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# Qurum: a case study of coastal archaeology in Northern Oman

Paolo Biagi, Wolfgang Torke,  
Maurizio Tosi and Hans-Peter Uerpmann

Despite a long tradition of research, prehistoric archaeology in the Middle East has paid little attention to those regions and cultures that were not involved in the development of agriculture and the formative process of the early stages. In general, post-Pleistocene subsistence strategies diverging from an early intensification of plant exploitation have been conceived as marginal adaptive configurations constrained to non-growth conditions (e.g. Flannery 1965). This cursory treatment has involved all prehistoric cultures spread over almost half of the Middle East, indiscriminating among those developed on high plateaus, in deserts and along the coastlands of the Indian Ocean. On the contrary we should expect that an increasingly selective control over determinant factors of change characterized the evolutionary process of these non-farming economies as well, by dealing with different resources and developing alternative adaptive strategies. The *nonfarmers* certainly made quite substantial achievements, although still elusive in the archaeological record (Tosi 1983). The importance of their accomplishments should become visible when the political and economic expansion of the early states during the third millennium B.C. integrated, in a single exchange network, all the territories between India and Mesopotamia, as well as parts of the Red Sea coasts and the Arabian mainland. At the beginning of the second millennium B.C., we may see across the whole Middle East the effects of such an integration by the acquisition of different patterns in farming and camel breeding. Multi-cropping, the introduction of alien crops such as sorghum, rice, sesame, cotton, and various fruit trees, combined to alter the ecological configuration of Middle Eastern farming, securing at the same time further growth through the control of territories and resources previously unexploited.

Our proposition is that this second climax in the early development of farming was achieved primarily by incorporating domesticates and techniques developed, either in the desert zones marginal to the first agricultural revolution, such as the Saharo-Arabian desert belt and the coastlands of the Gulf, Arabian and Red Seas, or in distant centres of plant diversity, mainly Sudan, India and South-East Asia. This second aspect was made possible at quite an early stage by the development of watercraft and navigation techniques first accumulated in the dispersed coastal communities of fishers and mollusc-gatherers.<sup>1</sup> Nevertheless, we do not believe that the

<sup>1</sup> A direct relation between early offshore exploitation and the dispersal of agriculture across the Mediterranean is being pieced together from recent excavations at coastal sites in Greece and Sicily. Both Franchthi (Jacobsen 1981) and Uzzo caves (Piperno N.D.) document, in contexts of the late seventh millennium B.C., immediately preceding in stratigraphical sequences the earliest appearance of domestic plants and animals, a very sharp increase in the number of individuals and species as well as the size of captured fishes and marine animals.

building of large plankwood vessels fit for oceanic crossings could have been accomplished before the late fourth millennium B.C. (Johnstone 1980: 174–184), since it required both radical innovations in metallurgy and the regulation of long distance trade with remote countries by the political elites of Egypt and Mesopotamia as part of their economic strategies. The development was made possible by the earlier maritime adaptations of the coastal populations of Arabia, Iran and Baluchistan, forefathers of Arrian’s ‘fish-eaters’, totally alien to the early steps of agriculture and yet so instrumental to its dispersal and further expansion.

Along the 6,000 kms of desert coastlands encircling the Erythrean Sea, from Mesopotamia to Egypt, archaeological explorations have been restricted to very few sites, and these have been directed mostly to determine relationships between local Bronze Age cultures and the Sumero-Akkadian states (e.g. Bibby 1969). A second generation of studies, initiated after 1973, has been more aptly directed to the understanding of indigenous developments during the fourth and third millennia B.C., concentrating on the oasis belt of the Oman Peninsula (Cleuziou 1981; Cleuziou and Costantini 1980; Weisberger 1981). A specific research programme on early maritime adaptations has been developed only from 1977 in northern Oman. The area is strategically located at the hinge of sea routes linking Iran and Baluchistan to South Arabia and the Horn of Africa, and although still at a considerable distance from the head of the Gulf, it was influenced at an early stage by coastal interchanges with Mesopotamia, documented by the spreading of Ubaid wares in the Eastern Province of Saudi Arabia and Bahrain at the end of the fifth millennium B.C. (Fig. 1) (Oates *et al.* 1977).

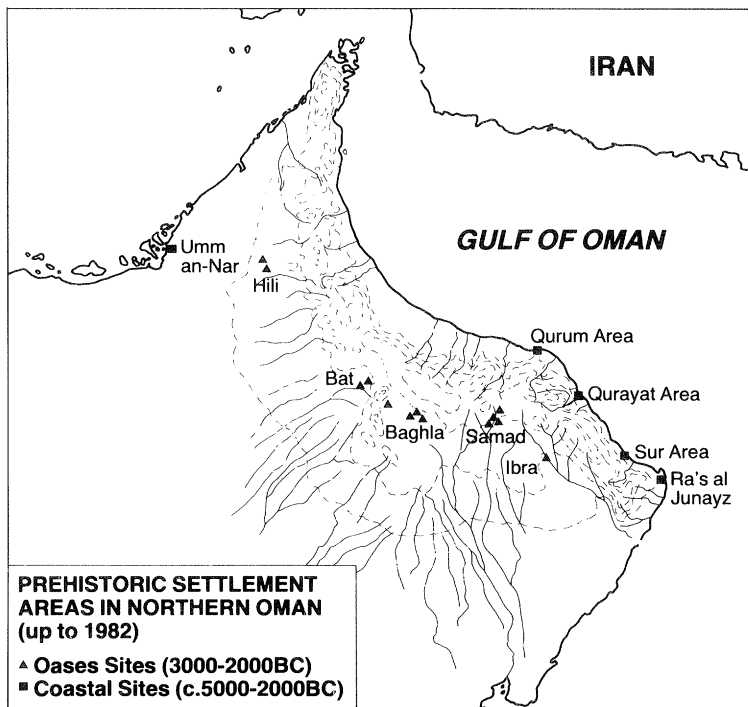


Figure 1 The main prehistoric settlement areas so far determined in Northern Oman

### Defining the early steps of a research strategy

Our operational strategy<sup>2</sup> has been shaped along two main directions: the first at a sub-regional level focuses on subsistence patterns as indicators of change in environmental relations, the second is to understand the supra-regional interactions along the Arabian coastland and with the early oasis economies of the pre-desertic hinterland. This second aspect is being investigated through the analysis of cultural variability in a series of short-term case studies along the coast, while other expeditions are carrying out the study of contemporary sites related to farmers and herders.

