

# Rewriting the end of the Early Bronze Age in the United Arab Emirates through the anthropological and artefactual evaluation of two collective Umm an-Nar graves at Hili (eastern region of Abu Dhabi)

The Hili archaeological complex in Al Ain (U.A.E.) is important for its wealth of third-millennium BC Umm an-Nar burial and settlement sites. Two of the most significant burial sites are Tomb N at Hili and Tomb A Hili North. The latter is a classic circular Umm an-Nar monumental grave, while Hili N is a pit-grave, one of only two Umm an-Nar period pit-graves discovered so far in the U.A.E. Both of these tombs contained the remains of hundreds of individuals, in the case of Tomb A Hili North, more than 300, while around 600 people had been deposited in Hili N. Both population groups have been the subject of anthropological and artefactual analyses and a comparison of the findings help to shed light on the chronology of the end of the Umm an-Nar period.

**Keywords:** anthropology, artefacts, Arabia, Bronze Age, collective grave, typology

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## Introduction

The latter part of the third millennium BC in the Oman peninsula is known as the Umm an-Nar period, considered as the second part of the local Early Bronze Age (EBA), c. 2700–2000 BC (see e.g. Al Tikriti 1989; Potts 1990, 1997; Frifelt 1991). The large funerary complex at Hili oasis, now part of the modern town of Al Ain, Emirate of Abu Dhabi, U.A.E., dates from that period and contained fifteen

tombs, all of which have been excavated (Al Noemi n.d.; Bibby 1970; Frifelt 1975; Al Tikriti 1981), and several settlement sites (Cleuziou 1980, 1982, 1989).

Two of the graves, Tomb A at Hili North, a classic circular monumental Umm an-Nar grave, and Hili N, a pit-grave, are situated only 1.5 km apart. Tomb A Hili North is now sited in a fun park — Hili Fun City — and Hili N has been incorporated into a public archaeological park, along with a number of

other EBA graves and settlements. The two graves are exceptional both in terms of the volume of human remains recovered and in the richness of artefacts buried with the dead. Both the skeletal and artefactual remains have been studied in detail and provide a unique opportunity to compare and contrast two neighbouring graves of the end of the Umm an-Nar period.

### The excavations at Tomb A at Hili North and Hili Tomb N

Each tomb has undergone two stages of excavation.

#### *Tomb A at Hili North*

Tomb A Hili North was excavated during three seasons from 1981/82 to 1984 by the former French Mission in Abu Dhabi, under the direction of S. Cleuziou and B. Vogt. Excavations ceased in February 1984 before the contents of the grave had been fully removed. The grave was then protected and the tomb partially restored. A final excavation to recover the remainder of the skeletal material was carried out in January 1995 by one of the authors (R.M.). Publication of the excavations is forthcoming (Cleuziou, Méry & Vogt).

#### *Hili N*

Hili N was accidentally discovered while clearing up around the classic circular grave, Tomb E, excavated in the 1970s. Excavations by the Department of Antiquities and Tourism in Al Ain (DATA), led by W.Y. al Tikriti, were conducted over five

seasons from 1985 to 1989 (Stage 1). A huge volume of skeletal and artefactual material was removed, while some of the contents were left intact to demonstrate the incredible richness and depth of the burial deposits (Haddu 1989).

In November 1998 a new programme of excavation and study (Stage 2) began, part of a joint project by the Department of Antiquities and Tourism and the French Archaeological Mission in the U.A.E, led by W.Y. al Tikriti and one of the authors (S.M.). Precise excavation methods, developed specifically for excavating collective graves (Duday 1995), were employed. After eight seasons, excavations were completed in March 2006, although the anthropological analyses of the recovered remains have still to be concluded.

#### Grave structure

The two tombs are very different in construction. Brief descriptions of grave architecture are given here as both have been described elsewhere (for Tomb A at Hili North see Cleuziou & Vogt 1983; 1985; Vogt 1985; for Hili N: Al Tikriti & Méry 2000; Méry et al. 2001, 2004, in press).

#### *Tomb A at Hili North*

Tomb A Hili North was of the classic, circular form, the characteristic grave type of the Umm an-Nar period in the Oman peninsula (Cleuziou & Vogt 1983; 1985; Vogt 1985: 20). Like some other Umm an-Nar tombs, this was a two-storey construction and had a diameter of 10.5 m (Fig. 1). The lower

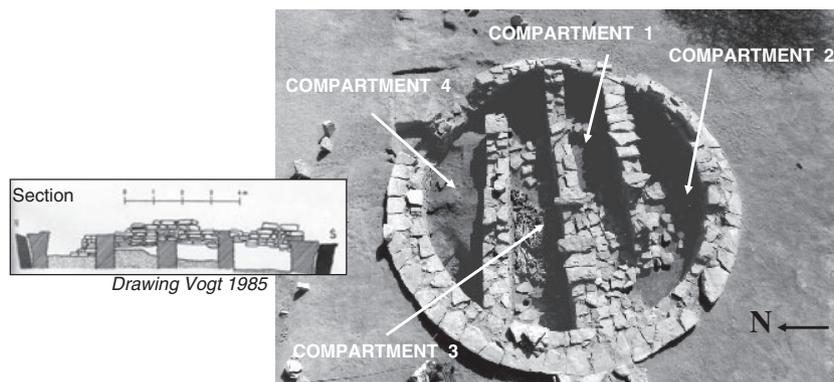


Fig. 1. The subterranean level, Tomb A at Hili North. (Photo: S. Cleuziou).

level was subterranean and 1.5 m deep, and the ruined upper storey, deduced from facing stones found scattered around the tomb, reached a height of at least 2 m above ground (Vogt 1985: 20; Cleuziou, Méry & Vogt, forthcoming). The better-preserved underground part had northern and southern halves that did not communicate with each other. Each of these consisted of two compartments linked by narrow passageways, making four compartments in total, all originally paved. Entrance to the upper storey was through doorways at the east and west. Access to the lower storey was gained from the upper level, probably through an opening in the eastern end of Compartment 1. The contents of the tomb had been partly robbed and destroyed.

*Hili N*

Unlike the typical graves of the Umm an-Nar period, Hili N is a simple pit dug out of the ground (Fig. 2). Oval in shape, approximately 7 m long, 2 m wide and 2.5 m deep, its northern and western sides were strengthened by a stone wall and its surface demarcated by a stone perimeter (Al Tikriti & Méry 2000; Méry *et al.* 2004). Some ashlar blocks from the facing of a circular Umm an-Nar tomb (probably the neighbouring Tomb E) were

used to reconstruct the wall during the use of the pit-grave. The southern end, shallower than the rest of the tomb and originally thought to be a later addition (Haddu 1989), is now interpreted as the entrance to the tomb and part of its original construction. When found the tomb was covered by long flat slabs and the underlying funerary deposits were intact.

