

Reconsidering the 'Ubaid of the Southern Gulf: new results from excavations on Dalma Island, U.A.E.

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Introduction

Archaeological excavations carried out on Dalma island, located some 45 km off the coast of Abu Dhabi in the United Arab Emirates, have revealed new information on the 'Ubaid period in the southern Arabian Gulf. Work undertaken by ADIAS at the site (DA11 and DA12) between 1992 and 1994 established the presence of an 'Ubaid-related coastal settlement with structures and middens. The site lies within the compound of the Jama'iyya nahda li-imrat al-Zubyaniiya (the Abu Dhabi Women's Association) and was first reported in the 1994 Seminar Proceedings (Flavin & Shepherd 1994). This paper is concerned with excavations carried out on the site in March 1998 and also outlines current post-excavation analysis. A report on the full results is in preparation.

The 1998 Field Season

The aim of the short 1998 season was to re-excavate two trenches (*op. cit.*) in order to recover samples for radiocarbon dating and additional stratified material for environmental analysis, a number of key layers being targeted. This work led to the exciting discovery of earlier phases of occupation and further traces of house structures (Beech & Elders 1999; Elders & Beech 1998). The sequence in each trench is summarized below, from the modern surface downward.

A small extension to Trench 1 (previously measuring 5 x 2 m) was excavated down to the lowest level reached in 1993, c. 80 cm below the

modern surface. The main objective was to take samples from a possible hearth (context 15) which had been recorded during the earlier season. The latest deposits (Phase 1) comprised both modern and prehistoric occupation material in a mixed layer of sand and stones, the result of levelling to form the present ground surface. Phase 2 was a layer of aeolian sand with lenses of ash and shell probably representing deflated midden material. In 1993 two parallel slots or gullies were recorded cutting into this layer, perhaps the latest surviving traces of undisturbed prehistoric occupation. An incomplete carbonized date-stone was retrieved from samples during the 1994 season, coming from a redeposited sand layer (context 4) which lay just below the two slots. Phase 3 comprised several interleaving sand lenses containing occupation material. Phase 4 was a layer extremely rich in charcoal and ash (context 15), containing abundant quantities of pearl oyster shell, sea urchin spines, articulated segments of fish skeletons and plaster vessel fragments. Traces of burnt mud-brick with date-stone impressions as well as a second carbonized date-stone were recovered from this deposit. Phase 5 was a layer of aeolian sand beneath the charcoal layer, which sealed an extremely hard and level deposit. This was a deliberately metalled, laid surface. Eight post-holes (one of which had first been recorded in 1993) had been dug into it, seven clearly forming part of a circular structure. Stones and plaster vessel fragments had been wedged into these holes as packing material for the posts. A concentration of

pearl oyster shell was noted outside the postulated building. Finally, (Phase 6) a small sondage (50 x 50 cm) was excavated through the floor to investigate the depth of stratigraphy beneath. About 12 cm below the floor was a lower floor of compacted greenish clay in which the remains of a decayed post could be seen. This represents an earlier structural phase that it was unfortunately impossible to investigate due to lack of time.

In 1994, a large trench (Trench 2) had been excavated down to a layer rich in fish bone and shell (context 40). This deposit was targeted for further sampling, facilitated by the opening of a small 2 x 1 m extension to the earlier trench. Phase 1 was similar to the uppermost layer in Trench 1. Phases 2-4 comprised several sand layers with occasional lenses of ash, shell and scattered fish bone. Phase 5 was a layer of concentrated shell and fish bone which lay to the north of a post-hole and plaster (? door) post socket. South of this area the sand was sterile. This seems to represent a further structure, with food debris swept or accumulated against the wall. To the east of this structure was an irregular layer of plaster. Phase 6 was recorded in the section of a modern intrusion during the 1994 season, and consisted of sand lenses with occupation debris and further possible surfaces overlying the sterile natural at a depth of about 1.70 m below the modern ground surface.