In general, attention is centred on bioarchaeological remains as best indicators in both local and interregional developments. Following the recent evidence from the Mediterranean reported in note 1, we postulate as most determinant to the evaluation of economic change the relation between an increased control over maritime resources and the appearance of domesticates. Growing control of water craft and navigation should be evaluated through the indirect evidence from the products brought by catch and exchange.

Artefactual evidence is expected to be of lesser significance since in general the material culture of these nonfarming populations may be inconspicuous and conservative, for intensified exploitation of maritime resources may require few adjustments to a Palaeolithic technology

All along the desert coastlands of Arabia prehistoric settlements are found at short distances from each other, allegedly with little or no dependence on the distant oases of the interior at early stages of their development. The first steps in the exploration of such a wide phenomenon has been to select a few areas exhibiting a marked clustering of sites in order to detect, as soon as possible, long occupational sequences. Our project at Qurum, a fast growing resort area 13 km west of Muscat, may be regarded as the first of such attempts. No particular criterion guided our selection other than logistical comfort and the need to counteract rapid deterioration of sites for the increasing activity of contractors.

Survey work, discontinuously carried out by our team over the past five years, indicates that in Oman there are two main types of archaeological sites related to coastal adaptations: (1) highly deflated mounds on top of tabular promontories jutting into the sea, often overlooking mangrove swamps; and (2) low-rising deposits resting on sand ridges usually related to *sabkha* formations and earlier coastal configurations. All Qurum sites are of the first type and cluster on the southwestern headlands of Ra's al-Hamra, a large tertiary limestone promontory, marking the eastern end-point of the sandy Batinah coast (Fig. 2).

Ten sites (RH 1-10) were located by R. Jäckli of Petroleum Development (Oman) during the early 1970s and were visited by M. Tosi in the spring of 1975. In the following two years three of them were destroyed and only very limited information has been recovered (RH 1-3, 7, 8). One small site, RH9, after closer examination proved to be a modern *Murex* processing area. Excavations have been pursued on the remaining four sites: RH4, RH5, RH6, and RH10. The first one was briefly tested in 1977, while destruction was under way for the building of a residential compound, using the contractor's foundation trenches (Durante and Tosi 1977).

<sup>2</sup> Five seasons of excavations have been conducted so far at Qurum: 1977, 1979, winter 1981, autumn 1981 and 1982 by the Instituto Universitario Orientale of Naples, with the cooperation of the Instituto Italiano per il Medio ed Estremo Oriente of Rome, the Fundação C. Gulbenkian of Lisbon and the Centro Studi e Ricerche Ligabue of Venice. The Urgeschichte Institut of Tübingen University jointly conducted this field activity in 1977 and in 1981 carried out separately the new programme on the Qurum hinterland. The authors wish to express their thanks to the Minister of National Heritage and Culture of Oman for his continuous support to the development of this project.

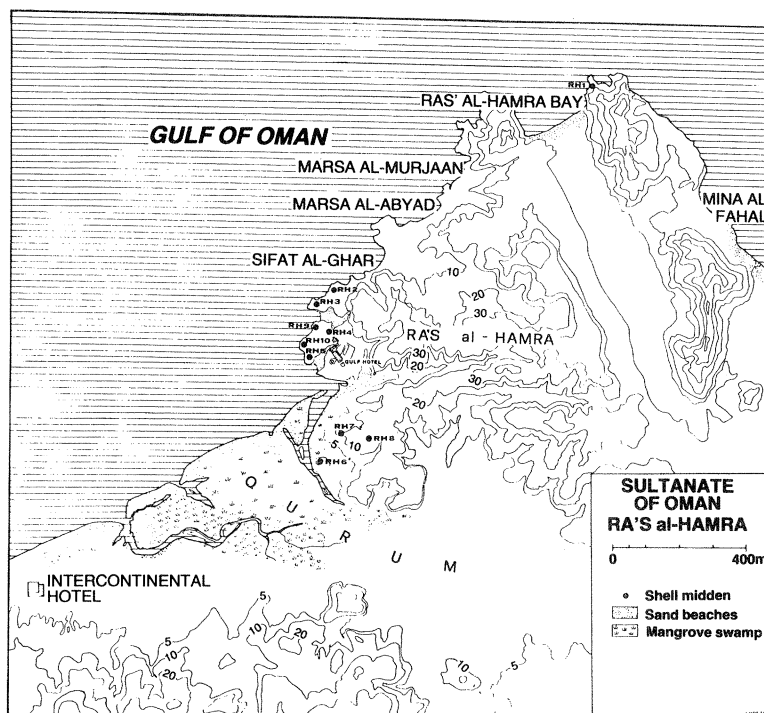


Figure 2 Shell middens and other prehistoric sites in the Qurum area

The sites are rather inconspicuous low-rising mounds dotting the Ra's al-Hamra tertiary limestone formation (Rácz 1979) and are predominantly built up by fine grained sediments.

Shells make up to 20–30 per cent of the deposit and a further 10–15 per cent is represented by lithic materials either introduced by human activity or originating from the limestone bedrock. The intensity of human occupation is evidenced by the crowding of structural remains interspacing and pitting the deposit in each site. Only site RH6, located on the lowermost limestone platform, rising only 2 m above Wadi Aday, is a true mound of dumped shell remains (Tosi 1975: 194–6).

Excavations have been concentrated on the two most endangered sites of the complex: RH5 and RH10 on top of the highest limestone headland. The most remarkable discoveries made at both sites are well preserved burial grounds. At RH5 a graveyard of 500–600 sq. m. extends over the whole north eastern quadrant. Burials are dug in shallow pits and are partly superimposed showing at least two distinctive levels of deposition, with an approximate density of 1.8 tombs per sq. m. We reckon an expected total figure of 200 skeletons that would make RH5 the largest prehistoric cemetery of the South Arabian mainland so far identified (Coppa *et al.* n.d.). The extensive body of information recorded on the human remains will be related to the subsistence data from the analysis of faunal remains. Moreover the discovery of the cemetery has stimulated further lines of investigation into early maritime adaptations, concentrating on osteological and dental evidence.

Although the present paper is devoted to more general issues, and limits of space exclude any presentation of the graveyard excavations, it is relevant to our topic to recall the strong maritime orientation dominating the funerary ritual. Skeletons are buried contracted on the side,

the great majority look seaward and are accompanied by a few ornaments of shell and bracelets cut from the conch shell, *Fasciolaria trapezium*. A recurrent aspect of the ritual was the deposition over the body of large quantities of bones representing perhaps, the remains of a funerary meal. Green turtles (*Chelonia mydas*) and fishes are most abundant. In several graves, turtle bones have been placed in such a fashion to suggest a special relation of this animal with man. The ideological reference to the sea is further emphasised by the discovery of three burials where the deceased was laid, holding in the right fist, a single pierced pearl, and by several occurrences of individuals with one hand raised towards the head holding a *Macrocallista* valve as if to hide the face behind the shell.