During the original excavations, in the absence of any internal compartments or recognised stratigraphy in the burial deposits of 1.5 m, the grave was divided into four arbitrary sections (S1 to S4) and up to six layers (L1 to L6) approximately 25 cm deep. The top two layers were largely sterile, while artefacts and bones were found in all others. The section left in situ after the Stage 1 excavations roughly corresponds to the southern part of Section 3.

Following Stage 2 excavations, four levels of deposits were identified: Level IV (top), Level III (intermediate), Level II (low) and Level I (basal). Between Levels II and III is a layer (referred to as the ‘wadi gravel layer’ before its removal in 2006) that corresponds to the collapse and reconstruction of the western wall of the pit-grave.

Differences in excavation and recording techniques make the precise relationship between the

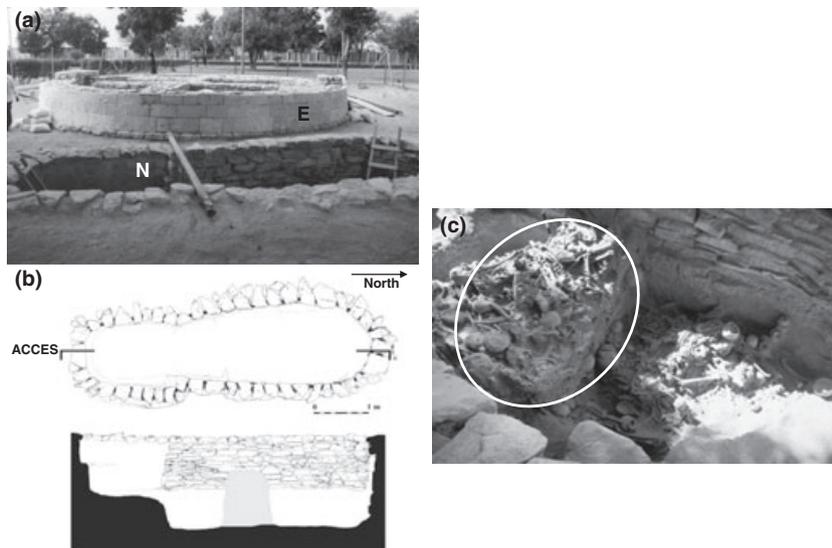


Fig. 2. Hili N, grave structure. a. pit-grave N was dug close to Tomb E. b. access to the grave was from the south. b and c. the central part of the bone deposits was left intact in 1989 (after the first seasons of excavations by the team of the Department of Antiquities and Tourism in Ain). (Photos: S. Méry, W.Y. al Tikriti; Drawing: C. Chalumeau).

Section 1	Section 2	Section 3 (North)	Section 3 (South)	Section 4
*L1	-	-		-
L2	L2	-		-
L3	L3	L3	Level IV	L3
L4	L4	L4	Level III	L4
	L5	L5	Levels I-II	L5
		L6		L6

\*L = Layer

Fig. 3.

Hili N: diagrammatic representation of the tomb, showing four sections, the old layers and new levels. The shallower depth at Section 1 at the southern end of the grave is indicated.

old 'layers' and new 'levels' difficult to determine. However, approximate correlations are indicated in the diagrammatic representation shown here (Fig. 3). The shallower southern end (Section 1) is also shown.

Thus, new Level IV equates with old Layer 3, Level III with Layer 4, and Levels I-II with Layers 5-6. For clarity, the new levels will now be used when referring to the whole tomb.

**The skeletal material**

Tomb A Hili North and Hili N contained the remains of approximately 300 and 600 individuals, respectively.

*Tomb A at Hili North*

Bones were recovered from all four chambers of the subterranean level and weighed 194.9 kg in total (Bondioli, Coppa & Macchiarelli 1998).

Compartment 1 produced 98.6 kg of bones. Beneath a destruction layer were four principal contexts of skeletal remains: a large bone heap, a platform of mortared stones containing some skeletal material, a dense inhumation layer with a pile of skulls on top and a thin layer of smashed disarticulated remains. The bone heap, originating from the ruined upper storey, relates to the robbing and destruction of the tomb. Three groups of twenty-one, six and five skulls were discovered. Beneath these skulls was a layer of remains, some of which were articulated (Vogt 1985).

Compartment 2 generated 16.7 kg of smaller bones and bone splinters from a thin layer.

Remains from Compartment 3 were the best preserved, most stratigraphically significant and the greatest in volume (147 kg). In part of the chamber an upper deposit of bones was clearly

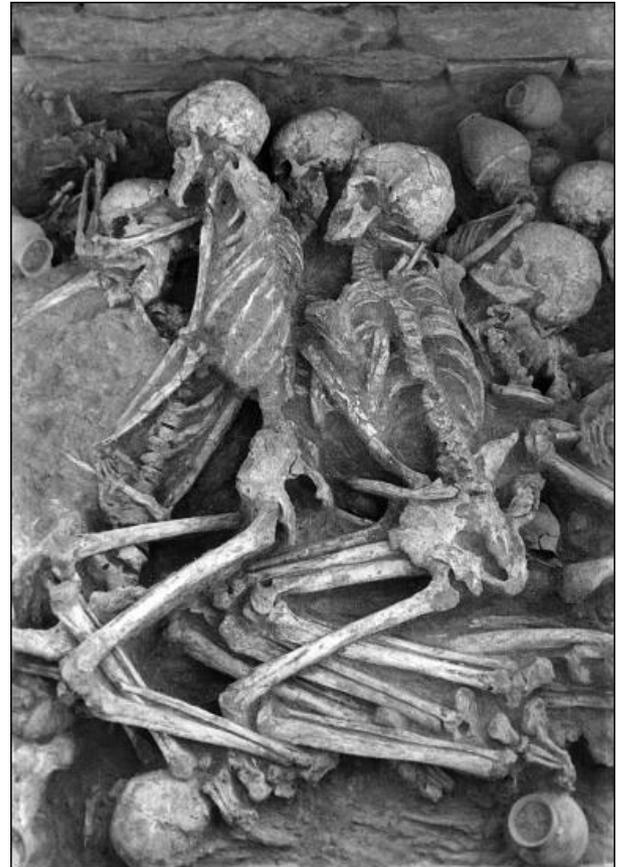


Fig. 4.

