AR-RAṢFA, A STRATIFIED MIDDLE PALEOLITHIC OPEN-AIR SITE IN NORTHWEST JORDAN: A PRELIMINARY REPORT ON THE 1997 EXCAVATIONS

by

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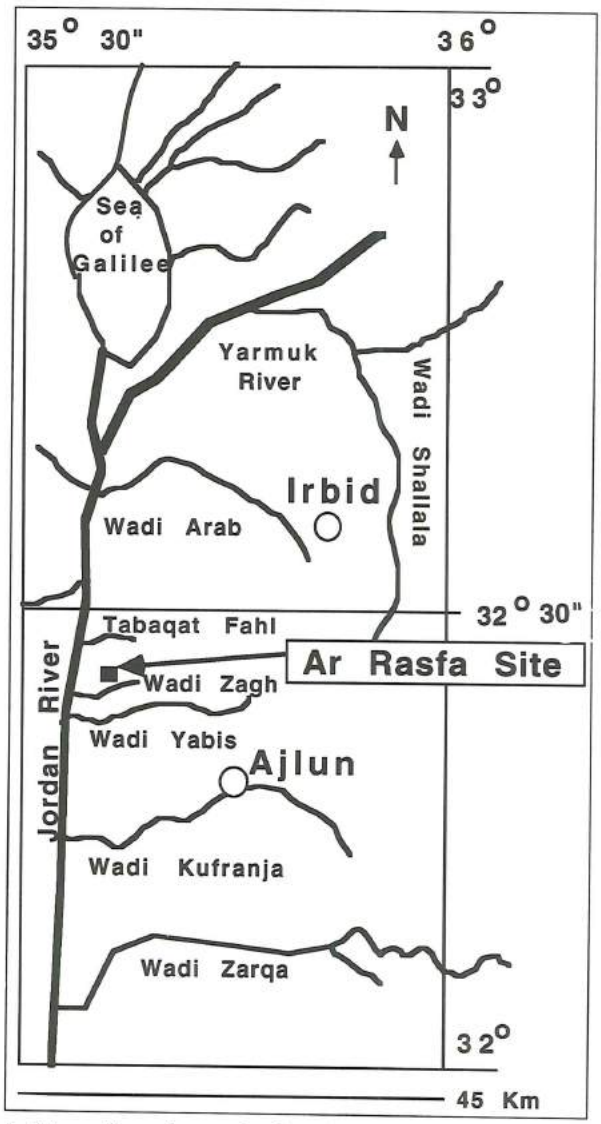
Abstract

Even though geographic and paleoclimatic evidence suggest that northwest Jordan was a favorable habitat for human settlement during Middle Paleolithic times, surprisingly little is known about the Levantine Mousterian archaeological record in this area. Survey and excavations in 1997 revealed, ar-Raṣfa, a stratified Middle Paleolithic site in the Wādī az-Zagh (Fig. 1). Superficially similar to other Jordanian Middle Paleolithic sites in representing an "early" variant of the Levantine Mousterian, the lithic assemblage from this site actually presents a more complex pattern of industrial variability.

Introduction

Paleoanthropologists are increasingly interested in the Middle Paleolithic Period in Southwest Asia. This period has the potential to shed considerable light on several of the most important issues in human evolution, such as the origin of modern humans, behavioral differences among Late Pleistocene humans, and the fate of the West Eurasian Neanderthals.

The principal Middle Paleolithic archaeological entity in Jordan and adjacent countries is called the "Levantine Mousterian." Levantine Mousterian assemblages have been dated by a variety of methods (radiocarbon, thermoluminescence, electron-spin resonance, uranium-decay series, and amino acid racemization) with most contexts dating to between 45,000-240,000 BP . (Mercier *et al.* 1995). Levantine Mousterian lithic assemblages differ from European Mousterian assemblages in several key respects, high percentages of Levallois tools



1. Map of northwest Jordan showing the location of the ar-Raṣfa site.

and laminar debitage (blades) and typically low proportions of intensively retouched flake tools, handaxes, and foliate bifaces. The distribution of Levantine Mousterian sites within the Levant is closely correlated with the Mediterranean *Quercus-Pistachia* woodland.