### **The environment and its exploitation**

Qurum is located on the most critical ecological interface along the northern coastline of Oman, where the flat Batinah sand beaches turn into the rocky coast of north-eastern Oman, continuing further 200 kms till Ra's al-Hadd, at the eastern corner of the Arabian peninsula (Fig. 1.).

When dealing with coastal sites it seems advisable, for a more systematic approach, to divide the terrestrial section of a site catchment area from its marine counterpart. According to the archaeological record sea and shore were more significant to the Qurum population than the land.

Three general divisions can be made in the marine environment of Qurum. The first is the ecotone zone; flat sandy beaches extending to the west, and rocky shores varying from vertical cliffs to boulder-and-gravel beaches which are found to the east of the sites. The second major area is represented by a submerged ridge, an underwater continuation of the promontory of Ra's al-Hamra towards the little island of Fahal, some 5 km to the north. This submarine bar causes the upwelling of waters from the ocean floor with all its positive effects on local planktonic life. It is not surprising that this part of the coast is known for its abundance of fish. The third major division of the aquatic environment of Qurum intermingles with the land; the channels and estuaries of a tidal creek just south and west of the shell middens. Although usually filled with seawater, it also receives the occasional floods coming down the Wadi Aday from the coastal mountains. Tides flow in and out the channels to submerge or expose the mudflats covered with dense mangrove thickets.

There are fish in the mangrove channels, but more important for the economy of the prehistoric population were the molluscs of the tidal mud flats. The species *Terebralia palustris* L. which was extensively exploited at Qurum as well as in all prehistoric sites so far studied on the Arabian Sea (Durante 1979: table 1), still densely populates the mangrove area, while *Ostraea* species live on the aerial roots of the mangrove.

The amphibious biotopes of the tidal creek must also be considered when dealing with the terrestrial part of the catchment area. It has already been mentioned that the channels of the swamp usually do not contain fresh water. Thus it is unlikely that the open channels of the swamp could ever have been used as a fresh water supply. However, fresh water is reached today at a depth of less than 2 metres in the gravels of Wadi Aday on the southern fringes of the mangrove zone. Taking into account that a large part of the water supply for the Capital Area of Muscat nowadays is taken further upstream from the aquiferous gravels of Wadi Aday, it seems likely that in prehistoric times fresh water was still more easily available.

The relevant question is, where the transition from wadi bed to mangrove swamp was located

in the past. It is obvious that the mouth of Wadi Aday underwent extensive morphological changes during the Holocene due to the combined action of sea level changes and the transport of sediments with flood waters from the interior. Most likely the worldwide rise of oceans during the first three thousand years of the Holocene initially lead to deep incursions of the sea into the outlet of Wadi Aday. The near absence of *Terebralia* shells noticed in the earliest levels of RH4 (Durante and Tosi 1977: 161, table 6) might indicate that just after the end of the main transgression, an open estuary existed later to be replaced by a mangrove swamp. In addition, the Wadi Aday provided a major trade route connecting the coast with the interior. Sites along the newly explored Wadi Wattiyah show that this route was used during the time of formation of the shell middens. Some inland connections can also be traced from the lithic material used beyond the gravel plan of Wadi Aday. Black flint was discovered in ancient conglomerates on the slopes of Mina al-Fahal to the east of the sites, whereas the common red and green chert is found still further east in the mountains separating Mina al-Fahal from Ruwi and in the Ruwi basin itself. Thus, the vast majority of the lithic materials used at Qurum is found within a radius of two hours around the sites.

It is now clear that the prehistoric Qurum population raised cattle, goat and probably sheep. The contribution of these animals to human nutrition was quite low, judging from the scarcity of their bones among the faunal remains. Most of those finds come from the graveyard of RH5, where they were placed as part of the funeral ritual. How early domestic animals already came in use at Qurum cannot be told yet. For the wild land animals, one can conclude that their contribution to the diet was also very low. Few gazelle bones were found in the excavated area, while bird bones are virtually absent.

Turning back to the sea, a small number of porpoise and dolphin bones indicates some marine hunting or the use of freshly stranded animals, although their overall contribution is still low in comparison to the myriads of fish. More important than all mammals together were the turtles, numerous both in the graves and in the settlement layers. These animals may either have been speared at sea from a boat or killed on the beach when laying their eggs. Those eggs were of course another potential source of protein, but the soft shells do not survive.

It is always extremely difficult to rank the different food sources according to their respective dietary contributors. There are potential resources which have not been traced yet from the archaeological record. This is especially true for plants. And there are many difficulties in ranking the identified resources. Nevertheless, according to the immense number of shells, one may rank the contribution of molluscs to the diet as second only to fish. Sea turtle are seen as third in importance. Mammals, both hunted and raised, fall far behind.

The 'niche packing' situation, undoubtedly found in Qurum (Durante and Tosi 1977: 139), apparently was not fully exploited in its terrestrial portions by the ancient inhabitants. Among several possible explanations for this strategy, two seem at present more plausible: one might be that food availability was not the limiting factor of population density in the area. If life-span and fertility were kept low by diseases like malaria and thalassaemia, the most accessible niches of the biotype would have been extensively exploited. The other, maybe, more likely explanation, is that the shell middens only represent part of the economic life of its inhabitants: If the coastal sites were only seasonal settlements, the exploitation of terrestrial resources would have been concentrated at inland camp sites frequented during other parts of the year.

### **Preliminary considerations on fish remains**

The evaluation of the fish remains from the different archaeological complexes of Qurum Ra's al-Hamra has not yet been completed. For this reason the following gives only a preliminary account of the character of the finds and some of the problems they raise. The recovered osteological remains belong to fishes of several size classes. Preserved are bones of rather small individuals with a total length of about 10 cm and a weight of a few decagrammes as well as those of relatively large fishes averaging a total length of more than 100 cm and a weight of more than 10 kg. Analysis to date indicates that the different classes of weights within the preserved material do not occur with the same frequency and there seems to be some concentration at special weight classes.

The highest number of remains derives from small fishes with total length of c. 10 cm. We may estimate for the better preserved layers of RH5 that millions of these small fishes were caught. Remains of larger ones weighing about 2–4 kg are also frequent though less numerous than those from the smaller class. Considering the amount of meat they provide, this group played the most important role in the diet of the prehistoric fisherman. The number of remains of intermediate sized fish is relatively low.

