

K. Schippmann, A. Herling, J.-F. Salles (Hrsg.)

GOLF-ARCHÄOLOGIE

Mesopotamien, Iran, Kuwait, Bahrain,
Vereinigte Arabische Emirate und Oman



WADI SUQ FINE WARES FROM SHIMAL AND HILI SITES
(UNITED ARAB EMIRATES)
A TECHNOLOGICAL AND PROVENIENCE ANALYSIS

Sophie MÉRY

Introduction

Since the discovery of its type-site in 1972 (Frifelt 1975: 372-381), fifteen years of archaeological research have demonstrated the extension of the Wadi Suq culture throughout the Oman Peninsula, possibly as far as Masirah Island in the south (pers. comm. A. A. Shanfari and G. Weisgerber quoted by Cleuziou and Tosi n.d.). Although the early second millennium date already proposed by Karen Frifelt in 1975 (Frifelt 1975: 381) for the graves excavated in the Wadi Suq and the Wadi Sunaysl remains unchanged, transition from the previous Umm an-Nar to the Wadi Suq Period as well as duration of the latter have been pending for a long time. Finally, recent discoveries at Shimal indicate an extension of the Wadi Suq culture into the late second millennium B.C. (Vogt and Franke-Vogt 1987: 34-36), and Tell Abraq is going to provide a chronological sequence for the whole period (Potts 1990).

As far as ceramics are concerned, scholars have mainly described and compared them for chronological purposes, and only proposed formal typologies - with the exception of Peter Donaldson (1984: 199-206). From one publication to another (de Cardi 1988, Frifelt 1975, Cleuziou 1981, n.d., Cleuziou and Tosi n.d., Donaldson 1984, 1985, Vogt and Franke-Vogt 1987), one can draw the following picture: shape and decoration of the Wadi Suq pottery are completely different from the previous Umm an-Nar one, the Wadi Suq assemblage is restricted to the Oman Peninsula and seems to display a low degree of stylistic variability from one region to another.

Our purpose here is to present some results of a laboratory analysis (1) involving macroscopic and thin section studies on ceramics from Hili and Shimal. They are key-regions for a better understanding

(1) Previous laboratory analysis program involving thin section and X-ray fluorescence studies has been carried out on ceramic samples from Shimal Site 1 by J. R. Cann and C. K. Winter (in Donaldson 1985: 122-126) in order to characterize the fabrics macroscopically recognized by the excavator (Donaldson 1984: 204-206).

of the Wadi Suq culture, since Hili 8 remains the single settlement in the Oman Peninsula with a continuous third-millennium occupation, and Shimal represents the most densely settled area known for the second millennium B.C.

Using laboratory analyses, our main attempts have been:

- to reconstruct technology of the Wadi Suq potters
- to reconstitute petrographic environment of ceramic manufacture
- to test stylistic homogeneity versus provenience homogeneity
- to detect possible inter-regional exchanges (Hili and Shimal areas are more than 100 kilometers apart).

Method of analysis

Our study involved a macroscopic and low/power microscopic examination of the whole material from Hili 8 Period III (excavated by the French Archaeological Mission in Abu Dhabi, see Cleuziou 1979) and from four tombs at Shimal - namely sites 1 and 6 (excavated by Peter Donaldson, and published by Donaldson: 1984, 1985 and de Cardi: 1988), and tombs Sh 102 and Sh 103 (excavated by the Göttingen Mission at Ras al-Khaimah, see Vogt and Franke-Vogt 1987).

This examination aimed at identifying three different types of ware (the fine, medium and coarse wares), defined by particular fabrics, shaping and finishing, as well as a limited corpus of shapes and decoration. It involved also the description and classification of fabrics, characterised by colour of the paste, dimensions, shape, orientation, colour and frequency of mineral inclusions, as well as dimensions, shape, orientation and frequency of pores (see Méry 1987: 97-101).

After identification, ware and fabric types have been sampled for thin section study. For the present paper, a single type of Wadi Suq pottery has been selected: the *fine ware*, a ceramic type found both at Hili and Shimal sites.

Thin section analysis has been carried out in order to reconstruct the theoretical petrographic environment of ceramic manufacture and to provide information on technology (such as clay preparation techniques). It allows identification and description of microfacies (1), distinguished by their matrix (all inclusions, clayey or not, smaller than 5 microns) and coarse fraction (non-plastics larger than 5/10 microns). Primary minerals and rock fragments are identified, as well as artefacts (such as grog, vegetal or animal temper). It also allows description of micro-structures (through the observation of shape, dimensions and orientation of inclusions and pores) and part of the post-depositional components.