From a paleoanthropological standpoint,

the most important aspects of the Levantine Mousterian are its human fossil associations. Unlike Europe and Western Asia, where the Middle Paleolithic is associated solely with Neanderthals, the Levant appears to have had a more diverse human population. To most researchers, these Levantine Mousterian human fossils are to be divisible into two groups, one consisting of modern-looking humans from the sites of Skhul and Qafzeh, and another consisting of more Neanderthal-like humans from the sites of Tabun, Amud, and Kebara (Rak 1993. Trinkaus 1984; Vandermeersch 1991). Because the morphological differences between these Neanderthals and early modern humans have often been attributed to profound bio-behavioral differences between these hominids, their joint association with the same Levantine Mousterian archaeological complex in the Levant constitutes a major evolutionary paradox (Binford 1968; Clark and Lindly 1989; Trinkaus 1992). Several recent studies have sought evidence for significant behavioral differences between Neanderthals and early modern humans within the Levantine Mousterian (Lieberman 1993; Lieberman and Shea 1994; Shea 1989, 1993, 1998), but these efforts have been constrained by a dearth of Middle Paleolithic sites at which archaeological residues have been recovered by controlled scientific excavations.

In order to increase the sample of well-excavated Levantine Mousterian sites, the author started a project to investigate the Middle Paleolithic archaeological record in the 'Ajlūn District of northwest Jordan. Our initial focus in the 1997 season was to evaluate surface localities identified by previous surveys in the lower reaches of the Wādī az-Zagh and Wādī al-Yābis (Muheisen 1988; Palumbo *et al.* 1990). Sixteen localities were examined in this area, and test excavations were conducted at one of them. This site, ar-Raṣfa, contained stratified Levantine Mousterian lithic artifacts whose character suggest the Middle Paleolithic record of northwest Jordan has unique properties not apparent in the sites thus far known from southern Jordan or from adjacent parts of northern Israel.

Regional Background

Physiographically northwest Jordan is bounded to the north by the Yarmuk River, to the west by the Jordan River, and to the south by the Wādī az-Zarqā'. The eastern boundary is somewhat arbitrary at roughly 36° (east longitude, but corresponds roughly to the ecotone between the hilly woodland flanks of the Jordan Valley and the level steppe-desert of interior Jordan. Elevations in this part of Jordan range from more than 100 m bsl on the Jordan Valley bottom to about 900 m in the highlands. The bedrock geology of this region is composed of Senonian-Paleocene and Cenomanian-Turonian (Cretaceous) limestones up-thrust and faulted by the formation of the Jordan Rift Valley. Cenomanian-Turonian limestone predominates in the 'Ajlūn District and in the project area . (Bender 1974: 27-28,115) These chalky limestones feature numerous caves/dissolution cavities and contain abundant nodular deposits of high-quality flint. Numerous seasonal and permanent rivers cross-cut these limestone hills, exposing a variety of Quaternary deposits. The most conspicuous Pleistocene formations are a series of Middle Pleistocene conglomerates overlain at lower altitudes by the al-Lisān marls, residues of the eponymous lake that filled the Jordan Valley until early Holocene times (Macumber and Head 1991).

Geographic considerations suggest northwest Jordan would have been relatively densely populated during Late Pleistocene times. Even today, northwest Jordan is the most humid part of the country, enjoying mean annual rainfall between 400-800 mm over the last several decades (Bender 1974:10). (This is essentially the

same as the present rainfall for the Mediterranean watershed of Israel north of the Beersheva Basin.) Comparable levels of present-day rainfall occur in Jordan only in isolated peaks of the Transjordanian Plateau, such as the Mādabā Plains. The decomposition of the limestone under humid conditions creates a nutrient-rich terra rosa soil that is today intensively cultivated.

Even under modern hyper-arid climate, scrub Mediterranean oak-terebinth vegetation predominates throughout those parts of northwest Jordan that are not under cultivation (Zohary 1973). From the standpoint of human hunter-gatherer subsistence opportunities, the Mediterranean woodland is the most resource-rich of Levantine phytozones (Naveh 1984). There are more species of edible plants, higher population densities of most vertebrate species, and thus greater potential for pre-agricultural human subsistence in the Mediterranean woodland than there are in the adjacent Irano-Turanian steppe (Danin 1995). The most common large mammal remains from Levantine Mousterian sites are ibex, mountain gazelle, aurochs (wild cattle), red deer, fallow deer, and wild boar, all species endemic to Mediterranean woodland habitats (Kingdon 1990, Qumsiyeh 1996, Shea 1998, Tchernov 1988).

