

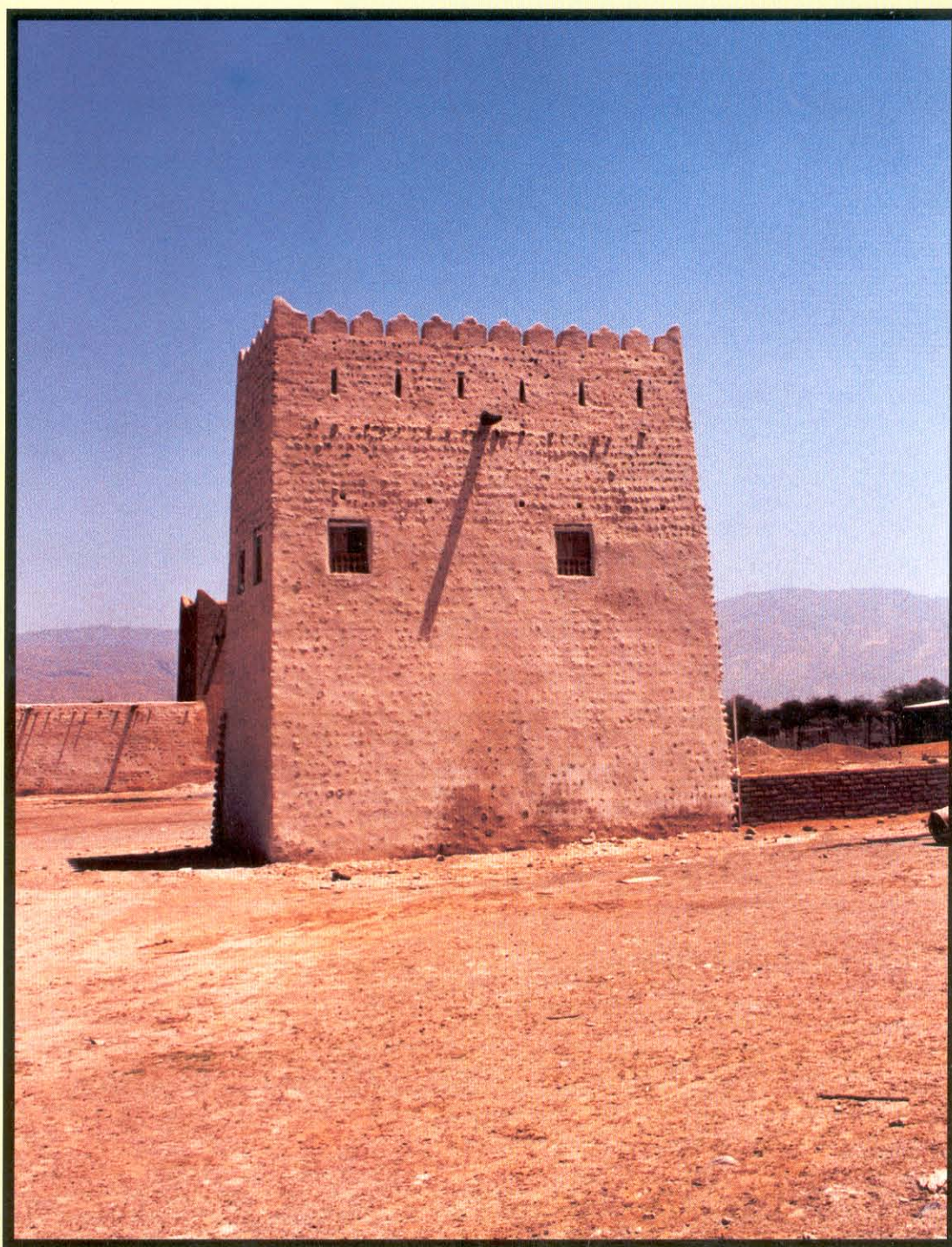
TRIBULUS



Journal of the Emirates Natural History Group

Vol. 11.1

Spring/Summer 2001



NOTES FOR CONTRIBUTORS

TRIBULUS is the name of the Bulletin of the Emirates Natural History Group. The Group was founded in 1976, and over the next fourteen years, 42 issues of a duplicated Bulletin were published. The revised format of TRIBULUS, introduced in 1991, permits the inclusion of black and white and colour photographs, not previously possible.

TRIBULUS is published twice a year, in April and October. The aim of the publication is to create and maintain in standard form a collection of recordings, articles and analysis on topics of regional archaeology and natural history, with the emphasis on the United Arab Emirates and adjacent areas. Papers, short notes and other contributions are welcomed from anyone but should not have been published elsewhere. Guidelines are set out below. The information carried is as accurate as the Editorial Board and Advisory Panel can determine, but opinions expressed are those of the authors alone.

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TRIBULUS,
Emirates Natural History Group,
P.O. Box 45553,
Abu Dhabi - U.A.E.

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The plant motif above is of the genus *Tribulus*, of which there are six species in the UAE. They all have pinnate leaves, yellow flowers with free petals and distinctive five-segmented fruits. They are found throughout the country, except in coastal *sabkha*.

The animal motif above is of a tiny golden bull, excavated from the early Second Millennium grave at Qattarah, Al Ain. The original is on display in Al Ain Museum, and measures above 5 cm by 4 cm.

Manuscripts should be typed, on one side only, and double-spaced, and should be accompanied by a disc for material in excess of 500 words in length. A short abstract should precede the article, with the address(es) of the author(s) at the end.

Photographs may be submitted and should be either glossy black-and-white or colour prints or colour slides, which should be clearly captioned. Line drawings and maps should be in black ink on strong white or translucent paper.

References should give the author's name, with the year of publication in brackets, and with the list of articles, showing title and publisher, in date order.

Scientific names should follow customary nomenclature in Latin, while the English and, if appropriate, available Arabic names should also be supplied.

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.....Picture by **Robert Carter**

Back: A relief of **Arabian Oryx** on the Third Millennium BC round tomb at Hili, Al Ain.

.....Picture by **Simon Aspinall**

The Editorial Board of TRIBULUS and the Committee of the Emirates Natural History Group acknowledge, with thanks, the support of the Group's Corporate members, a full list of whom can be found on Page 4, without whom publication in this format would be impossible. We also acknowledge the support and encouragement of our Patron, H.E. Sheikh Nahayan bin Mubarak Al Nahayan, the U.A.E. Minister of Higher Education and Scientific Research.

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EDITORIAL

As will rapidly become apparent from a quick scan of the Contents page, this issue of *Tribulus* is devoted almost in its entirety to archaeological topics. We make no apology for this: the issue is timed to coincide with the holding of the First Conference on Emirates Archaeology, held in Abu Dhabi in April 2001.

The Conference itself is a significant event. It is now over forty years since archaeology in the UAE began, with the commencement of excavations by a Danish team at Umm al-Nar. Over subsequent decades, but, in particular, in the last fifteen years or so, the UAE has become one of the most active countries in the region as far as archaeological investigations are concerned, but while Bahrain and Oman, for example, held conferences on the topic several years ago, with ensuing collected papers of considerable value, it has taken until 2001 for such an event to occur in the Emirates.

The Zayed Centre for Heritage and History, part of the Emirates Heritage Club, organisers of the conference in association with the Ministry of Information and Culture, deserve credit for their initiative, while the EHC's Patron, Deputy Prime Minister HH Sheikh Sultan bin Zayed Al Nahyan, also deserves thanks for offering his patronage and support to the conference. Organising such an event is by no means cheap, and, without such top level Government support, it is unlikely that it would have taken place.

It is to be hoped that the Conference itself will provide a timely boost to efforts to raise the country's archaeology and cultural heritage further up the political agenda. On the ground, archaeological work takes place throughout the UAE every year, with important new discoveries being made on an annual basis. At the same time, however, much needs to be done to ensure that archaeological sites, once identified, are protected and cherished. This requires action not merely from Departments of Antiquities, but also from other Government institutions. It is, or should be, unacceptable, for example, that archaeological sites that have been carefully fenced off to protect them are still being destroyed by other agencies of Government.

The issue of site identification also needs to be addressed at a national level. The federal legislation on protection of the environment requires that Environmental Impact Assessments and Baseline Studies should be carried out before development work takes place.

The same should apply to archaeological sites, which are, after all, an essential component of the cultural heritage of the people of the United Arab Emirates.

For that to take place, the introduction of federal legislation on archaeology is essential, and it is pleasing to be able to report that a draft federal archaeology law is now nearing completion. Not before time, either! Even when that is introduced, however, it will remain to be seen whether there is any effective implementation and

enforcement, just as is the case with the environmental legislation.

Protection of archaeological sites has already attracted some high level interest and involvement. In Sharjah, for example, the main road from Dhaid to al-Madam was diverted on the specific instructions of HH Dr. Sheikh Sultan bin Mohammed al-Qasimi, the Emirate's Ruler, in order to preserve, and permit full excavation of, the early 1st Millennium AD fort at Mileiha. In Ra's al-Khaimah, Deputy Ruler HH Sheikh Sultan bin Saqr al-Qasimi has also ensured that new road building does not impact on known sites. There is, though, room for much more to be done.

While legislation has yet to be introduced and enforced, however, it is also encouraging to see that enlightened corporate institutions are beginning to play a role in protecting archaeological sites. The Abu Dhabi National Oil Company, ADNOC, for example, has the protection of national heritage as part of its Group Health, Safety and Environment policy, while its subsidiary, the Abu Dhabi Company for Onshore Oil Operations, ADCO, has introduced a review of archaeological factors as part of its environmental assessment programmes.

If the April Archaeological Conference helps to push such issues more to the fore, it will have achieved one of its key objectives - as well as providing a forum for many of those working in UAE archaeology, from, home and abroad, to get together for a valuable few days of discussion.

The papers in this issue of *Tribulus* are a mixed bunch as usual, at least in terms of geographical location, albeit all with an archaeological theme. Christian Velde reports on the restoration of the Falayah fortified farmstead in Ra's al-Khaimah, where the 1820 treaty that introduced a British political presence to the region was signed. As he notes, that represents, arguably, the beginning of what is now the UAE.

Tatsuo and Hanae Sasaki report on excavations at Luluyyah, near Khor Fakkan, where they have been working on a hill-fort from the mid-Islamic period, one of the least understood parts of the UAE's history.

Mark Beech and Heiko Kallweit examine the archaeological and environmental remains from a shell midden in Ra's al-Khaimah, while Peter Hellyer and Mark Beech report on Carbon 14 dating of Iron Age hearths on an island west of Abu Dhabi. Finally, Brien Holmes, the Chairman of the Al Ain chapter of the ENHG, announces his discovery of a previously unrecorded Iron Age site in the desert near Al Ain, confirming, yet again, that in archaeology, as in natural history, the non-specialist still has a crucially important role to play.

Gary Feulner provides a short note on damselflies to provide a little bit of variety, but natural history topics, your Editors promise, will predominate in the next issue!

Corporate Members of the ENHG

Production of *Tribulus*, and many of the other activities of the Emirates Natural History Group, including the grant programme of the Group's Conservation Fund, would not be possible without the generous support of the Group's Corporate members, many of whom have provided consistent assistance over many years. The Editorial Board and the Group Committee acknowledge, with thanks, the invaluable support of the following companies and bodies:

ABN Amro Bank, Abu Dhabi Company for Onshore Oil Operations, (ADCO), Al Fahim Group, Al Nasser Holdings, Al Sayegh Richards Butler, Banque Nationale de Paris, Bin Hamoodah, The British Council, British Petroleum, HSBC, METCO, Mobil Abu Dhabi, Mohammed Bin Masood & Sons, National Bank of Abu Dhabi, Omeir Travel Agency, Ready Mix Abu Dhabi Ltd, Simmons & Simmons, Union National Bank

Falayah: The summer residence of the Qawasim in Ra's al-Khaimah, U.A.E.

by Christian Velde

Introduction

The fortified compound at Falayah was built in the 18th Century to serve as a summer residence for the Qawasim family, rulers of Ra's al-Khaimah and much of what is now the northern Emirates, as well as part of the coastal region of southern Iran and several of the offshore islands in the Arabian Gulf, including Abu Musa and Greater and Lesser Tunb. Surrounded by palm gardens and scattered houses, the compound provided a retreat from the town of Ra's al-Khaimah during the summer heat.

Its historical importance dates back to the war between the Qawasim and the British/Omani forces in late 1819. In January 1820, a treaty was signed at Falayah between the Qassimi Sheikh and the commander of the British expedition. This treaty, (to which other Sheikhs along the Arabian Gulf coast of the UAE subsequently acceded), provided the framework within which Britain established its presence in the region, and can, therefore, be seen as the foundation stone of what is today the United Arab Emirates.