Dominant among the small fishes are herrings and sardines. They are typical school fishes and usually occur in vast quantities. Nowadays they are still caught in the immediate surroundings of the site throughout the year, but in certain periods some of these species appear in particular masses. These fishes often come very close to the shoreline, and they easily can be caught by fine-meshed nets in large quantities.

Among bigger fishes are members of the group of the *Scombridae* (tunas and mackerels) and *Carangidae* (jacks and pompanos). Tunas are migrating fishes, and even in relatively short periods may travel long distances. They mainly feed on smaller fishes and cephalopodes and often can be found near the surface of the sea. Like herrings and sardines, tunas often form large schools and can be caught in great quantities. Although most of the tunas and jacks species today are to be caught near Muscat throughout the year, some species are particularly numerous at certain times.

In addition to these rather mobile species of fishes whose schools usually come close to the surface, a relatively small number of bones come from larger fishes, either territorial ones like sea basses, or predominantly living near the seafloor, such as *Sparidae* (porgies) and *Lethrinidae* (scavengers).

Variability both in size classes and behaviour can be regarded as an indication of differentiation in fishing equipment and methods. The presence of the very large quantities of small fishes can only be explained by the use of nets with very small meshes or extremely dense-plaited fish-traps. Neither of these are suitable for catching such big fishes as tunas and jacks. Their catch requires either wide-meshed nets or line-and-hook. That fishing with line and hook was practised is proven by the presence of stone, shell and metal hooks at all sites in Qurum.

The prehistoric fishermen occupied an area with different and closely articulated marine ecotones. This multiplicity promoted the development of different fishing techniques. West of the site are large soft grounds with very shallow sandy beaches. With the changing of tides, here rather large areas are alternately covered by the sea or fall dry. East of Ra's al-Hamra runs a rocky bluff and the ocean floor here is permanently covered by the sea.

A submarine, partly rocky ridge reaches Fahal island providing very rich fishing grounds. For



the catching of small fishes, like herrings, the most suitable area surely is the sand beach. Even nowadays, fishermen here catch herrings and anchovies with long nets pulled by hand from the shoreline. This way of fishing may be done without boats. At the steep coast, it is possible to fish with line-and-hook directly from the cliff; so here too fishing can be done without using some kind of a vessel. But when we look at the large amounts of *Scombridae* (tunas and mackerels) and *Caringidae* (jacks and pompanos) in the archaeological material, it seems to be quite unlikely that all these fishes could have been caught directly on the shoreline. Although these fishes quite often occur relatively close to the coast, systematic catching is only possible with the use of something like a boat.

A weak point in developing any explanation based on modern conditions is that the annual cycles of these fishes today may be an adaptation to recent circumstances. Marine transgressions or regressions in the relatively shallow waters of the Gulf must have influenced the life cycles of migrating fishes, so in this case we perhaps cannot transfer present day observations back into a fourth-third millennia context.

### The archaeological sequence of RH 5

Elements of dwelling structures have been uncovered in the southern sector of the site, where burial disturbance has been minimal and termite activity most evenly protected the residual deposit.<sup>3</sup>

The first large number of postholes arranged in a curvilinear sequence was detected in sq. HXO and named 'House 1' (Fig. 3). According to size, postholes may be grouped into two categories: larger ones average 30 cm in diameter, while smaller ones range between 5 and 10 cm. The plan of the structure is determined by the eastward curving row of the smaller postholes. The layout is completed on the outside by two of the largest postholes, coupled on a N-S axis, c. 1.20 m apart.

An oval shaped hearth reduced to the edge of powdered pebbles and containing abundant fish remains, a few charcoal fragments and chert flakes was laid slightly aximmetrical within the curved segment of postholes. A further feature is represented by the triangular settings of smaller postholes against the inner face of the southern arch. The dwelling structure was found to have been dug into the concreted grey sediment of an earlier occupation phase.

Several artefacts were collected on the living floor of House 1 embedded in the topsoil, and provided the first reliable contextual association. These include a notched stone or 'net-sinker', some gabbro hammer-smoothers, a fragment of a soapstone open ring, three quartzite side-scrapers together with several flint flakes and a light green chert punch (Fig. 4). Around the structural configuration of postholes the living floor still relatable to House 1 includes also a number of irregular shallow pits, filled with thick packed fish bones interspaced by shell lenses.

Further south, in sq. KDI/KDJ, the concreted gray sediment disappears abruptly through slope erosion. The more than 1 m. thick sedimentary deposit still left in this southern lobe of the site is a loose aggregate of thin-layered sheets of light brown sand, contained a high percentage of rolled shells and fish bones. Since no structural features interrupt this series, we have considered the whole as an episode of colluvial relocation. Clearance of all secondary deposits over an area of approximately 100 sq. m. brought to light the bottoms of 113 postholes and 5 oval pits cut out of the limestone bedrock. Only part of the postholes may be assembled according

<sup>3</sup> Relative preservation of the deposit has been increased by intense termite activity over most of the site. Thanks to the kind assistance of Mr M. Gallagher of the Ministry of National Heritage and Culture of Oman, the Termite Research Unit of the Centre of Overseas Past Research in London has identified them as *Anacanthotermes ochraceus* Burmeister (e.g. Harris 1976: 84-6). Termites alter the fine grained sediment in a hardened ochre crust, made by a diffused system of small cells and inter-connecting galleries, 3-5 cm thick that has severed spread of humidity by percolation.

