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Archaeology of the Borderlands: 4th Millennium BC Mesopotamian Pottery at Ra's al-Hamra RH-5 (Sultanate of Oman)

Introduction

Since 1986 when the first painted sherds of Ubaid style were found at Umm al-Quwayn (Boucharlat et alii 1991: 68–69, fig. 3–4), this type of pottery has become a regular feature of the 5th millennium coastal sites along the coast of the United Arab Emirates (figure 1): so far, about five settlements or graves from Dalma in Abu Dhabi, al-Zahra in Ajman, Umm al-Quwayn, and the Jezirat al-Hamra peninsula in Ra's al-Khaimah have yielded a small number of these sherds (Haerinck 1991: 85, 1994: 153 and fig. 1 n° 3–4; Uerpmann 1992: 89–90; Haerinck 1994: 153, 157; Flavin and Shepherd 1994: 125–128; C. Phillips and B. Vogt comm. pers.). In the Sultanate of Oman however, no Ubaid pottery was found, neither in coastal and inland sites (Biagi 1994).

RH-5 in the Qurum area is the most ancient site where pottery was found in the Sultanate of Oman. It is dated from the 4th millennium. Among the pottery of RH-5, the Iranian origin (Biagi et alii 1984: 53; Cleuziou and Tosi 1989: 28, fig. 3) of a vessel of fine grey ware should be confirmed by mineralogical and chemical analyses in progress. The vessel was found in two pits of Phase VII (pits HXF and HXP-B, Cf Biagi and Salvatori: 1986: 6, 8; Biagi 1987: 15), dating to the first half of the 4th millennium according to the latest 14C reassessment by P. Biagi (1994: 18)[1].

A few more sherds were found at RH-5 in 1984 (unpublished), which cannot be related neither by shape or decoration to any type of pottery production known so far. At the request of Professor M. Tosi a petrographical analysis in thin-section has been carried out on five of these sherds. The aim was to

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[1] 3542 BC (Bln 3140), 3717 BC (Bln 3401) are the two available calibrated 14C dates for the pits. In his paper, P. Biagi refers to a previous article where he published non calibrated 14C of the same samples (Biagi and Isetti 1989: tab. 1), but he does not explain why the dates are now up of about 500 years.

determine their paste composition and to see if they could be related to any of the petrographical groups known from the Bronze Age Oman Peninsula (Méry 1991a, 1991b, 1994). The results led to the identification at RH–5 of two fragments of vessels which have been manufactured in Mesopotamia.

Macroscopical and microscopical description of the Mesopotamian pottery from RH–5

Potsherd A704 was found in HXV/AB square, level 1. A700 was collected on the surface of the site. Both are wallsherds belonging to two different vessels. A700 is beige in colour (5 Y 7/4 YR 6/2), 5 cm^2 in surface and 0,6 cm thick. A704 is greenish (2,5 Y 7/4), 9 cm^2 in surface and 0,8 cm thick (plate 1). Macroscopically, both are sandy and contain numerous red and black inclusions (≤ 0,3 mm) as well as some charcoal fragments (≤ 2 mm).

Thin–sections under optical microscopy show that the sherds have very close composition (plate II, n. G–H):

– a nearly overfired marly clay matrix, dark green, isotropic;

– a sandy fraction which is quite abundant (10–15% of the surface of the thin–section), ranging between 50 and 200 microns (350 microns as a maximum).

Calcitic grains are recognizable from the shape of round holes surrounded by a characteristic thin micritic aureole. Angular quartz grains, silexoïds, radiolarite fragments, and opaque iron oxide grains are numerous. They are associated with felspars, micas (biotites and muscovites), epidotes, automorphic hornblendes, sub–automorphic uncoloured pyroxenes and basaltic or andesitic rock fragments.

Comparison with Mesopotamian Fabrics from Mesopotamia and the Gulf

Both samples from RH–5 can be related to Fabric A group which is one of the two main petrographical groups identified in the study of the Mesopotamian vessels found in Omani sites dated from the 5th, 3rd and 2nd millennia (Méry 1991a: 178–185).

Sampling. 16 vessels or potsherds from several Mesopotamian sites of the 5th to the 3rd millennium BC were submitted to petrographical characterization: al–Ubaid, Larsa, Khafajah, Djamdat Nasr, as well as Kheit Qasim and Bahize Zahireh in the Hamrin region (table 2 and figure 1)[2]. The Mesopotamian sherds

[2] The petrographical study was completed in 1992 by an X–Ray fluorescence characterization program conducted by Dr G. Schneider (Arbeitsgruppe Archäometrie, Institut für Anorganische und Analytische Chemie, Berlin). The results are under study and will be published separately (Méry and Schneider n.d.). 12 additional samples have been characterized by XRF (Uruk: 3 items from Uruk period and 4 items from ED I period; Bahize Zahireh: 4 potsherds of Scarlet Ware; Kheit Qasim: 1 potsherd of Scarlet Ware). The 3rd millennium pottery from Ur, Telloh, Susa and Buraimi in the Sultanate of Oman was studied at the British Museum (Western Asiatic Antiquities) and at the Louvre (Département des Antiquités Orientales), but not sampled. The majority of these vessels are macroscopically identical to the Mesopotamian pottery found in the Gulf.

were compared to 38 samples from vessels or potsherds of Mesopotamian style found in the United Arab Emirates and the Sultanate of Oman. With the 2 above–mentionned sherds from RH–5, the sampling was consituted by the following items:

– 3 sherds of Ubaid style from Jezirat al–Hamra (5th millennium);

– 18 vessels of Jamdat Nasr to ED I–II style, found at different sites of the Hafit Period, c. 3100–2750 BC (table 1, figure 2 n. 2–6);

–14 vessels of Early Dynastic II–III style, recovered at different sites of the Umm an–Nar Period, c. 2750–2100 BC (Figure 2 n. 7–9, 12);

– 1 unpainted potsherd which could be macroscopically related to the group of Mesopotamian wares from Shimal (Wadi Suq Period, c. 2000–1300 BC).

Two Mesopotamian sherds of Akkadian–Ur III type from period Ia at Qala'at al–Bahrain (figure 2 n. 10–11) have also been studied in thin–section.