The Radiocarbon Dates

The two carbonized date-stones were submitted to the Scottish Universities Research and Reactor Centre (SURRC) radiocarbon laboratory at the University of Glasgow for AMS radiocarbon dating, undertaken in conjunction with the University of Arizona AMS facility. Calibrations were made using Stuiver *et al* (1998) and are calculated with 2 sigma errors from the probability distributions. The more complete date-stone from the charcoal layer (context 15 in Trench 1) gave a date at the end of the 6th millennium BC, 5110 +/- 160 BC (AA-32032), whilst the upper date-stone (from context 4) was from the first half of the 5th millennium BC, 4670 +/- 130 BC (AA-32031). This earlier radiocarbon date is broadly comparable with the oldest dated sample from the site of Al-Buhais 18 in Sharjah (currently being investigated by Hans-Peter and

Margarethe Uerpmann) which was previously the oldest known radiometrically dated site in the United Arab Emirates. The Dalma radiocarbon results can now be seen to be amongst some of the earliest dates for settlement of the offshore islands of the Gulf.

The Date-stones and Date Impressions

An article detailing the significance of the Dalma date-stones is currently in preparation (Beech & Shepherd, forthcoming). Prior to the new results from Dalma, the earliest evidence for the date-palm (*Phoenix dactylifera*) in the United Arab Emirates was the carbonized dates and date-palm imprints excavated from Hili 8 (Period 1b — Building VI deposit), dating to around 3000 BC (Cleuziou 1989; Costantini 1985). Consideration of existing records indicates that dates have been cultivated since at least the 5th millennium BC (Nesbitt 1993: 31; Zohary & Hopf 1988: 149). In this context, the discovery and dating of the Dalma carbonized date-stones are of some interest as they represent some of the earliest remains of date consumption found within the entire Middle East. Although it cannot be determined whether they represent wild or cultivated palms, it seems that the fruit was being consumed at this early time. Dates may have been harvested locally on Dalma or were perhaps brought into the settlement as trade goods.

Work in Progress

Pottery

'Ubaid-type pottery has been found on many of sites on the eastern side of the Arabian peninsula during the last twenty years: in Kuwait (unpublished), eastern Saudi Arabia (Burkholder 1972, 1984; Golding 1974; Masry 1974), Bahrain (Roaf 1976), Qatar (Smith 1978) and most recently in the United Arab Emirates. Preliminary analysis of the pottery from the Dalma site (now standing at fifty sherds) undertaken by Phil Treveil indicates that most of the 'Ubaid-type sherds recovered are of the typical green/brown fabric with black painted decoration so distinctive of the tradition deriving in southern Mesopotamia. It was previously thought that the nature of the 'Ubaid pottery at site DA11 indicated settlement during the fifth or early fourth millenniums BC ('Ubaid 3-4), although the radiocarbon dates suggest a substantial revision of

this interpretation (*i.e.* to 'Ubaid 1-2).

Sophie Méry and Gerhard Schneider have recently completed an initial study of two 'Ubaid pottery sherds from the site. They have undertaken chemical analyses using X-ray fluorescence, confirming that the sherds fit within the range of their chemical composition group 1, typical of sites from southern Mesopotamia (Méry & Schneider 1996). Similar sherds were also reported by them from Jazirat al-Hamra in Ras al-Khaimah (Méry & Schneider 1996: table 1).

Plaster vessels

A quite remarkable feature of the finds recovered from the Dalma excavations has been the occurrence of plaster vessel fragments (first reported in Flavin & Shepherd 1994). Preliminary analysis by Phil Treveil indicates that the sherds are relatively thick when compared with contemporary pottery, being in the range 0.9-2.2 cm with a mean of 1.1 cm. Their lack of symmetry indicates that the vessels were probably moulded. Most sherds are laminated with two or more distinct layers, probably a result of the initial construction method, with layer upon layer being built up to achieve the required vessel thickness. Replastering also occurred. Thin layers on the interior of some vessel fragments which are compositionally different from the main fabric may have been added to produce grinding surfaces or to act as waterproofing. Both vertical and simple out-turned rims are present in the assemblage with the majority of vessels being bowls or dishes. The use of moulds would only have allowed for simple vessel forms.

During the short 1998 season nearly 600 fragments of plaster vessels were recovered, bringing the total assemblage recovered from the site to over a 1,000 sherds. The majority are from plain undecorated bowls with rounded bases. Some of the body fragments were decorated, however, with black stripes and chevron patterns, appearing to imitate the classic decoration on 'Ubaid pottery sherds.