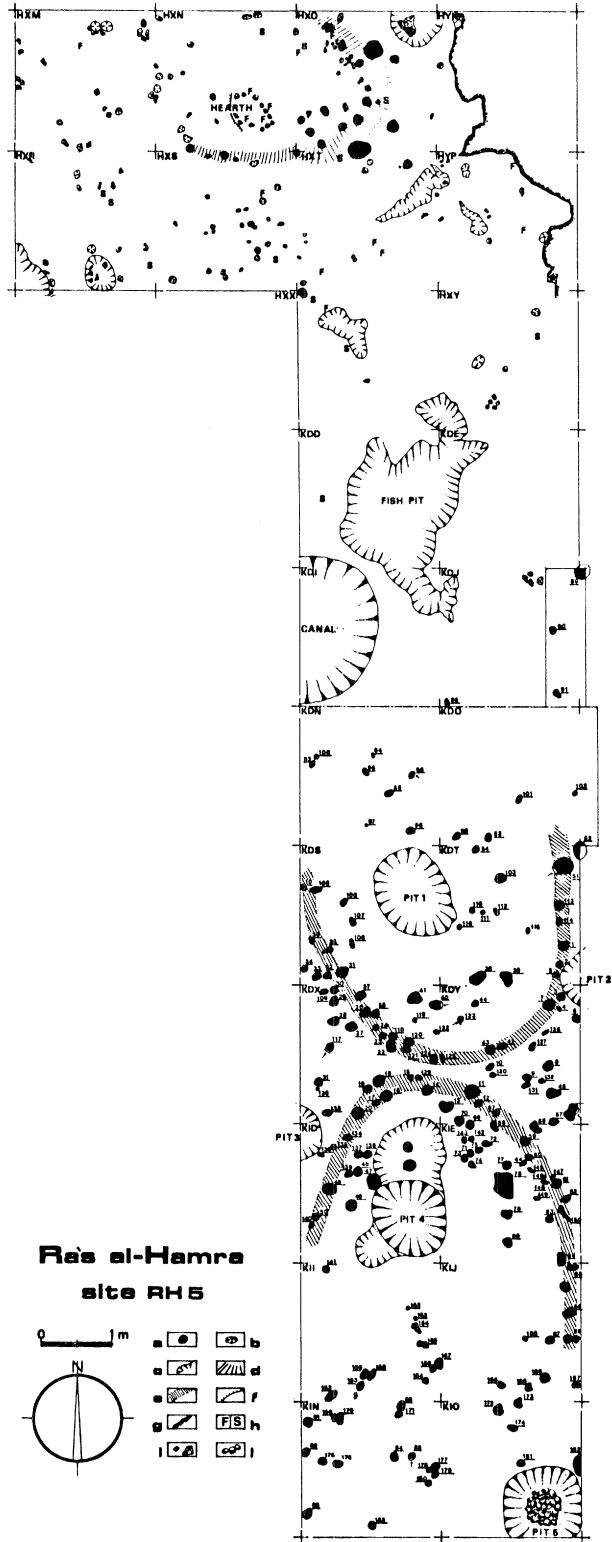
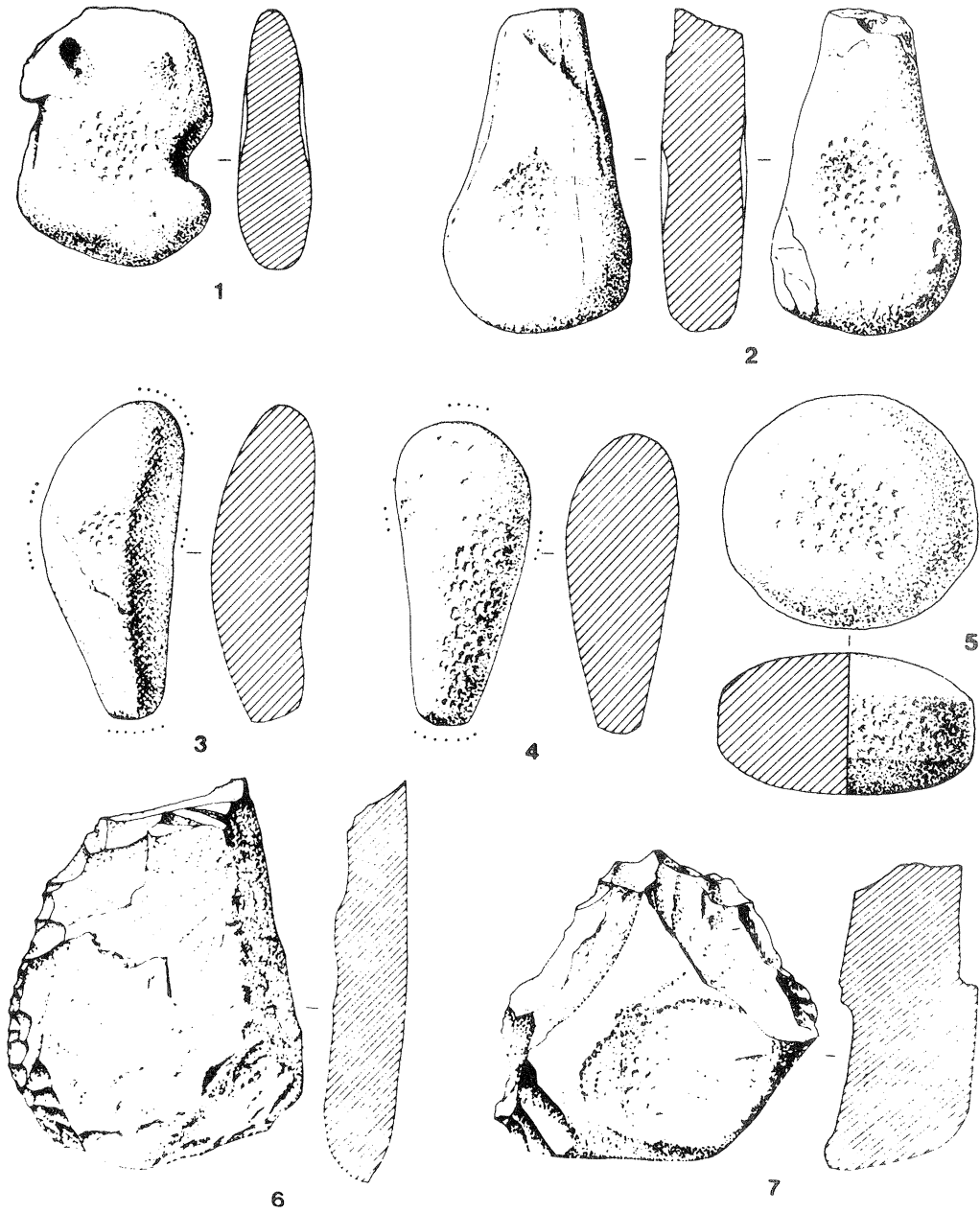


Figure 3 Qurum: site RH 5. Plan of exposed structures in south-eastern section of the site. *a*, post-holes; *b*, shallow circular depressions; *c*, pits; *d*, large depressions; *e*, presumed layout of hut structures; *f*, edge of hearth; *g*, limit of site; *h*, chipped stone (F) and polished stone artefacts (S); *i*, limestone stones; *l*, riverine pebbles. Small arrows point to wedge stones laid inside postholes



*Figure 4* Qurum: site RH 5. Lithic artefacts from floor of House 1: 1, notched pebble for net-sinker; 2, hammerstone from pebble; 3-4, gabbro pebbles used as smoothers on ends and sides, and as hammerstones on faces; 5, 'mill-stone'; 6-7, large quartzite scrapers

to any definite building plan. Most of the southernmost postholes in sq. KID/KIE are so eroded to be of little use, while the others may be aligned to form two distinctive curvilinear configurations contiguous and in opposite orientations (Plate 1). Again the oval pits are symmetrically arranged on the centre of the curving postholes alignments, according to the same pattern of the later House 1. Similarities can be observed also for the triangular arrangements of postholes scattered between walls and pits. In seven cases (PH 40, 51, 85, 96, 117, 123), postholes still display lateral stone wedges set vertically (Fig. 3). Often we have observed that postholes were arranged in pairs, coupling a smaller one close to a larger one to strengthen the load capacity in more critical points.

