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# HDOR 410, a mid-Holocene campsite (Hadramawt, Yemen) and the difficulty of determining cultural tradition

Located in Wâdî Mikhfar, Yemen, the stratified site of HDOR 410 was excavated by the French Archaeological Mission in Jawf-Hadramawt. The site illustrates the co-existence of a form of expediency and a form of complexity in the production of lithics, revealing the presence of industries with low technological visibility (expedient production of flakes) at a time traditionally characterised by marked typological constraints (production of trihedral points).

**Keywords:** expediency, lithic technology, Yemen, Hadramawt, mid-Holocene

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## Introduction

The French archaeological Mission in Jawf-Hadramawt, directed between 1996 and 2006 by Dr M. Mouton (CNRS), and currently by Dr A. Benoist (CNRS), is a CNRS/French Ministry for Foreign Affairs operation. Since 1988 this research project, initiated by Dr S. Cleuziou and Dr M-L. Inizan, has brought together many researchers working on problems in the evolution of human settlements from earliest times until the period of the mature South Arabian states (first millennium BC).

During survey carried out in 1999, over 300 sites of various periods were located throughout central and eastern Hadramawt. This operation applied the acronym HDOR to those sites discovered in eastern Hadramawt in 1999 and during subsequent fieldwork in 2002 and 2004. In recent years, building on Inizan's previous work, many sites — particularly those with Pleistocene and Holocene lithic industries — have been documented in the area of Ramlat as-Sabatayn and Shabwa (Inizan & Ortlieb 1987; Inizan 1989; Cleuziou *et al.* 1992; Inizan *et al.* 1998). The potential of the area warranted both new surveys

and, if possible, excavations. Two campaigns (February and October–November, 2002) were thus undertaken at prehistoric sites in eastern Hadramawt. These operations and subsequent analysis were particularly successful in increasing the size of the known lithic corpus.

The HDOR Project concentrated its operations around the South Arabian site of Makaynûn, near the modern village of as-Sûm. Most of the tributary wadis of Wâdî Masilah, principally Wâdî al-Khûn and Wâdî Mikhfar, were restudied (following the preliminary survey of 1999) by lithic specialists. Wâdî Wa'shah, about 50 km to the north-east, was also revisited and found to contain important prehistoric remains (Crassard & Bodu 2004; Crassard 2008a; 2008b). The research carried out within the framework of the HDOR Project thus covers, within the Wâdî Wa'shah region, an east–west-oriented rectangle *c.* 10 km long and 5 km wide and, as in the area of Wâdî Al-Khûn, an east–west-oriented rectangle *c.* 20 km long and 10 km wide.

In Wâdî Wa'shah, sediments were trapped and well preserved in certain zones, providing material

for absolute dating. A certain number of lithic assemblages that could be refitted were preserved on the surface, attesting to a relative lack of post-depositional disturbance. The state of freshness and the quality of the edges in some assemblages contrasted with the strong patina generally present on the chert, showing that well-preserved industries could be still be found on and immediately under the modern ground surface.

The sites with lithic industries in Wâdî Wa'shah are rich and varied. Although most represent flint-knapping workshops, enough finished products were found to enable us to unambiguously characterise both the objectives of these production sequences and their chrono-cultural affinities. Resulting from a strictly local production, and even when they are not completely finished, such diagnostic objects, discovered in association with their *débitage* (discarded waste flakes), permits a thorough analysis of the *chaînes opératoires* that were followed by the ancient flint-knappers.

Soundings were conducted at sites where it seemed possible to obtain absolute and relative elements of dating. Three partially excavated sites (HDOR 419, HDOR 561 in Wâdî Wa'shah and HDOR 410 in Wâdî Mikhfar) contained stratified contexts in which organic remains suitable for dating as well as diagnostic cultural remains (e.g. arrowheads, ornaments, various tools) were recovered.

