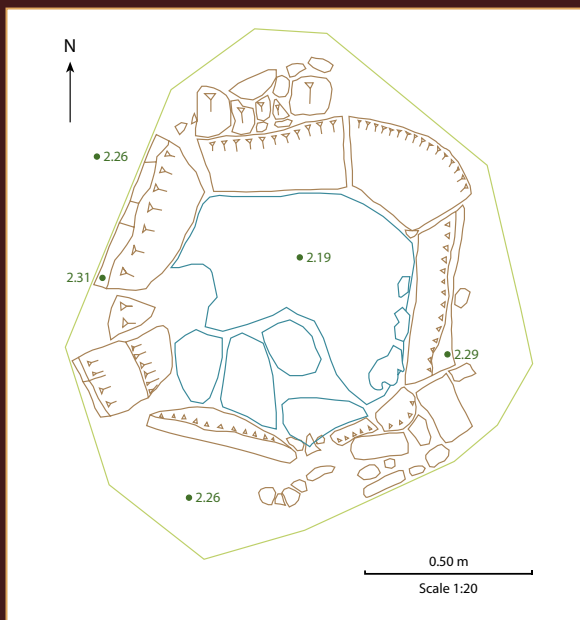


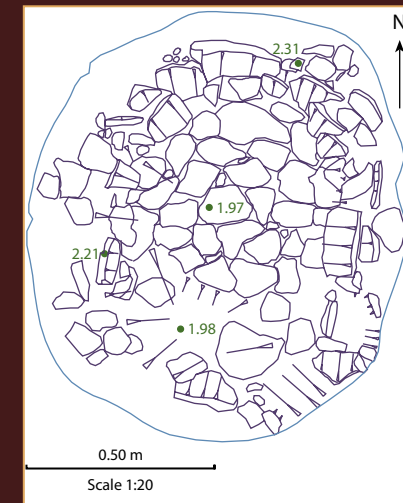
FIGURE 34 AK1.2 hearth

AK1 FEATURES

AK1.1* Rectangular hearth made up of six flat stones, set on edge within a cut (max. diam. 0.56×0.51 m; depth 0.44 m). The stones (207) were wedged closely together and appear to have been lightly shaped to fit into the cut. The hearth was lined at the bottom with five additional stones (210) laid flat to form a level surface. An area approximately 2.0×2.0 m around the hearth had been recently disturbed (206) and was filled by several layers of very loose, light brown sand with abundant inclusions of small shell (201, 202, 204, 205, 208 and 209). It appears that this hearth was excavated by the previous expedition and subsequently back-filled, as represented by the cut and sand in-filling.

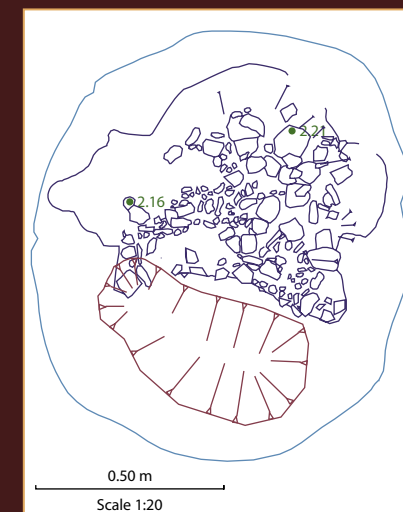
AK1.2* Roughly circular hearth (max. diam. 1.3 m; depth: 0.6 m), with almost vertical sides and a flat bottom. It was stone-lined with the base made up mostly of a single large stone with some smaller beach rocks. All the stones at the base of the feature were heavily burnt, clearly indicating its use as a fire-pit/hearth. The sides of the feature were lined with large slabs of beach rock with very flat surfaces ($0.5 \times 0.4 \times 0.05$ m). Above the bottom was a layer of stones in a sand and shell matrix, all of which showed clear signs of burning. Four stones had single perforations. These appear to have been thrown in at random, but the burning suggests they were part of the cooking process. Overlying this primary fill were two layers of compact, brownish-yellow layer of sand (304 and 303), containing charcoal flecks, burnt stone, pottery and an iron fish hook. Both these deposits represent wind-blown material filling in the hearth after it was no longer in use. A secondary use of the hearth is indicated by a subsequent bowl-shaped circular depression (302) which sat within the earlier hearth above the first set of windblown sand. This was then covered with further sand deposits and then the modern-day surface crust.

AK1.3* Oval-shaped pit (019) with a stone-lining and base (max. diam. 2.45×1.86 m; depth: 0.40 m). The stones lined a cut that had been made in the natural beach deposits (022). The base was lined with slabs of beach rock of irregular shape (typically $0.20 \times 0.20 \times 0.03\text{--}0.07$ m). A row of slabs was also set vertically against the edge of the cut to form the lining (021), reinforced in places with a second or third row behind. Where the slabs did not fit closely together rubble had been packed into the gaps. The slabs used for the sides are quite large (approx. $55 \times 30 \times 7$ cm). Part of the southern end of the feature was destroyed by a later cut (023). Along the southeastern edge there



a

b



c



FIGURE 35 AK1.3 Stone lined pit
a Original build (021)
b Secondary surface (017)
c Final lining (013)

was a separate rectangular compartment separated from the main part of the pit by two stones. It was filled with a brown, compact sand with shell inclusions. Although not excavated, there is a suggestion on the surface that there may be another such space on the western side of the feature.

The pit was filled with a layer of silty sand and shell which included many oyster shells (whole or in part?). A secondary surface of rough stone slabs was then laid down (017), partially covering the pit lining. A typical slab size is $0.20 \times 0.20 \times 0.02\text{--}0.05$ m. The thickness varies, with two or three stones placed on top of one other in places. A silty sand and shell packing was between the stones. The southern part of this surface had also been destroyed by a later cut (023).

A final stone lining was then added (013). This was built of small stones with a compact light brown

silt/sand/shell packed amongst the stones. The later cut (023) may have been contemporary with this final surface, or perhaps marginally later, as both are then sealed by the same layer of compact sand and shell (010). The roughly oval cut (023) is in the southern half of the feature (0.84×1.5 m; depth 0.25). It cut through the pit surfaces and also obviously destabilised the southern revetting, several pieces of which had slipped down to the bottom of the cut.

There was no evidence of burning on the stones or in the fill so AK1.3 was presumably used for storage or processing, perhaps of pearl oysters, rather than for cooking.

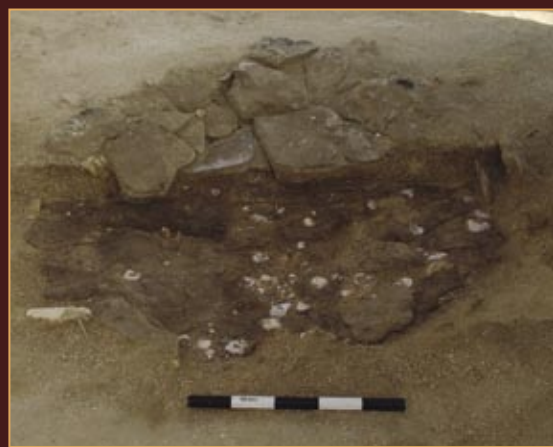
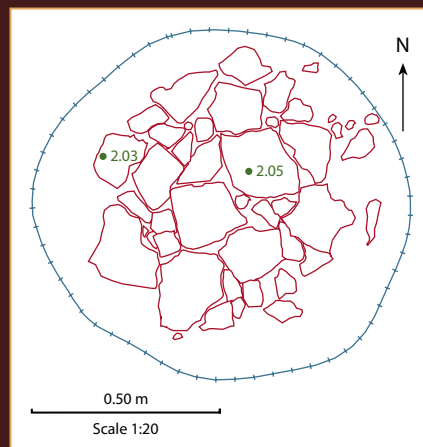


FIGURE 36 AK1.4 Stone lined pit

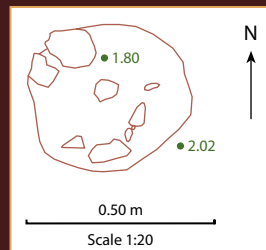


FIGURE 37
AK1.5 Pit

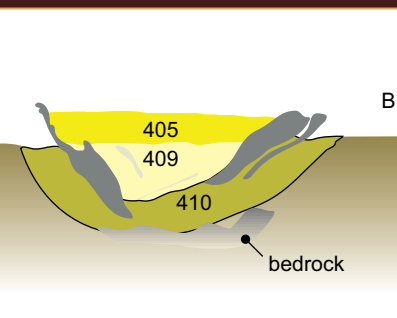
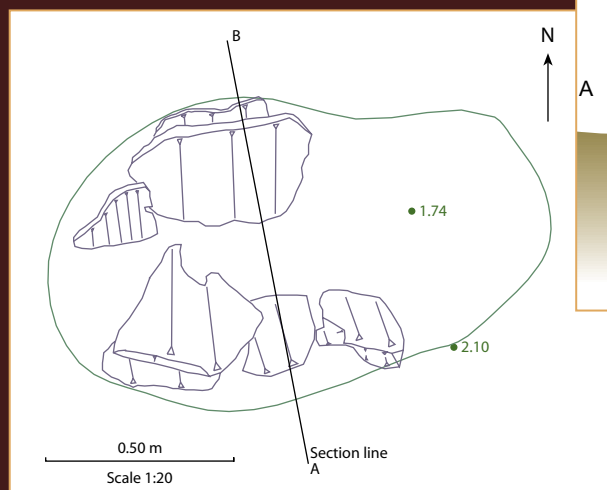
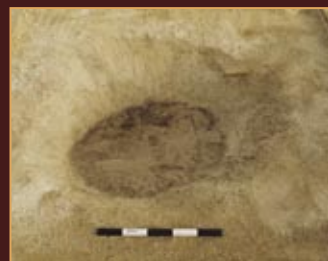