Fabric Group A. Whatever their origin (Iraq, Bahrain, the United Arab Emirates or the Sultanate of Oman), 50% of the samples have the petrographic composition which we already described for the KH–5 samples (Group A, plate II n. D–F). Abundance and granulometry of the temper fraction are quite variable. In Mesopotamia, this fabric is attested at al–Ubaid, Larsa, Khafajah and Djamdat Nasr (n=12). In the Gulf they are certified in the following sites:

– 5th mill. (n=2): shell–midden of Jezirat al–Hamra;

– 4th mill. (n=2): Qurum cemetery RH–5;

– Hafit Period (n=5): Hili 8 settlement Period I, Hafit cairn 23;

– first half of the Umm an–Nar Period, c. 2750–2400 BC (n=3): Hili 8 settlement Period II phase a–c1, Ra's al–Aysh grave, Umm an–Nar cairn V;

– second half of the Umm an–Nar Period, c. 2400–2100 BC (n=2): Ra's al–Junayz RJ2 settlement, Qala'at al–Bahrain;

– Wadi Suq Period (n=l): Shimal settlement SX.

No matter where they were found in the Gulf, the vessels associated with Fabric A were obviously manufactured in Mesopotamia. Their identical composition has already been stressed. From local geological data, one cannot exclude the possibility that clays with a compatible composition did exist and were used in Oman (Méry 1991a: 184–185). But it is however very unlikely that potteries of the same fabric (a complex mixture of several rock type elements displaying no petrogenetic links) were manufactured separately, in geographically distant regions with distinct geological settings. In all probability Mesopotamian–style wares originate from the region to which they are stylistically related. A further argument is that among the bulk of Bronze Age omani vessels which were analysed in thin–section during the past ten years (so far, more than 350 vessels or potsherds from the periods of Hafit, Umm an–Nar and Wadi Suq), there is not a single item which belongs to Group A. On the contrary, Bronze Age Omani pottery types display fabric groups completely different.

We suspect that the Mesopotamian vessels found in the Gulf which are associated to Fabric A came from southern Mesopotamia rather than the Hamrin region, because the four samples from Kheit Qasim and Bahize Zahireh sites are

petrographically distinct from the other samples we analysed from Mesopotamian sites. Our sampling is very small, but this hypothesis is supported by the study of S. Mynors (1986: 463, 480–481). She was able to differentiate the Hamrin area and the southern Mesopotamian region through the petrographical and chemical (INAA) characterization of several hundreds of ED vessels from 10 sites located in Iraq, Iran and Syria.

Other Fabric Groups. 52% of the analysed samples from Oman belong to a second petrographic group (fabric H, n=20) and 8% to a third one (fabric I, n=3). Except one occurence of Fabric H at Larsa, these latter fabrics have not been identified among samples from Mesopotamian sites. These two groups can be described as tollows:

– Fabric H is characterized by a low to medium–heated marly clay composition (plate II n. A–B). Low–heated clay vessels are characterized by a light brown colour, with birefringent clays in the matrix and well preserved calcite grains in the temper fraction. Clays are no longer birefringent and calcite grains are micritic in the medium–heated clay vessels. Temper fraction (50–300 microns, about 20% of the surface of the thin–section) is a mixture of calcareous rock fragments, as well as siliceous (quartzites, silexoïds, radiolarites), and basaltic or andesitic rock fragments. Uncoloured pyroxenes are numerous as well as iron oxids grains and epidotes.

– The matrix of Fabric I is characterized by a mixture of tiny carbonates and micas (plate II n. C). Temper fraction (below 100 microns) entails quartz, calcite, micas, amphiboles and some effusive rock fragments (Méry: 1991: 181).

Fabrics A and H are closely related except that the abundance of the temper fraction is higher in Fabric H. Samples of Fabric H also contain more ferro–magnesian components (biotites, amphiboles) and pyroxenes. Clays of Group A are more heated than the others (therefore their matrix and the state of the carbonates in the temper fraction are different).

In Oman, Fabric H is attested at Jezirat al–Hamra (n=l), Hafit cairn 3 (n=l), Bat cairn 1138 (n=l), Jebel Dhanna cairn 3 (n=4), Hili 8 Period I and Period IIa–cl (n=5), Umm an–Nar settlement and cairns I and II (n=6), Hili North Tomb A (n= 1), Ra's al–Junayz RJ2 Period IIC (n=2).

In spite of a single occurrence at Larsa, there are several indicators that Fabric H was very likely manufactured in Mesopotamia:

– Fabrics A and H are chemically very close (Méry and Schneider n.d.).

– The same composition is attested in Oman at Jezirat al–Hamra (5th millennium) as well as at Ra's al–Junayz at the end of period II (about 2400–2300 BC.).

– So far as we know, no local Bronze Age Omani pottery seems to have been manufactured with this type of elay.

The composition of Fabric I is not diagnostic, therefore we prefer to complete the chemical characterization and comparison with petrographical datas from Mesopotamian and Omani wares.

There is no clue as to a possible sequence among the Mesopotamian fabrics

attested in Oman since Fabrics A and H are both attested at 5th millennium Jezirat al–Hamra and 3rd millennium Umm an–Nar. Fabric I is only found among Jamdat Nasr to ED I–II vessels from cairns of the Hafit period.

Confrontation with the Results of Previous Laboratory Analyses

Ours is not the first physico–chemical program leading to the conclusion that there were Mesopotamian vessels in Oman. More than twelve years ago, H. S. Mynors tested about twenty jar rim sherds found at Umm an–Nar [3] by petrography and neutron activation. Her conclusion was that "... *there has been a movment of Early Dynastic jar types from Sumer to the Gulf site of Umm an–Nar*". (Mynors 1983: 386, see also 1986: 463, 481–483). She did not identified at Umm an–Nar any local copy of Mesopotamian jars. Our analyses on samples from Umm an–Nar merely confirm the same results.