### Discovery and description of HDOR 410

Concurrently with the work carried out in Wâdî Wa'shah, part of the team of the French Archaeological Mission in Jawf-Hadramawt surveyed the northern bank of Wâdî Masilah and its tributaries, in a micro-region between the villages of al-Khûn and as-Sûm. Wâdî Mikhfar is a small tributary of Wâdî al-Khûn, itself a tributary of Wâdî Masilah (Fig. 1). The entirety of Wâdî Mikhfar was surveyed, from the wadi bed to the lateral sides, over its entire length of 2.5 km. Seventeen prehistoric surface sites were identified. Only one stratified site was discovered at the edge of the wadi: HDOR 410, which was eventually excavated (Figs 2–3). This is referred to as HDOR 410 'Block A', to distinguish it from another tested zone in the vicinity, a small rock shelter with a very low ceiling, which could have

been used as a temporary dwelling area, known as 'Block B'. A *c.* 2 m<sup>2</sup> sounding was excavated to a depth of 1.20 m, but no archaeological remains were found.

### Excavation and stratigraphy

HDOR 410 is a site of human occupation close to a rock shelter, situated apparently with regard to protection from the prevailing winds and the sun during a good part of the day and hidden from the view of potential animal prey and other human groups. Such a location is unusual and, leaving aside the sub-recent occupations by Bedouin of such rock shelters, rare in this region. This explains, in addition, the small proportion of prehistoric sites under shelter: their chances of survival are lower as reuse of rock shelters may have gradually destroyed them and they may not have enjoyed sufficient sedimentary covering to ensure their conservation. HDOR 410 has the unusual distinction of being protected by a set of large limestone blocks, fallen down from the cliff above. At the foot of the most imposing of these blocks, the vestiges of knapping operations using good quality chert were found on the surface. As the orientation of the site favoured the accumulation of stratified deposit, an excavation of 12 m<sup>2</sup> was thus opened directly beneath the rock shelter. All excavated sediments were systematically sieved, beginning with a mesh size of 2 mm.

The excavation revealed a total of twelve hearths, concentrated in three distinct levels. The material from the surface was collected within a unit called Level 1. The first stratigraphic layer, Level 2, was disturbed. Nevertheless, two hearths (Fy6 and Fy11) were associated with the bottom of this layer, at the interface with the next level. Only one hearth (Fy10) was directly associated with Level 2.

The first undisturbed level, Level 3a (Fig. 4), contained at least seven ellipsoidal or circular hearths (Fy1, Fy2, Fy3, Fy4, Fy5, Fy7 and Fy8) with an average diameter of 50 cm (two of them exceed 1 m in diameter). The hearths take the form of hollows, without any stony installation (Figs 5 & 6). However, the presence of many heated stones in Level 3a indicates the use of the hearths for cooking. Some of the large stones were used on the hearth edges, perhaps as supports for fuel. The precise contemporaneity (or simultaneity)