FIGURE 38 AK1.6 Stone lined pit

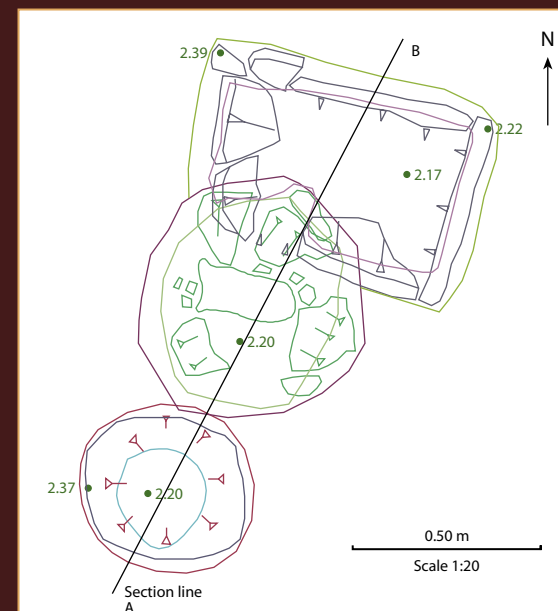


FIGURE 39 AK1.7, 8 & 15 (from A to B)

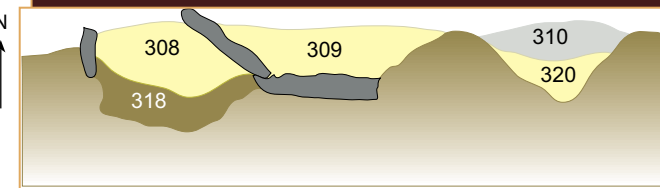


FIGURE 40 AK1.9 Hearth

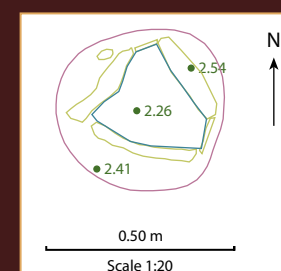


FIGURE 41 AK1.10 Post hole

AK1.4* Shallow, bowl-shaped, stone-lined circular pit which was relined once (max. diam. of cut 2.05 m; max. diam. of base 1.52 m; depth 0.18 m). The base was neatly lined with large stones packed round with smaller ones (426). Only a few stones remained in position. There was no trace of burning. The primary fill was a yellow brown deposit of shelly sand and silt, 12 cm deep (423). The lower horizon of the fill contained many broken and unbroken pearl oyster shells. The pit was subsequently relined with stones (404), sealing the shelly deposit. This later surface was noticeably less regular than the earlier one. Some stones in the centre blackened, with thin patches of powdered charcoal adhering to them. The surface was overlain by a deposit of loose shell and sand (403) and a deposit of grey brown silty sand with ash and charcoal (402).

The shell fill of AK1.4 suggests it was connected with the storage and processing of pearl oysters. It was then reused as a temporary fireplace.

AK1.5* Small shallow pit, sub-circular in plan (diam. 1.25–1.40 m; depth 0.36 m). The base of the pit was formed by a slightly inclined plate of natural bedrock. The pit was filled by loose yellow-brown burnt silt (407) containing large angular stones, and sealed by 0.2–4 m of friable crusted silty sand.

AK1.6* Shallow oval pit (diam. 0.78 × 1.22 m; depth 0.31 m). The base and sides of the pit were formed by irregular uneven slabs of natural bedrock. The stone in the side of the pit were set at an angle in a matrix of yellow brown sandy silt (410). The pit was filled with a friable shelly, silty sand deposit (409) and sealed by 0.2–6 m of crusted yellow brown sand silt and shell (405). The fill contained only shell fragments, and there were no traces of burning.

AK1.7* Stone-lined rectangular pit (0.45 × 0.65 m; depth 0.30 m). It was lined along all four sides, but not the base, with beach rocks (321). The lining was

blackened and friable due to intense burning. The primary fill of the hearth (318) was a soft, dark black organic loam fill (depth 0.15 metres) containing numerous flecks of charcoal and small burnt stones. Above this lay a compact dark brown silty sand deposit (308; depth 0.10 m). Charcoal flecks and small stones were found within this matrix which is interpreted as a mixture of windblown sand and shell and material from the earlier deposit. AK1.7 is cut on the southern side by AK1.8 and is therefore earlier than the latter.

AK1.8* A stone-lined circular hearth (diam. 0.65 m; depth 0.15 m) with sloping sides and a flat base. It cut through AK1.7. The hearth was partially lined with slabs of beach rock, placed at an angle (319). The lining was partially burnt at the bottom. There was a single fill (309) of compact, brown, sand and shell (depth 0.05 m). This did contain small burnt stones and minute charcoal flecks but in general was very similar to the natural sand, and consequently is

interpreted as a windblown or tidal deposit. AK1.8 was poorly constructed. The fill was relatively sterile suggesting that the hearth may have been cleaned out before it was abandoned.

AK1.9* A rectangular hearth constructed of upstanding beach stones surrounding a single flat rock which served as the base (317; 0.35 × 0.55 m; depth 0.15 m). The stones were very burnt and friable. The single fill was a compact, black silty sand (depth 0.10 m), containing small- and medium-sized burnt stones and flecks of charcoal (311). The hearth was similar in shape and size to AK1.7, but shallower and upstanding.

AK1.10* A circular post hole (416; max. diam. 0.42 m; depth 0.26 m), lined with flat stones set vertically into a matrix of silty sand. It was filled with a dark grey deposit of loose silt and charcoal (413; depth 0.04 m) which was in turn sealed by 0.22 m of yellow brown sandy silt (412; depth 0.22 m).



FIGURE 42 AK1.12 and AK1.191 Stone-lined structures and later hearth AK1.192

AK1.11* Oval-shaped pit (0.96 × 1.25 m; depth 0.28 m) filled with a deposit of yellow-brown loose sand, silt and shell.

AK1.12# Sunken structure with stone lining and base (2.13 × 1.90 m; depth 0.30 m to top of upper base). Four surrounding walls, roughly linear though bowing slightly outwards, with a break in the southeastern corner. It is not clear if the break is original or the result of later activity, though it is abrupt and uneven. The walls comprise slabs of beach rock (diam. 0.15–0.30 m; th. 0.04–0.07 m), single stone depth, laid two or three stones deep against the cut.

Base is formed of beach rock slabs 0.18–0.26 m diameter, closely butted to form a fairly neat surface. Slight slope north to south, but flat rather than concave. At the southeastern end of the structure it can be seen that the base overlies a deposit of oyster shell in a brown sandy matrix, which in turn overlies a further layer of stones, presumably the primary base of the feature. The upper stone base butts the surround wall, showing that the surround was in place before the base was laid.

In places a cut is visible around the surrounding walls, any gap being filled with a mid-brown silty sand. A small sub-rectangular arrangement of stones (1.05 × 0.51 m; depth 0.20 m) is attached to the northeastern corner of the main structure, seeming to merge with those walls. No base visible and no sign of burning. This function of this feature is not clear. It is possibly associated with structure AK1.172 immediately to the east.

AK1.13* Circular stone-lined hearth (max. diam. 0.75 m; depth 0.23 m). Six large slabs placed vertically lined the sides of the pit, kept in place by wedging smaller stones and sherds of pottery between them. A large flat stone was then wedged into the bottom, further reinforcing the sides. Further stones appear to have been added to the lining of the pit, covering earlier scorched ones. This suggests the hearth was repaired. The lowest fill was a layer of burnt sand with charcoal (234) that covered the whole of the base (234; depth 0.05 m). This was sealed on the eastern half by a layer of brown sand and shell layer, containing ash, charcoal, and pottery sherds and burnt stone from the collapsed lining (231). Two deposits of sand accumulated above the collapse (230 and 229; 0.30 and 0.08 m in depth respectively). Two stones were subsequently placed on top, one vertically and the other at approximately 45 degrees (228), representing a second phase of use. During this last phase, the installation was much shallower, with a depth of 0.17 m. Two layers of grey sand and ash represent the final use of the hearth (215 and 225).