The complex consists of three stone buildings close to a wadi, and surrounded by palm gardens. These gardens were part of an extensive and prosperous group of gardens along the edge of the gravel outwash fan of the Wadi Bih, whose high water table, resulting from the collection of water from the Ru'us al-Jibal, permitted a fertile area of gardens to be established from Shimal in the north to Fahlain in the south.

In 1999, Sheikh Sultan bin Saqr al-Qasimi, Deputy Ruler of Ra's al-Khaimah and Director of the Emirate's Department of Antiquities and Museums, gave instructions for the historical complex to be restored and, subsequently, to be opened to the public. In association with the restoration work, a programme of excavations was initiated to clarify the history of the complex. As of April 2001, the excavations were still continuing. This paper provides a preliminary overview of the results thus far.

The mosque

The westernmost building at Falayah is a mosque (Fig. 1), which was used by the Qasimi family and also served as the main Friday mosque for the area. It was built on a low mound within which are preserved the remains of an earlier farmstead. Excavations have revealed the postholes of an 'arish building, pits and a *tannour* made from a large storage jar. The walls of the mosque are made of stones from the adjacent wadi, bound by mortar. The floors were raised 50 cm. above ground level, probably to prevent the mosque from flooding during heavy winter rainfall. The building is rectangular in plan, combining a large external courtyard with a small prayer hall. This hall receives light through several low-positioned windows, and the room is also ventilated by small holes in the upper parts of the walls. Rectangular niches might have been used as bookshelves and wooden lamp holders were affixed to the walls. An interesting feature is a narrow and arched *minbar* in the eastern wall, with two steps. This type of *minbar* is also present in a number of other old mosques in Ra's al-Khaimah.

The original floor was not preserved. It could have been plastered or, alternatively, just a layer of compressed clay. Entrance to the mosque was through two entrances in the south and north sides of the courtyard, which is itself divided into three parts. The western and middle sections were separated by three square pillars, topped

by long beams which covered the western part and would have supported a roof, perhaps of 'arish, to provide shade for people praying in the courtyard. The courtyard floors were made of a thick layer of compressed clay, providing a hard and long-lived surface. The eastern part of the courtyard is raised as a platform with a second *mihrab*. It may have been used during the morning and evening prayers when temperatures were cooler. This platform, which was plastered, had a raised and walled square structure in the northeastern corner, which was used as a minaret.

The fortified farmstead

The summer residence consists of a large stone tower to the west and a separate three room building with an incorporated mudbrick tower to the east. Both units were once connected by walls which enclosed a courtyard area between them (Fig. 2). While these walls had been made from sunburned mudbricks towards the garden area in the south, the enclosure wall on the wadi side might have consisted of a stone wall. There are no remaining traces of this wall apart from the attachment at the northern side of the single tower.

The stone tower and state courtyard

The impressive stone tower and the courtyard form the public part of the complex. The tower is rectangular and has inclined walls (Fig. 3). It has three storeys, the highest of which has no roof and is surrounded by a crenellated wall. A secondary building seems to have been attached to the south, where traces of attachment are still visible. Another extension from the tower, no longer preserved, was a roofed portico in front of the entrance. The presence of this is shown by a row of holes for anchoring beams at first floor height.

The entrance into the tower from the courtyard leads into a high storeroom with niches and wooden lamp holders which was also used as living quarters. The door could be secured with a thick beam, the ends of which were placed in holes in the walls.

A stone staircase leads to the second floor, where the state Majlis is located. Six windows and several small rectangular holes ventilate the room. Two doors led to the attached building to the south and to the roof of the portico in the east. The Majlis walls were fitted with niches and lamp holders. This room may be where the 1820 peace treaty was signed. The roof of the tower was reached by a ladder made of short mangrove poles inserted into the wall diagonally across a corner. A crenellated wall surrounded the roof, which was used as a firing platform, with several vertical firing slots and a hooded firing point.

The private rooms and private courtyard

A private building with a second, private, courtyard, is connected to the east of the state courtyard (Fig. 4). This building comprised a row of three rooms, divided by a mudbrick tower in the middle. The northernmost of these rooms was used as a private Majlis, with its two doors permitting family members to enter either courtyard from the room. Five windows overlook the state courtyard in the west and the wadi in the north, while none overlook the private courtyard in the east, in order to ensure that no visitors would be able to look into the *Harem*, the private area of the family.

While the Majlis could be accessed from both courtyards, the other rooms could be entered only from

Falayah

Mosque

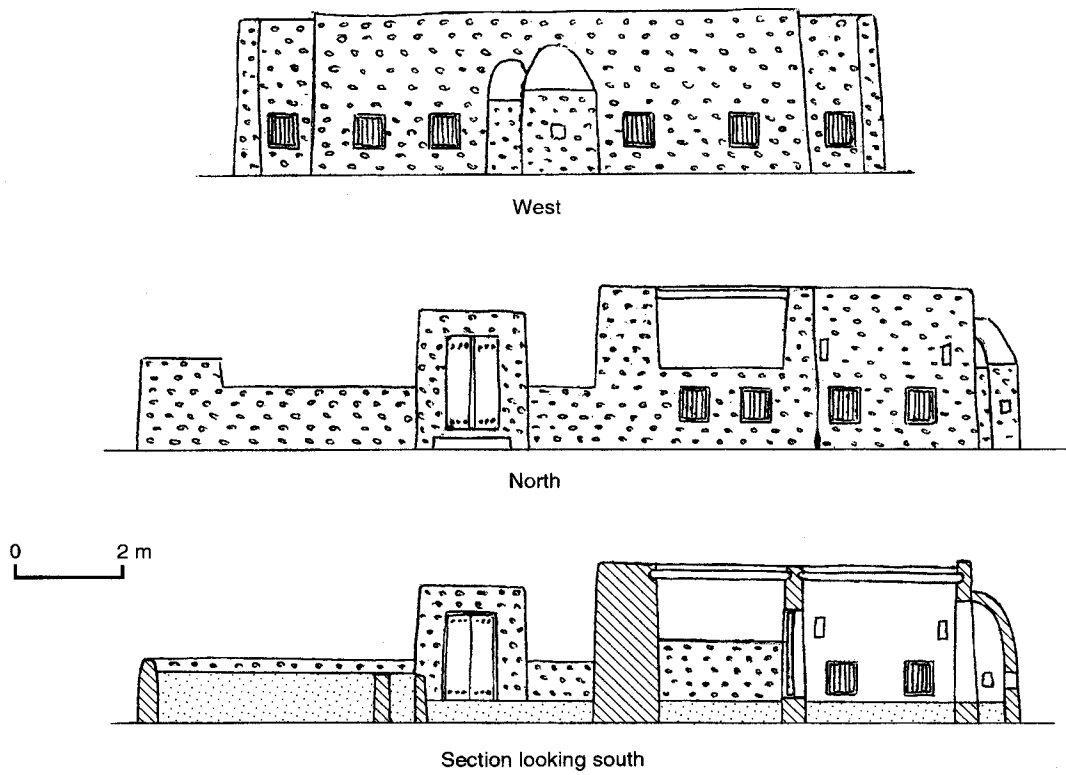


Fig. 1. External elevations of the Falayah mosque

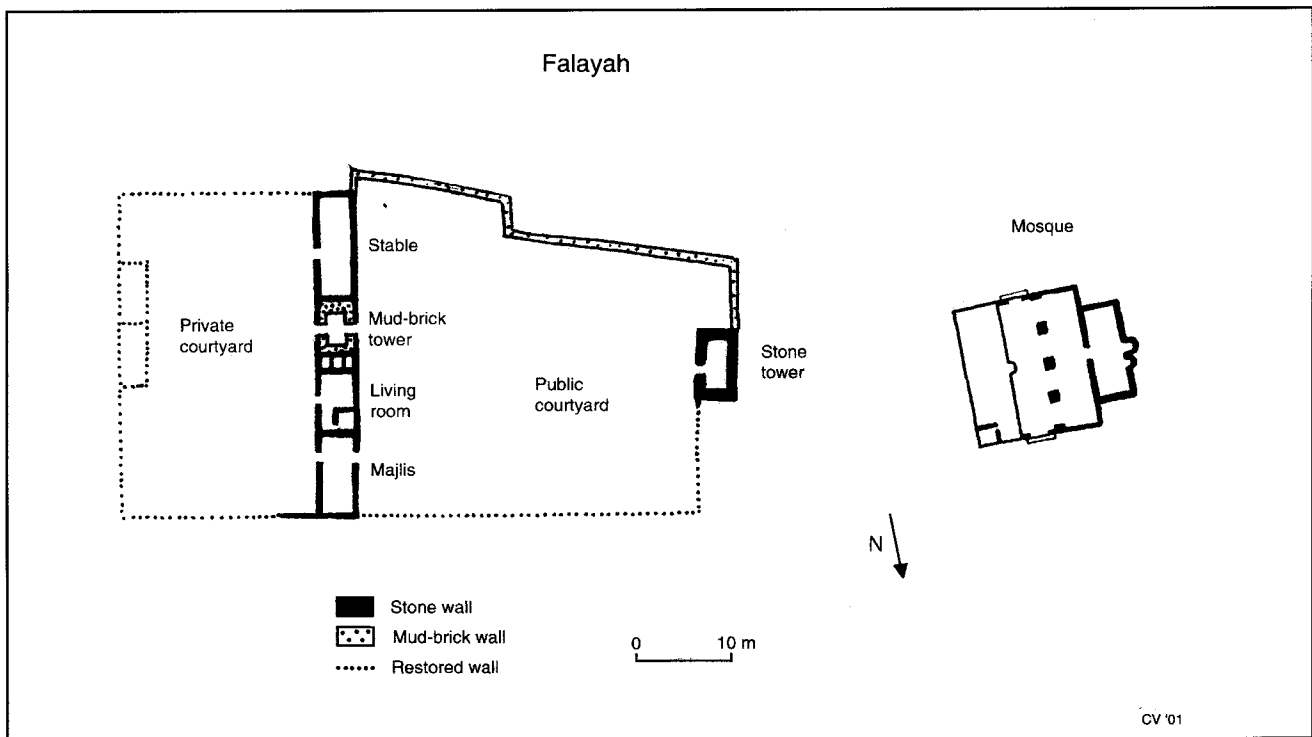


Fig. 2. Plan of the Falayah fortified farmstead

the private courtyard, indicating they were for domestic use. The second room is a typical living room with its own plastered bathroom, separated by a wall, in the northwestern corner. The southern end is a raised platform, which had a dual purpose. Its three compartments were used for storage and covered with wooden planks, permitting it to be used as a sleeping place. The second and third rooms are divided by the mudbrick tower, which has a stone facing of 1.5 metres in height at the base to protect the mudbricks from erosion by water.

The tower has two doors, and may have been used as a guarded entrance from the state courtyard to the private courtyard. Its first floor could only be reached from the outside, using a ladder to climb up to a small door. Vertical firing slots emphasise the defensive character of the tower. The last room of the private building had no niches or lamp holders, and may have been used as a stable, or for storage purposes. The examination of the

building as a whole indicated that the Majlis and the living room were built first as a separate unit. At that period, the living room was used only for storage and the corner used later as a bathroom was used as a *Madbasa* (date press).

A small mudbrick building complements the private courtyard to the east. Archaeological investigation of this building was still in progress as this report was written, but it may be assumed that the building was used as a kitchen, store and servants' quarters.