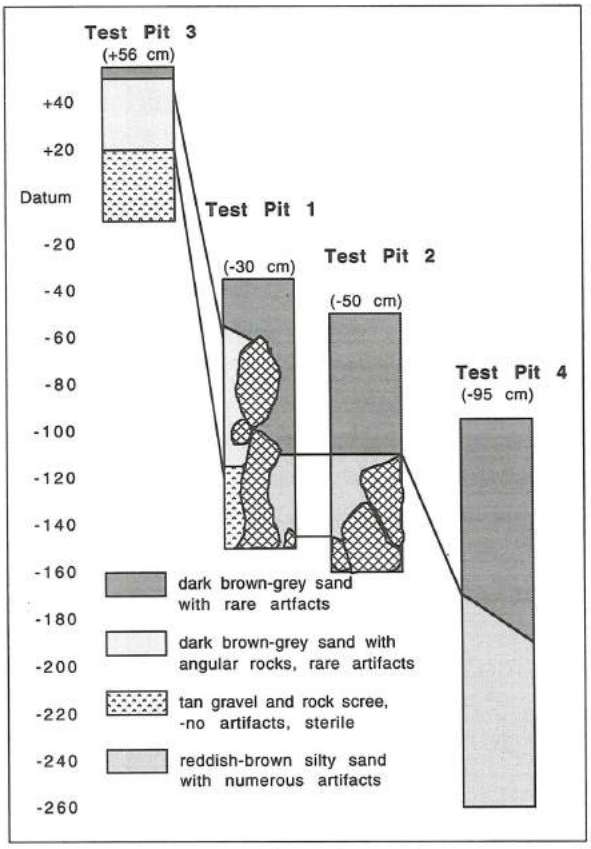
Pollen cores from the Jordan Valley, most notably the Amazyahu borehole, south of the Sea of Galilee, indicate that the Late Pleistocene climate of the Levant was considerably cooler, and episodically wetter, than it is at present (Horowitz 1987). Cooler and/or wetter temperatures would have expanded the southward and down-slope extent of the Mediterranean woodland beyond its restricted present-day distribution (Weinstein-Evron 1990). Consequently, it is likely that, unlike much of the rest of the country, northwest Jordan may have remained a permanent refugium for Mediterranean woodland biota. If this was the case, then northwest Jordan was probably a major focus for human settlement during Late Pleistocene times. Support for this hypothesis can be seen from the numerous finds of open-air sites Middle Paleolithic sites in Ṭabaqat Faḥl (Macumber 1992; Macumber *et al.* 1997), Wādī Ziqlāb (Banning and Fawcett 1983), Wādī az-Zarqā'(Baubron *et al.* 1985), and Wādī al-Yābis (Palumbo *et al.* 1990), and in the al-Ghawr (Muheisen 1988).

Our ultimate research goal is to identify a series of Middle Paleolithic sites arrayed along an altitudinal transect running west-east across northwest Jordan graben. In 1997, our work focused on sites at lower elevations. Of the sixteen sites examined in the lower reaches of Wādī al-Yābis and adjacent parts of the Wādī az-Zagh, ar-Raṣfa was the most promising locality, and therefore the logical focus for test excavations.

The ar-Raṣfa Site and Its Setting

The ar-Raṣfa Middle Paleolithic site occurs on a rocky outcrop on the southwestern side of the eponymous hill approximately N 32°24'15" by E 35°36'30" at an elevation of -37 m bsl. The nearest prominent architectural landmark is a hospital located about half-way between Merazza and ash-Shaykh Muhammed along the al-Ghawr highway (Fig. 1). The site was identified by tracing surface finds of rolled Middle Paleolithic tools upslope to their source on the summit of a bluff overlooking the lower reaches of the Wādī az-Zagh basin. Ar-Raṣfa is a natural basin approximately 100 m (N-S) by 60 m (E-W) on the southeastern slope of a limestone headland at an elevation of -37 m bsl. The northern and western margin of the site marks the articulation of limestone and conglomeratic deposits, while the eastern and southern margins are defined by steeply-eroded limestone escarpment featuring two prominent limestone pillars. The surface of the site appears relatively free of the large blocks that cover most other surfaces in the area, but there is no evidence of recent cultivation on the site.