Context, formal analysis and shaping-marks

At *Shimal*, fine ware represents the great majority of the funerary assemblage whereas it is scarce in the settlement (less than 5% of the material).

 (1) Details on this analytical method are given for example in Courtois (1976) and Echallier (1984).

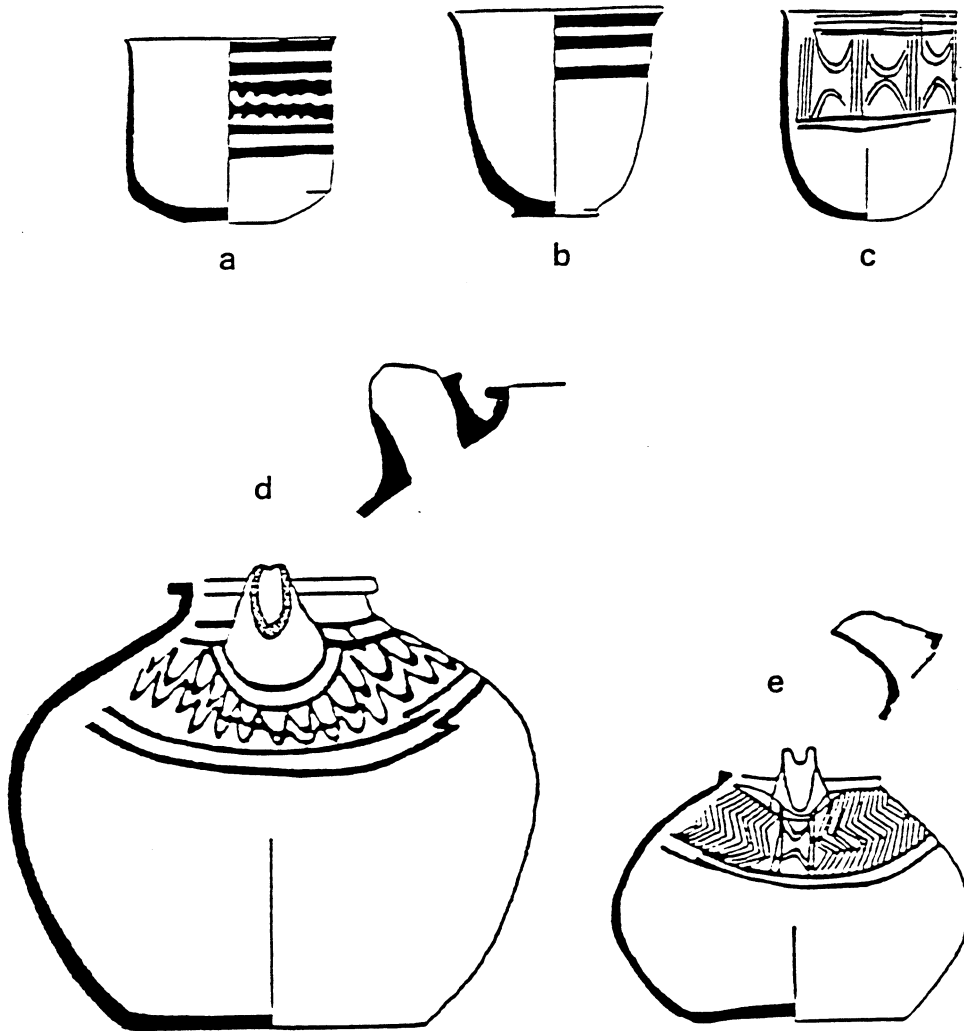


Figure 1. Wadi Suq fine ware from Shimal, tombs Sh 99 (a, b), Sh 102 (c), Sh 103 (d, e):

- a: beaker shape a (Vogt and Franke-Vogt 1987: fig. 32 n° 1)
- b: beaker shape b (ibid: n° 3)
- c: beaker shape c (ibid: fig. 12 n° 16)
- d: spouted jar (ibid fig. 24 n° 7)
- e: spouted jar (ibid: fig. 24 n° 4)

Except a few pinched miniature jars, all vessels have been thrown. Throwing marks left by potter's fingers (already noticed by Donaldson 1984: 199 on site 1 ceramics) are usually visible on the internal and/or external walls of the vessels. Their specific shape varies from shallow fine ridges to pronounced corrugations. After throwing, vessels were frequently removed from the wheel with a string (often from the rotating wheel, leaving a characteristic spiral).