FIGURE 43 AK1.12

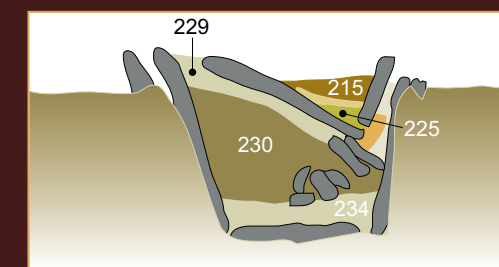
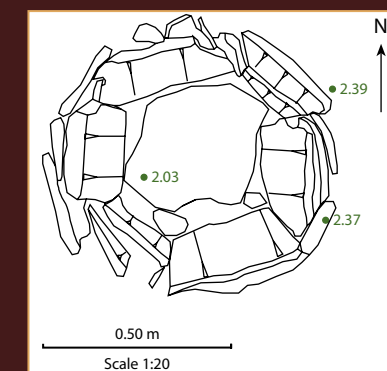


FIGURE 44 AK1.13 Hearth



FIGURE 45 AK1.14 Pit



FIGURE 46 AK1.15 Pit



FIGURE 47 AK1.16 Pit

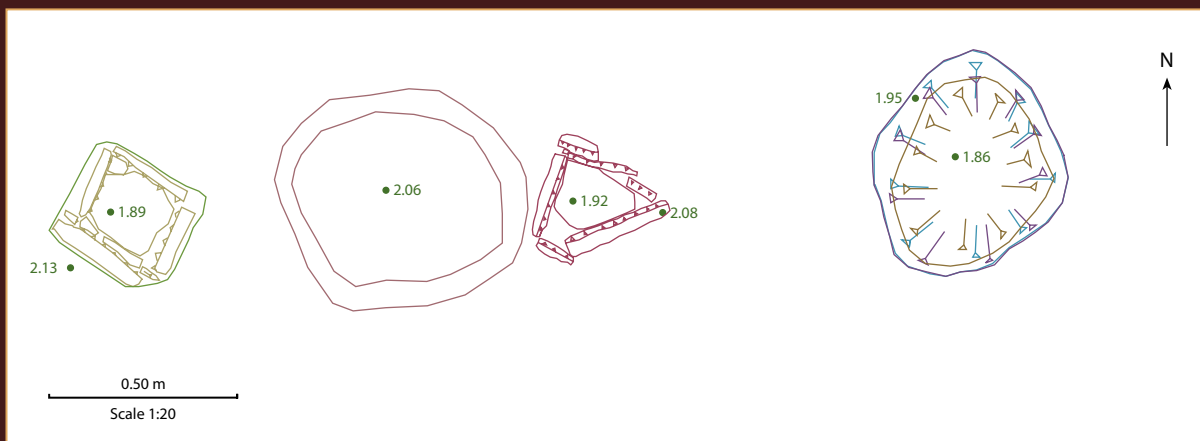


FIGURE 48
AK1.16–19
(east to west)

AK1.14* Small sub-circular pit (diam. 0.24 m; depth 0.08 m) filled with dark grey powdered charcoal and silt (420) overlain by yellow brown sandy silt (418). The truncated remains of a small bonfire or post burnt *in situ*.

AK1.15* Circular pit cut into the natural sand (diam. 0.25 m; depth 0.2 m). The primary fill of the feature was a brown silty sand (320), containing a few flecks of charcoal and very similar to the natural sand. Above this was a loose, dark, ashy sand with shell and flecks of charcoal (310). This top layer contained more ash and charcoal than the earlier fill, suggesting perhaps some re-use. Alternatively, this later material might be rake-out from AK1.8 located close by to the north.

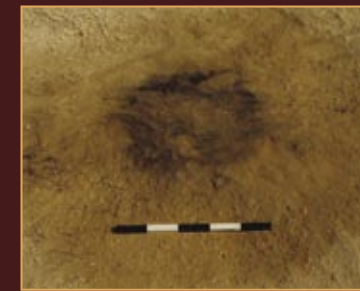
AK1.16* Shallow sub-circular pit easily visible in the natural shell horizon (diam. 0.5 m; depth 0.20 m). It was filled with a dark brown and black silty sand which contained charcoal flecks, burnt shell and a single pottery sherd. Above this was a wind-blown layer of brown sand (322). The feature is a small fire pit with its primary deposit preserved *in situ*.

AK1.17* Hearth set into the sand (max. width 0.35 m; depth 0.16 m). Triangular in shape with each of the sides formed by flat slabs of rock, and with a single stone at the base. The lining on the north side is incomplete and has collapsed. Near the base, the stones were very burnt and blackened. The primary fill of the feature was compact dark brown/black sand with charcoal pieces. (330), containing a single large pottery sherd. Above this, was windblown sand (324).

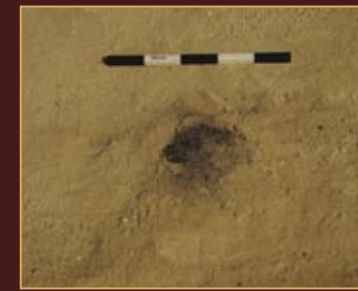
The degree of burning at the base of would suggest that the feature was a hearth, but the size and shape of AK1.17 indicates that it was a post hole that had been burnt *in situ*.

AK1.18* Patch of ash seen on the surface of the natural sand and shell horizon (diam. approx. 0.60 m; depth 0.05 m). No cut was visible and the edges of the feature were not easily defined. The patch was shallow and contained flecks of charcoal and small burnt stones.

AK1.19* Rectangular post hole (l. 0.31–0.34 m; depth 0.30 m). Neatly constructed with the sides and base made up of flat stones set on edge. The stones were burnt and crumbly towards the base of the feature. The



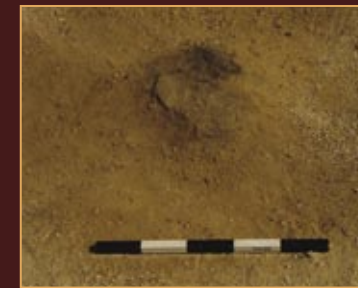
AK1.21



AK1.22



AK1.23



AK1.24



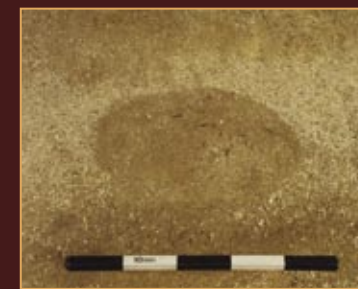
AK1.25



AK1.26



AK1.27



AK1.29



AK1.30

uniformity of the stones suggests that they were cut or chosen as particularly suitable for the construction of the feature. The fill was a dark brown, sandy and shelly material with numerous flecks of charcoal (331). Over this lay a windblown deposit of sand and silt (326), representing post-abandonment material. AK1.19 was similar in size to AK1.17 but better made. The size suggests the feature was used as a post hole, again with the post being burnt *in situ*.

AK1.20 Patch of powdered ash and charcoal (0.85 × 0.65 m) from a temporary hearth.

AK1.21 Patch of powdered ash and charcoal (0.53 × 0.75 m) from a temporary hearth.

AK1.22 Patch of powdered ash and charcoal (diam. 0.15 m) from a temporary hearth.

AK1.23 Patch of powdered ash and charcoal (0.53 × 1.35 m) from a temporary hearth.

AK1.24 Patch of powdered ash and charcoal (0.24 × 0.38 m), from a temporary hearth.

AK1.25 Group of four upright stones set in a matrix of yellow-brown silty sand (0.17 × 0.18 m; ht. 0.08 m). A post hole perhaps associated with AK1.10.

AK1.26 Patch of powdered ash and charcoal (0.40 × 0.54 m) from a temporary hearth.

AK1.27 Patch of powdered ash and charcoal (0.37 × 0.43 m) from a temporary hearth.

AK1.28 Patch of powdered ash and charcoal (0.38 × 0.83 m) from a temporary hearth.

AK1.29 Shallow concave cut (diam. 0.48 m; depth 0.12 m), filled with windblown sandy silt. Shallow post hole?

AK1.30 Shallow cut (diam. 0.26 m; depth 0.08 m), filled with a wind-blown deposit of yellow-brown shelly sand and silt.

AK1.31* Large oval stone-lined pit (3.07 × 3.35 m; depth 0.68 m). The stone lining (435) comprised angular slabs of shelly beach rock (max. l. 0.60 m), carefully laid to form a concave bowl of random course and bond. The lowest central slabs exhibited signs of blackening. The primary fill was a deposit of loose silty shell (434), with darker lenses and a small quantity of shell fragments. Above this was a layer of yellow brown

FIGURE 49

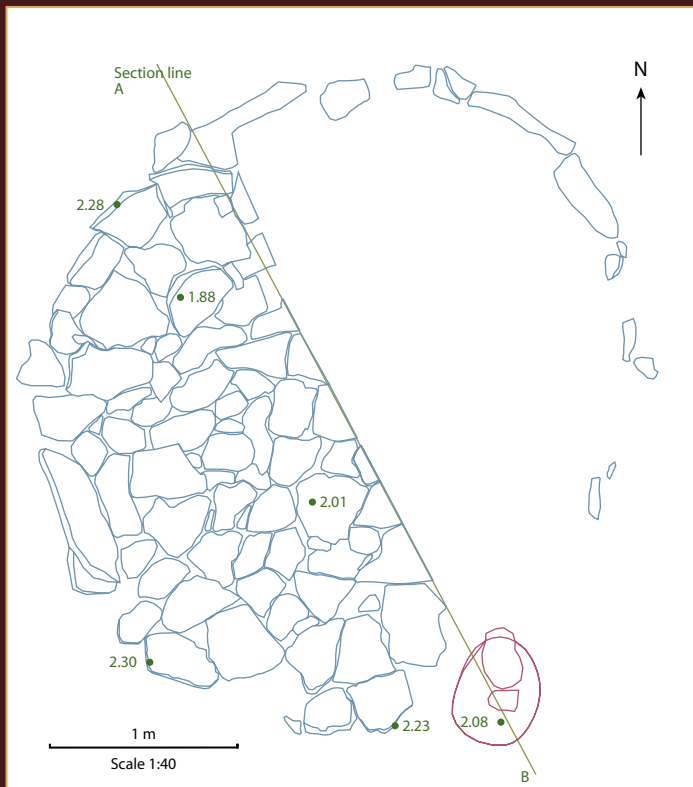


FIGURE 50
AK1.31
Stone-lined pit

sandy silt (433) containing a small quantity of charcoal and small fragments of burnt stone. This appears to be an ephemeral hearth set above the disused pit. Two further deposits were noted (432, silty shell; and 431, sandy silt). The fills of the feature all derive from a large series of small, natural episodes of deposition. The alternate shelly/silty nature of the contexts might represent seasonal or annual changes.