Detail of the thirty-one contracted skeletons in Compartment 3 of Tomb A at Hili North. (Photo: R. Macchiarelli).

separated from a bottom layer. The lower remains rested directly on a stone pavement and consisted of thirty-one articulated, partly overlapping, contracted skeletons (Fig. 4) with right arms flexed in front of their faces, and the left stretched out over the next skeleton (*ibid.*; Bondioli, Coppa & Macchiarelli 1998).

Compartment 4 had been completely robbed of both contents and paved floor. Only 6 kg of very fragmentary bones was retrieved (Vogt 1985).

An estimated 50% of bones were burnt. In Compartment 3 burnt remains overlay the bottom layer of unburnt articulated inhumations (Cleuziou & Vogt 1983; Vogt 1985). This burnt upper deposit originated from the destroyed upper storey. Compartment 1 also contained a mixture of burnt and unburnt bones, especially in Units 2 and 3, and a recent brief examination of remains from Compartments 2 and 4 by one of the authors (K.M.) indicates

that these too consisted of both burnt and unburnt bones.

### Hili N

Bone weight from the Stage 1 excavations was 413 kg. An estimation of the bone material from Stage 2 gives a total for the whole tomb of 551 kg. Only a small quantity (13 kg) was retrieved from Section 1, as would be expected for an area that served as the entrance to the grave. Approximately 212 kg of skeletal material was recovered from Section 4, 187 kg from Section 3 and 139 kg from Section 2.

The skeletal assemblage consisted of both complete and fragmented, as well as articulated and disarticulated bones. An apparent lack of articulated bones led to the initial conclusion that Hili N was an ossuary (Haddu 1989). However, Stage 2 excavations have revealed several partially articulated skeletons, and hundreds of small body parts in anatomical connection, at all levels, indicating that the grave was a place of primary burial for most individuals (Méry *et al.*, 2004). Disarticulation and fragmentation is most likely to have occurred during subsequent rearrangement of the remains.

As at Tomb A Hili North some bones were burnt. Two discrete areas of burning were found, one in Section 1, and another corresponding to Levels III and IV of Sections 2 and 3 (Fig. 5). Overall,

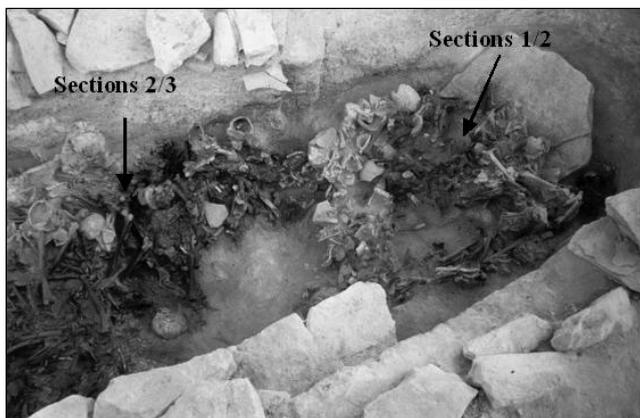


Fig. 5. Hili N during the Phase 1 excavations in the 1980s. The two areas of burning at Sections 1 and 2 and Sections 2 and 3 are visible, separated by an area of unburnt bones. (Photo: W.Y. al Tikriti).

about 20% of bones were burnt. Some were only partly burned; others were black or brown, indicating burning at low temperatures, while a few were white. The latter colouration is achieved with high temperatures (in excess of 645°C; see Mays 1998: 218), as might occur towards the centre of a fire. Darker coloured bones result from temperatures of about 280°C and under. Such colour variation is suggestive of *in situ* fires, and not full cremation. The burning at Hili N is discussed in greater detail elsewhere (Gatto *et al.* 2003; Méry *et al.*, in press).

### Biological profiles

#### Tomb A Hili North

Anthropological analysis of the Tomb A Hili North material was conducted by one of the authors (R.M.) in February 1984 and again in January 1995. In the mid 1980s El Najjar examined excavated material and also twenty-one articulated skeletons still in the grave. Only brief reports of the anthropological findings have been published (El Najjar 1985; Bondioli, Coppa & Macchiarelli 1998).

El Najjar estimated that the tomb contained at least 188 individuals (1985: 38). This estimate was subsequently increased to 300 (Bondioli, Coppa & Macchiarelli 1998). While El-Najjar (1985) 42 identified very few children (only six from 188 individuals), the later analysis revealed high infant mortality (Bondioli, Coppa & Macchiarelli 1998). Significant young adult mortality was noted by both authors. The mortality profile of the thirty-one articulated skeletons revealed eight children under 10, five juveniles and eighteen adults, i.e. a percentage ratio of 42% immature individuals (Bondioli, Coppa & Macchiarelli 1998). Both studies indicated a tall population. El-Najjar (1985) 39 calculated average male height at 178 cm and 172 cm for females, while Bondioli, Coppa and Machiarelli (1998) reported 177 cm and 170 cm, respectively, based on the thirty-one articulated skeletons. Although not specified by El-Najjar, it is likely that he too based his calculations on the articulated skeletons.

El-Najjar (1985: 40) found very little evidence of disease, while Bondioli, Coppa and Macchiarelli (1998) reported a high frequency of ante mortem tooth loss (said to be consequent to caries and date

consumption), cribra orbitalia (a sign of anaemia during childhood), some instances of generalised infection and some traumatic lesions.

The anthropological information for Tomb A Hili North has largely been based on the articulated skeletons: whether this profile is for the present representative of Tomb A Hili North remains to be ascertained.

### *Hili N*

The anthropological analysis of Hili N from Stage 2 excavations is not quite complete and the following reflects the findings to date. An estimated 600 people were buried in the pit-grave. High sub-adult mortality (43%) and young adult mortality is indicated. Average heights, calculated from foot bone lengths in the absence of complete limb bones, were 171.1 cm for males and 163.5 cm for females (McSweeney 2003).

There was a very high frequency of ante mortem tooth loss (68% of all mandibles) (Fig. 6), resulting from caries, advanced attrition and periodontal disease. From hundreds of cranial and orbital fragments displaying porotic hyperostosis and cribra orbitalia (Fig. 6) it is clear that a large proportion of the population suffered from anaemia and/or starvation during childhood. Some of these individuals died in infancy, while others survived into adulthood. Repeated periods of illness or

malnutrition during childhood were apparent from the presence of hypoplastic lesions on tooth enamel.