Most vessels are beakers with straight to slightly everted walls and slightly everted tapering rims. They show some variations in dimensions (there are mainly two sizes), shape and decoration. Three are salient shapes:

- the best represented (*Fig. 1a*) is a carinated beaker with a flat or slightly rounded base (Donaldson 1984: fig. 3 n° 3, 5, 6; Vogt and Franke-Vogt 1987: fig. 23 n° 9, 10; de Cardi 1988: fig. 1 n° 3, 11, 14, fig. 2 n° 19, 33). After having been removed from the wheel and probably dried, its lower part was scraped with a blade, leaving either unequal sharp-edged facets (Donaldson 1984: fig. 3 n° 3, 6) or long, flat sweep traces (*ibid*: 199). Fine drag grit-marks are often visible on the surface.
- short footed trimmed beakers (*Fig. 1b*) with or without carination are less numerous (Donaldson 1984: fig. 5 n° 27, 28, 32; Vogt and Franke-Vogt 1987: fig. 23 n° 13, fig. 32 n° 4, 5; de Cardi n.d. fig. 1 n° 2, 4, 16).
- trimmed beakers (*Fig. 1c*) with a rounded bottom and a flat or slightly rounded base are scarce (Donaldson 1984: fig. 3 n° 4; Vogt and Franke-Vogt 1987: fig. 12 n° 18; de Cardi n.d.: fig. 1 n° 8)

Globular spouted jars are famous among the funerary Wadi Suq assemblage: at Shimal they do exist in small numbers in all tombs. The spout was either shaped (not very carefully in general) on the shoulder (*Fig. 1d*) (see also Donaldson 1984: fig. 7-9, fig. 10 n° 64 and 65; and Vogt and Franke-Vogt 1987: figure 24 n° 3, 5), or on the rim (*Fig. 1e*) (see also Vogt and Franke-Vogt 1987 figure 13 n° 10, figure 24 n° 6; and de Cardi 1988: fig. 4). The lower part of the spouted jars has often been scraped (Donaldson 1984: fig. 7 n° 55, fig. 8 n° 56).

Whatever their shape, most vessels were decorated with black patterns painted either on the clay or on a red (rarely beige) external slip. Most frequent are vertical chevrons, zigzags, straight lines, series of undulating and straight lines, sometimes vertical lines and festoons (see *Fig. 1*). Naturalistic motifs are scarce (de Cardi n.d. figure 1 n° 6, figure 2 n° 21).

Compared to settlement SX at Shimal (Franke-Vogt *in* Vogt and Franke-Vogt 198: 77-81, 86-89 and Méry *in* *ibid*: 99), fine ware is over-represented at Hili 8, since it covers more than 50% of the assemblage of Period III (*i.e.* 868 diagnostic sherds, see Cleuziou n.d.). Most sherds are rims and wall fragments of beakers with straight to slightly everted walls and slightly everted tapering rims identical to those from Shimal (Cleuziou 1981 fig. 4 n° 2-4, 9-11, 17-20). Beakers shape 1 are attested (*ibid*: fig. 4 n° 13). A few fragments of spouted jars have also been found, with the spout located on the rim (*ibid*: *Fig. 3*). Fine Wadi Suq ware from Hili 8 might have been wheeled (due to its degree of fragmentation. it is sometimes difficult to be affirmative), and a lot of vessels have been scraped, giving either a brushed aspect to the sherd or drag grit-marks. Most of them have been string-cut. Vessels were decorated with geometric black patterns identical to those from Shimal, either painted on the claybody or on a red-purple (rarely beige) slip.

Formal comparisons for Shimal and Hili fines wares are well known from the Wadi Suq and Wadi Sunaysl tombs, where Karen Frifelt found beakers (Frifelt 1975: fig. 22b, 23e and 27b) as well as spouted jars (*ibid*: fig. 20a-b, 21a).

Local geology

Shimal is located on the Ras al-Khaimah coastal plain, in the northern part of the United Arab Emirates (*Fig. 2*). Wadi Suq graves are located on wadi gravel fans, immediately edged to the east by the mass-mountains of the Jurassic to Aptian Musandam Group, mainly comprising shallow-water limestones, dolomitic and sandy limestones (Glennie *et alii* 1974: 162-165). Close to *Shimal*, Triassic mountains of the Elphinstone group (*ibid*: 99) are mapped between Ghalilah and Rams villages, along the Wadi Sha'm and the Wadi Ghalilah. The lower part of this group includes dolomites, dolomitised limestones and skeletal grainstones; its upper part includes quartz sandstones, fossiliferous marls and skeletal limestones. The Musandam, Elphinstone and Ruus al-Jibal groups are also mapped by K. W. Glennie along the Wadi Bih, the solely wadi crossing the mountains to connect Dibba on the Oman Sea. The Permian to early Triassic Ruus al-Jibal group (*ibid*: 192) comprises two thick dolomites beds separated by argillaceous limestones, dolomites and shales.

