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The Question of Upper Pleistocene Connections between East Africa and South Arabia

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Recent genetic contributions to the field of palaeoanthropology suggest that all modern humans are derived from a common ancestral population living in sub-Saharan Africa between 200,000 and 100,000 years ago (Cann, Stoneking, and Wilson 1987, Vigilant et al. 1991, Horai et al. 1995, Quintana-Murci et al. 1999, Ingman et al. 2000). This proposition is supported by early Upper Pleistocene human fossils discovered at sites such as Border Cave and Klasies River Mouth in South Africa (Rightmire 1979, Singer and Wymer 1982) and the Omo Kibish formation in Ethiopia (Butzer, Brown, and Thurber 1969, Day 1972).

The model of African genesis posits an expansion of modern human populations out of Africa and into western Asia. If there were early Upper Pleistocene human pulses emanating from Africa, the route of dispersal (assuming that maritime travel directly across the Red Sea was not possible) would have been limited to two conduits—the Levantine corridor connecting Egypt and the Near East and the Arabian corridor, where the Bab al Mandeb Strait links the Horn of Africa with South Arabia (fig. 1).

There is a plethora of data from Middle Palaeolithic archaeological sites throughout the Levantine corridor, though it is debatable whether these lithic traditions support or refute migration via this route (cf. Marks 1990, Van Peer 1998, Bar-Yosef 2000, Kleindienst 2000, Vermeersch 2001). Scholars have been hindered from studying Middle Palaeolithic/Middle Stone Age sites in the

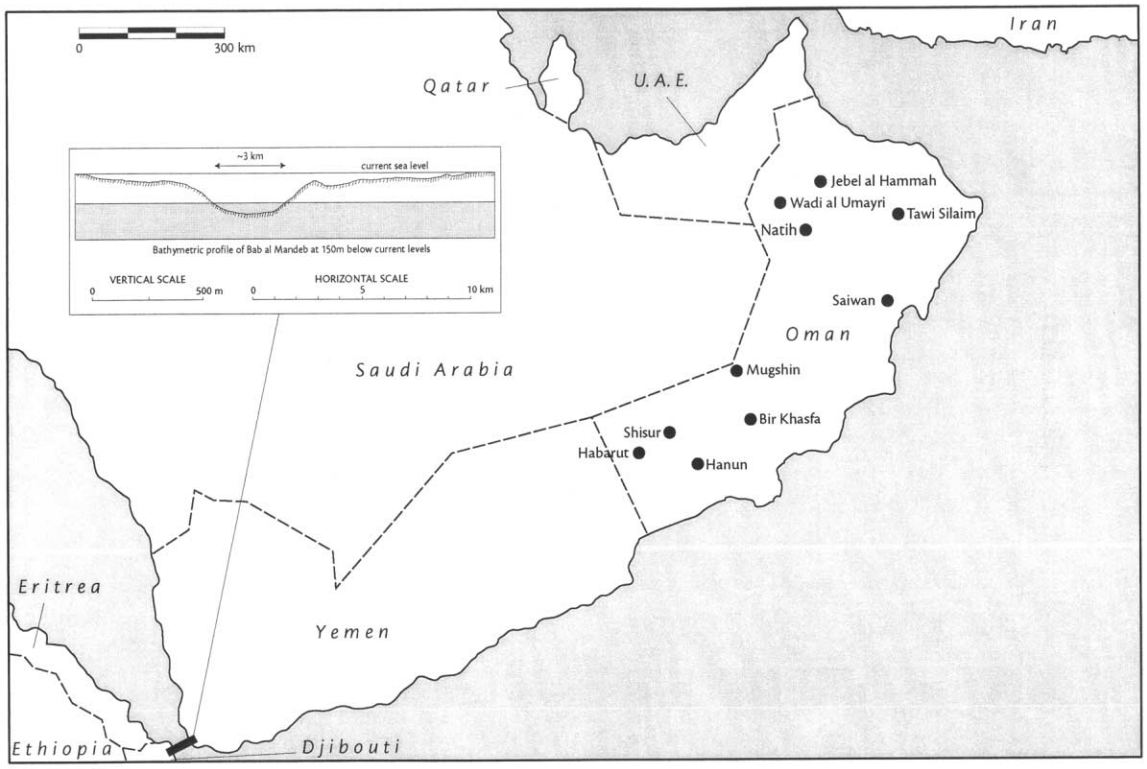

FIG. 1. *Southern Arabia, showing the distribution of Khasfian sites, and the bathymetric profile of the Red Sea at the Bab al Mandeb Strait.*