Residence, Farmstead and retreat

The combination of a stone tower, private buildings and courtyards had a dual domestic and defensive function, and the complex as a whole may be accurately described as a fortified farmstead. It served as a summer residence for the ruling Al-Qasimi family in the Falayah palm groves, where the climate is more

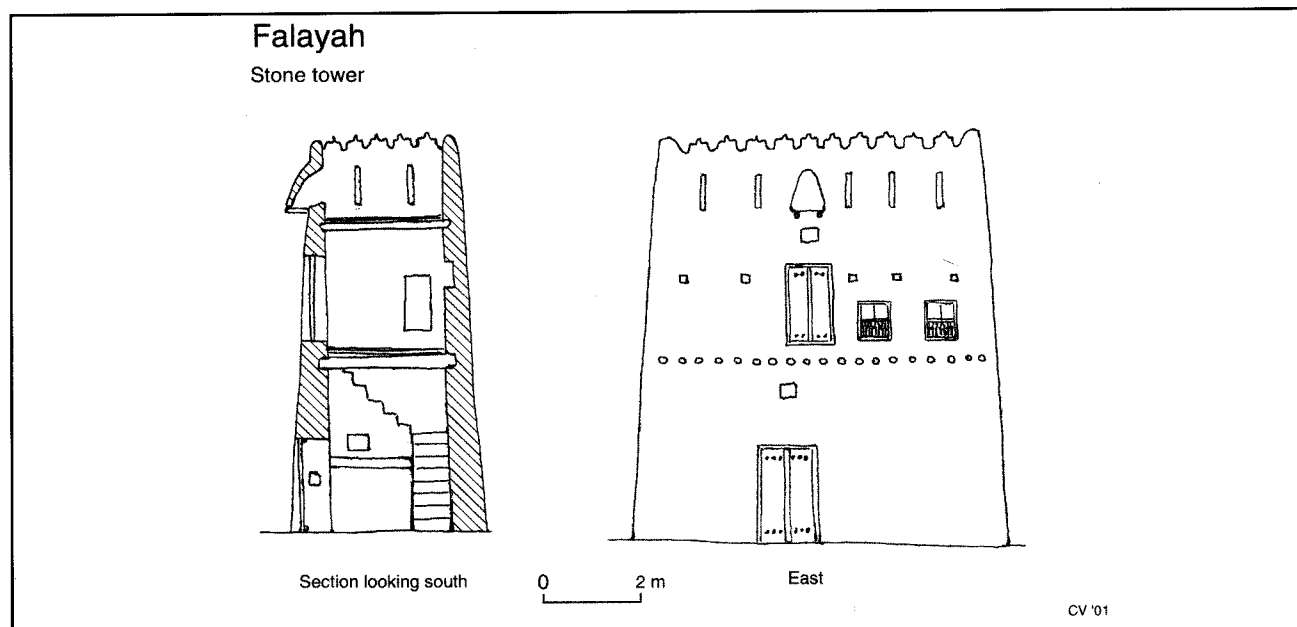


Fig. 3. The stone tower

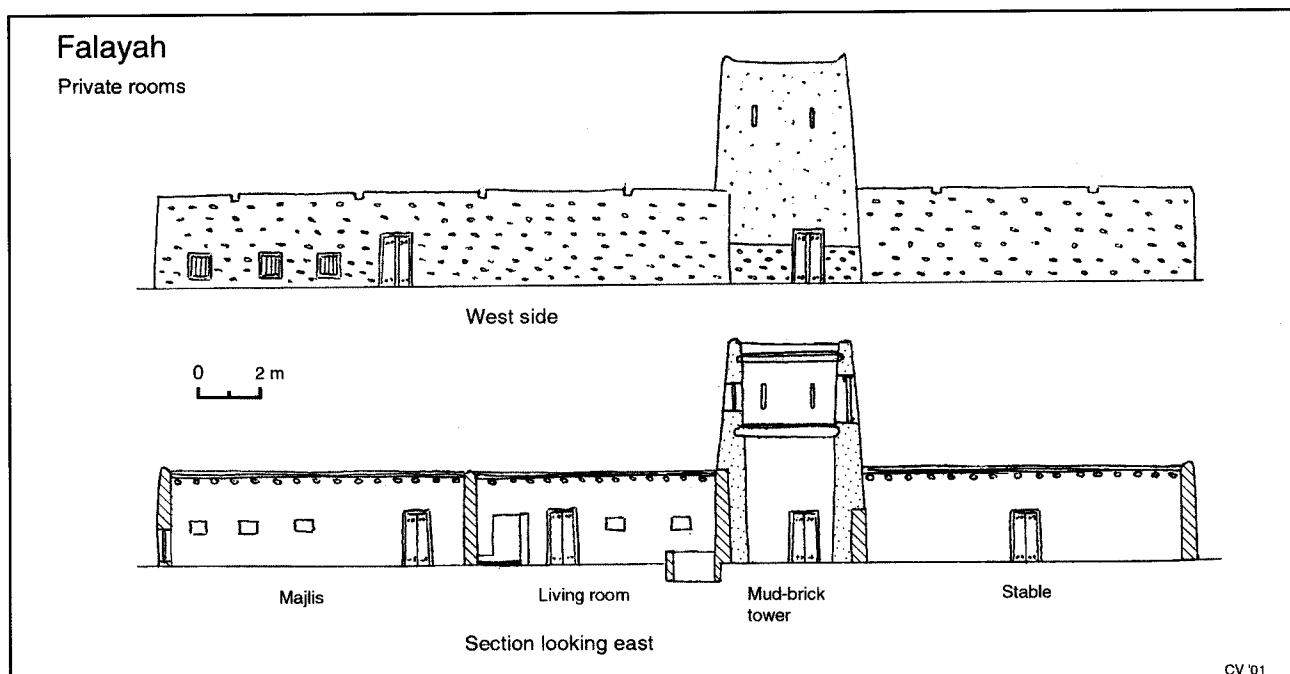


Fig. 4. The domestic buildings



Plate 1: Exterior of the restored mosque. *All pictures by R.A. Carter*



Plate 2: The restored stone tower

pleasant than on the nearby coast. At the same time, agricultural work in the palm gardens could be administered from this place. The fortified towers and the large central courtyard were designed for defence against the sporadic raids of lightly armed tribesmen. The complex may also have been used as a place of retreat for the population of the Falayah area, who could gather inside the courtyard with their livestock. At the same time, the Falayah complex was part of a network of fortified positions with visual contact throughout Ra's al-Khaimah. These operated as a network providing a warning system against raiders from outside. A walled courtyard used as a place of refuge during times of attack is a well-known phenomenon, known as "*Sur*" which can be found throughout the coastal plains of the Oman peninsula. Around 100 were recorded and studied on the Batinah coast of Oman (Costa, 1985). Such types of fortification are typical in areas of dispersed settlements inside palm gardens, which relied upon wells for supplies of water.

The stone tower with its attached buildings and portico has parallels with two other towers in the Nakheel area of Ra's al-Khaimah, (Kennet, 1995: Tower 5, al-Hudayba, and Tower 11, al-Uraybi). Both were also part of a fortified complex. These closely related towers may also have been residences of Sheikhs, while their similar design suggests that they may all have been constructed around the same period. Until relatively recently, most houses on the coastal plains of Ra's al-Khaimah were built of mudbrick and the Falayah complex is representative of this type of architecture. Residing in a stone built structure must have been a symbol of wealth and power, while the construction of an associated mosque can also be seen as an additional element of prestige.

The restoration

The Falayah complex has been restored using traditional techniques and materials. All stone walls were rebuilt in the traditional manner, using wadi cobblestones set in lime mortar, and plastering the walls. The burnt lime for the mortar and plaster was produced at Falayah itself, by burning coral and limestone with palm trunks in an open fire. Eroded mudbricks were replaced with new bricks of the same dimensions. The material used was the typical clay/silt mix of the surrounding gravel fan. Indeed, the raw material was obtained from the original sources, using old claypits in the vicinity of the complex.

The roofs and lintels above the doors and windows were replaced using mangrove poles, apart from the support for the first floors in the two towers, where palm trunks were used, as had been the case originally. Apart from one small fragment, no original doors or windows had survived. These were reproduced copying traditional examples.

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**Christian Velde,
Resident Archaeologist,
National Museum of Ra's al-Khaimah,
PO Box 94.
Ra's al-Khaimah**

e-mail: nmrak@emirates.net.ae



Plate 3: The domestic buildings, with the rebuilt defensive tower in the centre

Excavations at Luluyyah Fort, Sharjah, U.A.E.

by Tatsuo Sasaki and Hanae Sasaki
Japanese Archaeological Mission to the UAE

Introduction

The main purpose of the archaeological research carried out by the Japanese Archaeological Mission to the UAE is to study the maritime trade between the Arabian Peninsula and East Asia during the Islamic period. This involves research on the coastlines of the Arabian Gulf and on the UAE portion of the Gulf of Oman.

We had previously undertaken excavations at several archaeological sites in Egypt, Bahrain, Iran, Iraq and south-east Asia. In the UAE, we had excavated two sites at Julfar and Jazirat al-Hulaylah, both in the Emirate of Ra's al-Khaimah, dating from the 5th to 10th Centuries and the 14th to 16th Centuries. We sought, therefore, to find a site dating to the intervening period, from the 11th to 13th Centuries.

Annually from 1995, we undertook survey work along the coastline of Sharjah Emirate with Mr. Isa Abbas Hussein of the Sharjah Archaeological Museum. Eventually Mr. Hussein identified a fort at Luluyyah, just north of Khor Fakkan, on the East Coast. Here ceramic sherds from the 13th Century were identified among the surface collection.

The Excavations

The first season of excavations at Luluyyah Fort was undertaken in April and May 2000, and involved the putting down of test trenches and the making of a contour map of the fort.

A second season began on 21st December 2000 and concluded on 13th January 2001, during which several features, including a house, were found within the fort.

Location

Luluyyah Fort is located on top of a low hill near Ra's Luluyyah, on the northern side of Khor Fakkan. Lying one km from the coast of the Gulf of Oman, it is situated at 24 deg. 22 mins. 46 secs. North and 56 deg. 20 mins. 46 secs. East. From the top of the fort, 66.7 metres above sea level, a full view over the Luluyyah farming area to the north and the bay and town of Khor Fakkan to the south is possible. The fort is located just above the west side of the pass through the mountains between Khor Fakkan and the present-day village of Luluyyah.

According to Sheet 42/80 of the 1976 map of the United Arab Emirates, the pass was originally at a height of 34 metres. It has subsequently been reduced by road construction to a maximum height of 25 metres. The mountains rise higher to the west of the fort.

To the east of the fort, the mountains rise to a high point of 152 metres, reaching the sea and dividing the bay of Khor Fakkan from Luluyyah. A stone wall has been constructed along the western ridge of this mountain, extending to a tower that lies to the east of the fort.

Structures

The fort is rectangular in plan and has walls constructed of stone. The external face of these walls is smooth, with stones of between 10 cm and 30 cm in diameter. The surrounding walls of the fort are one metre thick, with a stone face on either side. Smaller pebbles and clay comprise the fill.

Inside, the fort is sub-divided into two terraces, on the upper of which is a rectangular tower. The floor of the tower is at an elevation of 66.7 metres.

The lower terrace, presumed to be for residential use, is 36 metres in width, and is reached by a stair of six stone steps descending from the tower. A water tank and house remains were visible on this terrace, with many hearths or fireplaces being revealed by excavation.

House

A house constructed of stone was in the north-east corner of the fort. This has three rooms adjoining the north wall of the fort, while a bread-baking oven and a number of hearths were found inside the rooms. There were also hearths just outside the wall of the house.

Semi-circular alignment of stones (religious structure)

A roughly semi-circular alignment of stones was found between the water tank and house, inside which was a triangular shape, paved with smaller stones, pointing west-south-west, *i.e.* towards Mecca. The alignment is, therefore, interpreted as a simple religious structure.

Circular pits or post-holes

Circular pits were found on the lower habitation level and in the rock, of an average diameter of 20 to 30 cm.

Stepped stairway

Six steps of a stone stairway were found on the slope between the tower and the lower terrace (*see above*).

Water Tank (Cistern)

The water tank inside the fort is rectangular, 4.60 m. by 3.10 m. The corners of the inner compartment are semi-circular, with internal dimensions of 3.90 m. by 2.20 m. Two lines of stones on the shorter sides outlined rectangular water tank at the surface and drain on the surface. Interior walls are vertical, with a plastered flat base, with the tank having a depth of 2.80 m. Some blocks of coral have been used for construction, but the majority of the construction material is beach rocks. A pinkish clay has been used for the infilling of spaces between the stones and for plastering the surface, with a further whitish-gray gypsum plaster applied on top.

Two sherds of Chinese green ware (celadon) bowls, many sherds of unglazed earthenware and a number of both small and large stones were found during excavation of the deposits inside the tank.

Grid C2 (Trench A)

Trench A was 4.5 m. long and 1 m. wide, and was laid down on a flat area adjacent to the water tank. It was eventually extended to 4.8 metres width, to east and west, while squares of 2.4 m. and 1.6 m. were added at the southern end. Ashes with a small quantity of fish, bird and other animal bones, as well as mollusc shells, were found at all levels within the trench.

Three pits or postholes, of 24 cm diameter, and three



Plate 1 (above): The Luluyyah fort during excavation. The inland part of Khor Fakkan is visible at top left. Plate 2 (below, left): The view towards Khor Fakkan's Oceanic Hotel. Plate 3 (below, right): Work in progress.