### **Ceramic evidence**

A preliminary comparative study shows that the pottery from Tomb A Hili North is akin to the lower layers at Hili N (Levels I–II), but there is an absence or rarity in Hili N of several types found at Hili North Tomb A. The pottery from intermediate and top layers at Hili N (Levels III–IV) is quite distinct.

### *Tomb A Hili North and Levels I–II at Hili N*

In both contexts, local and regional pottery belong to the assemblage known for the monumental circular tombs of the most recent type, like Hili North Tomb B (unpublished), Hili 1059, Hili Tomb A and part of the assemblage of Hili Tomb B (Méry 2000: 90, 138). More than a half of the local pottery is shaped from coils on the potter's wheel, according to experimental work at Hili.

Stylistic parallels (Fig. 7) include:

- *Hili Sandy Red Ware* (local, domestic pottery): bowls, jars, miniature pots and suspension vessels (compare Méry 2000: figs 81.2 and 88.3 with Al Tikriti & Méry 2000: fig. 8.2 and 6)

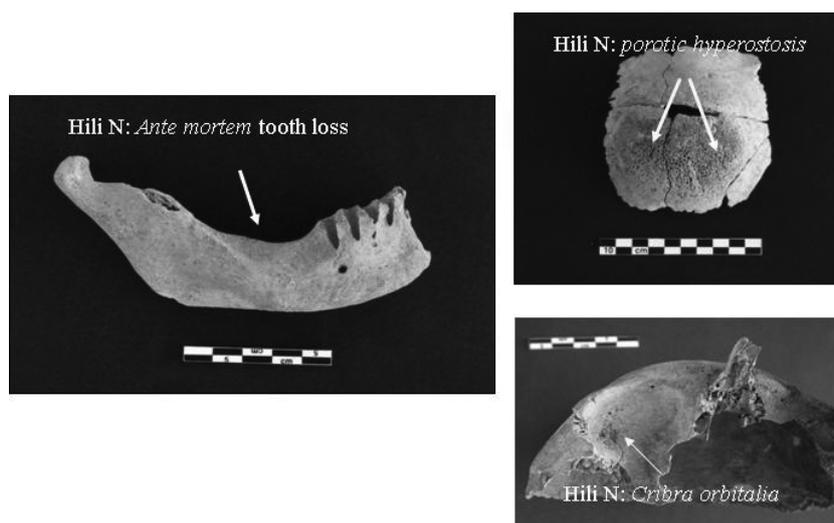


Fig. 6.  
Hili N: typical pathological lesions.

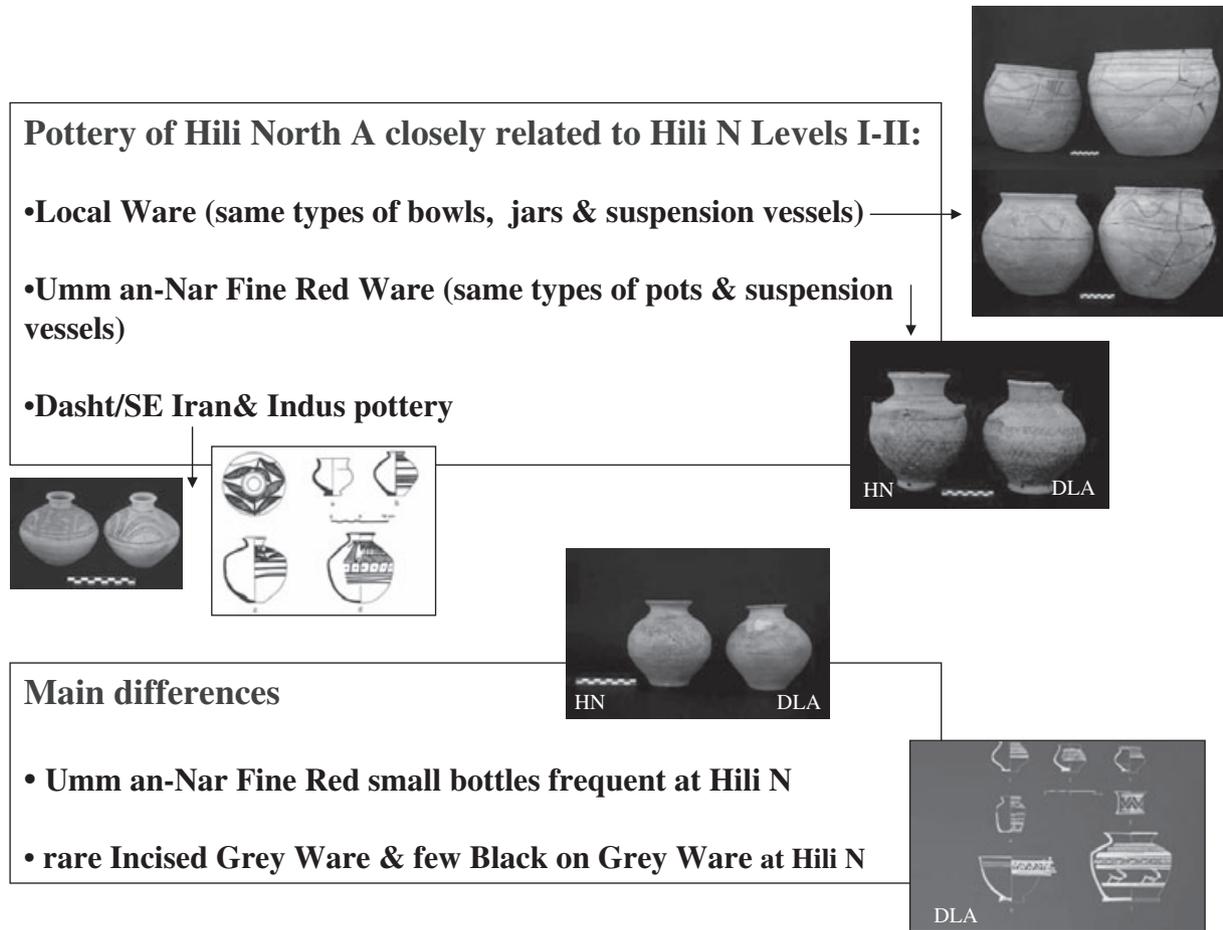


Fig. 7. Some characteristic pottery parallels and differences between Tomb A at Hili North and Hili N. (Photos: S. Méry; Drawings: H. David).