Hili 8 is located in the al Ain oasis (Emirate of Abu Dhabi), along the western foothills of the Jebel Hajjar mountains. Al Ain is dominated by Tertiary limestones such as the Jebel Hafit and the Jebel Aqlah mountains. The substratum consists of limestones, dolomites, marls and shales. Sediments sampled in or around *Hili 8* are fossiliferous marls rich in angular detritic quartz and siliceous rock fragments mixed with a few basics and ultrabasics (pyroxenes, olivines and serpentines). First magmatic ranges of the Jebel Hajjar, mainly consisting of gabbros and peridotites stand 30 km east from *Hili*. They belong to the Semail Nappe, a massive Upper Cretaceous ophiolitic ridge extending over 600 km throughout the Oman Peninsula. The Wadi Jizzi, one of the three major valleys which crosses the Semail Nappe from east to west, connects the *Hili* area with Sohar on the Oman Sea.

Since the Oman Peninsula has a complex and specific geological history resulting in radical and abrupt changes in the petrography from one area to another, it is a propitious setting in which to conduct a provenience study program of archaeological ceramics. It has been recently demonstrated for Umm an-Nar pottery types that specific areas could be delimited as potential clay sources while others areas could be strictly excluded (Méry 1986, Blackman *et alii* 1989).

Analytical results

Macroscopic study

If we consider fabric itself, most fine ware vessels from *Shimal tombs* are slightly different, especially in composition of the inclusions, as well as texture and alteration type (which led Donaldson - 1984: 204-206 - to differentiate 19 fabrics among the 67 pots from *Shimal Site 1*). However, two main fabrics may be roughly distinguished (Méry in Vogt and Franke-Vogt 1987: 100):

- fabric 4: bright red to red brown colour. Very numerous white opaque inclusions of 0.5 mm or less, seldom reaching 2 mm. Numerous rounded micropores, few chopped vegetal impressions.
- fabric 5: beige, orange, pale red, to brown colour. Numerous light-grey, black and white opaque inclusions of 0.5 mm or less, seldom reaching 2 mm. Numerous rounded micropores, chopped vegetal impressions.