AK1.32 Spread of ash and crushed charcoal lying directly below the surface. Roughly crescent-shaped in plan (0.62×0.56 m). Grey black colour on the surface above a red orange brown horizon. Depth unknown but appears from surface to be $0.01\text{--}0.03$ m. The red-orange-brown coloration below is from scorching of the underlying ground surface, indicating quite intense heat. The nature of the deposit suggests a single episode of burning.

AK1.33 Post hole (width 0.44 m) with a mid-brown sandy fill. Two stones set vertically into the cut, with a third possibly still buried. Central depression: max. diam. 0.20 m. Stones protrude above the modern surface by 0.04 m.

AK1.34 Post hole (0.27×0.26 m) filled by mid-brown silty sand. Contains three stones set vertically in a triangle ($0.25 \times 0.25 \times 0.22$ m). Central depression is 0.07×0.08 m. A fourth stone is set within the cut but outside the triangle of stones. Stones protrude by 0.03 m.

AK1.35 Ovoid spread of ash and charcoal directly below clearance layer (0.44×0.34 m) in a shallow depression (0.05 m). Thin grey ash layer over black crushed charcoal. Underlying layer scorched dark red-brown.

AK1.36 Post hole (diam. 0.24 m) with mid-brown sandy fill. One stone set vertically and protruding above surface by 0.07 m, with a second eroded stone lying just proud of surface. No central depression visible. Stones may have moved or perhaps the post was wedged against the side of the cut.

AK1.37 Ovoid spread of ash and charcoal below clearance layer (0.19×0.16 m). Fine grey ash above a black crushed charcoal layer. Slight scorching of underlying ground surface seen at west side. Depth unknown but at least 0.01 m.

AK1.38 Post hole (diam. 0.34 m), with fill of mid-brown silty sand. Three stones around edge, one upright, two steeply angled down, forming three sides of a rectangle. Protrude up to 0.08 m above



AK1.33



AK1.38



AK1.34



AK1.39



AK1.35



AK1.40



AK1.36



AK1.41



AK1.37

FIGURE 51

surface. Dimensions of central hole 0.27×0.18 m. An additional stone was present in the centre of the feature.

AK1.39# Post hole. Visible in plan and to some depth as partially revealed by previous excavation. Three stones, one set vertically and two set on end and steeply angled, sitting within a matrix of mid-brown silty sand. Two of the stones appear to form a surround (0.25×0.25 m; depth 0.13 m; internal hole $c.0.10 \times 0.08$ m). The third stone is jammed between the other two, perhaps to provide additional support.

AK1.40 Post hole? Visible in plan and to some depth. A small, roughly ovoid cut (0.21×0.10 m) with a mid-brown silty sand fill. In the centre lies a single upright stone (th. 0.03 m) which protrudes 0.07 m above the surrounding intact fill. Lies in an area of fragmented bedrock so interpretation is not clear.

AK1.41 Four steeply angled stones set within a matrix of mid-brown silty sand (dimensions 0.46×0.31 m). The four stones protrude up to 0.09 m above the surface, but do not form any regular pattern. Possibly a post support where the stones are jammed down the sides of the post rather than set into a surround.

AK1.42 Spread of ash (0.82×0.30 m). No evidence of any underlying burning.

AK1.43 Ovoid spread of grey ash and black crushed charcoal (0.31×0.20 m). Appears to be a thin smear, with ground at south end scorched deep red brown. *In situ* burning. Limited nature of scorching and deposit suggest a single episode.

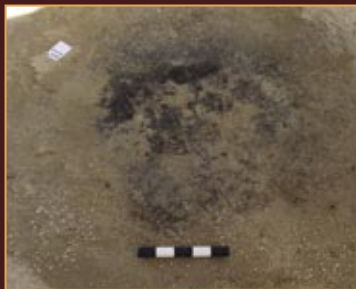
AK1.44 A circular depression (diam. 0.28 m; depth 0.06 m) containing grey ash and crushed charcoal lenses above deep orange-brown scorched earth. Nearby are three ashy areas: a spread of ash (diam. 0.20×0.18 m); a concentrated patch of ash, crushed charcoal and small burnt stones ($0.05\text{--}0.02$ m); and a patchy spread of ash (0.28×0.13 m). The circular depression is the site of the hearth, with the ashy areas representing episodes of rake-out.

AK1.45 Post hole (0.30×0.21 m) with fill of mid-brown silty sand. Six upright or nearly-upright stones visible protruding up to 0.07 m above the surface. Four stones line the cut, the other two lie within, forming a central shaft (0.07×0.14 m).

AK1.46 Post hole (0.40×0.29 m) with fill of mid-brown silty sand. Contains single central stone angled steeply down. (0.12×0.10 m; th. 0.04 m; protruding 0.05 m).



AK1.52



AK1.54



AK1.58



AK1.59



AK1.62



AK1.66



AK1.67



AK1.69



AK1.74



AK1.77

FIGURE 52

AK1.47 Post hole (0.23 × 0.19 m) with fill of mid-brown silty sand. Single stone (0.09 × 0.04 m; protruding 0.09 m).

AK1.48 Post hole? Cut (0.20 × 0.10 m) with fill of mid-brown silty sand. Single upright stone (0.15 × 0.03 m; protruding 0.08 m).

AK1.49 Post hole (diam. 0.16 m) with fill of mid-brown silty sand. Contains two stones (0.15 × 0.08 m long; 0.02 m thick; protruding 0.06 m), one upright the other steeply angled, forming a 'v'-shape with a central depression (diam. 0.08 × 0.08 m).

AK1.50 Circular spread of ash and charcoal (diam. 0.31 m) within a dished depression (0.04 m deep). Ground beneath scorched deep red-brown. Smaller patch of ash and charcoal to the east, surrounding ground unburnt. Represents a hearth and associated rake-out.

AK1.51 Area of ash and crushed charcoal (0.26 × 0.28 m). Soft grey ash layer over a crushed charcoal lens. The ground below, visible at the edges, has been scorched to a deep red-brown.

AK1.52 Patch of ash and charcoal (0.45 × 0.38 m). Thin lens of grey ash over crushed charcoal layer. Ground north scorched deep red-brown.

AK1.53 Post hole with single upright stone (h. 0.20 m long; th. 0.06 m; protrudes 0.08 m). Sits within an indistinct oval cut (0.27 × 0.20 m) filled with mid-brown silty sand.

AK1.54 Spread of ash and charcoal (0.90 × 0.82). Mixture of grey ash and crushed black charcoal. No evidence of scorching to ground below but little depth of deposit revealed by surface cleaning.

AK1.55 Upright stones with nearby spread of ash and charcoal (diam. 1.30 m). Stones do not form any visible pattern. No scorching of ground surface visible, but little depth uncovered. Perhaps represent hearth and associated dump of debris.

AK1.56 Post hole (0.30 × 0.37 m) filled mid-brown silty sand. Single steeply angled sits within the cut (l. 0.18 m; th. 0.02 m; protrudes 0.05 m).

AK1.57 Post hole (diam. 0.19 m) filled with mid-brown silty sand. Two nearly-upright stones in a 'v'-shaped arrangement line the central shaft (0.07 m wide). Stones protrude up to 0.08 m.

AK1.58 Post hole (0.32 × 0.22 m) with fill of mid-brown silty sand. Three upright stones arranged in a 'v'-shape line the central shaft (up to 0.16 m wide).

AK1.59 Post hole (diam. 0.20 m) filled with mid-brown silty sand. Two upright stones (l. 0.10 and 0.20 m; th. 0.06 m; protrude 0.06 m) arranged in a 'v'-shape line the central shaft (diam. 0.14 m).

AK1.60 Post hole (0.27 × 0.22 m) filled with mid-brown silty sand. Single upright stone (l. 0.19 m; th. 0.02 m; protruding 0.08 m).

AK1.61 Post hole (0.14 × 0.09 m), filled by mid-brown silty sand. Single upright stone (l. 0.13 m; th. 0.05 m; protruding 0.06 m).

AK1.62 Post hole (diam. 0.27 m) filled by mid-brown silty sand. Three upright stones in a triangle, (l. 0.07–0.17 m long; th. 0.02–0.05 m; protruding up to 0.08 m). Central shaft formed by these stones has a maximum width of 0.08 m.

AK1.63 Post hole (diam. 0.13 m diameter) filled with a mid-brown silty sand. Single upright stone (0.10 × 0.04 m; protrudes 0.05 m).

AK1.64 Post hole (0.25 × 0.18 m), filled with a mid-brown silty sand. The western end contains a triangle of three nearly-upright stones (l. 0.10–0.14 m; th. 0.02–0.04 m; protrude up to 0.08 m) with a tiny stone between two of them. The stones form a central shaft with a maximum width of 0.11 m.