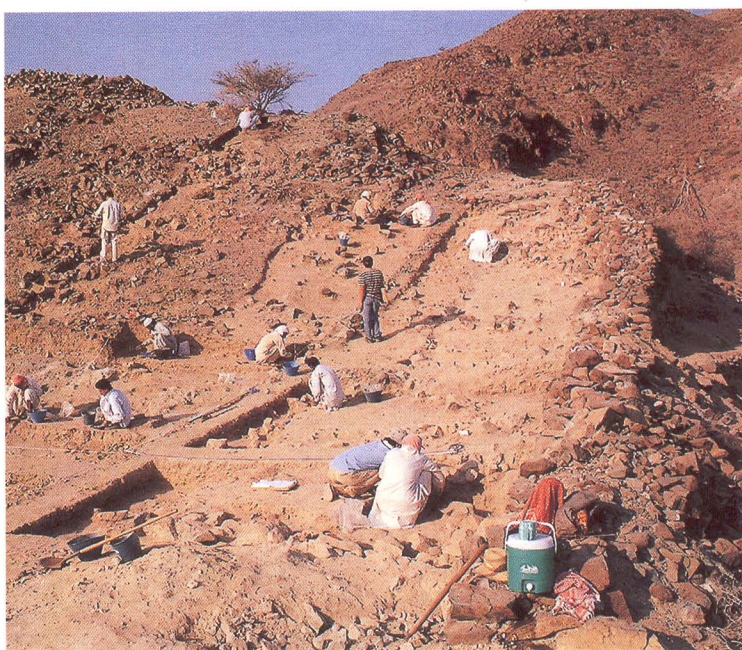


Plate 4 (below): The fort from above, with the water tank (cistern) in the centre. *All pictures by T. & H. Sasaki.*





Plates 4 (left) & 5 (right): The house on the north-east side of the fort. Note postholes at bottom right of Plate 5.

hearths with black ash deposits were found on a pinkish clay surface, which is the same material as that used for the plastering of the water tank. The three pits were approximately in alignment, with depths of 5 cm., 14 cm. and 5 cm., with flat bases. Small chips of rock and clay comprised the fill.

Very small and fragmentary sherds were found during excavation of the Trench A, including one sherd of a Chinese celadon (green ware) dish, five sherds of a Chinese green ware bowl and one white covered box. At the north-east corner of the trench, more firmly packed layers of clay and several stones were identified. There were charcoal and ash between the clay layers. This shows the habitation floor.

To the east of the wall of the water tank, a group of pebbles, a patch of clay and hearth no.14 were found together. The group of pebbles was placed for around 90 cm along the wall, with the clay adjoining the east side of the pebbles. Black ash was present in three areas of hearth no.14, with the stones at the base of the hearth being small and cracked, in contrast to the larger stones surrounding the hearth. Some shell and small stones were present in the ash.

During the 2000 season, excavation of Trench A stopped at the level of the pink clay floor, where pits 1,2 and 3 were found. 2 groups of paved pebbles were found on the floor, aligned in a North-South direction. A group of pebbles, hearths and 3 pits on the south side of the trench may be associated with each other.

D 3 (Trench B)

Trench B was initially laid out on a sloping surface, 1 metre in width and 4.1 metres in length. The width was later enlarged to 3 metres.

Hearth 4 and Hearth 5 were found in this trench. There was a dark roughly circular spread of ash on a floor of cracked and/or chipped stone. Four glass bangle fragments were found mixed with the dark gray ash in hearth 4, three being plain and the fourth of twisted glass. Fish spines were found in Hearth 5.

Hearths 7 and 11 are located just below the modern surface. Three small white shell beads were recovered close to Hearth 7, while a bronze ring and a fragment of a glass stick (for application of kohl?) were found in Hearth 11.

Several pits, Nos. 4 to 12, were identified on the surface of the rock, in rough alignments. Pit 4 had a depth of between 23 - 30 cm, with a flat bottom (because of the sloping surface of the rock) and was filled with clay and small stones. One bird bone, small pieces of charcoal and a small black glass bead were found in the lower part of the pit. Other pits were shallower, usually 10-16 cm in depth, although 9, 10 and 11 had depths of 4 cm.

A larger Pit, no. 1, was also identified, with another large pit, No. 2, north of it. Both were on a sloping surface. A bronze object resembling a coin and a small fragment of a Chinese green ware bowl with a carved lotus decoration were found in the deposit of Pit 1.

F 2,3 (Trench C)

Trench C was laid out with a width of 3 metres and a length of 3.6 metres along the section line through the fort. A 20-30 cm, thick layer of clay with a deposit of small stones lay above the cracked natural rock. One sherd of a Chinese green ware bowl was found in the trench, as well as a small quantity of earthenware sherds and bones.

Finds

Sherds of pottery, stone objects, fragments of glass and a small number of other items were scattered on the surface of the steep rocky slope on which the fort is located. Earthenware sherds were most abundant, with a total of 324.9 kg being collected, followed by glazed pottery, mainly from Iran. Chinese ceramics, glass vessels, bangles and some small ornaments were also present, along with a few, but heavy, stone objects such as mortars and grinding stones.

Environmental remains included bones of fish, birds and other animals as well as mollusc shells, collected from the surface and also during excavation of the trenches.

The dating of these finds, and of the fort itself, was derived from the ceramics, which were ascribed a date in the late 13th to early 14th Centuries AD.

The Ceramics

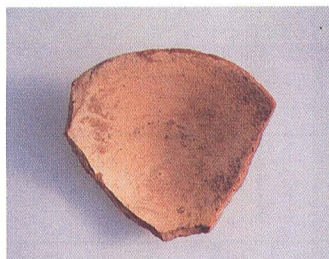
Earthenware and unglazed wares are the most abundant. The remainder of the ceramic assemblage was classified by glaze, fabric and decoration. Green glazed ware and blue glazed ware are co-dominant, while decorated black painted ware and a yellow glazed ware with painted brown-black decoration were also numerous. Chinese ceramics are relatively few in quantity, but are not rare.

Catalogue of wares

Islamic glazed ware

Incised on white slip with under-glazed yellow ware (*sgraffiato*). Pink and pale pink fabric. 12th-13th C. and 16th/17th C.

Blue-green glazed ware with yellow fabric, harder than Sasanian and Abbasid blue-green ware fabrics.



LLY-IW001



LLY-IW002



LLY-IW003



LLY-IW004



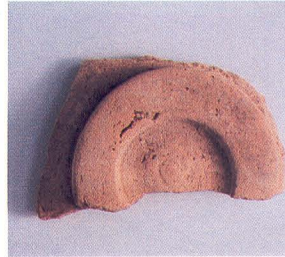
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LLY-IW006



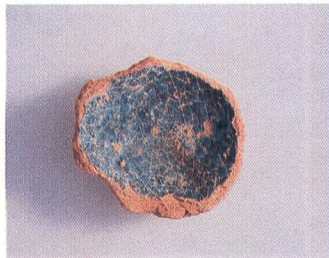
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LLY-IW008



LLY-IW009



LLY-IW010



LLY-IW011



Plate 6: Glazed Islamic wares from Luluyyah



Plate 7: Sherds of Chinese glazed green ware (celadon). Note the lotus decoration on the sherd on 2nd row, left.

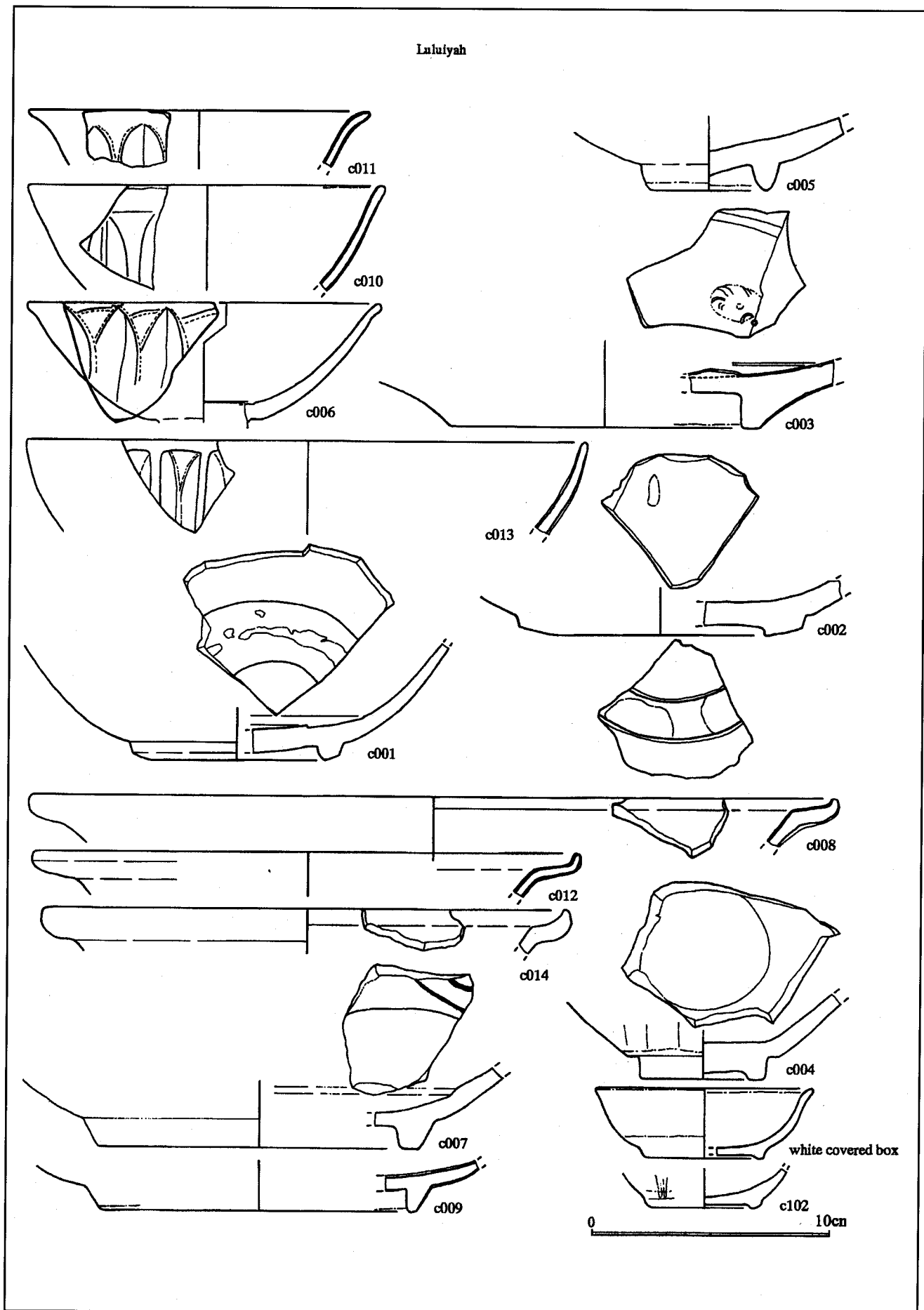


Fig. 1: A selection of the Chinese ceramics

Blue glazed ware, yellow fabric.
 Light green glazed ware, yellow fabric.
 Green glazed ware, yellow fabric.
 Green glazed ware, pale pink fabric.
 Green glazed ware, yellow/pale pink fabric.
 Blue/green glazed ware, yellow fabric.
 Blue/green glazed ware, pink fabric.
 Yellow glazed ware/Brown painted on yellow glazed ware, with fine pink/red fabric.

(Dishes and large bowls dominate in this ware, although jars and smaller bowls are also present. A ware decorated in brown and green is present, but very rare).
 Olive green glazed ware, red-gray fabric.
 Brown glazed ware, yellow fabric.
 Brown glazed ware, coarse yellow fabric.
 Brown glazed ware, red-gray fabric.
 Brown glazed ware, pale pink fabric.
 Brown glazed ware, gray fabric.
 Green painted on white glazed ware, yellow fabric.
 Black painted on white glazed ware, pink/yellow fabric.

Unglazed earthenware sherds
 (some with painted decoration)

Molded earthenware, yellow fabric (vases).
 Incised earthenware, yellow fabric.
 Incised earthenware, fine pink fabric.
 Incised earthenware, fine pinkish-red fabric.
 Incised earthenware, white surface, with fine pinkish-red fabric.
 Painted red earthenware, white slip, coarse red/black fabric.
 Painted red earthenware, coarse red fabric, black surface.
 Earthenware with light pink fabric.
 Earthenware with fine pinkish-red fabric.
 Earthenware, pink fabric.
 Earthenware, red fabric.
 Earthenware, coarse red fabric.
 Earthenware, coarse red-gray fabric.
 Earthenware, coarse red-black fabric.
 Earthenware, yellow fabric.
 Earthenware, coarse yellow fabric.
 Earthenware, coarse greenish yellow fabric.