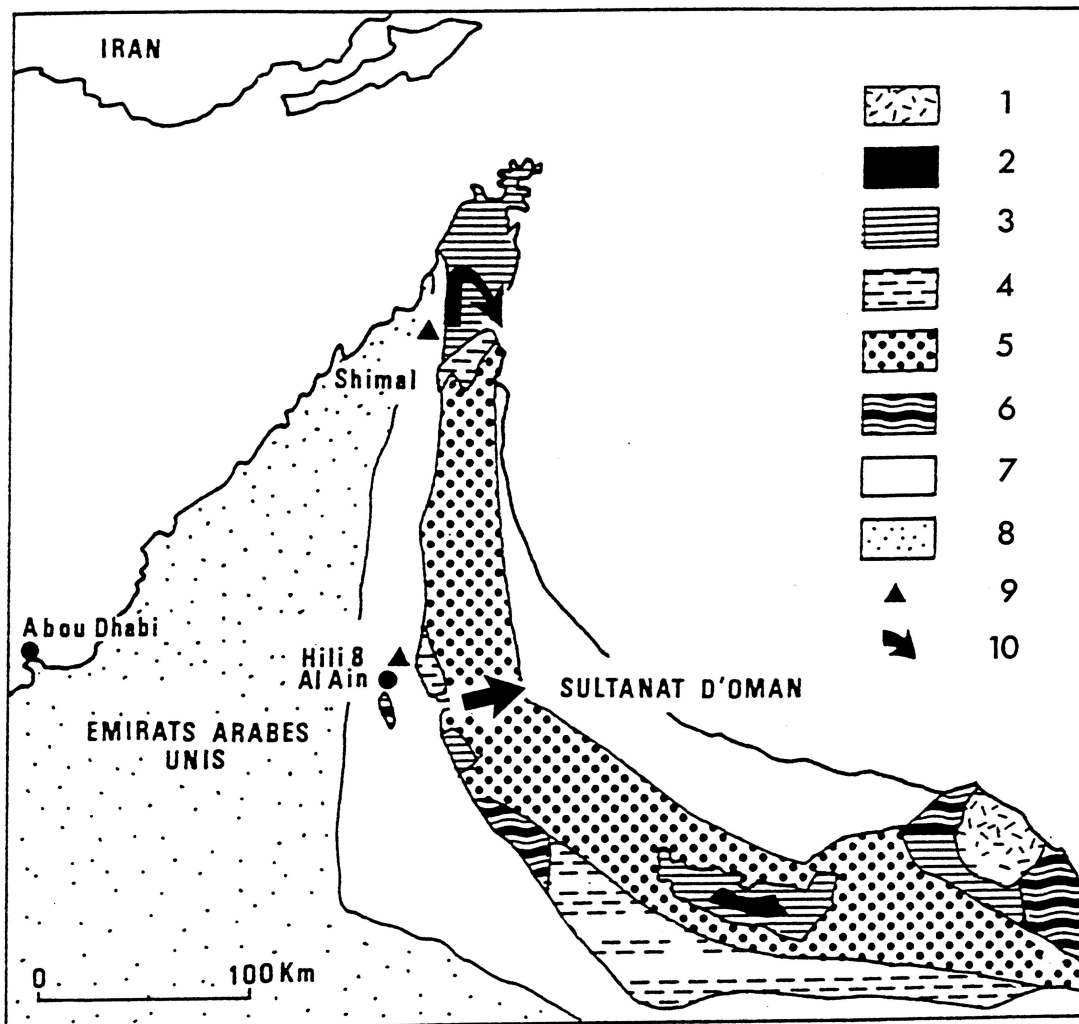


Figure 2. Sketchmap of the geology of the Oman Peninsula.

- 1: Pre-mid Permian quartzite
- 2: Pre-mid Permian granite
- 3: Mid Permian to Mid Cretaceous limestones and dolomites
- 4: Upper Triassic to Upper Cretaceous limestones
- 5: Semail ophiolite
- 6: Maastrichtian and Tertiary limestones
- 7: Wadi sediments
- 8: sand dunes and sebkhas
- 9: main archaeological sites referred to in the text
- 10: main wadis referred to in the text.

SAMPLE	REGISTRATION NUMBER	SHAPE
SHIMAL		
Sh.1.1	Donaldson 1984 n° 55	big jar
Sh.1.8	Donaldson 1984 n° 35	short footed beaker
Sh.1.9	Donaldson 1984 n° 34	rim of beaker
Sh.6.9	de Cardi n.d. n° 58	suspension vessel
Sh.102.1	RAK Museum n° 43/18	base of beaker
Sh.102.2	RAK Museum n° 44/24	spouted rim
Sh.102.5	not numbered	wallsherd
Sh.102.6	not numbered	wallsherd
Sh.102.8	RAK Museum n° 44/25	beaker
Sh.103.4	RAK Museum n° 44/16	beaker
Sh.103.5	RAK Museum n° 44/13	spouted jar
Sh.103.10	RAK Museum n° 44/20	beaker
HILI 8		
A 50	H8/81/2340a/UF728	rim of big jar
A 51	H8/78/756/UF59	rim of bowl
A 52	H8/80/2127/UF606	wallsherd
A 54	H8/81/2372/UF730	base
A 55	H8/81/2350a/UF728	wallsherd
A 56	H8/81/2339/UF739	wallsherd
A 58	not numbered	base of beaker
A 64	H8/78/763b/UF59	wallsherd of beaker
A 65	H8/78/779/UF59	wallsherd
A 67	H8/81/2361/UF722	wallsherd of beaker
A 68	H8/81/2501/UF743	rim of small jar
A 69	H8/81/2336/UF732	wallsherd
A 72	H8/78/805/UF59	base

Figure 3. Samples for thin section analysis referred to in the text.

Hili fabrics are not very different from Shimal fabric 5 and cannot be set into groups either by hand or low/power microscopic examination as we have done for previous Umm an-Nar wares (Méry 1986, Blackman *et alii* 1989). Paste colour varies from light buff to dark red. Amount, colour (principally opaque white, light-grey and black), and dimensions of the inclusions (most of them are smaller than 0,5 mm, few of them reach 2 mm) slightly differ from one sherd to another. Microporosity is abundant. Potters often added chopped vegetal temper to the clay, leaving after firing elongated rectangular, sometimes ribbed pores.

Thin section analysis

Nine microfacies have been distinguished out of twelve samples coming from four *Shimal tombs* (1). Compositional variations of the coarse fraction do exist among most of the samples from Shimal and especially concern granulometry as well as proportions of the minerals and rock fragments. Sh 102.2 and Sh 102.6 contain for exemple fragments of volcanic glass; Sh 1.8 and Sh 109 display dolomitic structures; Sh 1.8, Sh 1.9, Sh 102.8 and Sh 103.10 are rich in shell pieces and foraminifera; Sh 102.1 and Sh 103.5 contain spicules of sponge and radiolaria... an so forth.

Thin section analysis only partially confirms the validity of the macroscopic grouping: among fabric 5 samples, only Sh1.8, Sh 1.9 on the one hand, and Sh 102.8, Sh 103.10 on the other hand have the same microfacies. As for fabric 4 samples, only Sh 102.1 and Sh 103.5 are identical on thin section.