AK1.65 Post hole (0.18 × 0.14 m) filled with a mid-brown silty sand. Two stones in 'v'-shape (l. 0.07–0.10 m; th. 0.03 m). Space between has a maximum width of 0.09 m.

AK1.66 Post hole (diam. 0.33 m) filled with a mid-brown silty sand. Stones form three sides of a rectangle (l. 0.12–0.18 m, th. 0.02–0.07 m; protrude up to 0.10 m). Internal space is 0.16 × 0.10 m.

AK1.67 Post hole (0.23 × 0.19 m) filled with mid-brown silty sand. Three nearly-upright stones (l. 0.10–0.14 m; th. 0.03–0.06 m; protrude up to 0.09 m). Stones set close, but forming no obvious pattern. Around the northern edge is a lens of crushed charcoal, perhaps indicating that the post was burnt.

AK1.68 Spread of grey black ash and crushed charcoal (0.20 × 0.28 m). Slight reddening of ground surface to east of deposit.

AK1.69 Post hole (diam. 0.30 m) filled with mid-brown silty sand. Smears of crushed charcoal visible on surface. Single upright stone (l. 0.21 m; th. 0.04 m; protrudes 0.09 m). Charcoal from burning of post or more likely from activities near post.

AK1.70 Post hole (0.25 × 0.13 m) filled with mid-brown silty sand. Single upright stone (l. 0.16 m; th. 0.04 m; protrudes 0.10 m).

AK1.71 Post hole (diam. 0.28 m) filled by mid-brown silty sand. Single nearly-upright stone (l. 0.19 m; th. 0.05 m thick; protrudes 0.11 m).

AK1.72 Post hole (0.40 × 0.36 m), filled by mid-brown silty sand. Single upright stone (l. 0.23 m; th. 0.04 m; protrudes 0.09 m).

AK1.73 Post hole (0.31 × 0.31 m) filled by mid-brown silty sand. Four stones line the hole (l. 0.09–0.13 m; th. 0.02–0.06 m; protrude up to 0.10 m), forming a central shaft 0.09 m across.

AK1.74 Post hole (0.26 × 0.21 m), filled by a very shelly mid-brown silty sand. Two large upright stones (l. 0.23 and 0.20 m; th. 0.07–0.08 m; protrude up to 0.15 m). Laid parallel to one another with a gap of only 0.02 m.

AK1.75 Post hole (0.16 × 0.10 m), filled by mid-brown silty sand. Single upright stone (l. 0.10 m; th. 0.03 m; protrudes 0.10 m).

AK1.76 Spread of fine grey ash overlying a layer of black crushed charcoal (0.54 × 0.66 m). No sign of scorching on underlying ground surface.

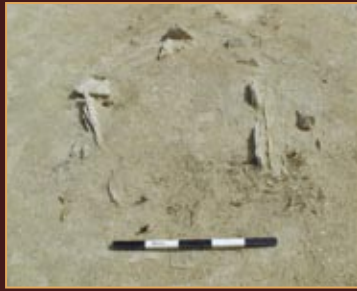
AK1.77 Post hole (0.87 × 0.42 m), filled with mid-brown silty sand. Northern half of cut contains single large flattish stone (0.32 × 0.21 m; protrudes up to 0.06 m). Southern half has three stones in a triangular pattern forming a central shaft (l. 0.12–0.22 m; th. 0.04–0.06 m; protrude up to 0.14 m). Central shaft 0.16 m across.

AK1.78 Roughly circular area of ash and charcoal (diam. 0.44 m). Thin grey ashy lens over black crushed charcoal. Towards southwestern side the ground has been slightly scorched, turning it a deep red brown.

AK1.79 Spread of mixed grey ash and black charcoal. Irregular in plan but approximately linear (0.70 × 0.26 m). Ground along northeastern edge scorched a deep red brown.



AK1.80



AK1.97



AK1.81



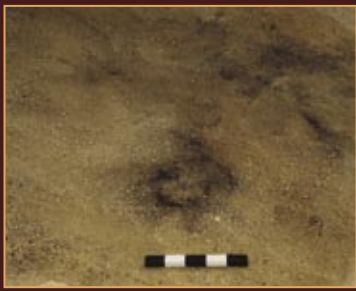
AK1.98



AK1.86



AK1.99



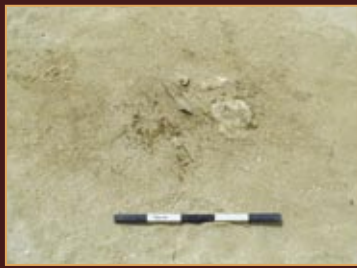
AK1.92



AK1.100



AK1.96



AK1.101

FIGURE 53

AK1.80 Post hole (diam. 0.35 m) filled with mid-brown silty sand. Single stone (l. 0.23 m; th. 0.08 m; protrudes 0.16 m).

AK1.81 Post hole (diam. 0.31 m) filled with mid-brown silty sand. Circular cut with single stone (l. 0.26 m; th. 0.07 m; protrudes 0.12 m).

AK1.82 Post hole (0.41 × 0.36 m) filled with mid-brown silty sand. Three stones, two upright and one angled steeply down arranged in a rough 'v'-shape (l. 0.14–0.22 m; th. 0.03–0.05 m; protrude up to 0.15 m).

AK1.83 Post hole (0.35 × 0.26 m) filled with mid-brown silty sand. Single stone (l. 0.13 m; th. 0.05 m; protrudes 0.10 m).

AK1.84 Spread of fine grey ash above crushed black charcoal. (0.39 × 0.43 m). No sign of scorching.

AK1.85 Post hole (0.16 × 0.13 m) filled with mid-brown silty sand. Single upright stone (l. 0.12 m; th. 0.05 m thick; protrudes 0.07 m).

AK1.86 Sub ovoid cut (0.76 × 0.45 m) filled mostly with mid-brown silty sand. A line of crushed charcoal and sand around the south side suggests a different lower fill. On north side is a roughly circular arrangement of stones, one upright, three nearly-upright and two fairly flat, forming an area 0.24 m in diameter. The stones (l. 0.06–0.12 m) are quite closely packed. Possibly represents two separate features, a post hole and a hearth?

AK1.87 Roughly circular area of fine grey ash (diam. 0.98 m) overlying a black crushed charcoal layer. Single slightly angled stone (0.29 × 0.20 m) sits in centre of surface. Deposit appears to overlie feature AK1.86 to the west. No evidence of scorching of underlying surface.

AK1.88 Post hole (diam. 0.18 m filled with mid-brown silty sand. Single stone (0.15 × 0.13 m; protruding 0.07 m). Possibly a post hole but as the stone fills most of the cut the post itself must have been very narrow, or the packing stone may have shifted after the rotting or removal of the post.

AK1.89 Post hole. Single upright stone (l. 0.08 m; th. 0.05 m, protrudes 0.04 m).

AK1.90 Post hole (0.42 × 0.30 m) filled with mid-brown silty sand. Three stones, one upright and two

nearly-upright (l. 0.10–0.13 m; th. 0.02–0.04 m; protrude up to 0.06 m), splaying out from a central area 0.08 m across. Stones have probably moved from their original positions, or the arrangement is very curious.

AK1.91 Post hole (0.37 × 0.27 m) filled with mid-brown silty sand. Four stones, two upright, two nearly-upright, towards the edges of the fill (l. 0.07–0.17 m; th. 0.02–0.06 m; protrude up to 0.10 m). Central shaft up to 0.13 m across.

AK1.92 Two adjacent ash and charcoal patches. Both with ashy grey lenses above black crushed charcoal. Northwestern patch (0.35 × 0.70 m) shows evidence of scorching on the south side, turning the ground a deep red brown. Scorching suggests *in situ* burning not dumping.

AK1.93 Ovoid cut (0.40 × 0.30 m) filled with mid-brown silty sand. Three stones laid to form three sides of a rectangle (l. 0.18–0.29 m; th. 0.04–0.06 m; protrudes up to 0.13 m). A fourth large stone and two smaller stones lie within.

AK1.94 Post hole (0.26 × 0.09 m) filled with mid-brown silty sand. Single upright stone in centre (0.24 × 0.05 m; protrudes 0.12 m).

AK1.95 Irregular area of grey ash and fine black crushed charcoal (0.60 × 0.80 m). Some underlying scorching at western edge where the ground is a deep red-brown colour.

AK1.96 Stone-lined hearth made up of at least seven nearly-upright stones (max. l. 0.35 m; th. 0.02–0.05 m; protrude up to 0.07 m) enclosing an area of 0.72 × 0.62 m. No difference between fill and surrounding ground discerned, but surface crust not removed.

AK1.97 Stone-lined hearth made up of a group of nearly-upright stones (l. 0.10–0.32 m long; th. 0.02–0.05 m; protrude up to 0.10 m) lining a cut and positioned to form three sides of a sub rectangle (1.03 × 0.72 m). One large nearly-upright stone visible within fill. Fill not distinguished from surrounding ground.

AK1.98 Stone-lined hearth. Rectangular surround of stones (l. 0.07–0.25 m; th. 0.02–0.05 m; protrude up to 0.05 m). Filled with mid-brown silty sand. Stones enclose an area of 0.88 × 0.63 m.