Chinese Wares

Wares present included a green ware (celadon). Green glazed ware bowls and dishes of the second half of the 13th Century AD and the first half of the 14th Century AD were dominant. A carved lotus decoration was commonly found on the exterior surface of bowls and dishes.
 Also present were white ware sherds and sherds in a brown ware, possibly used for storage vessels.

Glass

Fragments of black twisted bangles comprised the majority of the glass assemblage.
 Some small fragments of glass vessels were found, with vases and jars of a small size being most frequent.
 Cobalt blue glass beads were identified, with applied decoration in white, yellow, red and cobalt blue.
 A green glass bead and 2 black glass beads were recovered from trench B, where a small fragment of a small glass stick (for applying kohl or perfume?) was also found.

Other finds

Three bronze sticks, one 87 mm long and missing its upper part.
 A thin bronze ring was recovered from near Hearth 7 in

trench B.

Two pink coral beads, one from the surface inside the fort (19 mm long and 5-7 mm in width), and one from Trench B, where a crystal bead and 3 shell beads were also recovered.

A coin (or pendant) was found on the surface of Trench C. With cuts on both sides, it was probably used as a pendant.

Environmental Remains

Bones of fish, birds and other animals were collected during excavation of the water tank and Trench A. Bones of sheep and goat dominate.

Mollusc shells were collected from the interior surface of the fort and during the excavation of Trench A, the water tank terrace.

Stone

A collection of pebbles was made from the site, 434 being collected from the surface (average weight 230 gms) and 550 being among excavated material from Trench A (average weight 229 gms). Several hundred more pebbles are still present on the site. All have a smooth surface and a round shape, and they seemed to have been collected from nearby mountains or wadis. Most were used for paved stone floors, which were found outside the house.

Arrowheads (of earlier date)

A complete stone arrowhead, length 37 mm, width 11mm and thickness, made of brown flint or chert, was recovered from the deposit inside the water tank. It is tentatively dated to ca 5th Millennium BC.

A broken bronze arrowhead, length 72+ mm, width 17+ mm, thickness 3 mm, was collected inside the cultivation area of Luluyyah, and is ascribed a 2nd Millennium BC date.

An iron arrowhead was found in a lower layer in the northern part of Trench A. It closely resembled iron arrowheads known in the UAE from the 1st Millennium BC.

Conclusion

The excavation of the Luluyyah fort and the finds provide an indication of the daily life of its occupants, including information on the types of ceramics that were in use.

The study of the ceramics will also provide information on local and long distance trade. The Islamic pottery found at the site can be dated through the Chinese trade wares.

The Chinese wares found at Luluyyah were in the range of the 12th Century to the 14th Century and the majority can be dated to the period from the late 13th Century to the early 14th Century AD. This period seems to be the period of occupation of the Luluyyah fort and is between the main periods of occupation at Jazirat al Hulayla and Julfar, in Ra's al-Khaimah.

Acknowledgement

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Tatsuo Sasaki & Hanae Sasaki,
Faculty of Letters,
University of Kanazawa,
Kakuma-machi,
Kanazawa 920-1192, Japan

e-mail: hanaesa@kenroku.kanazawa-u.ac.jp

A Note on the Archaeological and Environmental Remains from Site JH57, a 5th-4th Millennium BC shell midden in Jazirat al-Hamra, Ra's al-Khaimah

by Mark Beech and Heiko Kallweit

Introduction

Site JH57 is located in the Jazirat al-Hamra region of Ra's al-Khaimah Emirate, United Arab Emirates, at UTM E 03 80 876, N 28 42 690. The site was first identified and described by Burkhardt Vogt during his archaeological survey of the region (Vogt 1994) and is situated approximately a kilometre inland from the present day coastline. The site lies on top of a low dune and extends over a 50 sq. m sandy area covered with light vegetation. With the exception of modern garbage such as glass and plastic, no major disturbance was visible when the site was visited in February 2000. The site was examined as part of a wider survey of Late Stone Age midden sites in the UAE, a project being carried out by team of German archaeologists financed by the German Research Foundation, "Deutsche-Forschungs-Gemeinschaft Bonn".

As in the case of many other midden sites in the region, Site JH57 shows evidence of two main periods of occupation. Flakes, blades and tools recovered at the site, made from different kinds of flint, match well with known examples belonging to the Qatar D industry. This dates to the late Neolithic or 5th to 4th Millennium BC and marks the earliest occupational level so far known in Jazirat al-Hamra. The second later period is indicated by numerous potsherds found on the surface of JH57. A number of these were collected and identified by Dr. Robert Carter, to whom we are grateful for their identification. All the collected potsherds date to the late Islamic period. The presence of flint flakes and raw material does not necessarily point to great antiquity of the site. Flint was used for several purposes such as lighting fires right up until the middle of the 20th century. The presence of particular typical tool types suggests, however, the likelihood of a Late Stone Age date for much of the site's deposits.

Comparable sites with preserved bones of mammals and fish, lithic artefacts and sometimes also Ubaid potsherds are recently recorded from several sites in the northern Emirates (Priour and Guerin 1991; Sabah 1996; Uerpmann 1996). The reason for the Ubaid presence in the Gulf area still remains unclear. Although Burkhardt Vogt recorded the co-occurrence of Qatar B blades and Ubaid potsherds on the Jazirat al-Hamra middens (Vogt 1994: 122), this has not been confirmed by this most recent recent survey or by the analysis and documentation of finds collected by Vogt during his 1987-88 survey. Similar examples of Qatar D tools were however found at Site JH6 (Fig. 1). These are typical Qatar D related projectile points, retouched blades and scrapers which are now on display in the National Museum of Ra's al-Khaimah.

On 28 April 2000, Mark Beech accompanied Heiko Kallweit and his team on a brief return visit to the site. It was discovered that recent bulldozing to make way for a new road track across the dunes had partially bisected Site JH57. As the site was seemingly under substantial threat the decision was made to collect all archaeological material from the surface of the site. This was subsequently catalogued and stored in the archives of the National Museum of Ra's al-Khaimah. This short report provides some details concerning the environmental material. Representative samples of marine mollusca were collected by hand from the

surface of Site JH57, along with all visible animal bone and crustacea fragments. These were subsequently examined to evaluate what kinds of resources may have been typically exploited.

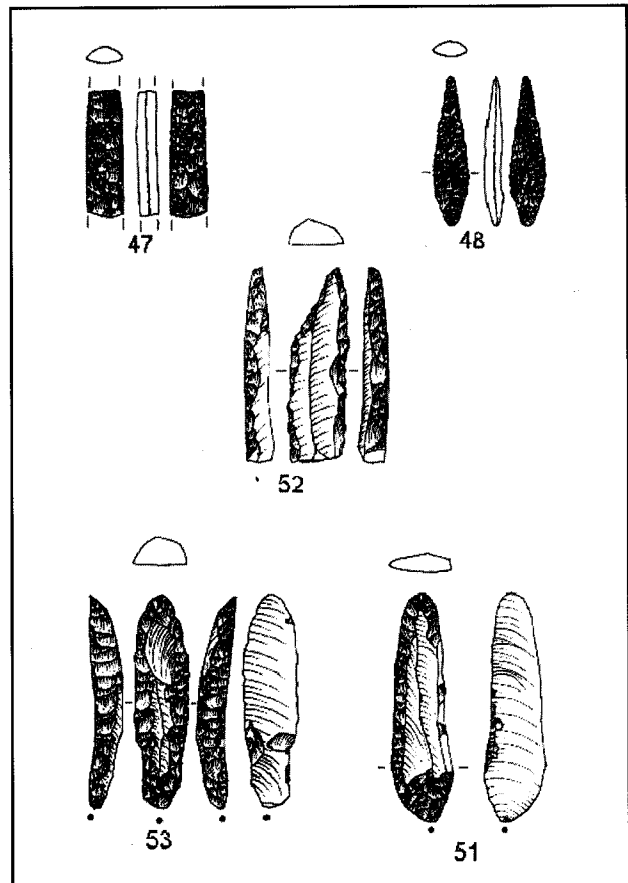


Fig 1: Jazirat al-Hamra. Lithic artefacts of Qatar D type from shell midden JH6.

Marine mollusca

A total of seven families of marine molluscs were noted during this very brief evaluation (Table 1). The most frequently represented taxa were *Terebralia palustris* and *Anadara sp. T. palustris*, at least during their adult phase, live predominantly in mud among mangroves. Most of the *Terebralia* were very small at Site JH57, ca 6 cm in length, with only a very few examples attaining a maximum length of 9 cm. It is interesting that the majority appear to be so small. Usually those which occur in the Shimal area to the north are fully grown. This may indicate that the mangroves here were more impoverished than those to the north, and that the people were forced to exploit younger immature specimens. One should be careful however to interpret the presence of juvenile *Terebralia*, as the young do not feed on mangrove leaves/detritus and they can happily occur in other habitats. Both adult and juvenile *Terebralia* have been recently found living in a storm

drain in Khor Fakkan on the UAE's East Coast (Feulner 2000). Mark Beech has also seen juvenile *Terebralia* in the Kalba area in a pool full of human domestic refuse some distance away from extensive mangrove areas. The genus *Anadara* is usually found in sand from the intertidal to offshore zone. *Hexaplex kuesterianus*, *Isognomon legumen* and *Fulvia fragile* all occurred in moderate numbers. The *Hexaplex* shells would have probably been collected on and under intertidal rocks. Several appeared to have been deliberately smashed open. This would have been carried out as food preparation in order to extract their soft inner body parts. *Isognomon legumen* would have similarly been collected under rocks in shallow waters. *Fulvia fragile* inhabits muddy sand along the lower shore. Occasionally there were Cerithiidae and a few cowrie shells (*Cypraea sp.*).

Vertebrate Fauna

Vogt mentions the presence of a dugong tusk used as a

tool (Vogt 1994: 122), but unfortunately did not state what other animal remains were recovered at the sites he surveyed.

A total of 75 bone fragments were collected from the surface of Site JH57. These included fragments of sheep/goat (*Ovis/Capra*) and dugong (*Dugong dugon*) (Table 2). The small collection of ovicaprid remains come from a range of body parts indicating that probably whole animals were present at or near the site. The unidentified fraction included cattle-sized long bone fragments as well as some small indeterminate bird and fish fragments.

The presence of dugong here is worth noting, especially as this is generally much further north than its present day distribution in the Gulf, which is centred in the lower Gulf along the Abu Dhabi coastline around the area west of Merawah island towards the eastern shores of Qatar (Tony Preen, *pers. comm.*). In 1994 a dead juvenile dugong was, however, discovered in Ra's al-Khaimah. Its skeleton is now stored in the National Museum of

FAMILY	SPECIES	FREQUENCY	HABITAT
Cerithiidae		Occasional	Intertidal in sand
Potamididae	<i>Terebralia palustris</i> (Linnaeus, 1767)	Frequent	Mud among mangroves (when adult)
Cypraeidae	<i>Cypraea sp.</i>	Occasional	Among rocks and coral
Muricidae	<i>Hexaplex kuesterianus</i> (Tapparone-Canefri, 1875)	Moderate	On and under intertidal rocks
Arcidae	<i>Anadara sp.</i>	Frequent	In sand, intertidal to offshore
Isognomonidae	<i>Isognomon legumen</i> (Gmelin, 1791)	Moderate	Attached under rocks from midshore to shallow waters
Cardiidae	<i>Fulvia fragile</i> (Forrskål, 1775)	Moderate	In muddy sand, lower shore and below

Table 1: Marine molluscs represented on the surface of Site JH57
(taxonomy and habitat descriptions follow Bosch *et al.*, 1995)

TAXON	NO OF FRAGMENTS	WEIGHT (g)
<i>Ovis/Capra</i> (sheep or goat)		
Mandible, left	1	2.5
Loose teeth fragments	4	4.5
radius, left	1	2.0
metacarpal, left	1	2.5
tibia	1	2.5
metatarsal	1	9.0
astragalus, right	1	3.5
<i>Dugong dugon</i> (dugong)		
rib fragment	1	45.0
long bone fragment	2	11.5
Large mammal (Bos-size)	19	103.0
Medium mammal (Ovis/Capra-size)	37	26.0
Unknown fish	1	0.1
Unknown bird	5	1.5
TOTAL	75	213.6