There is no necessary link between shape and fabric since a beaker (Sh 102.1) and a spouted jar (Sh 103.5) are identical in thin section. Moreover, there is no direct relationship between context of finding and type of fabric since beakers from Sh 102 and Sh 103 tombs have on two occasions the same microfacies (Sh 102.1 = Sh 103.5; Sh 102.8 = Sh 103.10).

Despite their differences, all samples from Shimal we analysed fall into the same broad petrographic family: coarse fraction is a mixing of sub-angular to rounded carbonates (comprising spathic calcite, microgranular limestone fragments and/or micrite) and angular to sub-angular quartz measuring between 10 and 500 microns, and rarely reaching 2 mm. Minor components are muscovites, orthoclases, plagioclases, epidotes and amphiboles.

The mineralogy of the ceramic samples is generally compatible with the petrographic environment around Shimal: Wadi Suq ceramics could be made from local clays and sands (or natural sandy clays) issued from the weathering of the calcareous ranges east of Shimal, then transported to the piedmonts and the main wadi beds such as Wadi Bih and Wadi Haqil.

If *Hili 8* fine ware is completely different in thin section from the Shimal one, potters also used different types of clay to produce pottery. Eleven microfacies have been differentiated from thirteen ceramic samples (only A54, A56 et A58 have the same microfacies). A50, A51, A54, A56, A58 and A57 comprise for exemple some fragments of micrite, A69 very numerous micrite and grains spathic calcite fragments, and some foraminifera and algae.

 (1) 6 samples of fabric 4: Sh 1.1, Sh 102.1, Sh 102.2, Sh 102.5, Sh 103.4, Sh 103.5; 6 samples of fabric 5: Sh 1.8, Sh 1.9, Sh 6.9, Sh 102.6, Sh 102.8, Sh 103.10. See Fig. 3 for identification and description of the samples.

In spite of their differences in granulometry or proportions in minerals or rock fragments, all samples from Hili 8 especially contain angular quartz mixed with fragments of serpentinites, olivines, pyroxenes, plagioclases, amphiboles and biotites. As documented at Shimal, fine Wadi Suq ware from Hili refers to a same type of petrographic environment.

Due to the frequency of ultrabasic minerals and rock fragments and the small amount of carbonates, Hili surroundings as well as al Ain oasis can be excluded as possible clay sources. The peculiar composition of the Wadi Suq pottery from Hili actually suggests that clay sources were very probably close to the ophiolites of the Semail Nappe, standing at least 30 km east of Hili at the opening of the Wadi Jizzi.

Conclusions

Our data document that Wadi Suq fine wares from Hili and Shimal do not only share stylistic but technical features:

- clay procurement: several clay sources
- fabric preparation: constant grain range-size, medium paste homogeneization, frequent vegetal temper addition.
- shaping: throwing (except pinched miniature vessels), string-cutting, trimming, scraping. Predominant beakers, few spouted jars. Same dimensions.

Comparative thin section study demonstrates that fine Wadi Suq wares from Hili and Shimal have been made from clays coming from different parent rocks. Two distinct petrographic environments of manufacture (or production areas) have been documented: one is compatible with the direct vicinity of Shimal, the other is not compatible with the al Ain area itself but agrees with micro-environments along the Jebel Hajjar mountains east of Hili.

Both at Hili and Shimal, thin section study also documents a high variability in the fabric production, which is probably a sign of a non-specialization in the clay source procurement.

No pottery exchange has been so far evidenced between Hili and Shimal sites. Production and distribution areas of ceramics seem therefore locally confined, whereas Wadi Suq pottery technology, function and style themselves spread out all over the Oman Peninsula.