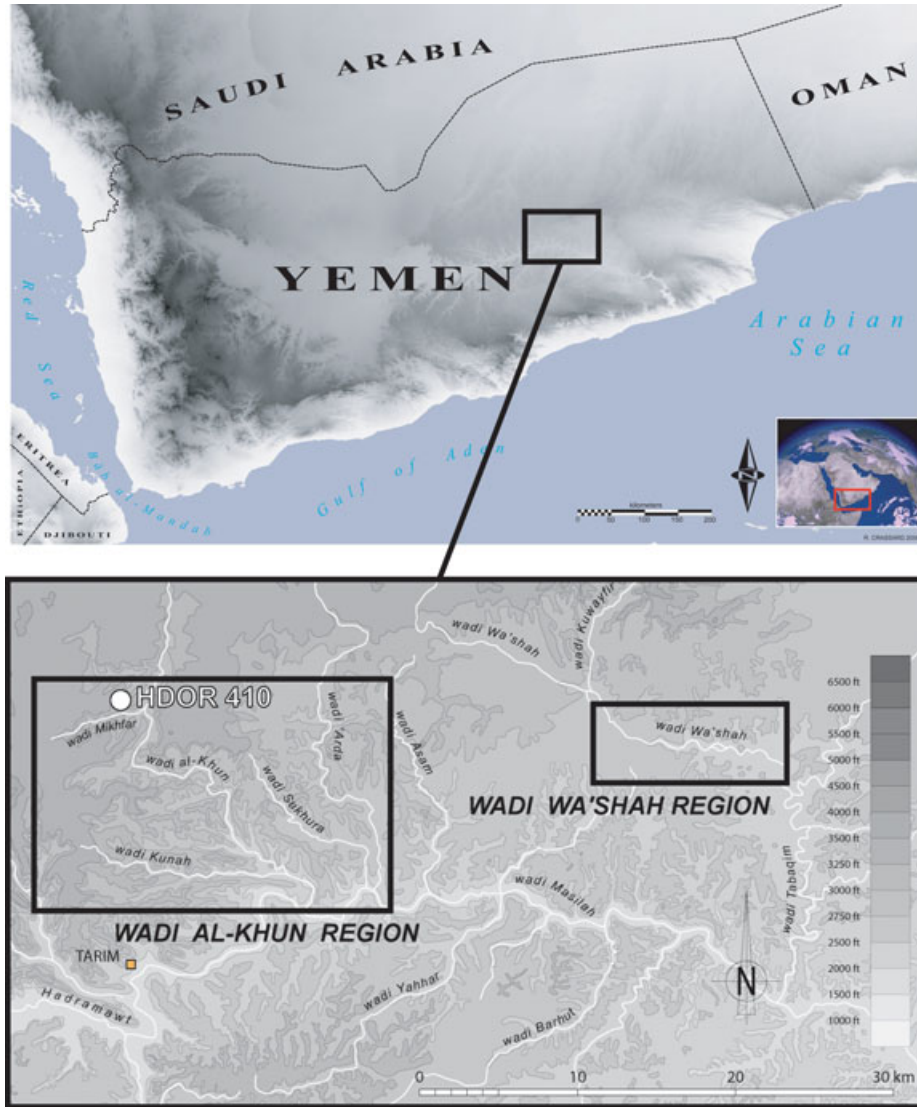


Fig. 1.  
Geographical situation (map H. David/R. Crassard).

of the hearths is not clear, but they all belong to the same chronological horizon since they were all dug in an apparently single level (Level 3a).

The next level, Level 4, contained few lithics but two hearths were found (Fy9 and Fy12). These resembled those in Level 3a, except that no burned stones were discovered. While the homogeneity of the level is clear, the two hearths do not seem as clearly contemporary as those in Level 3a. This can be explained by the nature of Levels 3a and 4, the first of which is a surface or stratigraphic micro-layer, while the

second is a homogeneous but thicker stratigraphic layer.

Below Level 4, a sterile 10 cm-thick layer made up of limestone and sand, rested on the limestone base. Figure 7 presents a stratigraphic diagram of the sediments at HDOR 410.

### Lithic industry and chronology

The surface of HDOR 410 had many knapping elements of good quality raw material. The slight patina and small size of the lithics suggested a relatively recent date, based on comparison with



Fig. 2.  
HDOR 410: general view of the site ('Block A').



Fig. 3.  
HDOR 410 excavation; appearance of Level 3a and deep sounding in the centre.

surface and stratified material found elsewhere in the area, e.g. at the stratified sites (Fig. 8) of HDOR 419 and HDOR 561 (Crassard & Bodu 2004; Crassard



Fig. 4.  
HDOR 410 Block A, Level 3a and the associated structures of combustion (Fy = hearth).



Fig. 5.  
HDOR 410, hearth Fy7 in section.

2008a), Khuzmum 045-A (McCorriston *et al.* 2002; Crassard 2008a), Gravel Bar Site GBS (Walter, McCorriston & Oches 2000; Crassard 2008a) and Manayzah (Crassard *et al.* 2006; Crassard 2008a). Two arrowheads were found on the surface (Fig. 9). They were worked on thick flakes, using direct, semi-abrupt and short retouch. The type is unknown in dated contexts and the absence of such finds at HDOR 410 strongly suggests that they post-date the stratified occupations there (hence belonging possibly to the 'Bronze Age').



Fig. 6.  
HDOR 410, Hearth Fy1 in section.