The broader fan of structural elements detected in this earlier settlement phase has indicated the existence of larger dwellings than House 1, but with the same plan. The ratio is almost exactly 2:1, since 4 m is the width of the earlier houses against the c. 2 m of House 1.

Unfortunately, no remaining pockets of floor deposit have been found suggesting that after the end of this first phase of occupation, the original context was completely removed by natural agents leaving only the few fractions resting on the lowermost features. Given the colluvial character of the overlying formation we may assume that before the occurrence of subsequent occupational phases, continuous erosional activity dissected and relocated downhill the upper sections of anthropic deposits. As a result, this first dwelling area was completely covered, its structures no longer being visible on the surface.

To expand future research options within the overall economy of the excavation, it was decided to open a long E-W test trench across the entire western side of the site (Fig. 5) for a total length of 20.80 m. Three occupational phases could be clearly distinguished in the section separated by colluvial episodes of varying thickness. Postholes dug out of bedrock and corresponding to the earliest settlement phase were uncovered in its easternmost part of the section where the sequence is best illustrated.

The second phase, to which 'House 1' living floor belongs is represented by the charcoal lenses and beds that might further divide this horizon into three subphases. In sq. HWH/HWI, at the centre of an eroded floor, there was uncovered a circular hearth of calcined pebbles. Some important finds were made on the adjacent floor, in sq. HWI, including the only potsherd located so far in context at Qurum, a 2 cm fragment of thin-walled black burnished ware.<sup>4</sup>

The graveyard, or at least the most recent burials, was laid after the end of the third settlement phase. In the northern and western parts of the site, less affected by slope regression, there is evidence of a fourth occupational phase following the burial episode. So far, the information is limited to a few postholes disturbing the graves and a spread of lithics possibly related to a workshop area, in the northwestern quadrant of the site.

To conclude, from the stratigraphical layout of RH5 there may be singled out five distinctive occupational phases with the graveyard interrupting the settlement series between the third and the fourth one. Both cultural evidence and pedological observations suggest close chronological proximity between all five phases.

<sup>4</sup> More sherds of the same black-burnished ware have been found during the 1983 campaign, associated with the topmost layers of RH5 clustering in its NW section beside the burial ground. Typologically they strongly recall the late fourth millennium B.C. pottery types of eastern Iran, extensively reported from the northeastern region as at Hissar II (Schmidt 1937) but reported also from Yahya IVC and VA in the Kerman region (Lamberg-Karlovsky and Tosi, 1973: 32-3, fig. 110). In general, the stratigraphical evidence suggests that these earliest potsherds at Ra's al-Hamra are concentrated in the badly eroded occupational phase following the cemetery. If further confirmed this layout would ensure a more closed dating of the burials and the last occupation of the site.

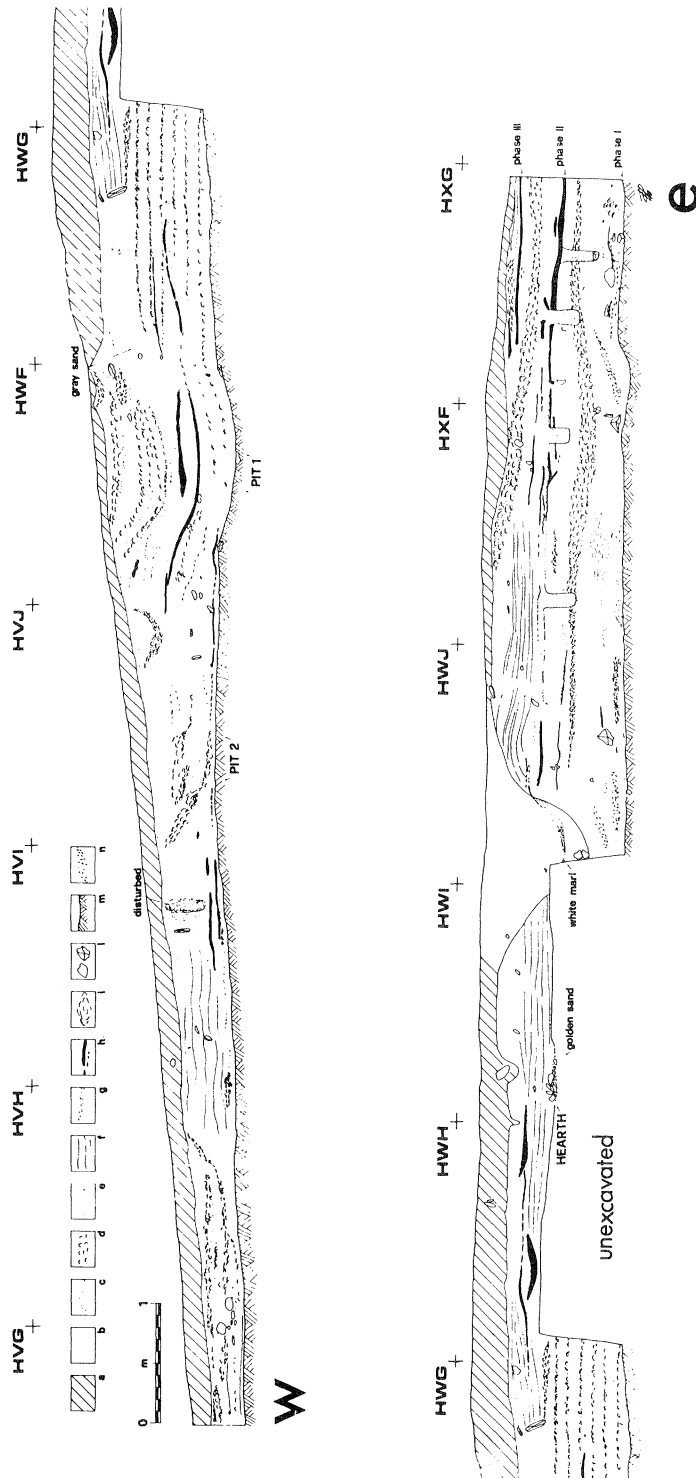


Figure 5 Qurum: site RH 5. Northern section of E-W test trench cut across western half of site: *a*, disturbed topsoil; *b*, light brown gray sand; *c*, fine sand; *d*, shell levels; *e*, fish levels; *f*, sandy sheets; *g*, whitish ash level; *h*, charcoal pieces; *i*, concreted whitish marl; *m*, bedrock limit; *n*, gravel levels. (Drawing P. Biagi)

No artefactual element may be compared to any known stratigraphical sequence in the Oman peninsula or elsewhere in the Middle East, therefore dating has been established only on radiocarbon determinations.