Sophie Méry
ERA 30, CRA, CNRS
IGAL

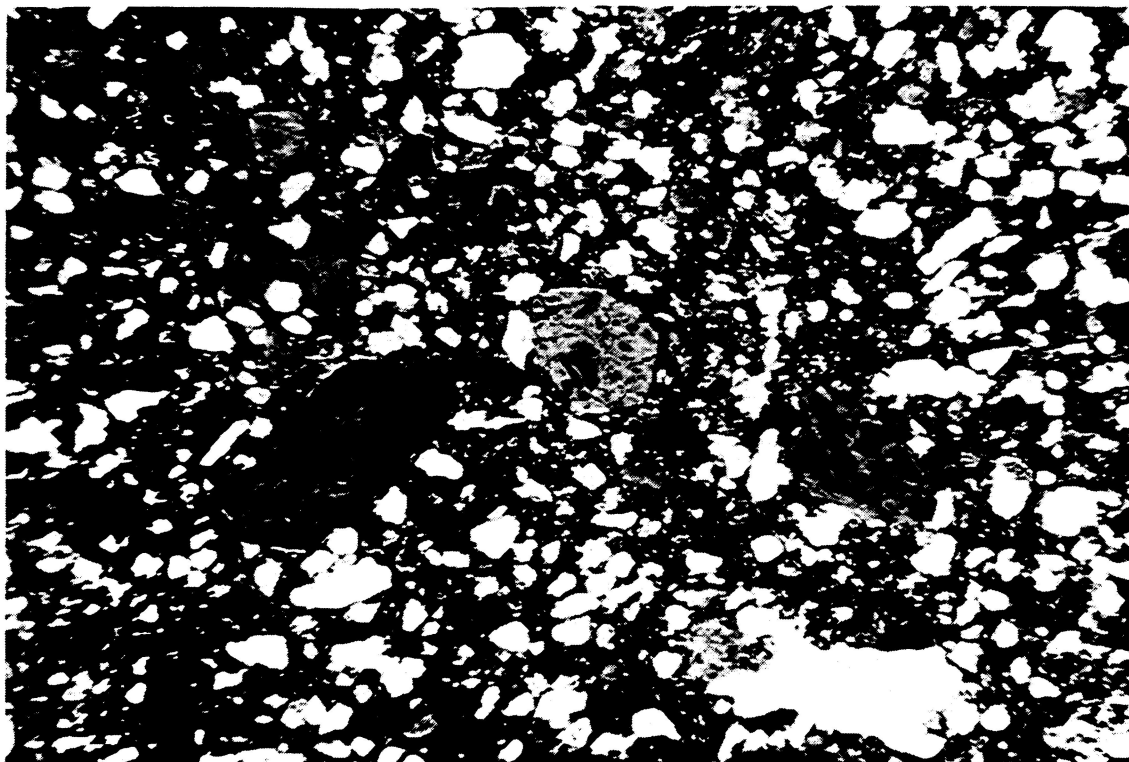
paper written in 1987

ACKNOWLEDGMENTS

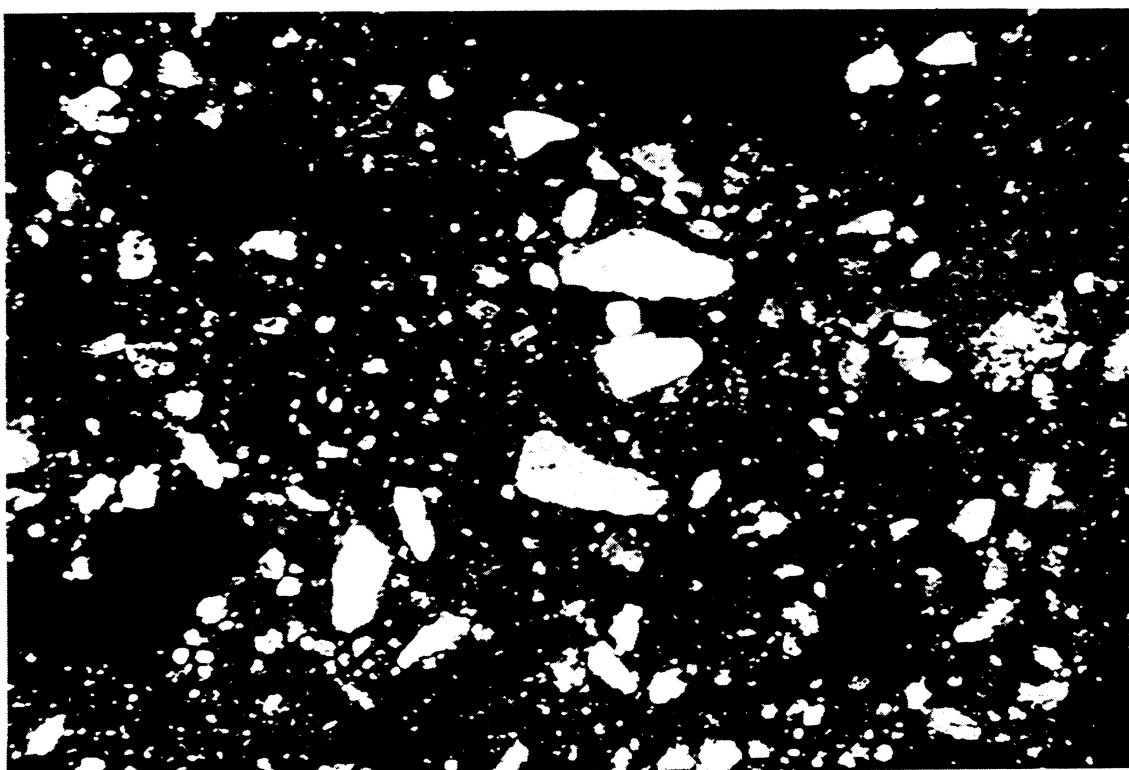
Thin section analysis was carried in 1987 out by the author at the Institut de Géologie Albert de Lapparent (Paris) under the direction of Dr J. C. Echallier (ERA 36, CRA, CNRS). Pottery drawings have been prepared by Dr Ph. Gouin (ERA 30, CRA, CNRS). We gratefully thank the Department of Antiquities and Tourism of al Ain and the Department of Antiquities of Ras al-Khaimah which generously provided samples. We also acknowledge Drs S. Cleuziou (ERA 30, CRA, CNRS, Director of the French Archaeological Mission in Abu Dhabi), B. de Cardi, J. C. Echallier, U. Franke-Vogt, K. Frifelt (Forshistorik Museum, Moesgard), Ph. Gouin, K. Schippmann (Director of the Göttingen Archaeological Mission in Ras al-Khaimah), W. Y. al Takriti (Department of Antiquities and Tourism, al Ain), M. Tosi (IsMEO) and B. Vogt for their support to this program.