- *Umm an-Nar Fine Red Ware* (regional, funerary pottery): pots and suspension vessels (Méry 2000: figs 49, 53.10–11; Al Tikriti & Méry 2000: fig. 7.1, 7)

Among imported pottery, a single Lower Mesopotamian pot was found in Tomb A Hili North, so far unique in shape in the Oman peninsula (Méry 1997: fig. 12.3), and none in Levels I–II at Hili N. The proportions, types and variety of other imported pottery types are similar in both contexts (compare Méry 2000: figs 151–154 with Al Tikriti & Méry 2001: fig. 9.2–4, 6 and 7):

- *Fine Red Indus Ware*: painted bottles and goblets come from the Indus valley with stylistic parallel (painted pattern) at Nausharo Period III and other sites dated from the second phase of the Indus Civilization (Quivron 2000).

- *Fine Grey or Red Dasht Wares*: some painted pots of several types come from the potters' workshops in the Dasht Valley, in Makran, south-west Pakistan (Blackman & Méry 1999: fig. 9; Besenval & Didier 2004).
- A few painted pots of beige sandy fabric may come from south-east Iran (compare Méry 2000: fig. 54.7, 11, with Stein 1937: pls 14–15), although this has not been confirmed by laboratory analysis.

Differences include a rarity of Incised Grey Ware at Hili N, and only a few Black on Grey Ware pots (Al Tikriti & Méry 2000: fig. 9.2). Both types of pottery come from Makran.

Small bottles of Umm an-Nar Fine Red Ware are numerous in Levels I–II at Hili N, but rare in Tomb A Hili North (Méry 2000: fig. 54.5; Al Tikriti & Méry 2000: 209, fig. 7.6).

*Levels III and IV at Hili N*

There is an evolution of local wares. Hili Sandy Red Ware is now rarely shaped on a potter's wheel, and some types are poorly fired. New shapes of jars and bowls are introduced (Fig. 8) (see also Al Tikriti & Méry 2000: fig. 8.1). Despite this evolution, local pottery style still followed the local Umm an-Nar tradition and the same functional categories were produced (jars, bowls, miniature jars and suspension vessels). A 'palm-leaf' motif incised on a bowl represents the only case of Wadi Suq style features on the local pottery from Levels III-IV, together with a spouted vessel (Al Tikriti & Méry 2000: fig. 8.7).

There is no similar evolution of regional fine pottery (Umm an-Nar Fine Red Ware); the same

types of pots and suspension vessels are documented in Levels III-IV as before. However new shapes of pots (pear-shaped) appear, similar to the pottery found in pit-grave B at Mowaihat (Al Tikriti 1989: pls 39.A, E and 40.E).

Only one Mesopotamian pot is present (Al Tikriti 1989: fig. 9.1); a similar pot was recovered at Kalba, but in an older Umm an-Nar circular tomb (Méry, Phillips & Calvet 1998: 171). Its shape is known in the Akkadian and Ur III periods at Ur (Woolley 1934: pl. 253.44b-c). Painted Indus bottles are rare in Levels III-IV at Hili N, but new types of Indus pottery appear, with parallels at Nausharo PIV or other sites of the second phase of the Indus civilization (Quivron 2000: figs 8.B, 12 B).

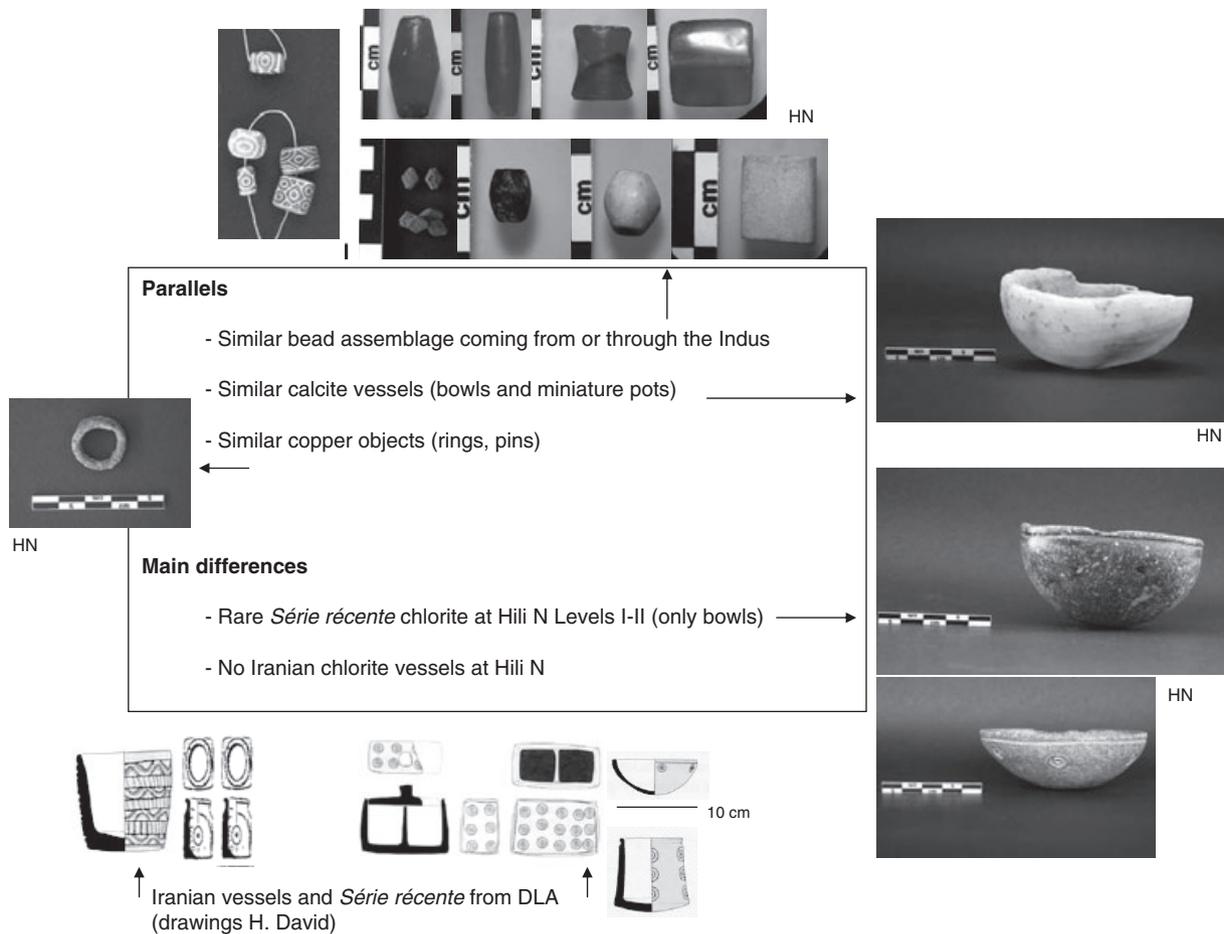


Fig. 8. Some artefactual parallels and differences between Tomb A at Hili North and Hili N. (Photos: O. Brunet and S. Méry; Drawings: H. David).