AK1.99* Small shallow circular cut (diam. 0.47 m; depth 0.17 m) which truncated the southern edge of AK1.31. It was filled with a deposit of dark grey powdered and silt (437) and is interpreted as a small fire pit.

AK1.100 Stone structure visible as an outer ring of stones forming three quarters of a circle (northwestern side is missing or buried). Mostly one course but three courses of fairly crude possible walling visible along the southeastern side (width 0.22–0.32 m; internal diam. of ring 0.50 m; external diam. 0.92 m). Piece of plastic protrudes from fill so either modern or previously investigated by French mission.

AK1.101 Cut (1.20 × 0.60 m) filled with mid-brown silty sand. Contains a group of six stones closely abutting (diam. range 0.05–0.20 m; protrude up to 0.05 m). There is no visible central cavity and the elongated shape of the feature suggests that it is not a simple post hole.

AK1.102 Hearth with stone lining (diam. at base 30 m; diam. at top 0.50; depth 0.35 m). Lined with a single row of flat stones except at northern end where there are two rows. Base is made up of bedrock. Excavated by French mission. No intact fills survive. Internal faces of the stones darkened grey-black from burning.

AK1.104 Single upright stone (h. 0.18 m).

AK1.105 Three upright stones. Two parallel and one at forty-five degrees.

AK1.106 Nine upright stones, covering an area of 0.41 m in diameter. Stones to south are parallel and on edge, larger stone to northwest, smaller stones used as in-fill.

AK1.107 Area of stones on edge (0.33 × 0.37 m). On east side, three parallel stones running east to west; on west side two parallel running north to south. One smaller stone to east.

AK1.108 Two upright stones (h. 0.18 m), narrowing to a 'v'-shape at northeastern end.

AK1.109 Two stones set at right angles.

AK1.110 Single upright stone (h. 0.10 m).

AK1.111 Two upright stones (0.11 m north to south).

AK1.112 Single upright stone (0.09 m north to south).

AK1.113 Single upright stone (0.07 m east to west).

AK1.114 Single upright stone, (0.11 m north to south).

AK1.115 Single upright stone (0.11 m north to south).

AK1.116 Four stones set on edge. Two form a ‘v’-shape converging to northwest, two are parallel northeast to southwest (0.36 m north to south).

AK1.117 Four stones (0.45 × 0.34 m) in no apparent pattern.

AK1.118 Three upright stones forming a rough triangle (0.21 × 0.23 m).

AK1.119 Ashy patch (0.46 × 0.52 m).

AK1.120 One upright stone in a circular cut (diam. 0.06 m).

AK1.121 Two stones, one upright and one flat (in area of 0.35 × 0.55 m)

AK1.122 Single upright stone (l. 0.14 m).

AK1.123 Three upright stones in a rough triangle (0.28 × 0. 30 m).

AK1.124 Circular ash patch (diam. 0.43 m).

AK1.125 Ashy patch (0.25 × 0.22 m).

AK1.126 Ashy patch (0.50 × 0.30 m).

AK1.127 Ashy patch (0.38 × 0.25 m).

AK1.128 Line of upright stones with some loose ones (covering an area of 0.87 m north to south, 0.55 m east to west). Close to, and possibly related to, AK1.127 and 129.

AK1.129 Line of upright stones (0.8 m north to south). One burnt face on southern stone. Possibly related to AK1.128.

AK1.130 Group of five stones (0.30 × 0.32 m). Central stone upright, others may be so.

AK1.131 Ashy patch (0.45 × 0.40 m).

AK1.132 Ashy patch (0.40 × 0.30 m).

AK1.133 Ashy patch (0.48 × 0.35 m).

AK1.134 Single upright stone (0.15 m north to south).

AK1.135 Single upright stone (0.10 m).

AK1.136 Ashy patch (0.35 × 0.25 m).

AK1.137 Ashy patch (0.15 × 0.10 m).

AK1.138 Ashy patch (diam. 0.10 m).

AK1.139 Two stones, one upright, one sloping. Some smaller stones scattered around (0.20 × 0.35 m).

AK1.140 Collection of stones in a rough circle (1.4 × 1.5 m) within a probable fill. Stones small, some loose some embedded.

AK1.141 Group of stones in possible linear arrangement (l. 0.50 m). One large stone and numerous smaller ones.

AK1.142 Single upright stone (l. 0.14 m; th. 0.03 m).

AK1.143 Three stones set in a ‘v’-shape with loose fill between.

AK1.144 Two upright stones slightly apart in linear alignment (0.10 × 0.30 m).

AK1.145 Single upright stone (l. 0.12 m; th. 0.04 m).

AK1.146 One upright and one sloping stone (0.25 × 0.25 m).

AK1.147 Single stone, partially burnt, only top visible (0.15 × 0. 20 m).

AK1.148 Two upright stones (0.10 × 0.25 m).

AK1.149 Rectangular stone with very straight sides and depression in middle (0.25 × 0. 35 m). Partially burnt.

AK1.150 Collection of upright and flat stones (over an area of 1 × 1 m). Close to bulldozer spoil and hearth 166.

AK1.151 One upright and two sloping stones (0.40 × 0.85 m).

AK1.152 Sub-circular arrangement of upright and flat stones (0.70 × 0.90 m) with possible fill. Stones to north upright and forming an edge.

AK1.153 Single small upright stone (l. 0.07 m; th. 0.03 m).

AK1.154 Single upright stone (l. 0.08 m; th. 0.03 m).

AK1.155 Three upright stones forming a triangle (sides measuring 0.10 m).

AK1.156 Single upright stone (l. 0.10 m; th. 0.03 m).

AK1.157 Single squarish upright stone (0.05 × 0.06 m).

AK1.158 Two parallel upright stones (0.12 × 0.08 m).

AK1.159 Group of upright, round stones, roughly linear (0.40 × 0.75 m); some stones partially burnt.

AK1.160 Ashy patch (0.25 × 0.45 m).

AK1.161 Ashy patch (0.15 × 0.20 m).

AK1.162 Ashy patch (0.10 × 0.30 m).

AK1.163 Ashy patch (0.10 × 0.20 m).

AK1.164 Ashy patch (0.20 × 0.30 m).

AK1.165 Ashy patch (0.20 × 0.35 m).

AK1.166 Ashy patch (0.20 × 0.40 m).

AK1.167 Ashy patch (0.40 × 0.50 m).

AK1.168 Ashy patch (0.25 × 0.20 m).

AK1.169 Ashy patch (0.40 × 0.30 m).

AK1.170 Ashy patch (0.15 × 0.30 m).

AK1.171 Single small upright stone (l. 0.07; th. 0.04 m).

AK1.172 Ashy patch (diam. 0.15 m)

AK1.173 Large circular group of mounded flat beach rock stones (3.60 × 3.90 m), near bulldozer spoil.

AK1.174 Two flat stones surrounded by ash (diam. 0.30 m).

AK1.175 Single upright stone (0.15 × 0.10 m).

AK1.176 Ashy patch (diam. 0.10 m).

AK1.177 Three upright stones edging southern part of a very loose sandy fill (diam. 0.70 m).

AK1.178 Two upright stones (0.20 × 0.10 m).

AK1.179 Two upright stones almost parallel but diverging slightly to south.

AK1.180 Single upright stone (l. 0.10 m; th. 0.04 m).

AK1.181 Single upright stone (l. 0.16 m; th. 0.03 m).

AK1.182 Ashy patch (0.10 × 0.20 m).

AK1.183 Ashy patch (0.30 × 0.35 m).

AK1.184 Ashy patch (0.60 × 0.40 m). Disturbed by bulldozer track.

AK1.185 Ashy patch (0.20 × 0.30 m).

AK1.186 Single upright stone (0.10 m × 0.35 m).

AK1.187 Ashy patch (0.25 × 0.35 m).

AK1.188 Ashy patch (0.50 × 0.70 m).

AK1.189 Ashy patch (0.20 × 0.30 m).

AK1.190* Stone-lined hearth (0.67 × 0.72 m; depth 0.22 m), filled with black sand, charcoal, and several heat-fractured stones that may have been pot-boilers (233).

AK1.191# Stone-lined hearth within AK1.12 (top 0.53–0.56 m; base 0.43–0.46 m; depth 0.57 m).

AK1.192# Stone-lined oval structure similar to, and east of, AK1.12 (see Fig. XXX). Stone surround and base (1.60 × 2.10 m; depth 0.23–0.31 m). Base only visible at west; eastern half of structure in-filled with horizontal slabs of beach rock, raising level to the height of the surround stones. These slabs appear to precede the insertion of hearth AK1.191 which abuts them.

AK1.195 Large ovoid cut (1.50 × 1.80 m; depth 0.32 m). Steeply sloping sides, flat base; clear distinction between fill and natural.

AK1.196 Post hole with two stones (diam. 0.34 m; depth 0.29 m).

AK1.197 Post hole (diam. 0.30 m; depth 0.18 m).



FIGURE 54 AK2.509



FIGURE 55 AK2.516

AK2 FEATURES

AK2.501 Curving stone wall (0.24 × 0.43 × 3.0 m) of limestone and beach rock (stones: 0.40–0.60 m long). Built with random coursing (2–4 courses extant). Collapsed at both ends.

AK2.502 Ashy patch. Dark brown-grey loose sand, silt and ash/charcoal (0.42 × 0.45 m).

AK2.503 Ashy patch. Dark grey loose sand, silt and ash/charcoal (0.32 × 0.47 m).