The six Early Dynastic III jars from Umm an–Nar (settlement, cairns I and II) which we analysed belong to Group H. The majority of the samples studied by H. S. Mynors (1983: 384) were petrographically identical to the pottery from Abu Salabikh, but different from Tell Rubeideh of the Hamrin region: "*The majority of fine sandy wares (Group A) and medium sandy wares (Group E) resemble most closely fabrics from Abu Salabikh with inclusions of mica, pyroxene, and epidote and fragments of siltstone, limestone and sandstone*". (Mynors 1986: 424). Therefore we think it likely that ED vessels associated with our Fabric H existed at Abu Salabikh and correspond to Groups A or E of Mynors.

Assuming that this hypothesis is correct and considering the fact that the samples from Bahize Zahireh and Kheit Qasim are petrographically different from the other Mesopotamian items, we can infer that Fabric H probably came from southern Mesopotamia, rather than from the Hamrin basin[4].

Mesopotamian vessels in Eastern Arabia from the late 6th to the 2nd millennium BC

The petrographical analyses confirm the hypotheses which were already suggested in the seventies (Frifelt 1970; During–Caspers 1971; al–Tikriti 1981,

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[3] I ED III type potsherds were recovered during the 1979 excavations conducted by Dr W.Y. al–Tikriti on the settlement of Umm an–Nar (al–Tikriti 1981: 120–128, 165–166. pl. 111H–I, 112A–E, 113A–E and G, pl. 114A, 115A–B, 117C, 118A–G, H and J; Mynors 1986: 235–238, fig. 8.91). S. Mynors also analysed a sherd of Jamdet Nasr painted polychrome from Hili (Ibid: 481) which appeared chemically close to the ED III vessels.

[4] Two items found at Hili (UAE) were also studied by S. Mynors. She assumed they came from the Hamrin basin (samples n° 2912 and 2915, ibid 1986: 482). According to their shape and decoration (ibid: fig. 8.91), it seems however very unlikely because such fine black–on–red pots and suspension vessels are manufactured in Oman (Méry 1991a) and are very typical of the 3rd millennium pottery assemblage.

1985; Cleuziou 1984. 1986, etc) on the presence of Mesopotamian vessels in the Oman Peninsula from the late 6th to the 2nd millennium BC. (figure 3).

Since the majority of the Mesopotamian vessels we analysed have the same compositions (Fabrics A and H), no matter when they were manufactured, the context of finding as well as the analysis of shapes and/or decoration are the only clues to the precise date of the exchanges. Localisation of the clay sources in Mesopotamia is as yet impossible: vessels of Fabric A are found at Larsa but also more than 200 km from there, at Djamdat Nasr or Khafajah. This difficulty is related to the very small scale of our sampling but also to the geology of the Iraqi alluvial plain, an heterogeneous but undifferentiated petrographic environment[5]. Therefore, we think that vessels of close compositions can be found in numerous Mesopotamian sites other than from al–Ubaid, Jamdat Nasr, Larsa and Khafajah sites.

Contacts between Mesopotamia and Oman can be evidenced by pottery vessels during four millennia. There were certainly not direct contacts during the late 6th–4th millennia (Haerinck 1991, 1994; Cleuziou and Méry n.d.). Direct contacts took place during the 3rd millennium, when Oman became integrated into the economical network which connected such distant regions as Mesopotamia, Saudi Arabia, Iran and the Indo–Pakistani borderlands (Cleuziou and Tosi 1989; Edens 1992; Méry 1991b, 1994; Potts 1993; Cleuziou and Méry n.d.). No matter *how* the vessels reached Oman, the frequency of their arrivals changed through time: scarced, scattered and intermittent until the outset of the 3rd millennium, these arrivals became more regular in the Hafit Period and especially in the first half of the Umm an–Nar Period. There maybe followed a period of decrease (at least in the interior of Oman) until the Wadi Suq period when vessels of this type are again well attested (Potts 1993).

The functional types of Mesopotamian vessels and the way in which these foreign products were locally adapted can vary. Painted pots (Obeid and Jamdat Nasr–ED II pots; figure 2 n. 1–6) remain highly valued funerary items in Oman until the outset of the Umm an–Nar period. In the first half of the Umm an–Nar period, storage and transport jars of ED II–III types (figure 2, n. 7–9) are likely to have been locally reused for storage and transport within Oman (Cleuziou and Méry n.d.). Such jars have been found at Umm an–Nar, Ra's Ghanada and Hili 8 period a–c1. At Ra's al–Junayz RJ2 Period IIC, c. 2400–2300 BC, most of the Mesopotamian jars contained bitumen (Cleuziou and Tosi 1994). Whatever the transported goods from Mesopotamia were (see for example Potts 1993: 425), Mesopotamian jars appear to have been seldom deposited into graves of the Umm an–Nar period, except at Umm an–Nar itself (cairns I, II, V–VII, Frifelt 1991).

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[5] S. Mynors (1986: 426–430, 480–481) faced that problem: "Because the central lowland region is almost covered by alluvium and sands [...] and owing to the absence of geological information in this area it has not been possible to identify regional variations in pottery fabric groups related directly to geological differences" (ibid: 37). This problem remains so far (G. Schneider pers. comm.).

There are a few occurences in Omani graves around 2400–2100 BC: a jar of ED III type near Ja'lan Bilad bani bu Hassan (Edens 1990: 45 and fig. 41 n.l), Late Akkadian type beakers at Hili N (al Haddu 1989: fig. 9) and at Munay'i (Cleuziou and Méry n.d.), one bottle at Hili North Tomb A (figure 2, n. 12). Mesopotamian sherds were seldom found at Shimal settlement SX during the Wadi Suq Period, but rimsherds of Old Babylonian and Kassite type are reported from Tell Abraq (Potts 1993a: 429–433).

No matter the period and the functional type, archaeometrical analyses evidence lack of imitations of Mesopotamian wares. There was no local pottery production in Oman in the 5th millennium and at least in the first half of the 4th millennium, but vessels were locally manufactured as early as 3100 BC (Méry 1991a: 107–117). The techniques used in the specialised pottery centres of Oman would have allowed to imitate Mesopotamian vessels, but it appears that it was choosed not to do so during the third millennium. This is best illustrated by the funerary deposits of the Hafit period: graves contain Mesopotamian vessels but rarely fine black–on–red Omani wares. Again, the lack of local imitations of Mesopotamian vessels during the Umm an–Nar period is related to a cultural choice: potters had probably the technical ability to imitate the Mesopotamian items, but large jars with a restricted throat were not incorporated at that time into the range of functionnal types manufactured in Oman. Very large jars with unrestricted to restricted throat will locally produced in Oman after 2000 BC only, during the Wadi Suq Period.