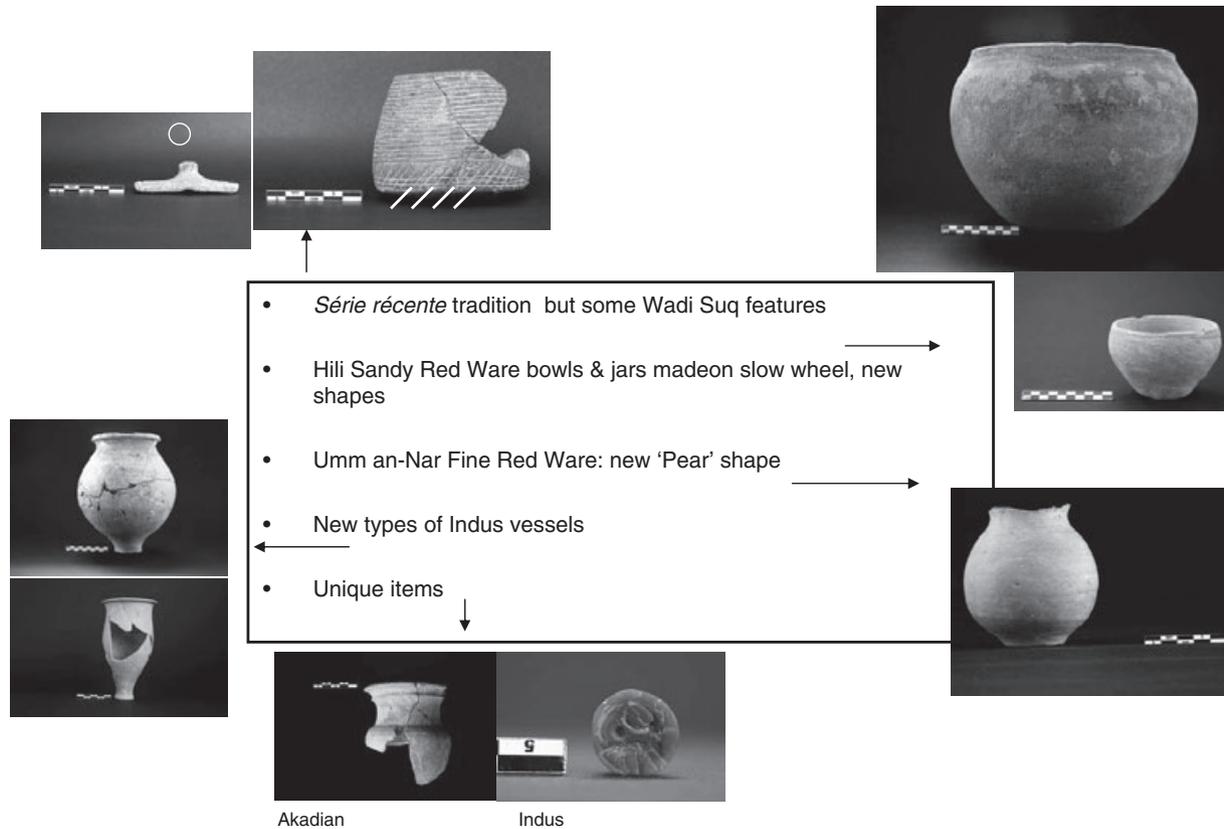


Fig. 9. Some characteristic pottery and artefacts from Levels III-IV at Hili N. (Photos: S. Méry).

**Other artefactual evidence**

For many artefacts types similarities are more evident between Hili North Tomb A and Levels I-II at Hili N, than with Levels III-IV (figs 8-9).

*Tomb A at Hili North and Levels I-II at Hili N*

The same types of copper artefacts (mainly rings, but also pins) are also represented in both contexts and there is a common absence of any weapons, although this is a feature of all Hili tombs.

In both tombs calcite vessels include miniature pots and copies of *série récente* bowls.

The bead assemblage, abundant and varied in both contexts, is characterised by the same predominance of items coming from, or through, the Indus world. Moreover, many types are the same, for example, carnelian beads, etched carnelian beads, small silver beads, paste beads, glazed paste beads (Cleuziou & Vogt 1983; 1985; Vogt 1985). At Hili N, carnelian beads are predominant in Levels I-II, and the entire 'etched' carnelian comes from the same layers.

Some differences are apparent between the two contexts. No lapis lazuli beads were found in Tomb A Hili North, while large silver beads are not represented at Hili N. Compared to Tomb A Hili North, imported chlorite vessels are absent in levels I-II at Hili N and *série récente* chlorite vessels are rare (David 2002: fig. 12.5, 7, 10), but calcite vessels are more numerous.

*Levels III and IV at Hili N*

At Hili N the intermediate and top levels are marked by a decrease in the variety and quality of imported beads from the Indus. Moreover, we now find more paste than carnelian beads.

Chlorite vessels include some types of the *série récente* as known at Tomb A Hili North and other tombs of the end of the Umm an-Nar period at Hili (bowls of types A and B, and rectangular boxes, see David 2002). However, some types that are well represented at Tomb A Hili North are absent in Hili N: for example, truncated beakers decorated with

double-dotted circles (David 2002: fig. 10.1–3). Some new stylistic features appear:

- Several ‘beehive-shaped’ beakers were found in Levels III–IV; locally there is only one other occurrence at Hili 1059, the last circular tomb constructed in the cemetery (Frifelt 1975: fig. 17.e). Other vessels of the same type come from tombs probably more recent than 1059 — Tell Abraq and pit-grave B at Mowaihat (Al Tikriti 1989: pl. 45.A–B; Potts 2000: 53, bottom; David 2002: fig. 14.1–3). The ‘beehive-shaped’ beaker is thus chronologically distinctive of the very end of the Umm an-Nar Period.
- A deep bowl of unusual fabric, shape and decoration (Méry *et al.* 2001: figs 9–10) was found in Level IV. A ‘palm-leaf’ motif is engraved, which is very rare in Umm an-Nar contexts (two cases at Hili N, both on pottery) but becoming in vogue in the Wadi Suq period. This bowl is so far unique in the Oman peninsula.
- Some other features confirm this evolution to the ‘style’ of the Wadi Suq chlorite assemblage, for example oblique hatched or cross-hatched incisions (David 2002), or the round button of the rectangular lids (Berthelot, personal communication).