Table 2: Vertebrate fauna represented on the surface of Site JH57

SITE NAME	COUNTRY	AGE	REFERENCE	NOTES
Failaka	Kuwait	Hellenistic	Desse and Desse-Berset 1990	6 fragments reported, including a rib with butchery chop marks.
Al-Markh	Bahrain	4 th millennium BC	Roaf 1974	Common in later phase.
Qala'at al-Bahrain site 520	Bahrain	Periods I and II (2150 – 1900 BC)	Uerpmann and Uerpmann 1994	7 dugong bones, including jugular bone, mandibular ramus, 4 rib fragments and a humerus fragment.
Dalma island, Abu Dhabi	United Arab Emirates	Late 6 th - Early 5 th millennium BC	Beech 2000	Present but quite rare in whole assemblage, mostly rib fragments.
Umm an-Nar, Abu Dhabi	United Arab Emirates	3 rd mill. BC	Hoch 1979	Dominant within assemblage. Larger and smaller individuals present (mostly larger). All skeletal parts represented. Many butchered pieces.
Ed-Dur, Umm al-Qaiwain	United Arab Emirates	1 st - 4 th century AD	Van Neer and Gautier 1993	Present but very rare in whole assemblage.
Akab island, Umm al-Qaiwain	United Arab Emirates	5 th -4 th millennium BC	Prieur and Guerin 1991; Jousse 1999	Dominant within assemblage. All skeletal parts represented. Many butchered pieces.
Tell Abraç	United Arab Emirates	2200 – 300 BC	Stephan 1995; Potts 2000: 61.	Present in assemblage.
Jazirat al-Hamra, Ras al-Khaimah	United Arab Emirates	5 th -4 th millennium BC		Rib fragment with traces of butchery chop mark and two other ?post-cranial fragments.
Shimal, Ras al-Khaimah	United Arab Emirates	Iron age (1200-800 BC)	Von den Driesch 1994	10 fragments reported in phase 4.

Table 3: Pre-Islamic archaeological sites with dugong remains in the Arabian Gulf

Ra's al-Khaimah. The dugong remains here consisted of a rib fragment which had traces of a deliberate chopmark on its surface, plus some other long bone shaft fragments. These were all very heavy and dense, typical characteristics of dugong bones.

The modified dugong tusk which Vogt previously reported may have been curated and introduced to the site as an artefact by the site inhabitants. Here though it now seems more plausible that we are actually seeing the remnants of butchered dugongs. As dugongs are heavy animals which are extremely difficult to handle once out of the water, it seems likely that they may have been butchered locally. This is significant in that it implies that perhaps dugong were living locally and that perhaps the marine environment during the site occupation was more attractive to dugongs than at the present day (i.e. perhaps there was a greater abundance of seagrass?).

Crustacea

Five pincer or 'chela' fragments (total weight = 4.5g) were identified as belonging to blue swimming crab *Portunus pelagicus*. This is still one of the main crab species caught for food in the Western Indian Ocean region (Guinot 1966). It is associated with shallow shores and lagoons, particularly with sandy bottoms, although it is also common on hard substrates in the Gulf (Peter Hogarth, *pers. comm.*). Such crabs may have been caught on the coastline close to the site.

Discussion

Site JH57 represents one of the earliest occupation sites so far known from the Jazirat al-Hamra region of Ra's al-Khaimah. It is clear from this brief evaluation that

during the 5th-4th Millennium BC its occupants not only maintained their own livestock, domestic sheep/goat (and possibly cattle?), but also exploited the rich marine resources locally available to them.

The butchered dugong rib found at Site JH57 indicates that dugongs may have been hunted in the waters adjacent to Jazirat al-Hamra. This is of some interest as the present day distribution of dugong in the lower Gulf is centred more along the Abu Dhabi coastline around the area west of Marawah island towards the eastern shores of Qatar, as stated earlier. It may suggest that suitable habitats, including extensive seagrass meadows, were more abundant close to Jazirat al-Hamra in the past than at the present time.

The discovery of dugong bones at Jazirat al-Hamra adds to the growing list of pre-Islamic archaeological sites in the Arabian Gulf where such remains have been discovered (Table 3). Dugong bones have also been found in association with a number of hearth sites from the Islamic period on the islands of Sir Bani Yas, Marawah and Balghelam, in the Emirate of Abu Dhabi.

Acknowledgements

Special thanks go to HH Sheikh Sultan bin Saqr al-Qasimi, Deputy Ruler and Director of the Department of Antiquities and Museums of Ra's al-Khaimah, and to Christian Velde, resident archaeologist at the National Museum of Ra's al-Khaimah, for their support and interest during our research visit to Ra's al-Khaimah during Spring 2000. We would like to thank Dr. Robert Carter for examining the potsherds from Site JH57 and Tony Preen and Peter Hogarth for additional information. Heiko Kallweit's participation in this work was financed by a grant from the German Research Foundation "Deutsche-Forschungs-Gemeinschaft Bonn".

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Mark Beech,
Department of Archaeology,
University of York,
York YO1 7EP, U.K.

e-mail: mjb117@york.ac.uk

Heiko Kallweit,
Andreas Hofer St. 154,
D - 79111 Freiburg, Germany

e-mail: heiko.kallweit@excite.de

C14 dating of Iron Age hearths on the island of Rufayq, Abu Dhabi

by Peter Hellyer and Mark Beech

Introduction

During late 1998 and early 1999, the Abu Dhabi Islands Archaeological Survey, ADIAS, undertook an archaeological baseline study of parts of the concession area of the Abu Dhabi Company for Onshore Oil Operations, ADCO, part of the Abu Dhabi National Oil Company, ADNOC, Group of companies.

Among areas examined was the Dabb'iya oilfield, west of Abu Dhabi, where a number of archaeological sites were identified. These included sites on the island of Rufayq, among which were a number of stone lined fireplaces (1).

In discussion with ADCO, it was decided to collect carbon samples from fireplaces at RU-2 and from another, more extensive, group of fireplaces at RU-5, so that these samples could be submitted for Carbon 14 dating, in order to determine the age of the sites.

Samples were collected in April 2000 by Dr. G.R.D. King (Academic Director, ADIAS), Miss Philippa Loates (Field Archaeologist, ADIAS) and PH from the following fireplaces:

Site RU-2.2

Site RU-2.3

Site RU-5.1

Site RU-5.2

The samples were divided into two parts, a control sample from each site, (held by ADIAS in its Abu Dhabi office) and a sample for testing. The test samples were shipped to the United Kingdom in June 2000 for radiocarbon dating.

Results

(by Mark Beech)

Radiocarbon dating of the four charcoal samples from archaeological sites on Rufayq was carried out by the Scottish Universities Research and Reactor Centre, SURRC, of the University of Glasgow.

Calibrations were made using the University of Washington Quaternary Isotope Laboratory Radiocarbon Dating Programme Rev. 4.0; 1998. The decadal atmospheric calibration curve is used throughout and the calendar age ranges, obtained from the intercepts method (Method A), are expressed at both the one and two sigma levels of confidence.

The results were as follows.

Sample Reference: Rufayq Site RU-2.2

Sample Code: GU-9156

Delta 13C rel. PDB = -22.0%

Radiocarbon age BP (Before Present) = 2790 +/- 70

Calibrated age range:

1 sigma cal BC 1105-834, cal. BP 2955 - 2784

2 sigma cal BC 1187-805, cal BP 3137-2755

Sample Reference: Rufayq Site RU-2.3

Sample Code: GU-9157

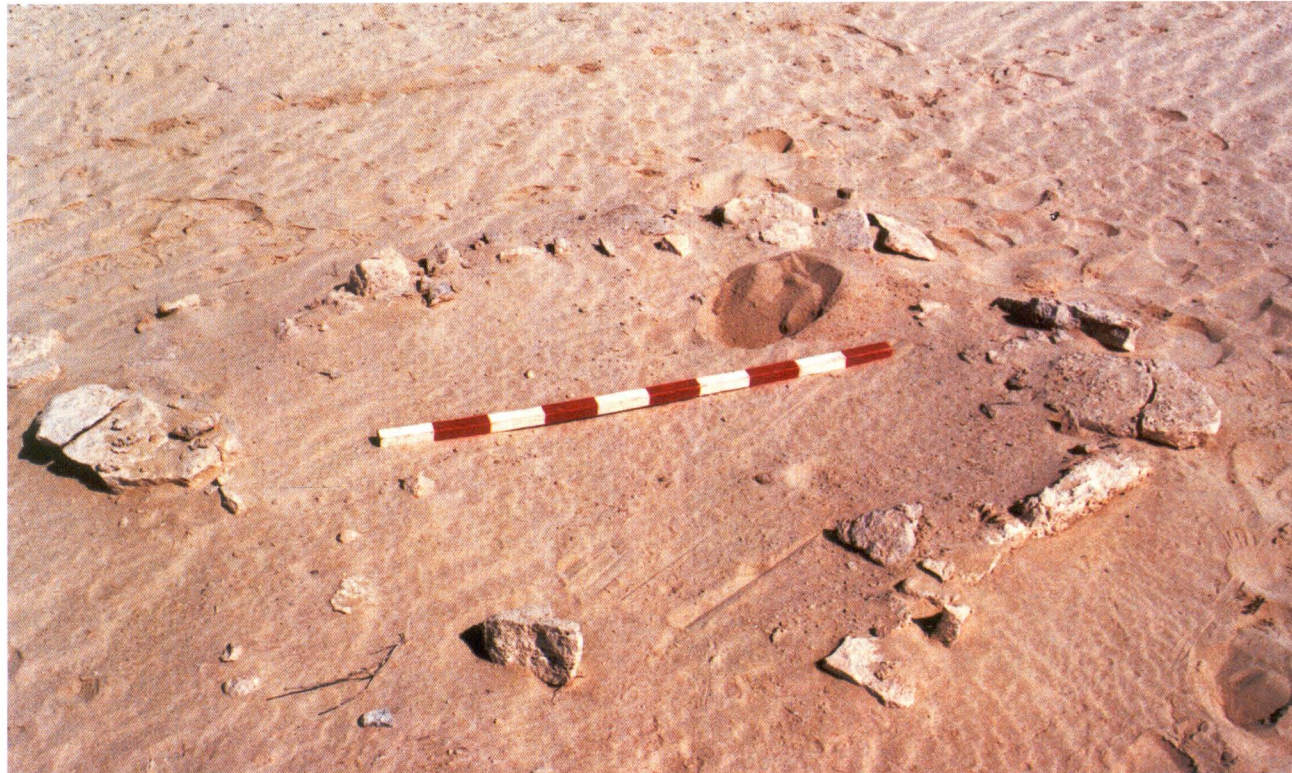
Delta 13C rel. PDB = - 20.9%

Radiocarbon age BP = 2890 +/- 110

Calibrated age range:

1 sigma cal BC 1259 - 917, cal BP 3209 - 2867

2 sigma cal BC 1405 - 817, cal BP 3355 - 2767



The Iron Age hearth at Rufayq Site RU-2.2. Picture: Peter Hellyer

Sample reference: Rufayq Site RU-5.1

Sample Code: GU-9158
Delta 13C rel. PDB = - 20.6%
Radiocarbon age BP = 2800 +/- 50
Calibrated age range:
1 sigma cal BC 1003 – 898, cal BP 2952 – 2847
1 sigma cal BC 1108 – 829, cal BP 3057 – 2778

Sample Reference: Rufayq Site RU-5.2

Sample Code: GU-9159
Delta 13C rel. PDB = - 22.5%
Radiocarbon age BP = 2480 +/- 60
Calibrated age range:
1 sigma cal BC 782 – 411, cal BP 2732 – 2361
2 sigma cal BC 798 – 401, cal BP 2748 – 2351

Discussion

All four samples produced dates that fall within the local Iron Age, which is generally considered to have lasted from c. 1300 BC to 300 BC, or 3300 BP to 2300 BP (2). Results from RU-2.2, RU-2.3 and RU-5.1 all fall within the range of periods Iron Age I/II (1300 BC to 600 BC). The result from RU-5.2 falls in the Iron Age II/III period, 1100 BC to 300 BC).

These results provide the first securely dated evidence of Iron Age occupation on the islands west of Abu Dhabi, although Iron Age metal weapons have been excavated from burial cairns at Bitashar, a mesa a few kilometres inland, south west of Jebel Dhanna (3).

As such, they provide an important addition to understanding of former patterns of occupation on the islands of Abu Dhabi.