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REFERENCES

Al-Haddu M.M., 1989, Excavations in Tomb N at Hili. *Archaeology in the United Arab Emirates* V, pp. 55–70.

Al-Tikriti W.Y., 1981, *Reconsideration of the Late Fourth and Third Millennium BC in the Arabian Gulf, with Special Reference to the United Arab Emirates*. Unpublished PhD Thesis, Trinity College, Cambridge.

—, 1985, The archaeological investigations on Ghanada Island, 1982–1984: Further evidence for the coastal Umm an-Nar Culture. *Archaeology in the United Arab Emirates* IV, pp. 9–19.

Biagi P., 1987, The prehistoric fishermen settlements of RH5 and RH6 at Qurum, Sultanate of Oman. *Proceedings of the Seminar for Arabian Studies* 17, pp. 13–20.

—, 1994, A radiocarbon chronology for the aceramic shell-midens of coastal Oman, *Arabian Archaeology and Epigraphy* vol. 5, pp. 17–31.

Biagi P. – Isetti E., 1989, The polished stone earrings of site RH5 and the distribution and chronology of the prehistoric earings of coastal Oman, *Rivista di Archeologia* 13.

Biagi P. – Salvatori S., 1986, Gli scavi nell'insediamento preistorico e nella necropoli di Ra's al-Hamra 5 (Muscat-Oman), 1980–1985, Rivista di Archeologia 13, pp. 5–25.

Biagi P. – Torke W. Tosi M. Uerpmann H.P., 1984 Qurum, a Case Study of Coastal Archaeology in Northern Oman. *World Archaeology* 16 (1), pp. 43–61.

Boucharlat R. – Haerinck E. Philips C.S. Potts D.T., 1991, Note on an 'Ubaid site in the Emirate of Umm al-Qaiwain, *Arabian Archaeology and Epigraphy* 2, pp. 65–71.

Cleuziou S., 1986, Dilmun and Makkan during the third and early second millennia BC, in Al-Khalifa H.A., Rice M. (Eds.): *Bahrain through the Ages, the Archaeology*, Kegan Paul International, Londres, pp. 143–55.

—, 1988, Dilmoun-Arabie (en marge de C.M. Piesinger: "The Legacy of Dilmun"), in Salles J.F. (Ed.): *L'Arabie et ses mers bordières*, Travaux de la Maison de l'Orient 16, pp. 27–58.

—, 1989, Excavations at Hili 8: a preliminary report on the 4th to the 7th campaigns. *Archaeology in the United Arab Emirates* V, pp. 61–87.

Cleuziou S. – Méry S., n.d. In between the great powers: Bronze Age Oman Peninsula, in Wright R.P. (Ed.): *Comparative and intersocietal perspectives: the Indus, Mesopotamia and Egypt, American Anthropological Association.*

Cleuziou S. – Tosi M., 1989, The Southeastern Frontier of the Ancient Near East, in Frifelt K., Sorensen P. (Eds.): *South Asian Archaeology 1985*, London, pp. 15–47.

—, 1994, Black boats of Magan, some toughts on Bronze-Age water transport in Oman and beyond from the impressed bitumen slabs of Ra's al-Junayz, in Parpola A. and Koskikallio P. (Eds.): *South Asian Archaeology 1993*, Helsinki.

During Caspers E.C.L., 1970, Trucial Oman in the Third Millennium BC. *Origini* IV, pp. 205–276.

Edens C., 1990, Brief Survey Around Bilad Bani Bu Hassan, in Cleuziou S., Reade J., Tosi M. (Eds.): *The Joint Hadd Project, Summary Report on the Third Season (1987–1988)*, Napoli, pp. 44–55.

—, 1992, Dynamics of trade in the Ancient Mesopotamian "World System", *American Anthropologist* 94, pp. 118–139.

Flavin K. – Shepherd E., 1994, Fishing in the Gulf: preliminary investigations at an Ubaid site, Dalma (UAE). *Proceedings of the Twenty-Seventh Seminar for Arabian Studies, 22–24 July 1993*, pp. 115–134.

Frifelt K., 1971, Jamdat Nasr Fund fra Oman (Jamdat Nasr finds in the Oman). *Kuml*, pp. 355–383.

—, 1991, *Third Millennium graves*, The Island of Umm an-Nar 1, Jutland Archaeological Society, Publication 26: 1, Aarhus.

Henrickson E. – Thuesen I., 1989, Upon this foundation: The 'Ubaid reconsidered, *CNI Publications*, 10.

Haerinck E., 1991, Heading for the Straits of Hormuz. An 'Ubaid Site in the Emirate of Ajman (U.A.E.), *Arabian Archaeology and Epigraphy* 2, pp. 84–90.

—, 1994, More prehistoric finds from the United Arab Emirates, *Arabian Archaeology and Epigraphy* 5, pp. 153–157.

Højlund F., 1994, *Qala'at al–Bahrain 1, the northern city wall and the Islamic fortress*, Jutland Archaeological Society Publications XXX: 1.

Méry S., 1991a, *Origine et développement de la production céramique dans la péninsule d'Oman à l'Age du Bronze*. Thèse de Nouveau Doctorat, Université de paris I–Panthéon/Sorbonne.

—, 1991b, Origine et production des récipients de terre cuite dans la péninsule d'Oman à l'Age du Bronze. *Paléorient* 17 (2), pp. 51–78.

—, 1994, La céramique, témoin de la dynamique culturelle en Arabie durant la Protohistoire, in *Terre cuite et Société, la céramique, document technique, économique, culturel*, XIV° rencontres Internationales d'Archéologie et d'Histoire d'Antibes, Editions ADCPA, Juan–Pins, pp. 395–406.