## Discussion

The similarities and differences between the two graves raise questions about the communities who used the graves and the chronology.

### *Chronology*

#### RELATIVE CHRONOLOGY AT HILI CEMETERY.

An architectural sequence was recently documented for the circular tombs at ‘Hili Garden’ and ‘Hili Fun City’ by one of us (S.M.) with the help of geologists and stonemasons (Gagnaison *et al.* 2004: 101). The fourteen circular tombs known at ‘Hili Garden’ and ‘Hili Fun City’ were constructed in a time span covering up to 500–600 years. There is a continuous and almost linear evolution in the quality of construction; the circular tombs were constructed one after the other (tomb Z is the most ancient, tomb 1059 is the more recent):

Four chronological phases of construction are proposed by one of us (S.M.) for the second part of

the Early Bronze Age at Hili, i.e. the Umm an-Nar period. Phases 1 and 2 are primarily based on the architectural analysis, while Phases 3 and 4 are also based on pottery and artefact analysis. Phases 1 to 3 correspond to the period of construction of the circular monumental tombs:

- *Phase 1.* Early circular tombs (Z, F, G, H), *c.* 2700–2600 BC. Phase 1 is based on the architectural analysis. The four tombs had mostly been pillaged and were in a ruinous state when discovered, and there is a virtual absence of material suitable for study. This is compounded by the fact that material that was discovered has not been published (although some items were illustrated in the unpublished doctoral thesis of W.Y. al Tikriti).
- *Phase 2.* Intermediate circular tombs (D, K, M, C, E), *c.* 2600–2400 BC. Phase 2 is also primarily based on the results of the architectural analysis: very little is known about the grave-goods of Tombs D, K, C and E. Tomb M is more informative. Previously considered to be the earliest Umm an-Nar tomb known at Hili (Cleuziou 1989), it now appears to be in the middle of the architectural sequence. Moreover, some pottery vessels have good parallels with pottery from Period I, IIa–c1 and IIc2 at Hili 8 settlement. This is logical if we consider that Phase IIa corresponds to the construction of Building II at Hili 8, which includes several facing stones of Umm an-Nar tombs that are very close (but not identical) to those of Tomb M.
- *Phase 3.* Recent circular tombs (Hili B, Hili A, Hili North Tomb A, Hili North Tomb B, Hili 1059): *c.* 2400–2200/2100 BC. The most elaborate (Tombs A and B at Hili North, Tomb A at Hili and Hili 1059) are the most recent. They date to a late (but not final) phase of the Umm an-Nar period. This phase is characterised by the importance of imported prestige artefacts from Dasht plain in Makran, Indus Valley and (possibly) south-east Iran.
- *Phase 4.* Pit-grave (the pit-grave Hili N, *c.* 2200/2100–2000 BC). No more monumental circular graves are constructed at Hili. The local pottery assemblage is marked by a

Table 1. Hili N: Table of radiocarbon dates.

Sample	Level	Radiocarbon Age BP	Calibrated age cal BC	Calibrated age cal BP	Method A 1 sigma BC	Method A 2 sigma BC
Pa 1835 Bone	Level I-II	3800 ± 60	2200	4149	2317–2137	2455–2034
Pa 1840 Bone	Level 4	3760 ± 70	2178,2166,2143	4127,4115,4092	2281–2038	2451–1950
Pa 1844 Charcoal	Level 4	3730 ± 30	2135, 2071, 2063	4084,4020,4012	2181–2041	2198–1987
Pa 1978 Bone	Level 4	3745 ± 40	2188, 2182, 2141	4137,4131,4090	2201–2044	2287–1984
Pa 1979 Bone	Level 4	3755 ± 45	2195, 2172, 2143	4144,4120,4092	2272–2052	2294–1984

strong evolution in technology and style at the second part of the use of the pit-grave.

#### TOMB A HILI NORTH AND HILI N.

It is apparent that both tombs were in use for a number of generations at the end of the third millennium BC.

According to the excavators of Tomb A Hili North, the large volume of bone and artefacts suggested a 'rather long occupation of Tomb A [...] 2–300 years may be an adequate estimate' (Cleuziou & Vogt 1983). Based on the *série récente* vessels (comparable to tombs at Hili and other regions of the Oman peninsula), and the Hili domestic ware (similar to Hili 8 IIf–g), Cleuziou and Vogt suggest 'the last centuries of the 3rd Millennium BC'. No C<sup>14</sup> dates have yet been published.

Soon after its discovery Hili N was considered to date to the end of the Umm an-Nar Period (Haddu 1989), part of the assemblage being more recent than that of Tomb A Hili North (Al Tikriti & Méry 2000: 216; Méry *et al.* 2001: 175–176). Studying the chlorite vessels of both sites, but independently from the rest of the material and data from both excavations, David (2002) 184) assumed 'some partial contemporaneity between the two tombs'. However, a stratigraphical analysis of the whole assemblage excludes this hypothesis: the first use of Tomb N is more recent than A Hili North.

However, we could demonstrate that Tomb A Hili North predates Hili N Levels I–II and part of the material from the following Levels III and IV heralds Wadi Suq types (chlorite vessels and pottery).

Radiocarbon dates (Table 1) confirm that Hili N was in use at the end of the third Millennium BC and for at least 100 years, at most 200 years<sup>1</sup>. Artefactual evidence suggests that the beginning of use of Hili N and the end of use of Tomb A Hili North are close. The single radiocarbon date from the basal level at Hili N (Pa 1835) does not contradict this hypothesis.

#### HILI N AND HILI E.

As previously stated, Hili N was immediately next to a monumental circular grave, Hili E that had been pillaged and found in a ruinous state. Architectural features indicate that it belongs to the intermediate phase (Phase 2) of the architectural funerary sequence at Hili and is considered to be older than Tomb A Hili North, or any of the other circular tombs of the most recent group (Gagnaison *et al.* 2004: 101). In Hili N a stone retaining wall was constructed during the creation of the pit-grave. The initial construction did not include facing stones. Part of this wall collapsed during the use of the grave, closing and sealing Level II deposits, and was subsequently reconstructed, using twelve facing stones from tomb E.

1 Radiocarbon dates were processed at the University of Paris VI-Jussieu by Dr. J-F. Saliège, LODYC-University VI (Méry *et al.* 2001: note 5). Two types of material were analysed: charcoal (Pa 1844) and bone (all other samples). The date obtained from the charcoal is very accurate with a small margin of error. Only one sample from the bottom level of Hili Tomb N (Level 1) was dated (Pa 1835), all other samples come from the top level of bone deposits (Level 4).