The stratified lithic industry is very homogeneous and is comparable with the finds first discovered on the surface of the site. Small flakes made from local chert are common (Table 1). The raw material was systematically and carefully selected. A preference is shown for fine-grained flint from the wadi bed, supplemented by some chalcedonies or jaspers. A study of the techniques used reveals simple knapping operations, not following a precise scheme or a particular technique. The main production was of

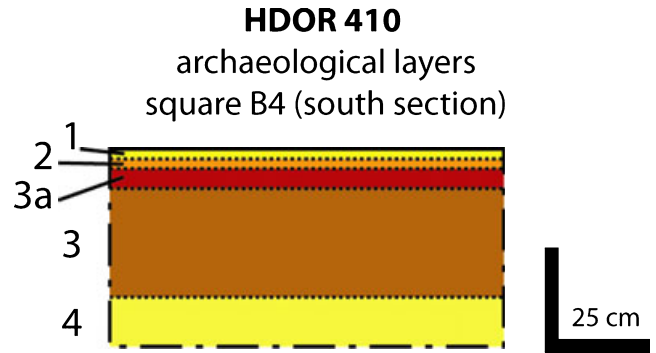


Fig. 7.  
Stratigraphic log of the B4 square at HDOR 410 (southern section).

irregular flakes and bladelets on small cores with single or multi-polar striking platforms. No precise functionality is associated with these types and the industry thus seems mainly expedient (i.e. made without a sophisticated level of predetermination and with very few technical constraints).

Tools are rare, accounting for only 0.6% (18 out of 2960) of the total number of knapped pieces. The information they provide on activities at the site is limited. Some scrapers on small flakes partially reveal the reasons behind the expedient production of flakes. Notches on thick flakes are

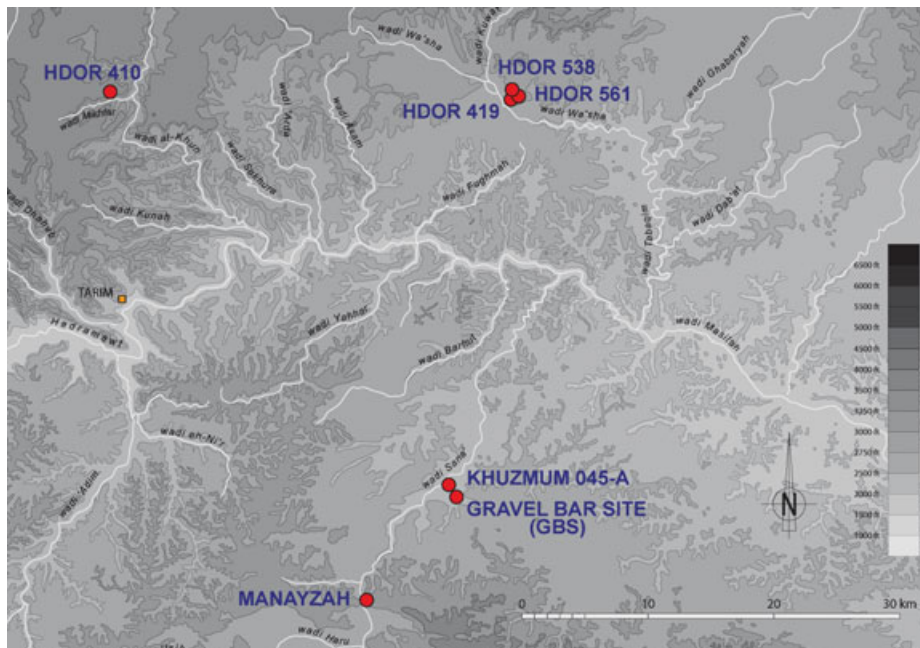


Fig. 8.  
Main early/mid-Holocene sites in Hadramawt.