Méry S. – Schneider G., n.d., Mesopotamian pottery wares in Eastern Arabia from the 5th to the 2nd Millennium BC: a contribution of archaeometry to the economic history. Proceedings of the Seminar for Arabian Studies, Cambridge, 1995.

Mynors H.S., 1983, An examination of Mesopotamian ceramics using petrographic and neutron activation analysis, in Aspinall A. and Warren S.E. (Eds.): *Proceedings of the 22nd Symposium on archaeometry*, Schools of physics and Archaeological Sciences, Bradford, pp. 377–387.

—, 1986, *Mesopotamian ceramics on the third millenium BC with analysis of pottery from Abu Salabikh, Kish and Ur.* Doctoral Thesis., University of Southampton.

Potts D.T., 1993, Rethinking some aspects of trade in the Arabian Gulf, *World Archaeology* 24 n° 3, pp. 423–440.

Uerpmann M., 1992, Structuring the Late Stone Age of Southeastern Arabia, *Arabian Archaeology and Epigraphy* 3: 65–109.

CAPTIONS FOR TABLES, FIGURES, AND PLATES

Table 1. Tentative chronology of Oman, 3500–1300 BC (radiocarbone dated sites).

Table 2. Samples of Mesopotamian vessels samples from Mesopotamia, Oman and Bahrein studied on thin–section by optical microscopy.

Plate 1. Sherds A700 and A704 from RH–5.

Plate 2. Crossed polars view of Mesopotamian vessels (magnification X40, except La 2, x 100). A: La 4 from Larsa. B: A 1050 from Jezirat al–Hamra. C: A622 from Hafit cairn 2. D: Kh 1 from Khafajah. E: La 2 from Larsa. F: A1049 from Jezirat al–Hamra. G: A700 from Ras al–Hamra RH–5. H: A704 from Ras al–Hamra RH–5.

Figure 1. Map of Middle Asia with reference to the sites where Mesopotamian wares have been macroscopically observed and studied on thin–section by optical microscopy (except Ur, Uruk and Susa). 1: al–Ubaid, 2: Uruk, 3: Larsa, 4: Ur, 5: Jamdat Nasr, 6: Khafajah, 7: Kheit Qasim, 8: Bahize Zahireh, 9: Susa, 10: *Qala'at* al–Bahrain, 11: Jebel Dhanna, 12: Ra's al–Aysh, 13: Umm an–Nar, 14: Jezirat al–Hamra, 15: Shimal, 16: Qarn bint Saud, 17: Hafit, 18: Mazyad, 19: Hili, 20: wadi Suq, 21: Bat, 22: Qurum, 23: Ja'lan Bilad bani bu Hassan, 24: Ra's al–Junayz.

Figure 2. Mesopotamian vessels from Protohistoric sites in Oman and Bahrein. N. 2, 3, 6–12 were analysed by petrography.

1: Dalma (Flavin and Sheperd 1994: fig. 9 n. 112ii). 2: Hafit cairn 14, 1043.A (Frifelt 1970: fig. 19d). 3: Hafit cairn 23, 1052.B (ibid: fig. 22a). 4: Hafit cairn 22, 1051.C (ibid: fig. 21a). 5: Hili 8, period I (Cleuziou 1989: pl. 22 n. 1). 6: Hafit cairn 1309, 1039.G (Frifelt 1979: fig. 14) 7: Umm an–Nar cairn I, n. 1010.F (Frifelt 1991: fig. 88). 8: Umm an–Nar cairn II, 1011.P (ibid: fig. 125). 9: Umm an–Nar cairn V, n. 1089.O (ibid: fig. 181). 10 and 11: *Qal'at* al–Bahrain period IIa, n. 520 ARL1 and 520 APO (Højlund 1994: fig. 244 and 242). 12: Hili North Tomb A, V77.

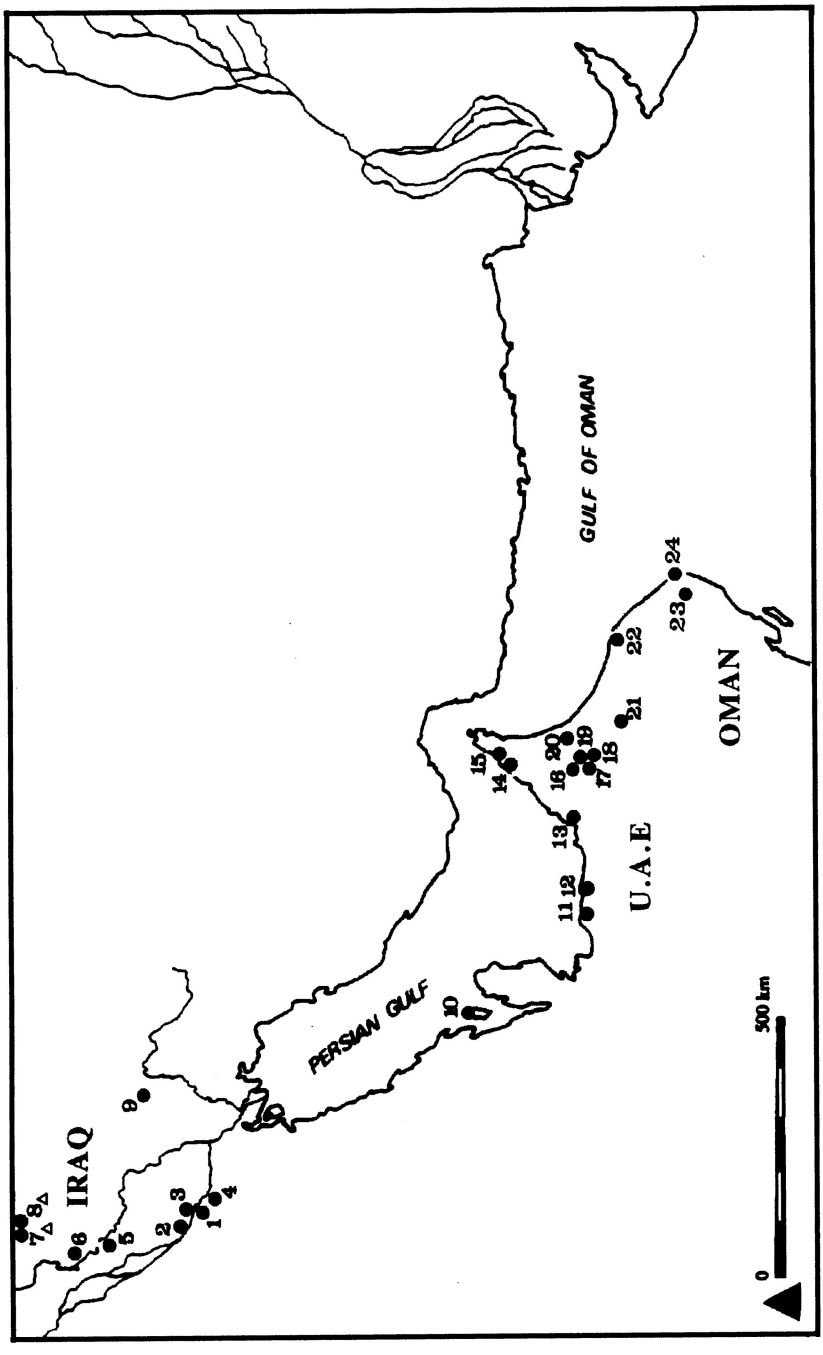
Figure 3. Reconstruction of the origin of Mesopotamian vessels found in the Oman Peninsula.