A major discovery at the site during the 1998 season was a semi-complete (?) limestone bowl which appeared to have residue traces, as well as impact damage resulting from its use as a mortar. A similar example was found at the 'Ubaid site of Al Da'asa located on the west coast of Qatar (Frifelt

1989: 413, Fig.6). This and a number of plaster vessel fragments are currently being analysed by Andrew Middleton and Louise Joyner from the Department of Scientific Research at the British Museum. They have so far undertaken X-ray diffraction analysis (XRD) on eleven plaster vessel fragments from Dalma. Initial results suggest that the vessels are made primarily of gypsum with small quantities of quartz and haematite. These are all readily available on Dalma, suggesting that the vessels were being made there. This hypothesis will shortly be tested by evaluating gypsum and haematite samples recently taken from the island.

Plaster has also been recovered from some 'Ubaid-related sites in the Arabian Gulf; at Dosariyah and Abu Khamis (Masry 1974). At Dosariyah in east Saudi Arabia, these were interpreted as representing wall or floor coverings and were predominantly made from calcite (70%) and silica components (30%), rather than gypsum (Malinowski & Frifelt 1993). The fact that such plaster vessels have not been found on other sites in the Gulf region perhaps indicates that it represents very much a local tradition. Further afield however in central Mesopotamia, Jasim noted that in the earliest level III at Tell Abada, the floors and walls in the houses were coated with thick layers of gypsum plaster.. and that '... a number of plano-convex discs made of gypsum, varying in diameter from 10 to 40 centimetres were found... and that these were perhaps moulds of some sort' (Jasim 1989: 89). Wright also noted that '... we have similar gypsum hemispheres...from later levels in Deh Luran' and stated that 'S.van der Leeuw, the Dutch ceramic archaeologist, identified them as being related to pottery production... the gypsum being used as an ideal material to use as a platform on which to build a pot.' (Wright 1989: 89).

Flint

Analysis of the lithic assemblage from the site has been carried out by Jakub Czacika. The flint tool inventory is limited and largely consists of drills/piercers and wedges. These may have been used to work a range of materials including shell. Several knives/scrapers were also recovered which may have been used for the processing of fish and mammal remains. During a recent brief geological

survey, a source of good quality nodular flint on the north-west side of the island was identified, which may have provided the raw material used in lithics manufacture at the site. A preliminary inspection of its colour and general appearance certainly suggests this possibility.

Animal bones

Work on the animal bones from Dalma by Mark Beech has so far identified domestic sheep/goat, gazelle, dolphin, dugong and turtle as well as large quantities of fish bone, including shark, needlefish, grouper, sea bream, emperor, jack and tuna. This represents the earliest known occurrence of sheep/goat and gazelle on the off-shore islands of the Gulf. The majority of the bone assemblage however, by both number of fragments and weight, consisted of fish bones. The fish remains from Dalma are interestingly much more diverse than the fish fauna recorded on other 'Ubad sites in the Gulf, where small inshore fish like seabreams and emperors are usually the only ones mentioned (Beech, in press). The presence of pelagic species such as tuna is noteworthy. A preliminary examination of these bones suggests that most were from medium-sized fishes, c. 60–80 cm in length; many of them belonged to the genus, *Thunnus* sp. The most frequently occurring species within the southern Arabian Gulf at the present day is the longtail tuna. According to modern fisheries data obtained from the Dalma Cooperative Fisheries Office (Mr. Asad Shahin, pers.comm.), only relatively small amounts of tuna are caught near Dalma at the present day, usually during a period of a few weeks at the beginning of the year. Most of the members of the tuna/mackerel family captured there now are narrowbarred Spanish mackerel — *Scomberomorus commerson* (Lacepède, 1800). In 1998, 52% of these were caught during the month of November, and 79% between the months of October to November. Surprisingly very few bones have been identified as belonging to this species within the Dalma bone assemblage. Although tuna are not caught in great numbers today, they were perhaps more readily available in the past. Tuna are known to aggregate around islands because of the availability of more food there than in the surrounding seas. The inhabitants of Dalma would

have been able to take advantage of the marked seasonal occurrence of these pelagic species as they passed on their migratory passage through to the deeper waters of the central Gulf. Tuna and other species may very well have been important trade items as well as providing a vital dietary component in dried form during the leaner hot summer months. Traditional drying of longtail tuna — *Thunnus tonggol* (Bleeker, 1851) is still carried out as a seasonal activity on the island.