AK2.504 Ashy patch. Grey loose sand, silt and ash/charcoal (0.30 × 0.32 m).

AK2.505 Ashy patch. Burnt sand and ash (0.56 × 0.66 m). Well defined, with very small charcoal fragments within a loose burnt sand.

AK2.506 Ashy patch. Grey/black, burnt sand and ash (0.36 × 0.47 m).

AK2.509* Rectangular arrangement of fifteen vertical stones (0.64 × 2.00 m) protruding 0.10–0.25 m. A few appear to have been slightly disturbed, but stones well butted at northern end. Possible grave.

AK2.510 Ashy patch. Dark grey-black burnt sand and ash (diam. 0.18 m).

AK2.511 Ashy patch. Dark grey-black burnt sand and charcoal (0.48 × 0.52 m). One unburnt stone in the middle.

AK2.512* Post hole with three stones (th. 0.02 m; l. 0.10 m; protrude 0.07 m) set in a triangle. Feature is 0.13 m deep and filled with light brown sand.

AK2.513 Post hole with three upright stones (l. 0.15 m; th. 0.03 m; protrude 0.05 m).

AK2.514 Post hole with three stones (th. 0.04 m; l. 0.12 m; protrude 0.05 m) set in a triangle. Feature measures 0.16 × 0.17 m.

AK2.515 Post hole with two upright stones set in a 'v'-shape. Depth 0.10 m. Stones protrude 0.05 m above surface.

AK2.516* Circular stone structure. Encircling wall (width 0.70–0.80 m) made up of as many as six courses of large flat irregular slabs of beach rock lying horizontally (external diam. 4.39–4.67 m; internal space 1.95 × 1.98 m). Interpreted as a semi-subterranean dwelling, perhaps used for seasonal occupation.

AK2.517* Arc of large upright beach rocks (l. 0.65 m; width 0.05 m; ht. 0.28 m), two rows deep, enclosing an area 2.77 m in length southeast to northwest. Adjacent to AK2.516 structure, with open side facing east. Possible wind-break.

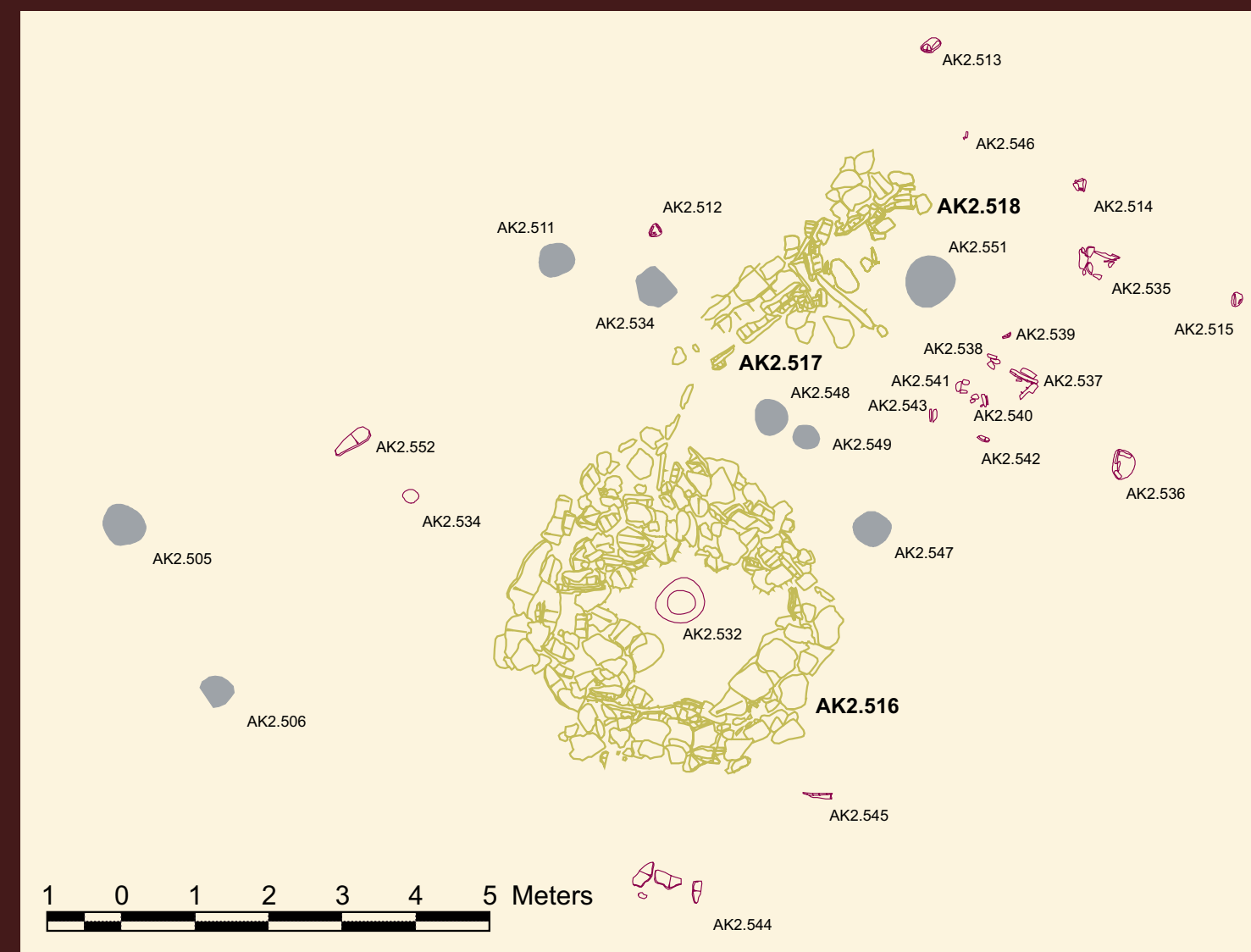


FIGURE 56
AK2 Main excavated area



FIGURE 57 AK2.517



FIGURE 58 AK2.532

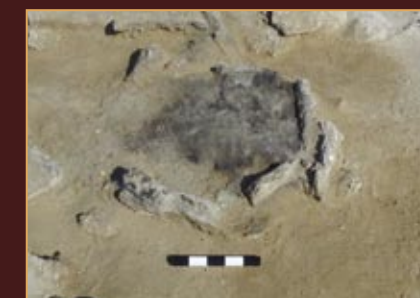
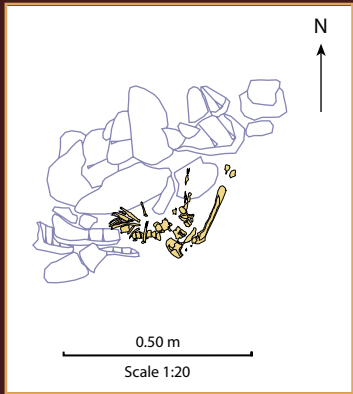


FIGURE 59 AK2.519



AK2.533



AK2.536



AK2.537



AK2.540



AK2.550

FIGURE 60

AK2.518* Arc of large upright beach rocks, two rows deep, joined to northeastern end of AK2.517 and contemporary with it. Possible wind-break.

AK2.519* Stone-lined pit/hearth (diam. 0.55–0.75 m; depth 0.40 m). Lining of irregular slabs (l. 0.40 m; th. 0.03–0.06 m). Upper parts of stones blackened. Stones absent at western end.

AK2.520 Roughly oval area of stones (diam. 2.0 × 2.3 m).

AK2.521 Line of upright stones (l. 1.32 m) abutted on northern side by area of smaller, flatter stones (width 0.10–0.20 m) running the length of the feature.

AK2.522 Rectangular area of large stones (0.65 × 1.75 m).

AK2.523 Small rectangular area of stones (0.16 × 0.60 m), two stones wide.

AK2.524 Small rectangular area of vertical stones (0.63 × 0.75 m), three stones wide. The area inside and outside the feature contains much rubble. No distinct fill is visible.

AK2.525 Linear arrangement of stones (l. 0.90 m). Fine ash and powdered charcoal to east and west. Burnt material runs up against the stones.

AK2.526 Two parallel lines of beach rock 0.85 m apart (stones: max l. 0.46 m; th. 0.03–0.05 m; protruding 0.06 m).

AK2.527 Two vertical stones forming a right angle (0.07 × 0.50 m; 0.06 × 0.39; protrude 0.07 m). Surrounded by rubble.

AK2.528 Stone-lined sub-rectangular pit (0.60 × 0.70 m. Stones: l. 0.28 m; th. 0.02–0.08; protrude 0.06 m). Lining is not complete, but some stones survive, one deep, on each side. Centre is filled with rubble.

AK2.529 Stone-lined sub-rectangular pit (0.62 × 0.64 m). Stones: max. l. 0.14 m; th. 0.02–0.04 m; protruding 0.05 m. Lining mostly one course, but two visible on north side.

AK2.530 Stone-lined pit. Six-sided, lined with one row of beach rock (0.66 × 0.70 m).

AK2.531* Circular, shallow hearth (diam. 0.58 m; depth 0.14 m), filled with grey sand.

AK2.532* Circular pit (diam. 0.72 m; depth 0.51 m) inside structure AK2.516. Steep convex sides taper to narrow base.

AK2.533* Incomplete human skeleton, disturbed by animal action and wall collapse. Head, cervical and thoracic vertebrae, and lower limbs absent. Flexed, lying on left side, facing north? Upper torso slightly elevated.