B.C.	Historical Mesopotamian sequence	Archaeological Omani sequence	*Hili 8*	*Ra's al-Hamra*	*Ra's al-Junayz*
3500	Uruk			IV	
3300				V	RJ2 PI
3100	Jemdet Nasr			VI	
2900	D.A. I	HAFIT Horizon	I a b c	VII	?
2700	II III A III B				
2500			II a-b c1 c2 d e f g		RJ2 PII
2300	Akkad	UMM AN-NAR			RJ2 PIII
2100	Ur III				RJ1
1900	Isin-Larsa Old Babylonian		III		RJ21
1700		WADI SUQ			
1500	Middle Babylonian				
1300					

Table 1

Site	Sample n.	Field n.
Jezirat al–Hamra	A1048	1988 Vogt's survey, no field n.
	A1049	1988 Vogt's survey, no field n.
	A1050	1988 Vogt's survey, no field n.
Ra's al Hamra RH5	A700	surface
	A704	pit HXP–B
Hafit and Mazyad	A21	Hafit cairn 3, vase 1
	A622	Hafit cairn 22, 1051A
	A623	Hafit cairn 23, 1052A
	A624	Hafit cairn 23, 1052B
	A626	Mazyad cairn 1309, 1309G
HILI 8	A2	2898 UF1348, period I
	A7	2878 UF1320, period I
	A12	2571 UF829, period I
	A14	2885 UF1320, period I
	A15	2567 UF820, period I
	A554	2868 UF1345, period IIa–c1
	A557	1248 UF106, period IIa–c1
	A593	1265 UF108, period I
	A799	121 surface, attribution period I
	A801	2684 UF814, period I
Jebel Dhanna 3	A159	1983 Vogt's survey, no field n.
	A160	1983 Vogt's survey, no field n.
	A161	1983 Vogt's survey, no field n.
	A162	1983 Vogt's survey, no field n.
Umm an–Nar	A641	cairn II, 1011.AM
	A643	cairn II, 1011.P
	A643	cairn, V, 1089.O
	A644	cairn II, 1011.B
	A977	cairn I, 1010.F
	A978	settlement, 1014.KL
	A1034	cairn II, 1011.FOb
Ra's al–Aysh 1	A165	1983 Vogt's survey, no field n.
Hili North Tomb A	A76	V77
Bat 1138	A845	cairn 1138, 1138A
Ra's al–Junayz RJ2	A1072	RJ2/244
	A1073	RJ2/980
	A1074	RJ2/1192
Shimal SX	A739	SX E19
al–Ubaid	aU1	no n.
	aU2	no n.
Larsa (ED I site survey)	La1	PL1.15
	La2	PL1.28
	La3	PL1.37
	La4	PL1.96
	La5	PL1.218
Khafajah	Kh1	no n.
	Kh2	no n.
Djamdat Nasr	DN1	no n.
	DN2	no n.
	DN3	no n.
Bahize Zahireh	BZ1	no n.
	BZ2	no n.
Kheit Qasim graves	KQ1	no n.
	KQ2	no n.

Table 2


IRAQ
PERSIAN GULF
GULF OF OMAN
U.A.E
OMAN
0
500 km
1
2
3
4
5
6
7
8
9
10
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23
24