Test excavations at ar-Raṣfa were carried out between 28 June-10 July, 1997, by a crew comprised of the author, Patricia Crawford (SUNY Stony Brook), and Yacoub Maryoud Oweis, Department of the Antiquities Representative from the 'Ajlūn Office. A systematic surface collection recovered more than a hundred lithic artifacts from ar-Raṣfa, of which the only typologically-diagnostic forms were those referable to the Levantine Mousterian (Levallois cores, retouched Levallois points). Our excavation strategy involved a West-East transect of four test pits, each of which was excavated by natural stratigraphy subdivided into 10 cm thick arbitrary levels (Fig. 2). Although bedrock was not reached in test pit 4, the stratigraphic similarities among these pits allows some general inferences to be made about the formation of the site. If the large boulders at the bottom of test pits 1 and 2 are bedrock, then this surface appears to be covered by a thin layer of gravel and angular rock scree. This scree is loosely consolidated and was probably exposed briefly before being buried by colluvial and alluvial deposits. The overlying reddish-brown (Munsell 5YR 5/4) sand/silt levels can be divided into a lower, more silty, unit of varying thickness that contains angular rock fragments and an upper, more sandy, unit with rounded cobbles and pebbles. Stone tools in the upper unit exhibited a mixture of fresh and semi-abraded surface conditions, as well as the characteristic white blanching that signifies prolonged exposure to sunlight. The lower unit, however, contained the overwhelming majority of stone artifacts, most of which were in fresh condition and unblanched, although many tools reacted visibly to exposure to sunlight during cleaning and labeling.



2. Schematic north profiles of test pits 1-4 arranged horizontally in relationship to datum.

In test pit 4, at about -120 below datum, a series of tan lenses were encountered. These lenses do not contain macroscopic carbon residues, but their association with burnt flints suggests these are diagenetically-altered hearths. Lithic artifacts were more densely concentrated in these levels than in overlying strata (60 per 10 cm unit, versus. 30 per 10 cm unit in overlying strata), but the sediment became increasingly hard with greater depth, slowing the pace of excavation, and resulting in the pit having to be closed before reaching bedrock. It is expected that future work at the site involving more extensive exposures will shed additional light on these levels. Unfortunately, neither bones nor macroscopically visible carbon residues were recovered by our excavations. Thus, lithic artifacts comprise the sole evidence of Levantine Mousterian activity.

The Lithic Assemblage

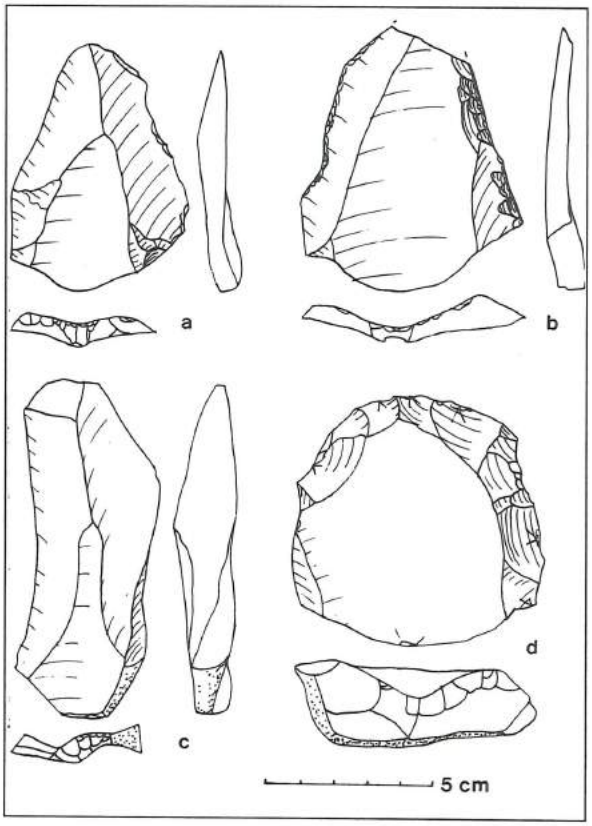
All of the lithic raw materials recovered from the site were made of flint. The most common lithic raw material is a distinctive tan/brown flint with red concentric rings

and superior flaking qualities. This material outcrops from Middle Cenomanian limestone near the site and can be found in the local conglomerate as well. Preservation conditions at the ar-Raṣfa site are excellent. The overwhelming majority (96%) of the 1238 artifacts recovered from excavation exhibit fresh, unabraded surfaces. That several sets of refitting stone tools have been found in the same and adjacent stratigraphic units, indicating a high degree of site spatial integrity.