Another important fish family exploited at Dalma were groupers. Regression analysis has been used to reconstruct the original size of some of the Dalma fishes, the estimated size of which has been plotted against the derived regression formula from modern groupers. Some examples were nearly a metre in length, suggesting considerable expertise in fishing methods.

Molluscs

The molluscan assemblage from Dalma is currently being studied by Emily Glover. Analysis of the material excavated in 1993–4 indicates that the turban shell — *Lunella coronata* (Gmelin, 1791), the pearl oyster — *Pinctada radiata* (Leach, 1814), and the clam — *Circenita callipyga* (Born, 1778) are the most commonly occurring species. All of these species would have been collected for food and together made up about 90% of the total number of individuals.

Lunella coronata is a common inter-tidal species inhabiting rocky crevices on boulder covered shores along much of the Emirates coastline. This species does not now survive on Dalma and Glover has noted that its disappearance may be related to the increasing sedimentation of the inter-tidal environment as a result of coastal reclamation. *Pinctada radiata* is abundant in the Arabian Gulf, living in shallow water down to depths of 20 m attached to gravel or sea grass. This species is the most important source of pearls and can be eaten (Lorimer, 1915). It would have been collected by diving from boats or by wading in shallow water. *Circenita callipyga* is an intertidal venerid clam that lives in sand, coarse gravel or muddy sand, usually in slightly exposed conditions. Dead shells are frequent on present day Dalma but no live specimens were found during a survey of intertidal

habitats at the time of the 1994 excavation. Preliminary study of the coastal palaeoenvironment indicates that the intertidal habitats of the island were rather similar to the present day in the middle Holocene, being dominated by rocky shores and sandy beaches. They differed from the coast of the Gulf where more sheltered lagoons and mangrove habitats predominated.

Conclusion

The 1998 fieldwork revealed important further traces of the settlement, confirming the presence of at least two round house-like structures with surviving post-holes and floors (Beech & Elders 1999; Elders & Beech 1998). Radiocarbon dates have now established the dating of the site as late 6th – early 5th millennium BC ('Ubaid 1–2). The discovery of a post-hole sealed beneath the roundhouse in Trench 1 provides a tantalising glimpse of an even earlier settlement at the site. A plaster layer uncovered in Trench 2 can perhaps be interpreted as a mixing slick either from building work or vessel production. Local production of plaster vessels on Dalma seems to have been a regular activity. This evidence strongly suggests long-term settlement on the island, rather than occasional visits during fishing or trading trips. The fact that sweet water, flint, gypsum, haematite and abundant marine resources were available, together with the island's favourable geographical position in the Gulf, would have made it not only a suitable stopping off point for traders travelling by boat, but also an attractive place for semi-permanent occupation. The production of plaster vessels on Dalma, with external chevron decoration copying classic 'Ubaid ceramics, is compelling evidence for this. The discovery of early evidence for the harvesting and consumption of dates also presents some intriguing questions. Might it suggest that the early peoples who settled on the island were already learning how to exploit the stands of wild date palms scattered around the shores of the Gulf? Were they perhaps even already managing or cultivating dates at that time? Interestingly, no other early finds of date-stones have been made on other broadly contemporary sites in the United Arab Emirates. Is Dalma really an unusual site because dates are present there, or is it simply a case of varying

preservation and retrieval?

Henricksen and Thuesen in their concluding summary to the volume, *Upon this Foundation — The 'Ubaid Reconsidered*, said that: 'The closer we examine the archaeological evidence, the clearer our perception becomes: the 'Ubaid was not a single, monolithic cultural or organizational entity, but rather consisted of many locally unique variations on a general 'Ubaid material-culture theme...' (Henricksen & Thuesen 1989: 457). It is now evident that, even in the southern Arabian Gulf, the inhabitants clearly formed their own distinctive version of the 'Ubaid which, although perhaps seeking to emulate some of the traits of the so-called 'Ubaid heartland, maintained a distinctive character.

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