A brief description of the two sites involved, RU-2 and RU-5 is appropriate.

Site RU-2 is a group of six fireplaces and raised sub-circular mounds (probably concealing fireplaces), situated adjacent to an eroded outcrop lying at the inner edge of an area of sand and near *sabkha* immediately above present day High Water Mark, on the western side of the island of Rufayq. During the Iron Age, sea level may have been slightly above current High Water Mark, and the site would then have been adjacent to the coast.

Site RU-5 lies on top of a raised area of rock to the northwest of Site RU-2, approximately 50 metres in from the current High Water Mark. In excess of twenty hearths as well as other features have been identified in this area, which, again, would have been adjacent to the coast during the Iron Age period.

The hearths or fireplaces are generally constructed of slabs of available rock inserted vertically into the sandy substrate, forming circular, sub-circular or near-rectangular shapes. In some cases, there are larger low sub-circular mounds with pieces of rock present on the surface, this rock often showing evidence of having been subjected to high temperatures. Excavation by ADIAS of such mounds on other islands, (e.g. Liffiyah and Balghelam) have shown them to conceal larger, rectangular fireplaces.

Such hearths have been identified by the Abu Dhabi Islands Archaeological Survey on many of the islands of Abu Dhabi, including the island of Abu al-Abyadh, immediately to the west of Rufayq (4), and also on the island of Qusabi, to the east of Rufayq, and also within the area of ADCO's Dabb'iya field (5). Some have also been identified on the Abu Dhabi coastline, although in far fewer numbers. In all, over 500 of such hearths have been located by ADIAS.

A few have also been identified by the Department of Antiquities and Tourism in the Diwan of The Ruler's Representative in Abu Dhabi's Eastern Region at Ghanadha, northeast of Abu Dhabi, where at least one was ascribed an Iron Age date of 2470 +/- 100 BP (6).

The number of hearths varies greatly from site to site. In some cases, (as at RU-2), there are only a few hearths present. In other cases, the number may be significantly greater. The largest known grouping of such hearths is on the island of Marawah, where Site MR-9 has in excess of 150 hearths, while a group of 30+ hearths has been identified on the island of Balghelam (Site BG-5/6). Site RU-5 is the third largest group thus far identified.

Carbon 14 dating has previously been undertaken on hearths from Sites MR-9 and BG-5/6. These have produced a wide range of dates, from c. 2000 BC to c. 200 AD, but all of the dates from these hearths have fallen either in the Bronze Age, (c. 3000 BC to 1300 BC) or in the Late pre-Islamic period (300 BC to 630 AD). Thus the Rufayq results have filled in the gap that previously existed for the Iron Age period.

Examination of the structures of these hearths has thus far suggested that all are of similar construction, suggesting that the same technology and style was utilised over a period of at least 2000 years. Oral information (7) and evidence from the island of Abu al-Abyadh (8) suggests that the same types of hearth were used well into the Late Islamic period, perhaps as recently as 40 - 50 years ago.

The relative consistency of the radiocarbon results from Site RU-2, where there are, in any case, only a small number of hearths, are sufficiently close for it to be suggested that the site may have been used over only a relatively limited period. It is possible that the site was abandoned as a result of a slight change in sea level, although there is, as yet, no data to confirm such a hypothesis.

Analysis of the Rufayq ceramic assemblage by Dr. Robert Carter offers a range of dates. The few sherds from RU-2, (all in association with RU-2.1, and, unfortunately, not with, RU-2.2 or 2.3), are probably Barbar (*i.e.* late third/early 2nd millennium BC) and Late pre-Islamic. The two sherds of pottery from RU-5 are both from RU-5.1, and are more likely to be Barbar than Iron Age, although precise identification is not possible. Probable Late pre-Islamic or Early Islamic material is present at RU-6, close to RU-5, while Late Islamic material is the majority of the RU-6 assemblage and is also present at other sites on the island, such as RU-3 and RU-7.

Altogether, the ceramic assemblage from Sites RU-2, RU-3, RU-5 and RU-6 suggest occupation of this part of Rufayq over a period of more than 4000 years.

The absence of Iron Age pottery at any of the Rufayq sites implies, however, that this period may have been largely aceramic on the island, although not necessarily on other islands or the coastline.

Conclusion

Hearth/Fireplace sites such as those of RU-2 and RU-5 are rarely accompanied by datable ceramics or other artefacts. Moreover, as is the case with the major site BG-5/6 and RU-5, they are often situated in areas where geographical factors (*e.g.* proximity to a sheltered coastline) mean that they would have been favoured for settlement over a long period. The presence of Late Islamic ceramics on such sites, which have also produced much earlier dates from radiocarbon dating is, therefore, not a reliable dating tool.

Moreover, the results of radiocarbon dating carried out on samples from fireplaces on Marawah and Balghelam, referred to above, have indicated that a wide date range can be obtained from sites which are similar in appearance.

In consequence, even if ceramics are present, the dates of such sites can only be determined with confidence through the carrying out of radiocarbon dating of charcoal.

The results from the dating of samples from Sites RU-2 and RU-5 confirm the importance of carrying out such dating, with the Iron Age dates obtained being of major

importance in confirming the continuity of occupation on the islands of Abu Dhabi during a period that is still little understood.

Acknowledgements

On behalf of the Abu Dhabi Islands Archaeological Survey acknowledge, with thanks, the continued support of the Abu Dhabi Company for Onshore Oil Operations, ADCO, and of the Abu Dhabi National Oil Company, ADNOC, for its programme of archaeological research in the Western Region of the Emirate of Abu Dhabi, and further thanks ADCO for funding the radiocarbon dating programme.

Mr. Nicholas Cochrane-Dyet, Deputy Chief Representative of British Petroleum, Abu Dhabi, arranged for the shipping to the United Kingdom of the samples from the fireplaces. Dr. Robert Carter provided information on the ceramic assemblage collected at the Rufayq sites.

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7. Darwish Juma al-Rumaithi, a local fisherman, has indicated that he used such hearths on the island of Balghelam in the 1950s and/or 1960s (Al Rumaithi, *pers. comm.*, 1997).
8. A small circular hearth with a piece of Late Islamic pottery used in its construction has been identified by ADIAS on Abu al-Abyadh (Hellyer *et al.*, 2001.)
9. See ceramic analysis by Dr. R.A. Carter in King, Hellyer & Aspinall, [1999].

Peter Hellyer,
ADIAS,
P.O. Box 45553,
Abu Dhabi, U.A.E.
e-mail: Hellyer@emirates.net.ae

Mark Beech,
Department of Archaeology,
University of York,
York, YO1 7EP,
United Kingdom
e-mail: mjb117@york.ac.uk

A newly recognised Iron Age site near Jabeeb, Al Ain, U.A.E.

by Brien Holmes

The presence of Iron Age settlement in the area between the city of Al Ain, in the Eastern Region of the Emirate of Abu Dhabi, and Dhaid, in the Emirate of Sharjah, in areas that are now covered in sand and unsuitable for agriculture is well attested. Immediately north of Al Ain, the Iron Age village at Rumailah has walls that were still standing to a height of two metres when excavated in the 1980s, although it was completely covered with sand. Further north, near the rocky outcrop of Qarn bint Saud (or Bida bint Saud), the presence of an Iron Age *falaj* (pl. *afaj*) and village has been proven by recent excavations carried out by Dr. Walid Yasin al-Tikriti, Archaeological Adviser at the Department of Antiquities and Tourism in Abu Dhabi's Eastern Region. On the al-Madam plain, south of Dhaid, another Iron Age settlement concealed beneath the sand has been the focus of recent excavations carried out by the Autonomous University of Madrid, in association with the Sharjah Directorate of Archaeology, part of the Department of Culture and Information.

In the intervening areas, evidence of an Iron Age *falaj* was identified in the 1980s by Dr. al-Tikriti in the Jabeeb area, more than fifty kilometres north of Al Ain, although it has not yet been published.

With the exception of Rumailah, the sites above mentioned all have *falaj* irrigation systems, now dried up, although they are a considerable distance from the Hajar Mountains, which provide the sources of water for the *afaj* of the villages in the Al Ain/Buraimi area. All are now also largely covered, often to a depth of two metres or more, by mobile sand dunes. It has been presumed that, during the Iron Age, there were supplies of underground water close enough to the surface to be tapped by *afaj*, these supplies perhaps being supplemented by greater rainfall than there is today.

With a declining water table, and perhaps a decline in rainfall, the *afaj* would have dried up, agriculture would have become increasingly unproductive and the settlements abandoned. The sand dunes would then have moved in to cover much of the settlement area, although remains of them, including artefacts such as potsherds, remained visible in areas of inter-dunal plains.

During weekend forays from Al Ain over the last few years, I have been able to locate numerous archaeological sites in the inter-dunal plains to the north of Al Ain. Many of these have yielded pottery of Late Islamic date, and may represent simple, but frequently re-visited, camp-sites comparable to one identified in the late 1970s by the Emirates Natural History Group near Al Khatam, on the route from Al Ain to Abu Dhabi.

In late 1999, I ventured into the Jabeeb area, exiting the Al Ain - Dubai highway at the Jabeeb overpass, which provides access to recently-established farms on either side of the highway. The route to the west was taken, towards an area where the sand dunes are higher, and the track is more substantial, due to the presence of numerous camel-camps and a small five-kilometre training track for camel-racing.

I returned to an area where I had previously located an iron object which was initially assessed as being a piece of jewellery, but which, on further study, seemed to resemble a key. The 'key' itself had been found on an inter-dunal gravel plain, surrounded for the most part by sand dunes. To the north-west, however, a flat promontory about the size of two football fields rose several metres above the floor of the plain.

On the surface of the promontory was an extensive scatter of potsherds, so thick that in many places it was almost impossible to walk without treading on them.

Recognising that the sherds were different from those familiar to me from the late Islamic camp-sites, I collected a representative sample and made it available for study to Dr. Robert Carter, ceramicist of the Abu Dhabi Islands Archaeological Survey. Dr. Carter identified the whole assemblage as being Iron Age in date.

A few weeks later, I was able to re-visit the site with Dr. Walid Yasin al-Tikriti, who noted that the site was several kilometres distant from the *falaj* he had previously identified in the Jabeeb area (all trace of which has now been obliterated by recent agricultural development). Dr. Al-Tikriti also confirmed that the potsherds were Iron Age in date, and noted that there was evidence of piles of soil at various points in the area, suggesting the possibility of a further *falaj* or *aflaj*. A GPS reading gave a position of 24 deg. 35 mins. 34 secs. N; 55 deg. 35 mins. 57 secs. E., while the site is 12.3 km into the desert from the Al Jabeeb underpass on the main highway.

With Dr. Al-Tikriti, I also visited a number of other pottery scatters I had identified in inter-dunal plains in the vicinity, these all proving to be Late Islamic in date.

Although the Iron Age date of the new Jabeeb site is confirmed from the ceramic evidence, the purpose of the site has yet to be determined. There are no signs of buried structures, such as shadows of walls on the surface, or of collapsed structures. The adjacent flat gravel plain would, presumably, have been suitable either for grazing animals or for agriculture at a time of greater rainfall or if irrigated, although the presence of a *falaj* is not confirmed. Perhaps the promontory was used over a long period as a camp-site for Iron Age inhabitants bringing animals to pasture.

Further study of the site is clearly necessary if these questions are to be resolved. However, there is extensive development currently taking place in the area, with dunes being levelled to prepare land for farming. The survival of the site is by no means guaranteed, and this preliminary 'Note' has, therefore, been prepared simply to place the existence of the site on record. Many more archaeological sites may lie within the eastern edge of the dunefield running north of Al Ain, although with the current pace of development, many may be destroyed before they are even recognised.

Acknowledgements

I am grateful to Peter Hellyer, Managing Editor of *Tribulus* and Executive Director of the Abu Dhabi Islands Archaeological Survey, who first insisted that I should show pottery from the Jabeeb site to the appropriate specialists, and arranged for it to be seen by Dr. Robert Carter, and then also encouraged me to place the site on record, albeit in a non-academic format.

I am also grateful to Dr. Robert Carter for examining the pottery, and to Dr. Walid Yasin al-Tikriti for also looking at the pottery and for visiting the site with me, as well as for his insights into the nature of the Iron Age presence north of Al Ain.

Brien Holmes,
PO Box 17258,
AL AIN, UAE

e-mail: bocknobby@hotmail.com

The damselfly *Pseudagrion decorum* breeding in the U.A.E.