### *Burial practices*

Although the structure of each grave is quite distinct, some parallels can be seen in burial practices. Both graves were used for a number of generations and appeared to have served all members of the respective communities. Extended use of a communal tomb would inevitably require periodic rearrangement of the remains to make room for further corpses. Evidence for such internal organisation can be seen in both graves. Tomb A Hili North contained both articulated and disarticulated remains, some of which had been rearranged (for example, groups of skulls). In at least one compartment (no. 2) bones had been removed and the chamber refilled with fine gravel (Vogt 1985: 22–23). Compartment 4 had only 6.1 kg of fragmentary remains, also suggestive of clearance.

At Hili N the apparent absence of articulated skeletons and a high degree of fragmentation led to the initial conclusion that the pit-grave was an ossuary (Haddu 1989). Subsequent excavations, however, revealed — in addition to disarticulated bones — the presence of hundreds of articulated body parts, many of which had labile soft-tissue connections that decay soon after death (e.g. hands and feet), and some partially complete skeletons. These indicate that Hili N was largely a place of primary deposition. The presence of high numbers of small bones of the hands and feet, often under-represented in secondary burials, also supports the conclusion of primary burial. Because Hili N was intact when discovered, the fragmentation and disarticulation must have occurred during periods of internal rearrangement and subsequent depositions.

Both graves contained some burned bones. Vogt (1985) refers to the presence of 'sooty' stones and partly burnt bones, subsequently estimated to be about 50% of the human remains.

Burning had also occurred at Hili N, where it was limited to two specific areas: one in Sections 1 and 2 at the southern end of the tomb and the other at Sections 2 and 3 (Fig. 5). Burnt bones are confined to Levels III and IV. None of the bones in Section 4, or from Level I–II had been burned. In the whole grave approximately 20% of the bones were burnt. In both tombs many bones were blackened or only partly burned, which indicates low temperatures of burning, more suggestive of a simple fire than cremation. It is also likely that the burning had

occurred in situ in both cases. Evidence for deliberate construction of the fire was clear at Section 3 of Hili N (Gatto *et al.* 2003). At Tomb A Hili North most of the burnt remains appear to originate from the destroyed upper story (*ibid.*). Fire appears to have been used only occasionally, but for what purpose is not clear.

### *People of common or different groups?*

So far, there is no anthropological evidence to suggest that the respective communities were socially or ethnically different; biological profiles appear to be similar. High sub-adult and young adult mortality was reported for both groups; 42% of the thirty-one articulated individuals in Tomb A Hili North and 43% of those from the Stage 1 excavations of Hili N were sub-adult. As with most skeletal populations, causes of death could not be established. However, it is likely that most would have died from infectious diseases. As known from recent history in the West and from developing countries today, it is the young who are most susceptible to such diseases. A form of anaemia occurring during childhood (probably iron deficiency anaemia) was present in both groups, and at Hili N dental hypoplasia also testified to repeated periods of infant-juvenile illness or poor nutrition. At both sites, those who survived childhood mostly died in early or middle adulthood.

Poor levels of dental health existed amongst both communities, an indication that their diet was similar. Contrarily, current evidence suggests that there were marked differences in both male and female average stature; those from Tomb A Hili North appeared to be taller by a margin of about 6–7 cm. Stature is governed by both genetics and diet. Such a marked differential in average height could either indicate biological distance between the groups, or unequal food resources. However, it is quite possible that stature estimations are biased, in the case of Hili N because of inaccuracies in the methodology deployed, and in the case of Tomb A because only the articulated adult skeletons, about 10% of adults in the assemblage, were considered. Further analysis may clarify the situation.

Grave-goods from the first period of use of Hili N indicate that the people and social structure did not change: (1) the local pottery (i.e. reused everyday containers) is the same in terms of wares, types,

shapes and proportions; and (2) the proportion and composition of personal ornaments, imported or rare items, are the same or similar.

Neither does the population change during the second period of use of Hili N, although some important (but so far unexplained) changes do occur. Exchange networks, such as with the Indus world, become less frequent and types of imported goods differ. Even more significant is the evolution of local pottery production; by now local potters rarely use the potter's wheel, but rather the turntable, to shape their coiled vessels.

Hili N is the only tomb at Hili occupied until the very end of the Early Bronze Age, around 2000 BC, and the assemblage of Levels III–IV marks the end of the Umm an-Nar period (last part of our Phase 4). Whether this assemblage is more recent than Phase IIg at Hili 8 settlement, where there was stated to be 'no change in the material assemblage' between phases F and G (Cleuziou & Vogt 1983) is unclear; only a reassessment of the pottery from Hili 8 would allow that question to be answered.

### Conclusions

The richness of the anthropological and artefactual assemblages from Tomb A Hili North and Hili N provides a unique opportunity to study and compare two neighbouring graves from the end of the third millennium BC and the communities who used them. While there are a number of differences, it is clear that these communities had similar burial rites and very similar biological profiles. Further anthropological analysis, currently under way, will allow a more detailed comparison of the two populations to be made.

Although both graves belong to the Umm an-Nar period, the construction of Tomb A Hili North was older than Tomb B Hili North, Hili 1059 and Hili N. The last circular tombs to be constructed in the area, Tombs B at Hili North and 1059 at Hili, represent the

highest point in terms of architecture (Gagnaison *et al.* 2004). The second period of use of Hili N (Levels III–IV) is clearly later than these tombs, based on all categories of artefacts. Local and regional pottery and artefacts are mainly in the Umm an-Nar stylistic and technological tradition, although some features signal the Wadi Suq style.

Based on the published pottery and artefacts from Hili 1059, the first use of Hili N (Levels I–II) and the pit-grave at Mowaihat (Haerinck 1991) may have been more recent than that of Tomb B Hili North and 1059, although the grave-goods from Tomb B Hili North are not published.

Circular Umm an-Nar graves are more numerous than pit-graves, only two of which are currently known (the other at Mowaihat, see Haerink 1991). Why pit-graves should suddenly make an appearance at the end of the Umm an-Nar period is not clear. However, the period when Hili N was used, at the very end of the Umm an-Nar period, around 2200–2000 BC, was marked by important changes in local technology (no more monumental tombs, no more use of the potter's wheel) and long distance exchange networks. Understanding the reasons for this socio-economic change, possibly related to the local or regional environmental evolutions, is challenging and needs to be further explored, at Hili and in the Oman peninsula.

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