Figure 1

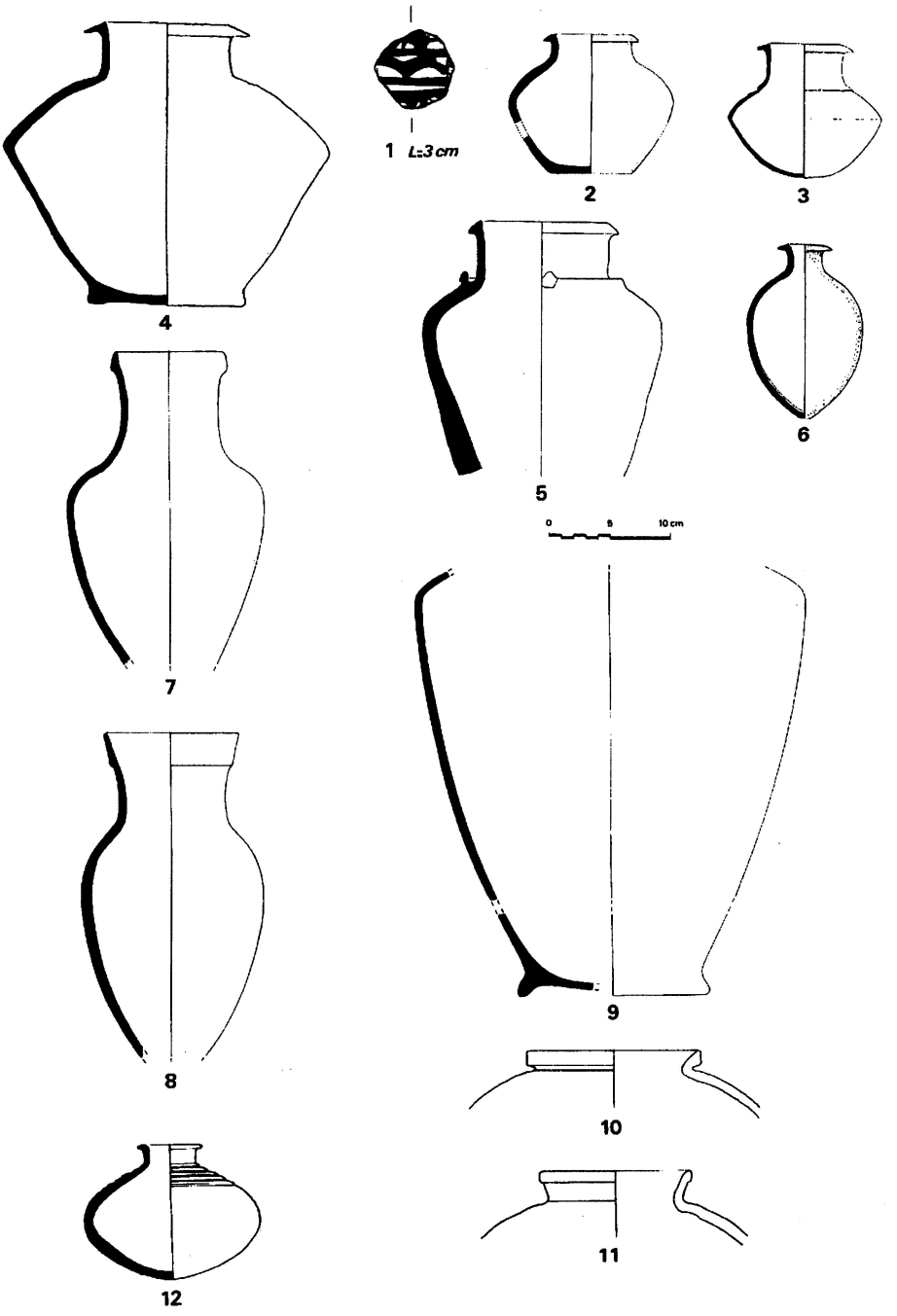


Figure 2

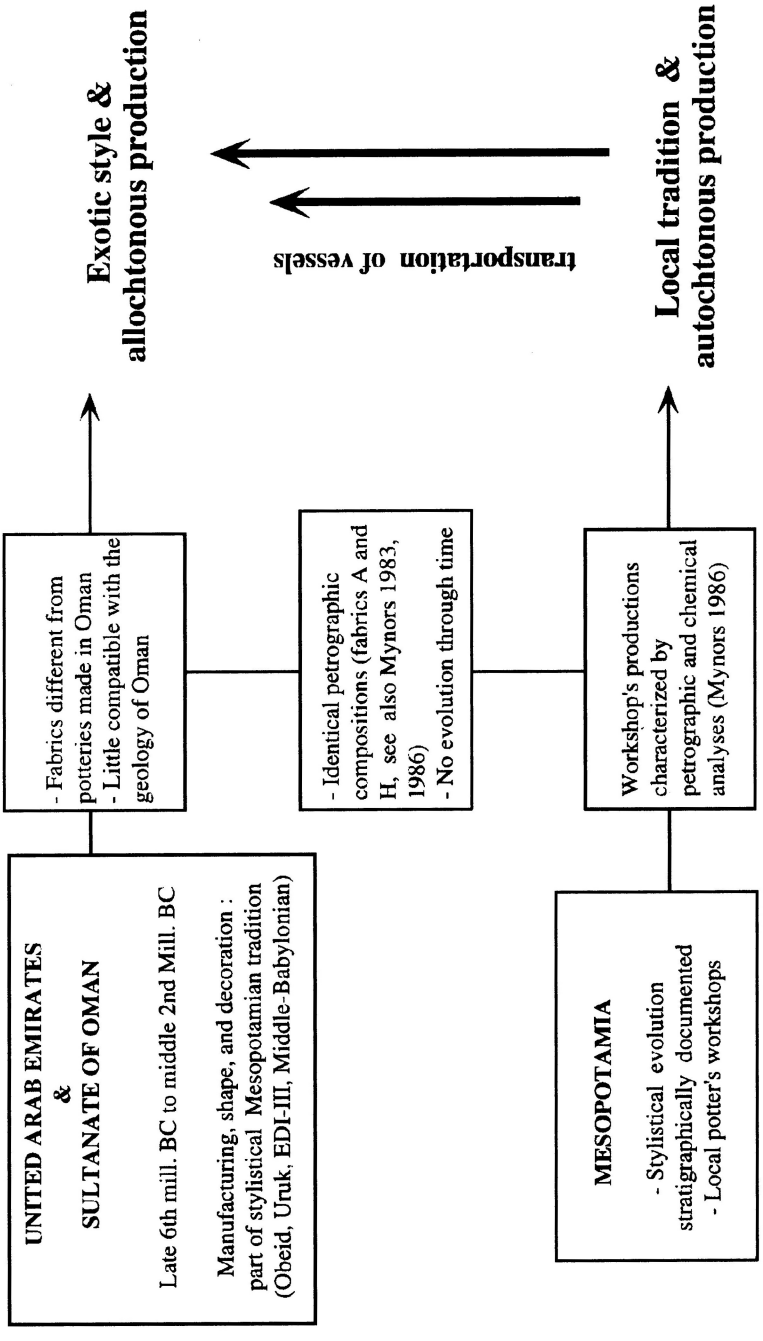
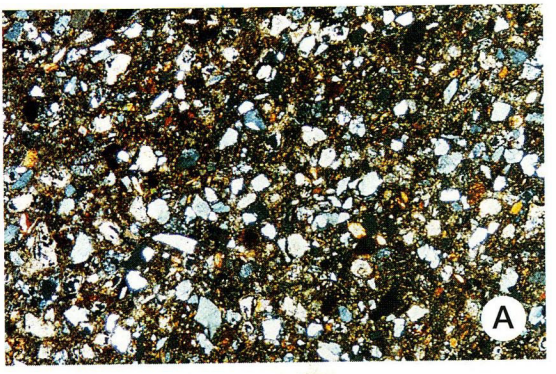
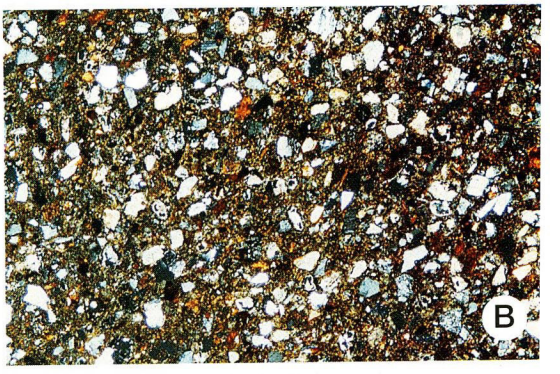