Arabian corridor; research has been restricted by sociopolitical conditions. Oman emerged from isolation and became accessible to foreigners in 1970 with the ascendancy of Sultan Qaboos, while the formerly divided Yemen was engaged in a protracted civil war until as recently as 1994.[1]

The few Pleistocene expeditions to South Arabia have documented a number of potentially important surface occurrences. Of particular interest is a group of typologically related open-air sites scattered throughout the Omani hinterland. The sites are found along inland-flowing widian and often associated with relict lakes on the Nejd plateau and in the Huqf depression (Pullar 1973, Biagi 1994). Fed by seasonal monsoon rains that intensified during interglacial pluvial phases, these channels were once perennial sources of water draining from the coastal highlands to a vast interior basin that is today blanketed by the sands of the Rub' al Khali.

A cursory techno-typological analysis based on the limited data presented in the literature indicates the widespread utilization of a *façonnage* reduction strategy at these sites. In contrast to core technologies, which typically rely on prior working of the raw material subsequent to the final removal of a tool blank in order to achieve a specific shape, *façonnage* industries attain the final product by invasive flaking across one or both faces of a preform (Boëda 1991). These Omani assemblages are dominated by small (30–80 mm), biconvex bifacial tools ranging in shape from foliate to ovate. The artifacts were initially reduced from thin plaquettes and subsequently shaped by flat, invasive scalar retouch. The high degree of lipping on biface thinning flakes indicates that they were thinned by soft-hammer percussion.

Occurrences following this general techno-typological scheme are presumed to be Upper Pleistocene on the basis of typological correlates in East Africa as well as their distribution in desiccated geomorphic zones that could have sustained hominid populations only during pluvial events. Find spots are reported in the north-central region of the sultanate at Jebel al Hammah (Smith 1977), Tawi Silaim (Smith 1977), Natih (Pullar 1977), Wadi al Umayri (Villiers-Petocz 1989), and Saiwan (Biagi 1994) and along the Huqf escarpment (Howard, personal communication) as well as at a number of localities in the south of Oman, including Hanun (Smith 1977), Shisur (Pullar 1973, 1977), Wadi Ghadun (Zarins 2001), Bir Khasfa (Pullar 1973), Mugshin (Pullar 1973), and Habarut (Pullar 1973). The absence of these sites outside of Oman does not stem from lack of data; rather, the distribution

1. Archaeological activities, however, were conducted during the 1980s by Amirkhanov in South Yemen and de Maigret in North Yemen.

is restricted to a network of widian and relict lacustrine deposits flanking the Rub' al Khali basin. Indeed, after a study of Middle Palaeolithic assemblages in Yemen, Caton-Thompson (1957:383) concluded that "the static, crude culture of South-West Arabia, as we know it, gives no support to the view that a land-bridge made intercommunication with East Africa possible."

Our preliminary reconnaissance of southern Oman in 2002 revealed one particularly rich occurrence of bifacial foliates in the Wadi Arah; it is located 5 km south of Bir Khasfa and is likely a continuation of Pullar's original site. The find spot is an open-air camp with intense foliate/ovate production. It is situated on the edge of a crescent-shaped outcrop of Tertiary rock that forms the margin of an ancient playa lake. The assemblage is derived from a fine-grained, opaque brown chert belonging to the Rus formation, which is found in abundance along the edges of the inner basin. The raw material naturally occurs in the form of large rounded cobbles derived from alluvial gravels, as well as thin disc-shaped plaquettes. The archaeological material is in pristine condition—there is no evidence for rolling and minimal wind abrasion. Two types of patina were observed: a light pinkish-yellow surface that characterized the Holocene artifacts (i.e., trihedral rods and Fasad points) from one area of the site and a darker brownish-orange patina on the bifacial foliates/ovates and associated debitage. A random sample of the latter material was collected within a 3-m radius around the vehicle, an area of approximately 28 m^2.

Attribute analysis carried out on all identifiable blanks (modified and unmodified) suggests a predominantly bifacial industry (table 1). Over half the blanks are biface thinning flakes, indicated by a suite of conditions including twisted longitudinal curvature, high angle platforms, thin pieces, platform faceting, presence of lipping, and radial, crossed, or bidirectional scar patterns (cf. Brézillon 1971). The single core within the assemblage is an exhausted non-volumetric core with centripetal removals across a flat working face (fig. 2*e*). Examination of scar patterns on non-biface thinning blanks shows the prominence (42%) of three-directional and radial patterns.