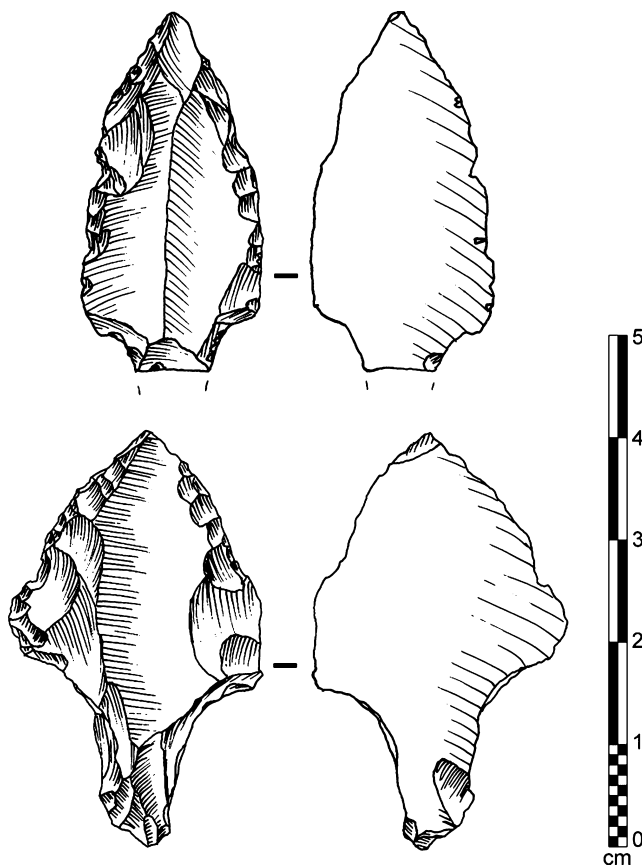


Fig. 9. Arrowheads found on the surface of HDOR 410 site (drawings R. Crassard).

too rare to propose any typology. Their manufacture was not restricted to a particular technical scheme.

These objects of ‘low technicality’ are stratigraphically associated with a particular arrowhead (Fig. 10) of a well-known type (Charpentier 2004). The discovery of this arrowhead in the southern half of Hearth 2 (Fy2) provides an important clue to the rock shelter’s date. This nearly complete, flat-convex point displays the typo-technological peculiarities of arrowheads from many surfaces and some stratified sites in Yemen and elsewhere in the southern part of

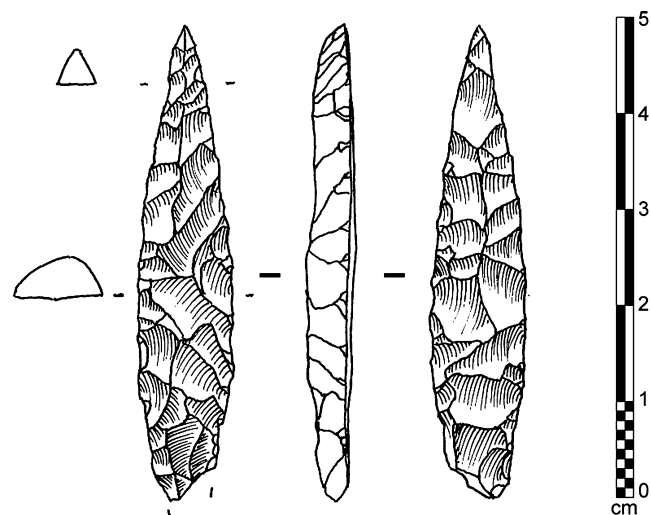


Fig. 10. Arrowhead with flat-convex section and trihedral point (square A3, hearth Fy2; drawing J. Espagne).

the Arabian Peninsula (Charpentier 2004; Crassard & Bodu 2004). The point has been regularly shaped by pressure flaking. In general it has a flat-convex section but a trihedral point and thus seems to belong to the ‘trihedral tradition’. The arrowheads from HDOR 410 thus belong to two types:

*Type HDOR 410-1* (Fig. 9): Type of point found on the surface, exact dating unknown; probably later than type HDOR 410-2. Arrowhead on blank with simple tang and short, direct retouch.

*Type HDOR 410-2* (Fig. 10): Bifacial point with a trihedral section and a slightly pronounced tang; dated to the fifth millennium BC.

A hearth from Level 3a yielded a radiocarbon date (Table 2) that places the occupation at HDOR 410 at the beginning of the fifth millennium cal. BC (square A5, Level 3a, hearth Fy7: 6030 ± 56 BP, 4993–4848 cal. BC). The older levels, including Level 4, go up to the second half of the sixth millennium cal. BC (square B5, Level 4, hearth Fy12: 6651 ± 50 BP, 5625–5544 cal. BC and square B5, Level 4, in the direct vicinity of hearth Fy12: 6389 ± 58 BP, 5466–

Table 1. Simplified inventory of the lithics found in HDOR 410 (total = 2960).