BIBLIOGRAPHY

- CLEUZIQU (S.), 1981, "Oman Peninsula in the Early Second millennium B.C.", *In South Asian Archaeology 1979* (H. Härtel Ed.), Berlin: 279-293.
- n.d., "The chronology of Prehistoric Oman as seen from Hili", *In Oman Studies*, *Orientalia Romana* 7, Roma.
- BLACKMAN (J.), MERY (S.), WRIGHT (R.), 1989, "Production and exchange of ceramics on the Oman Peninsula from the perspective of Hili", *In Journal of Field Archaeology*, vol. 16: 61-77.
- CARDI (B.) de, 1988, "The grave-goods from Shimal Tomb 6 in Ras al-Khaimah, U.A.E.", in D. T. Potts (Ed.), *Araby the blest: Studies in Arabian Archaeology*, Carsten Niebuhr Institute Publications 7, Copenhagen.: 45-71.
- COURTOIS (L.), 1976, *Examen au microscope pétrographique des céramiques archéologiques*. Notes et Monographies Techniques n° 8, CRA, CNRS, Paris.
- DONALDSON (P.), 1984, "Prehistoric tombs at Ras al-Khaimah", in *Oriens Antiquus* 23: 191-312.
- DONALDSON (P.), 1985, "Prehistoric tombs at Ras al-Khaimah", in *Oriens Antiquus* 24: 85-142.
- ECHALLIER (J.C.), 1984, *Éléments de technologie céramique et d'analyse des terres cuites archéologiques*. Documents d'Archéologie Méridionale, série Méthodes et techniques, Lambesc, 1975.
- FRIFELT (K.), 1975, "On Prehistoric Settlement and Chronology of the Oman Peninsula", in *East and West* 25: 359-424.
- GLENNIE (K.W.), BOEUF (M.G.A.), HUGHES CARKE (M.W.), MOODY-STUART (M.), PILAAR (W.F.H.), REINHARDT (B.M.), 1974, *Geology of the Oman mountains*, Verhandelingen K. N. G. M. G., Nederland, Vols. 1 and 2, tables and maps.
- MAGETTI (M.), 1982, "Phase Analysis and its Significance for Technology and Origins.", in J. Olin and A. D. Franklin (Eds.), *Archaeological Ceramics*, Smithsonian Institution Press, Washington D. C.: 121-135.
- MÉRY (S.), 1986, "Standardisation / spécialisation, quelle alternative ?" Paper presented at the Italo-Franco Symposium on Chronology, *ISMEO*, Rome.
- MÉRY (S.), 1987, "Notes on the Wadi Suq pottery from Shimal", in Vogt. B. and U. Franke-Vogt (Eds.), *Shimal 1985/1986, excavations of the German Archaeological Mission in Ras Al-Khaimah, U.A.E. A preliminary report*, Berlin: 97-101.
- POTTS (D.), 1990, "Tell Abrak and the Harappan Tradition in Southeastern Arabia", in G. Possehl (Ed.), *Harappan Civilization*, 2nd. ed., New Dehli.
- VOGT (B.), FRANKE-VOGT (U.) (Eds.), 1987, *Shimal 1985/1986, excavations of the German, Archaeological Mission in Ras Al-Khaimah, U.A.E. A preliminary report*, Berlin.



a



b

Figure 4. Microfacies of Hili and Shimal ceramics:

a: A 50, P. P. L., x20. Mixing of quartz, fragments of serpentinites and olivines.

b: Sh 103. 4, X. P. L., x20. Mixing of quartz and fragments of micrite.