### **Radiocarbon dates and suggested periodization**

Seventeen radiocarbon determinations have been carried out by three different laboratories on various kinds of material from the Qurum sites and are specified on Table 1. Apart from an expected shifting of settlements over the long span of time, the series exhibits a high degree of continuity in the occupation beginning in the second half of the seventh millennium B.C. according to the consensual calibration curve of Klein and others (1982) (Fig. 6). The period of widespread occupation corresponds to the contemporary settlement of sites RH3, RH4, RH5, RH10, all belonging to the fourth millennium B.C. There seems to be a sequential relation between the most sizeable sites of the area, RH5 on the higher platform of Ra's al-Hamra and the RH6 shell midden resting on the lowermost platform aside the mangrove swamps. The uppermost levels of RH6 are dated by Hv-11629:5660 ± 165 b.p., comparable with Hv-10924:5535 ± 88 b.p., given for the lowermost occupation of RH5. The other dates from RH5 related to phases II and III are overlapping in continuous sequence around calibrated values between 4000 and 3500 B.C. The graveyard should fall between these dates and the three almost identical ones from the other sites on the upper platform, RH3, RH4, RH10, equally distributed across the first half of the third millennium B.C. Thus the burial episode should be placed within the second half of the third millennium B.C. (Table 2). Evidence of later occupation, in the third and early second millennium B.C., rests so far only in the presence of a group of stone cairn burials furnished with Umm an-Nar ceramics excavated c. 250 m east of RH5 in the present area of the Gulf Hotel (Frifelt 1975), and on the scattered remains of the third occupational episode at RH10 presenting for the first time an extensive use of copper in the tool inventory.

In spite of its very insignificant volume, the archaeological site at RH10, which never exceeded 25–30 cm in height, contains at least five main periods of occupation, spreading over 7000 years and widely separated by periods of abandonment, lasting some 1500–2000 years (Fig. 6).<sup>5</sup> Quite in contrast, the adjoining site of RH5, occupied for only a millennium, is the largest prehistoric site in the whole area, with a deposit 2 m thick. We may assume that the overall dimension of coastal sites in Oman is related to intensity of occupation and crowding of stone structures counterbalancing standard deflation factors.

The relatively late dating of the Ra'salhamrian complex came as quite a surprise. Influenced by the aceramic late Stone Age type of assemblage we first thought that this was an Early Holocene occupation, consistent with similar complexes of the Levant and Mediterranean region in general. We were dealing instead with a cultural assemblage largely contemporary with the developed farming societies evenly spread across the whole Middle East north of the Gulf. Quite clearly, as already noticed by several authors for interior Arabia (e.g. Zarins 1979), artefact assemblages *per se* must be regarded as very poor chronological indicators in the context of non farming societies.

<sup>5</sup> A fourth occupational phase at RH10 has given dates ranging around the beginning of our era: Bln-2740: 1810 ± bp; Bln-2741: 2050 ± 50 bp.