Visiting amateur naturalist Graham Giles published an illustrated checklist of UAE dragonflies and damselflies in *Tribulus* 8.1 (Winter 1998). His work, and his predictions, facilitated the subsequent discovery in the UAE of two additional damselflies known to be resident in Oman. One of these, *Pseudagrion decorum*, a small electric blue species (first reported in *Tribulus* 9.2), was recently found to be abundant at the Wadi Shi dam near Khor Fakkan. This site provided the first records of *P. decorum* females in the UAE. These are dull yellow in colour. A number of pairs were observed mating, both flying in tandem and perched in "wheel" formation.

In one dramatic instance a pair flying in tandem alighted on a tiny sprig of underwater plant projecting above the lake surface. The female began to descend along the stem until she had pulled the male almost entirely underwater. At that point he released her and flew free.

She, however, continued to inch down the stem, tail first, "looping" like a leech, until she was out of sight some 6-8 inches or more below the surface, seeking just the "right" place to lay her eggs. Moments passed while three males circled over the sprig for 30 seconds, 60 seconds, 90 seconds, perhaps more, before she suddenly came up to the surface like a diver in a free ascent, only to be snatched up immediately in tandem once more.

The ladies in question apparently know what they want. Another female, deposited on some near-horizontal branches only an inch or two below the surface, fidgeted almost constantly during more than five minutes underwater, investigating various spots with the tip of her abdomen. It wasn't clear in the end if she had laid her eggs or not, but she, too, was off in tandem again within only a second of regaining the surface.

Despite its name, mating among *P. decorum* is a rather ungentelemanly affair. One pair mating in wheel formation on a twig was repeatedly molested by other males who landed on both the mating male's arched abdomen and the female's wings.

Gary Feulner



A mating pair of *P. decorum*

Abu Dhabi Coastline Oil Spill Protection Priorities 2000. Compiled and published by the Environmental Research and Wildlife Development Agency, ERWDA, PO Box 45553, Abu Dhabi, U.A.E. 54 pp. A3 landscape format.

In late 1999, ERWDA and a number of other Government agencies were invited by the Abu Dhabi National Oil Company, ADNOC, to collaborate in the staging of a major oil spill exercise, "Operation Ghazal." Early in 2000, a small spill occurred off the coast of Abu Dhabi when the oil tanker Al Jizya 1 sank off Sadiyat island, and ERWDA was involved in the clean-up and monitoring operation. Following that event, the Agency undertook the mapping of the coast and islands of the Emirate in terms of their sensitivity to oil spills. This book is the result of the work so far.

Utilising the expertise of its own staff, and also calling on the knowledge of other bodies like the Abu Dhabi Islands Archaeological Survey and individual experts, ERWDA brings together in this book all available information about mangroves, coastlines, turtles, dugongs, salt marshes, bird roosting and feeding sites and so on, and then prioritises particular areas in terms of their sensitivity to the impact of oil spills, mapping these on satellite imagery. These maps are then printed adjacent to maps showing data obtained from ground survey, with the complementary maps, side by side, identifying natural resources and protection priorities.

Logistically, the process is not quite as easy as it sounds. First of all, the Emirate of Abu Dhabi has an extensive coastline, more so when all of the islands are taken into account. The shallow inshore waters are used by marine mammals and reptiles, fish and birds for feeding, and the habitat communities of seagrasses and corals, also need to be taken into account. Secondly, the nature of the impact of an oil spill is variable, whether in its initial stages or in later stages when hardened deposits of oil are left on the beaches. Thirdly, the process of cleaning up a spill also has an impact. The movement of vehicles across a beach can damage the wildlife living on and just beneath the surface, while vehicles going to and from a beach can damage or destroy fragile archaeological sites.

This book tries to assess all of these factors in working out the sensitivity of particular areas, and then marks in a mixture of symbols and colour coding the significance of particular areas and what lies within them.

It is, of course, only a preliminary piece of work. To check the correctness of the information gathered from satellite imagery and other sources, ERWDA has identified 500 random control points, but, by the time of the completion of the book, had been able to send inspection teams to only 250 of these points. This checking suggests that around 90 per cent accuracy has been achieved, but it is acknowledged that further work is required.

It represents, however, a major contribution to knowledge of the coastal and inshore marine environment of the Emirate, not just in terms of oil spill sensitivity, but also for the broader topic of coastal zone management.

More time would have permitted more data to be collected, but in the nature of the book as a preliminary study, a cut-off point had to be imposed somewhere. Nonetheless, the results are certainly of great value. If any criticism of the book is to be made, it is only that it would have been appropriate to include an acknowledgement of the contributions made by other agencies. This will, no doubt, be remedied in any future edition.

ERWDA is now hard at work, in association with the Emirate's oil companies and other Government departments and agencies in the preparation of an Environmental Database for Abu Dhabi. This book is a good starting point, and sets a standard against which future work can be measured. It is to be hoped that it will be made widely available, not just to parties directly concerned, but to all with an interest in the coastal environment.

Peter Hellyer

Oman Bird List, Edition 5. Eriksen, J. & Sargeant, D.E. (comps.) 2000. Breeding atlas maps, histograms, 168 pp A5 softback. Published and distributed by the Oman Bird Records Committee, P.O. Box 246, Muscat 113, Sultanate of Oman. Price: RO 3 (UAE Dh 30), excluding postage

Well done, the Oman Bird Records Committee. Published in 2000 and running to 168 pages, Edition 5 of 'The Official List of the Birds of the Sultanate of Oman' is absolutely tremendous, and not solely on account of the 463 species, excluding those adjudged escapes, for which details of occurrence and distribution are given. The compilers, Jens Eriksen and Dave Sargeant, together with Hanne Eriksen and Panadda Panthong who entered all the data in the first place (a mere 209,000 plus records), must be roundly congratulated on production of this absolutely first rate publication. It is something which we have come to expect of the OBRC. Lamentably, others in the region have an enormous amount to do before they can dream of catching up!

For convenience, Oman has been divided into five arbitrarily defined regions, with each region in which a species occurring being clearly indicated in the text. For each species is given, as appropriate, the total number of records, a histogram of year-round occurrence (each month being divided into three), a brief text describing status (for vagrants all records are cited) and, for the 127 breeding species, a conventional half-degree breeding atlas map with possible, probable and confirmed breeding dots.

What more can be asked for - apart from the time to go off and explore this ornithologically-rich country? There is still much to be learnt, and indeed a number of suggestions are given as to where future studies and surveys should concentrate their efforts, for example, breeding surveys of those squares least visited, pelagic sorties, investigation of migration in the Musandam, shorebird studies and DNA analysis of the large white-headed gulls. The decision to treat with caution the taxonomy and identity of the large over-wintering white-headed gulls and the common breeding mystery swift in southern Oman is to be commended.

This List, by giving a concise account of the country's avifauna, makes it possible to compare Oman with the UAE. Over 209,000 records there may be from Oman, but only one of them pertains to robin (!), a species common enough in winter in the UAE. Meadow pipit is similarly classed as a vagrant, with, inexplicably, just five records to date. Oddly, too, there are only 22 records of white-throated robin, a total the UAE would often surpass in a single spring. Note, however, that a single 'record' may concern observation of one or more individuals.

Then again, Oman has four species of breeding sandgrouse when we can only muster two; 14 records, all frustratingly close to us in northern Oman, of great stone plover, a species yet to be seen in the UAE, plus the Dhofar wetlands and woodlands with their admix of

Asian and Afro-tropical species, not to mention supremely rewarding seawatching and so on. The design and layout is clear and the printing quality excellent. Are there any criticisms? Just one, perhaps only a personal one, and that is that despite the gazetteer of place names and coordinates, the inclusion of a place map would have been useful, even if it would have been cluttered as, at best, an A4 double-spread. However, I did enjoy an index designed as every index should be. Thus you can find, for example, Garden warbler listed as all of Garden Warbler; Warbler, Garden; *Sylvia borin* or *borin*, *Sylvia*. Now: is that one record or four?

Simon Aspinall

Journals Received

The following journals with material on the UAE and Oman have been received by, or have been brought to the attention of, the Editors.

Antiquity, Vol. 75, No. 287, March 2001. ISSN 0003-598X
New Hall, Cambridge CB3 0DF, UK. e-mail: catm20@cam.ac.uk

Archaeobotanical evidence for early date consumption on Dalma Island, United Arab Emirates (Mark Beech & Elizabeth Shepherd). pp.83-89.

This paper reports on the discovery of carbonised date stones at a Late Stone Age site on Dalma and subsequent analysis. Work at the site is undertaken by the Abu Dhabi Islands Archaeological Survey, ADIAS.

Adumatu, No.1 January 2000. ISSN 1319-8947.
P.O.Box 10071, Riyadh 11433, Saudi Arabia. e-mail: adumatu@suhuf.net.sa

This new journal on Arabian archaeology has only just come to the attention of the Editors (for which we offer our apologies). We wish its Saudi editors well. One useful paper on the UAE is in the launch issue, viz.

Magee, Peter (2000). *Patterns of Settlement in the southeast Arabian Iron Age*. pp. 29-39.

The Phoenix, No. 17, December 2000.
ISSN 0268-487X

Compiled by Michael Jennings, 1, Warners Farm, Warners Drove, Somersham, Cambridgeshire, PE17 3HW, UK. Published by the National Commission for Wildlife Conservation and Development, PO Box 61681, Riyadh, Saudi Arabia.
e-mail: arabian.birds@dial.pipex.com

The latest issue has two short notes of UAE relevance:

A.M. Abdi & Drew, C.R. (2000). *Black-necked Grebe: new breeding species for the UAE*. pp. 20-21.

The Note summarises observations of breeding black-necked grebe at the Al Wathba Lakes wetland reserve, near Abu Dhabi, from July 2000.

Cunningham, P.L. (2000). *Nest construction and building material used by Purple Sunbird in the UAE*. pp. 12-13.

The Note reports on observations of nest construction by a Purple Sunbird pair in Al Ain.

Short reviews of *Tribulus* (Vol. 9.2), *The Island of Sir Bani Yas* (Peter Vine, Trident Press) and *Wild About Reptiles* (Marijke Jongbloed, Barkers Trident &

ERWDA) are also included.

Zoology in the Middle East Vol. 22, 2001.

ISSN 0939-7140. Max Kasperek Verlag, Monchhofstr. 16, 69120 Heidelberg, Germany.

A further paper on studies into the wintering population of Houbara is included, part of work being taken by Abu Dhabi's Environmental Research and Wildlife Development Agency, ERWDA, to identify their origins through genetic analyses.

D'Aloia, M.-A. *Studies on the population structure of the Houbara bustard *Chlamydotis undulata* in the Middle East, with DNA analysis techniques.*

Falco (Newsletter of the Middle East Falcon Research Group), No. 17, January 2001. ISSN 1608-1544. PO Box 19, Carmarthen, SA33 5YL, UK
e-mail: nigel-barton@easynet.co.uk

The latest issue of *Falco*, (which is co-edited by Dr. Tom Bailey of Abu Dhabi's Environmental Research and Wildlife Development Agency), contains the usual range of papers and notes both on falcon distribution and on veterinary studies.

Those interested in the impact of trapping (for falconry) on the wild populations of saker falcons will find much of interest in this issue, while there is also a report on the second MEFRG Conference, held in Mongolia last year and on the buzzard (*Buteo*) population of Socotra.

Those with a more veterinary approach will no doubt study the sole paper directly related to the UAE, viz.

Verwoerd, Dirk (2001). *Aerosol use of a novel disinfectant as part of an integrated approach to preventing and treating aspergillosis in falcons in the UAE*. pp. 15-18.

Emirates Natural History Group Conservation Fund

The ENHG, Publishers of *Tribulus*, established several years ago a Conservation Fund, to support research and other projects related to natural history and archaeology. The Fund makes several grants a year, usually up to a maximum of Dh 5,000, although in exceptional circumstances larger grants may be made.

Preference is given to applications related to work in the United Arab Emirates and neighbouring countries, although projects further afield are also eligible. Recent recipients of grants include:

Australian Archaeological Mission to the UAE (for work at Muwailah, Sharjah).

M. Jongbloed, R.A. Western and B.Boer (for production of a new Checklist of the Flora of the UAE).

Dr. R. Khan (for studies of the white-winged wood duck in Bangladesh).

Grant applications should be submitted to:

The Chairman,
Emirates Natural History Group,
c/o P.O. Box 45553,
Abu Dhabi, U.A.E.



تريبلوس

مجلة الامارات للتاريخ الطبيعي

ربيع / صيف ٢٠٠١ م

المجلد ١٠١١