The toolkit is dominated by sidescrapers and bifacial foliates (table 2). Of the 11 sidescrapers, 6 are manufactured on biface thinning flakes. The bifacially worked tools are small and thin with flat, scalar, invasive soft-hammer retouch (fig. 2*a–d*). Nine foliates were found, making up nearly 20% of the material recovered. While the sample size is too small to form a detailed description of the reduction strategy, clearly the tool makers employed a combination of *façonnage* and centripetal core reduction, likely procuring raw material from local sources.

TABLE 1
Frequency of Identifiable Blank Types (Modified and Unmodified)

	n	%
Biface thinning flake	24	57.1
Flake	12	28.6
Primary flake	3	7.1
Blade	2	4.8
Primary blade	1	2.4
Total	42	100.0

TABLE 2
Frequency of Tool Types

	n	%
Sidescrapers	11	40.7
Bifacial foliates	8	29.6
Endscrapers	3	11.1
Truncated pieces	2	7.4
Retouched piece	1	3.7
Unifacial point	1	3.7
Bifacial fragment	1	3.7
Total	27	100.0

Biface production has been demonstrated to be a strategic response to increased mobility (Kelly 1988). The possibility of autochthonous technological development within Arabia, however, can be immediately discarded. Climatic conditions in the Arabian Peninsula during oxygen isotope stage 6 would have been too dry to support hominid populations. Because oscillating phases of pronounced hyperaridification preclude a continuous occupation of the Arabian Peninsula, Arabian Mousterian industries must derive from a foreign source. Expanding hunter-gatherer groups, exploiting the ameliorated landscape, likely originated from neighboring refugia in the Levant, East Africa, and/or the Zagros Mountains. It is reasonable to assume that these emigrating populations took their toolkits and technologies with them and any local developments derived from these bases.

Therefore, it is necessary to determine whether Arabian Mousterian assemblages demonstrate particular affinities with one or more surrounding regions. The Levantine Mousterian exhibits an uninterrupted lineage of exclusive core reduction, producing a high percentage of Levallois points (Bar-Yosef 1994). Lithic assemblages from the Zagros Mousterian are also limited to core reduction but are distinguished by tendencies toward heavy retouch of tools (Lindly 1997). In contrast, the East African Middle Stone Age is dominated by *façonnage* technologies producing diminutive bifacial foliates, although core reduction, often centripetal Levallois, also occurs (Clark 1988, McBrearty and Brooks 2000, Pleurdeau 2003). The characterization of the aforementioned industries is purposely left in general terms, as the data from Arabia are too poor to consider techno-typological affinities in any greater detail.

Pleistocene archaeology in South Arabia is problematic because the region is dominated by erosional rather than depositional geomorphic processes. Therefore, no dated,