UNITED ARAB EMIRATES
&
SULTANATE OF OMAN
Late 6th mill. BC to middle 2nd Mill. BC
Manufacturing, shape, and decoration : part of stylistical Mesopotamian tradition (Obeid, Uruk, EDI-III, Middle-Babylonian)
- Fabrics different from potteries made in Oman
- Little compatible with the geology of Oman
Exotic style & allochtonous production
- Identical petrographic compositions (fabrics A and H, see also Mynors 1983, 1986)
- No evolution through time
transportation of vessels
MESOPOTAMIA
- Stylistical evolution stratigraphically documented
- Local potter's workshops
Workshop's productions characterized by petrographic and chemical analyses (Mynors 1986)
Local tradition & autochtonous production

Figure 3

RH1 – A 700

RH5 HXV/AB – A 704


A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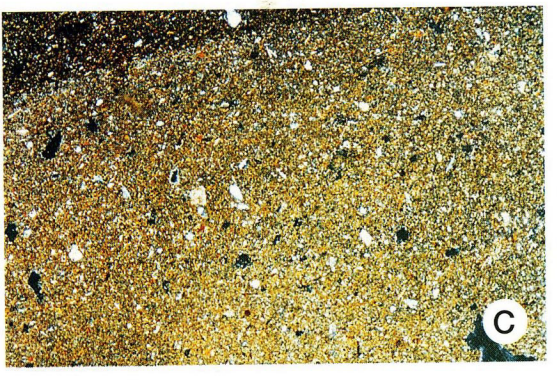
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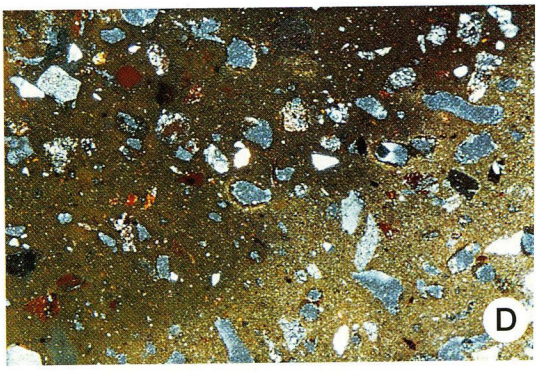
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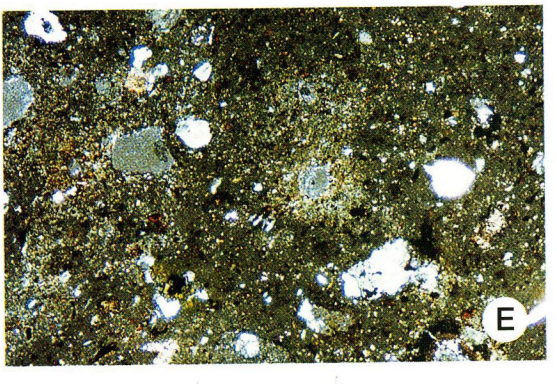
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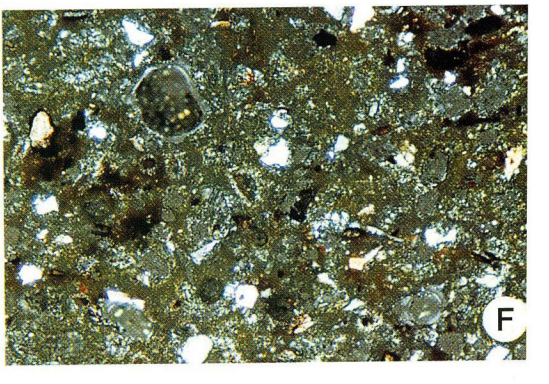
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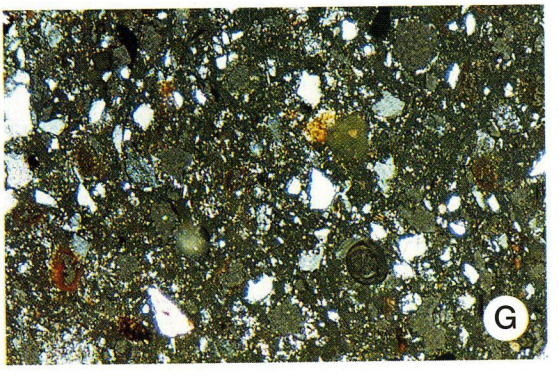
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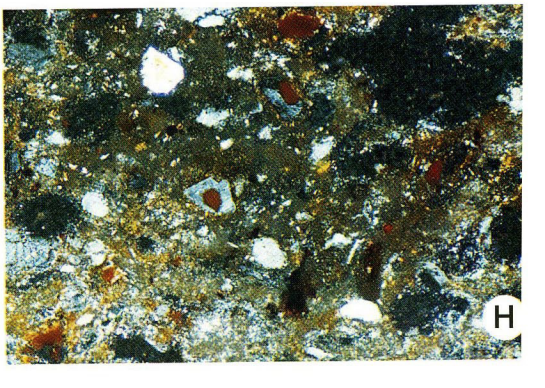
H