Layers	Flakes 2 × 2 cm	Flakes 3 × 3 cm	Flakes 4 × 4 cm	Flakes 5 × 5 cm	Flakes >5 × 5 cm	Cores	Tools	Others
1	170	88	18	9	4	2	4	5
2	497	171	86	48	15	4	4	9
3	952	386	191	97	48	41	10	22
4	49	15	9	4	2	0	0	0
Totals	1668	660	304	158	69	47	18	36

Table 2. AMS C<sup>14</sup> dates obtained on charcoal from HDOR 410.

<i>Designation</i>	<i>Nature</i>	<i>D13C</i>	<i>Lab. ref. Tucson</i>	<i>14C Age BP</i>	<i>Calibrated Age 1σ BC</i>	<i>Calibrated Age 2σ BC</i>
HDOR 410 B5 Niv 3 Fy 8	Charcoal	-25.8	AA64366	4482 ± 45	3333-3095	3352-3024
HDOR 410 Fy 3	Charcoal	-24.7	AA64367	4761 ± 46	3635-3520	3644-3377
HDOR 410 A5 Niv 3 Fy 7	Charcoal	-25.8	AA64365	6030 ± 56	4993-4848	5199-4783
HDOR 410 Niv 4 prox Fy 12	Charcoal	-25.40	AA64369	6389 ± 58	5466-5318	5478-5228
HDOR 410 B5 Niv 4 Fy 12	Charcoal	-23.7	AA64368	6651 ± 50	5625-5544	5643-5487

5318 cal. BC). Two other dates are considered too young (4482 ± 45 BP and 4761 ± 46 BP) and probably reflect disturbance by later charcoal (J-F. Saliège, CNRS, personal communication 2006).

Other sites with trihedral points in Yemen, the Sultanate of Oman and the United Arab Emirates have been dated. In Yemen, this type has been dated to the second half of the seventh millennium BC at Khuzmum 045-1A in Wâdî Sanâ (McCorriston *et al.* 2002: 68). This dating has been confirmed at the site of Manayzah, further south in Wâdî Sanâ (Crassard *et al.* 2006) where dates around the end of the seventh and beginning of the sixth millennium BC have been obtained. In the Sultanate of Oman, trihedral points from the second half of the sixth millennium BC to the second half of the fifth millennium BC have been found at Suwayh SWY-1 (Charpentier 2004: 60). Finally, in the United Arab Emirates, trihedral points dating to the sixth millennium BC are known from Marawah (Shepherd-Popescu 2003: 47).

**Conclusions**

The association of an expedient industry of flakes and irregular bladelets with a single example of a technically ‘complex’ tool suggests two interpretations. The first interpretation considers the presence of a trihedral point in an expedient techno-cultural context as an anomaly due to an external agent. If the point does not reflect the technical traditions of the group that occupied HDOR 410, it must be foreign in origin.

Alternatively, one could interpret the association between an expedient industry and our trihedral point as a reflection of lithic production sequences, which were not geared strictly towards either simplicity or complexity. The coexistence of these two operational concepts becomes probable then

within the same group of knappers at a given point in time. A lithic ‘type-fossil’ must always be understood in the context of the totality of lithic production, in order to interpret choices and know-how relative to needs.

HDOR 410 is a site of the late sixth/early fifth millennium BC, obviously of a temporary type, most probably a halting place for hunters who probably engaged in flint-knapping for limited use in response to a short-term need. The expediency observed in the production of flakes at HDOR 410 can be partly explained by the temporary nature of the site. The more elaborate kinds of knapping operations known for this period were not carried out at HDOR 410. It is important to underscore the expedient nature of the industry and the temporary character of the site, and not to attribute the industry to a regional technical tradition attested in a much more elaborate form at other sites of the period.

There remains, however, a difficulty in quantifying expediency, as the example of the modern and sub-modern Bedouin hearths shows. These hearths display very simple characteristics: three stones are used as a support for branches. Only one branch of average size is gradually advanced in the flames until total combustion has occurred. Taken out of context, this type of hearth appears to be technically very simple. It is, however, found all across Hadramawt nowadays and very likely reflects a cultural practice exceeding the scale of the clan and the tribe. Simplicity is thus not synonymous with deference to a cultural tradition. It can itself reveal the optimal adaptation of a human group.

The presence of a trihedral point allows us to associate HDOR 410 with a techno-complex capable both of the production of this type of lithic arrowhead, and of a far simpler type of expedient flint-knapping aimed at providing tools for hunters on the move.

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