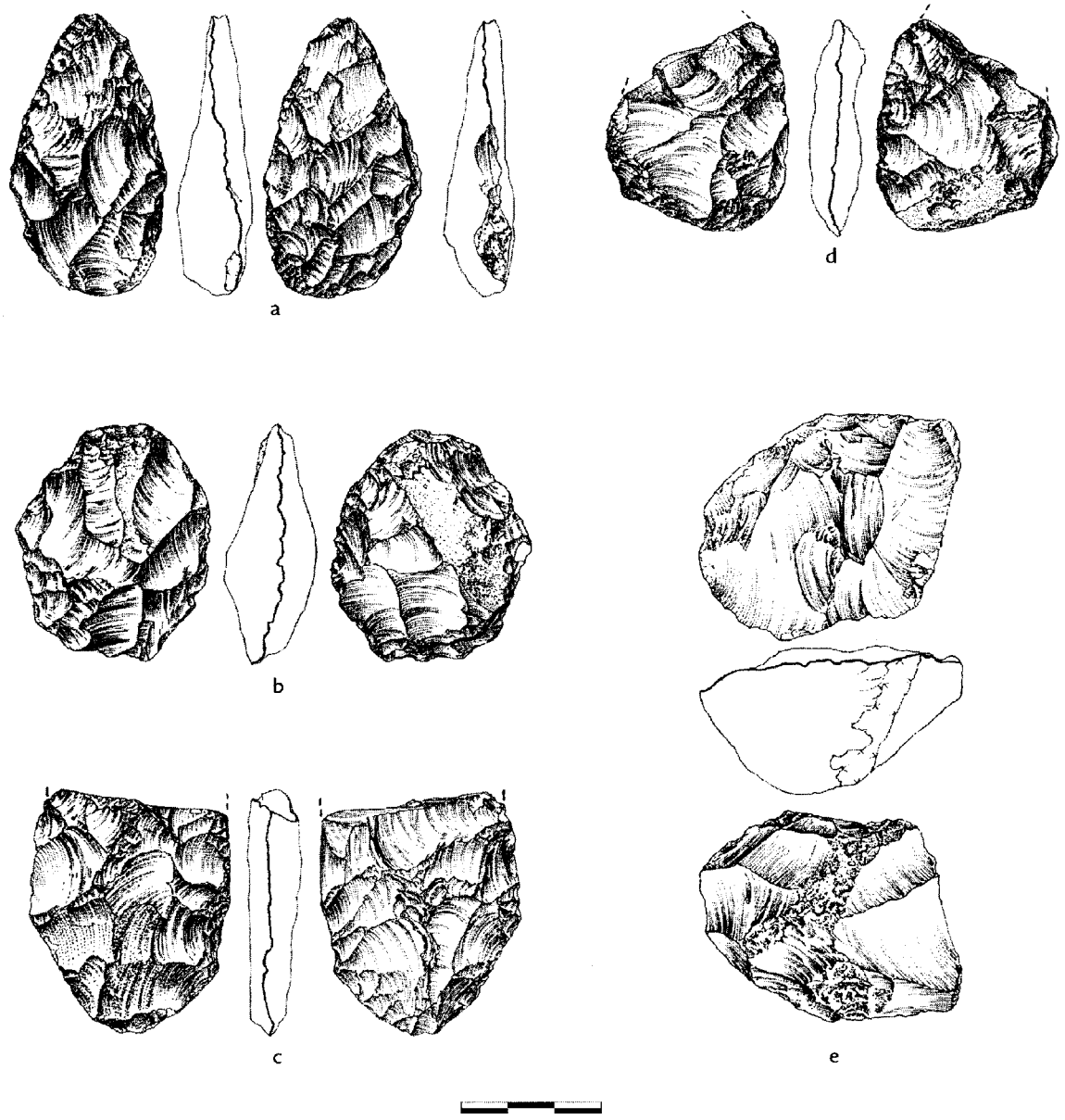

FIG. 2. *Artifacts collected from Bir Khasfa, Wadi Arah, during 2002 reconnaissance.* a–d, *bifacial foliates/ovates;* e, *centripetal Levallois core.*

stratified sites have been discovered in this area.[2] With no temporal resolution, these surface occurrences can be discussed only on the level of a general lithic tradition rather than scatters representing a homogeneous industry. Furthermore, it is impossible to discuss reduction strategies in any detail because of the lack of systematic collection. However, the South Arabian Upper Pleistocene assemblages typologically resemble those of East Africa.

Despite local differences between East African industries, diminutive bifacial foliates with flat, invasive soft-hammer retouch are a tool form exclusive to this region (Anthony 1972, Perlès 1974, Clark 1988). There is no evidence for bifacial technology anywhere in the Near East after oxygen isotope stage 6. Thus, the presence of an Upper Pleistocene bifacial tradition throughout the hinterland of South Arabia suggests connections with Africa. The complete absence of *façonnage* reduction in the Levantine and Zagros Mousterian underscores the disparity between East African/South Arabian and Near Eastern Upper Pleistocene lithic trajectories.

2. During the 2004 campaign, we exacavated an *in situ* Pleistocene deposit with three stratified industries of which the lower two assemblages demonstrate a bifacial technology. Preliminary results are forthcoming.

Ambrose (2003) posits a major bottleneck release during the last interglacial (128,000–71,000 BP) associated with the onset of more humid environmental conditions that resulted in the expansion of early humans out of sub-Saharan Africa. Palaeoenvironmental data from southern Arabia attest to at least three pluvial episodes roughly associated with oxygen isotope stages 5e, 5a, and 3 (Sanlaville 1992). These wet phases produced habitable conditions throughout the region, facilitating the movement of hunter-gatherer populations into a vacant, ameliorated environmental niche. It is noteworthy that a typologically identical foliate/ovate assemblage was found within an arid zone in northern Sudan, also appearing to be an intrusive element from sub-Saharan Africa (Rose 2004). If, indeed, the Oman foliates/ovates date to the Upper Pleistocene, it provides concrete evidence for one or more human dispersal events out of sub-Saharan Africa.

Future work must focus on defining the temporal and geographic limits of the Arabian Mousterian and describing the variety of reduction strategies employed by these Upper Pleistocene groups. The Arabian Peninsula is unique in that it served as a bridge between continents that was accessible only during pluvial events. Therefore, detailed chronological sequences throughout Arabia are crucial for understanding the timing and nature of the modern human exodus from Africa. Until these data have been obtained, the proposed model of Pleistocene connections across the Bab al Mandeb must remain conjectural.

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