AK2.534* Ashy patch (0.50 × 0.80 m; max. depth 0.04 m). Four stones line the eastern end.

AK2.535 Group of nine small stones (covering an area 0.40 × 0.55 m). Central fill of light brown sand with shell (0.20 × 0.28 m).

AK2.536 Post hole with four upright stones laid as three sides of a rectangle (0.22 × 0.30 m).

AK2.537 Post hole with four upright stones laid in a triangle (0.42 × 0.46; internal space 0.16 × 0.23 m). Filled with natural sand.

AK2.538 Post hole with three upright stones laid irregularly (0.16 × 0.20 m).

AK2.539 Post hole with single stone (l. 0.14 m; th. 0.04 m; protrudes 0.05 m).

AK2.540 Five upright stones (l. 0.16 m; th. 0.03 m; protrude 0.10 m). Fairly flat and firmly set, irregular plan (feature: 0.18 × 0.27 m).

AK2.541 Post hole with three upright stones forming three sides of a rectangle. (0.08 × 0.15 m). No cut visible, although stones are well set.

AK2.542 Post hole with single upright (l. 0.14 m; th. 0.03 m; protrudes 0.13 m). No cut visible.

AK2.543 Post hole with two parallel stones (0.12 × 0.15 m).

AK2.544 Three large stones (0.03 × 0.44 × 0.22; covering an area of 0.55 × 1.3 m) with fill in-between.

AK2.545 Single large flat stone (l. 0.46 m; th. 0.04 m; protrudes 0.10 m).

AK2.546 Post hole with single stone (l. 0.10 m; th. 0.04 m; protrudes 0.07 m). No cut evident, some small stone fragments to west of stone.

AK2.547 Ashy patch. Roughly circular area of burnt sand with ash and occasional charcoal (0.53 × 0.40 m).

AK2.548 Ashy patch. Area of burnt sand with ash and occasional charcoal fragments (0.39 × 0.42 m).

AK2.549 Ashy patch (diam. 0.30 m). Smear or lens on surface of context 1531.

AK2.550* Wall of irregular stone slabs (l. 1.60 m; width 0.26–0.54 m; max. ht. 0.22 m). Between one and three courses of random construction survive. Late re-use of part of AK2.516. Interpreted as a windbreak.

AK2.551 Ashy patch. Loose burnt sand and ash with occasional charcoal flecks, roughly circular (diam. 0.48 m).

AK2.552 Post hole with single stone (l. 0.60 m; th. 0.10 m; protrudes 0.08 m). No cut visible.

AK3 FEATURES

AK3.1041 Three or four upright stones forming a lining for a hearth? (width 1.60 m; internal space 0.4 m).

AK3.1042 Shell midden (diam, 2.4 m).

AK3.1043 Large stone structure.

AK3.1044 Stone-lined rectangular pit (0.3 × 0.5 m).

AK3.1045 Stone-lined square hearth (0.55 × 0.55 m).

AK3.1046 Large stone-lined rectangular feature, Stones on three sides, east end open (1.3 × 1.6 m).

AK3.1047 Large sub-rectangular feature (2.6 × 3.0 m) Upright stones visible mainly on north and south sides.

AK3.1048 Stone-lined rectangular feature (0.55 × 0.66 m).

AK3.1049 Stone-lined rectangular hearth (0.65 × 0.70 m).

AK3.1050 Five-sided stone-lined hearth (width 0.85 m).

AK3.1051 Stone-lined hearth (0.6 × 0.7 m). Only the stone in the northeast side is currently visible.



AK3.1052



AK3.1053



AK3.1054



AK3.1055



AK3.1056



AK3.1057



AK3.1059



AK3.1060



AK3.1061



AK3.1074

FIGURE 61

AK3.1052 Stone-lined square hearth (0.50 × 0.50 m). Bush obscures most of feature.

AK3.1053 Three stones on surface forming a simple hearth (0.38 × 0.65 m). Ashy fill.

AK3.1054 Stone-lined hearth (0.45 × 0.48 m).

AK3.1055 Stone-lined oval structure (2.2 × 2.7 m). Internal dividing wall at southern end.

AK3.1056 Sub-rectangular feature of upright stones. (1.0 × 1.4 m).

AK3.1057 Stone-lined oval structure (1.6 × 2.0 m).

AK3.1058 Stone-lined oval structure.

AK3.1059 Shell midden.

AK3.1060 Structure, but shape no longer discernible.

AK3.1061 Shell midden.

AK3.1062 Shell midden, many burnt shell fragments.

AK3.1063# Large shell midden (Edens 1999: fig. 4).

AK3.1064 Stone-lined hearth (width 0.55 m).

AK3.1065 Upright stones, half an oval (l. 2.5 m).

AK3.1066# = Structure A (Edens 1999: fig. 3).

AK3.1067# = Structure B (Edens 1999: fig. 3).

AK3.1068# = Structure C (Edens 1999: fig. 3).

AK3.1069# = Structure D (Edens 1999: fig. 3).

AK3.1070 Burnt stones, possibly the remains of a hearth (0.9 × 1.2 m).

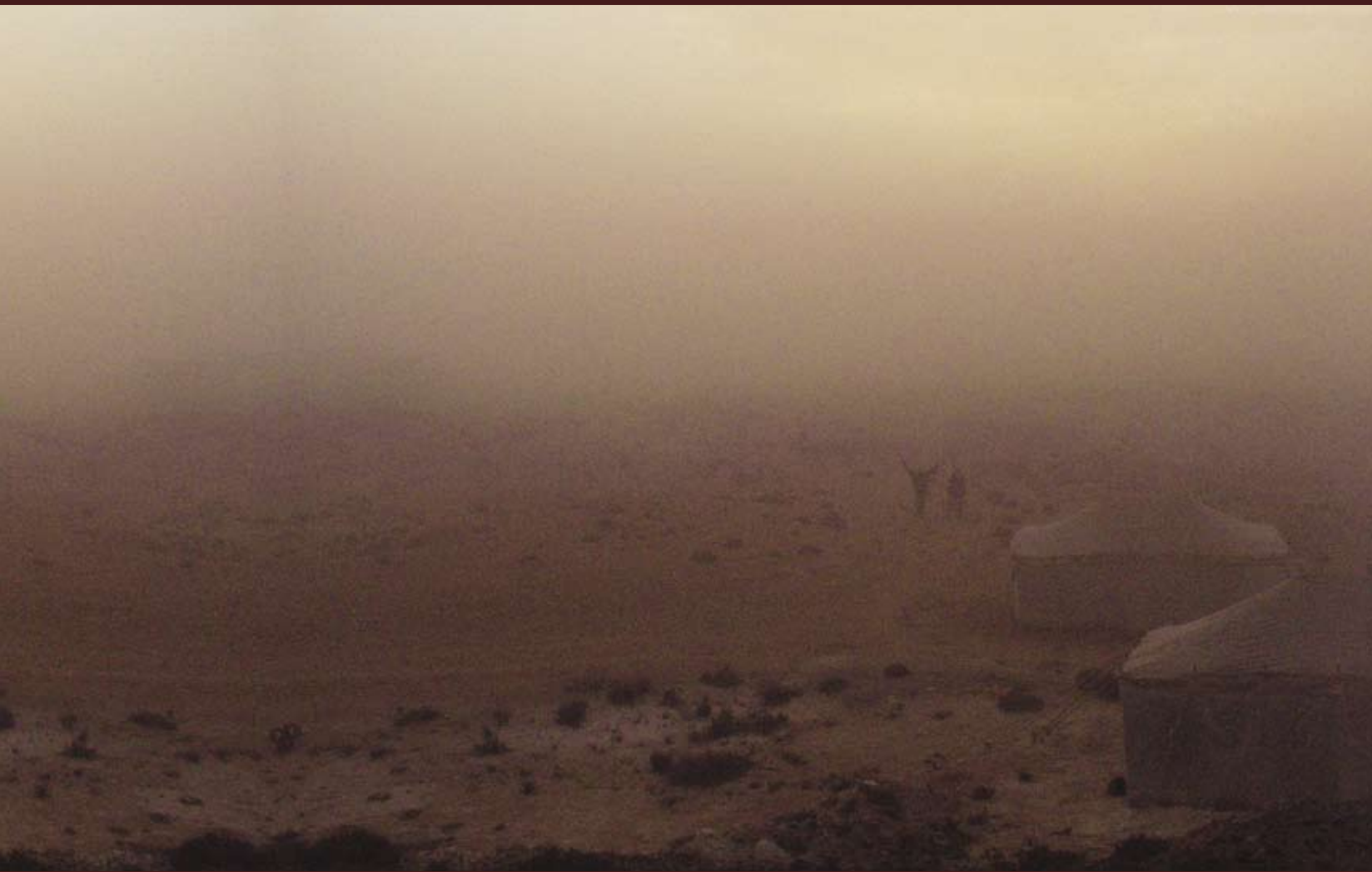
AK3.1071# = Structure E (Edens 1999: fig. 3).

AK3.1072 Large rectangular structure (3.0 × 3.4 m) divided into three areas.

AK3.1073 Post hole with two upright stones at right angles (0.2 × 0.3 m).

AK3.1074 Two sets of upright stones (0.9 × 1.2 m).

AK3.1075 Mound of rocks (0.6 × 0.9 m).



ISBN 0-953-95612-1



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