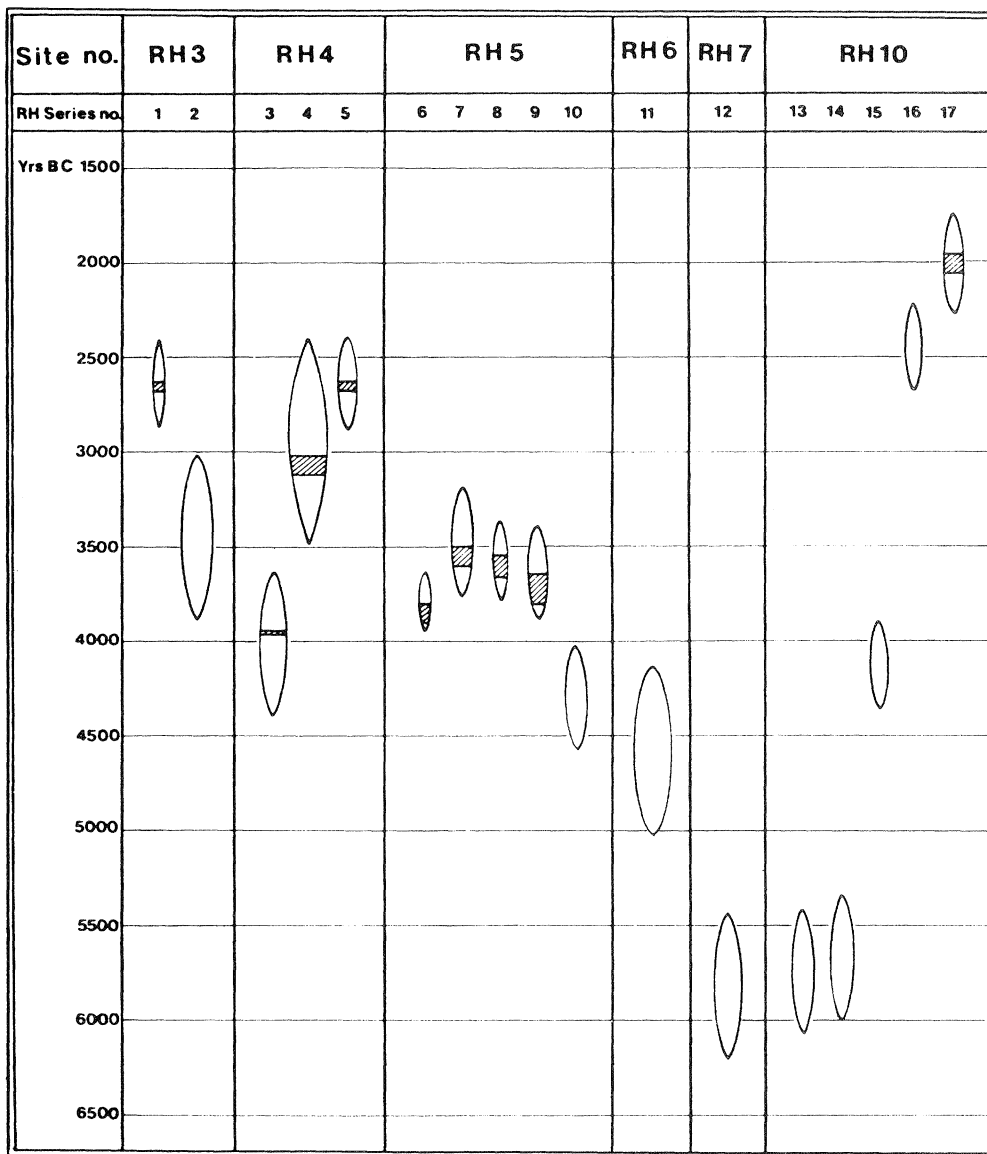


Figure 6 Relative distribution of radiocarbon dates from Quorum sites according to MASCA calibration (hatched segments) and Klein *et al*, 1982 (battleship profiles)

Table 1 Prehistoric Qurum radiocarbon dates. Determinations are derived from charcoal (C), bones (B), burnt soil (E) and shells (S)

RH Series Number	Lab. Number	Site	Locus/Layer	Type of Material	hL 5530 years b.p.	DATES	
						Calibrated after Ralph and others 1973 years B.C.	Calibrated after Klein and others 1982 years B.C.
1.	P-2673	RH 3	Surface	C	4030 ± 70	2680-2630 ± 70	2865-2400
2.	P-2738	RH 3	Surface	C	4170 ± 220	2910 ± 220	3875-3020
3.	P-2739	RH 4	burial fill 11 (2)	C	5140 ± 200	3690-3490 ± 200	2865-2400
4.	P-2740	RH 4	1 (-37 cm)	C	4320 ± 200	3130-3010 ± 210	3490-2430
5.	P-2741	RH 4	7 (-20 cm)	C	4030 ± 50	2670-2630 ± 60	4400-3640
6.	Bln-2735	RH 5	KDSA/D (1-2)	C	5010 ± 80	3900-3800 ± 80	3750-3185
7.	Bln-2736	RH 5	HEUB (2)	C	4680 ± 50	3600-3500 ± 50	3770-3360
8.	Bln-2737	RH 5	G 21	C	4740 ± 50	3650-3550 ± 50	3865-3385
9.	Bln-2738	RH 5	HSTC/D	C	4860 ± 60	3800-3650 ± 60	3925-3655
10.	Hv-10925	RH 5	below G. 19 (1)	E	5535 ± 85	4330-4270 ± 85	4540-4120
11.	Hv-11629	RH 6	HONC 1 (1)	B	5660 ± 165	4350-4330 ± 165	4905-4135
12.	Hv-10926	RH 7	Surface	S	7065 ± 105	not included	6360-5470
13.	Hv-10001	RH 10	DDJ (3)	S	6910 ± 105	not included	6170-5405
14.	Hv-10002	RH 10	DDJ (2)	S	6755 ± 100	not included	2650-2215
15.	Hv-10003	RH 10	DDL (1)	E	3940 ± 90	2940-2920 ± 90	4330-3860
16.	Hv-10004	RH 10	EAY G. 121	E	5230 ± 65	4000 ± 65	5975-5330
17.	Bln-2739	RH 10	EGA (1)	C	3550 ± 60	2050-1950 ± 60	2140-1715





*Plate 1* Qurum: site RH 5. Curvilinear configurations of postholes on bedrock, related to earliest phase

Table 2 A proposed relative chronology and sequence of prehistoric sites of Qurum

YRS B. C.	SITES IN QURUM AREA						
	RH 3	RH 4	RH 5	RH 6	RH 7	RH 10	others
1500							
2000						period IV	
2500	?						Umm an-Nar graves
3000	upper levels		settlement IV				
3500	?		graveyard			graveyard III	
4000	lower levels		settlement III				
4500	?		settlement II			period II	
5000			settlement I	upper levels			
5500							
6000						period I	
6500							

## Conclusions

The Ra'salhamrian assemblage of the fourth millennium B.C. presents such characters of cultural specialization and resource intensification that it might be regarded as an highly developed system, at the end of a local process of adaptation several millennia long. In general, though artefacts exhibit strongly conservative traits of a Late Stone Age tradition, while ceramics and metals were introduced only from the very end of the fourth millennium B.C. Nevertheless, a broad range of contacts was also involved in the formation of the Ra'salhamrian culture, as evidenced by the presence of goat and cattle bones together with the marine and coastal fauna. While the black burnished potsherds from eastern Iran mark the last episodes of occupation at RH5 and suggest an increasing integration of the fishermen population with the expanding agricultural societies of eastern Iran, interchange along the Ocean coastlands was an active factor of change at least as early as 5000 B.C. C. O. Sauer's (1952) imaginative suggestion on the prominent role of coastal populations in the early dispersal of cultivars might be finally developed into a testable proposition for the next generation of studies.

The Qurum project and the survey work carried out alongside have demonstrated that the arid coastlands of eastern Arabia store a remarkable amount of information on the prehistoric populations that might have mediated between Middle Asia and East Africa. Any further progress will anyway depend on the development of specific strategies and field methods, since the physical conditions met have not been experienced in the explored parts of the region. The ongoing Ra's al-Hamra project demonstrates both the continuity of fishing settlements in their changing articulation with the environment, and the emergence of a society strongly Ocean-oriented also in its ideological expressions. Unfortunately, to project such assumptions on a broader historical perspective will demand a much larger data base. Indeed, the study of maritime adaptations in the Arabian Sea will hardly come into shape before a number of different projects have been brought to an end.

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P.B. *Università di Genova, Istituto di Archeologia*

W.T. and H.-P.U. *Institut für Urgeschichte der Universität Tübingen*

M.T. *Istituto Universitario Orientale di Napoli, Dipartimento di Studi Asiatici*

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## **Abstract**

*Biagi, Paolo, Torke, Wolfgang, Tosi, Maurizio and Uerpmann, Hans-Peter*

### **Qurum: a case study of coastal archaeology in northern Oman**

First evidence of prehistoric coastal adaptations along the Arabian shores of the Indian Ocean is being recovered at Qurum in the Sultanate of Oman. The cluster of shell-middens currently excavated relates to a small population of fishermen of the 5th and 4th millennia B.C. having a strongly maritime-oriented culture. The economy was based on local resource intensification, but stock-breeding of goats and cattle was practised as well, suggesting early contacts with farming groups and the spreading of domesticates through coastal interchanges.