Table 1 summarizes the frequencies of the major artifact categories for the ar-Raṣfa assemblage (see also Fig. 3). The lithic assemblage from ar-Raṣfa is essentially homogeneous, with no major techno-typological contrasts among the test pits or between stratigraphic levels, and thus, it is described here as an undifferentiated whole. (Only those whole flakes and flake fragments longer than 2.5mm are tabulated here.)

Table 1. Composition of the ar-Raṣfa assemblage.

Artifact category	N	% of total	% of subtotals
Cores	200	16	100
Levallois cores	116	9	58
Pebble-cores	50	4	25
Discoidal cores	35	3	18
Prismatic blade cores	13	1	7
Cores-on-flakes	20	16	10
Battered cobble	1	0.001	0.5
Whole flakes	789	64	100
>50% cortical flakes	256	21	25
<50% cortical	344	28	33
Non-cortical Flakes	186	15	18
Flake	485	39	47
Blade	211	17	20
Point	93	8	9
Levallois debitage	228	18	22
Levallois point	42	3	5
Levallois blade	26	2	3
Levallois flake	144	12	18
Retouched flakes	44	4	6
Flake fragments	249	20	100
Retouched fragments	30	2	12
Total artifacts	1238	100.0	



3. Selected lithic artifacts from ar-Raṣfa (a. Levallois point, b. Levallois point, c. Levallois blade, d. Levallois core).

Most cores are Levallois cores, that is, they exhibit a hierarchical division of surfaces into an upper flake release surface and a lower unexploited volume and the characteristic facetted eminence on their worked edge(s). Like many other Levantine Mousterian assemblages, the ar-Raṣfa assemblage contains a small number of prismatic blade cores. Although these are technologically prismatic blade cores, most are rather simple, single-platform cores that contrast typologically with the multi-platform blade cores typical of Levantine Upper Paleolithic assemblages. Ar-Raṣfa also features a sizeable proportion of pebble-cores. Commonly termed "choppers" or "core-scrapers", most such tools are too small to have been effective hand-held tools, and they are more realistically viewed as aborted attempts at

core reduction. No handaxes or handaxe fragments were recovered from excavation.

Although ar-Raṣfa was clearly the site of considerable flintknapping, no unequivocal hammerstones were recovered. The single battered cobble we recovered could be a hammerstone that was abandoned after a single large flake was detached, rendering it difficult to grip, or it could be a cobble that was "tested" for use as a core and rejected. Numerous rounded cobbles were excavated from the same levels as the stone tools, and it is possible that limestone and flint hammerstones that were used briefly may not differ morphologically from chert and limestone cobbles in the geological "background".

Among whole flakes, cortical flakes are about twice as abundant as non-cortical flakes, indicating a high incidence of primary lithic reduction on site. Oval and subrectangular shapes predominate among whole flakes, but blades are notably common as well. Many of the latter are "naturally backed knives" whose steep and asymmetrical dorsal cross-section suggest they are core-trimming flakes. Levallois debitage amounts to 22% of whole flakes, but only a small percentage of flakes are retouched (6%), characteristics that are consistent with a local abundance of lithic raw material (Rolland and Dibble 1990). A somewhat larger percentage of flake fragments exhibit retouch than do whole flakes, and in numerous cases, it is clear that the retouched fragment is part of a larger retouched tool. Two such tool fragments feature transverse burinations similar to those on chamfered endscrapers from early Upper Paleolithic contexts. The fragmentary character of retouched tools at this site could suggest ar-Raṣfa was a locality where use-exhausted tools were replaced with freshly-knapped replacements.

Table 2 summarizes the relative frequency of retouched tools from ar-Raṣfa. Retouched tools are relatively rare at ar-Raṣfa, accounting for only 7% of the debitage. Scrapers are the most common category (27%), followed by denticulates (14%) and truncated-facetted pieces. The truncated-facetted pieces listed here differ from cores-on-flakes in that they do not feature any secondary flake scars larger than 25mm. Most of these truncated-facetted pieces are facetted in such a way as to remove the flake bulbar eminence, a feature that may be related to fitting them into a handle.

Table 2. Retouched tool typology.

Retouched Tool Types	n	%
Scrapers	20	27
Transverse Scrapers	8	11
Side Scrapers	12	16
Denticulates	14	19
Truncated-Facetted Pieces	10	14
Combination Tools	7	9
Notches	6	8
Awls	4	5
Burins	3	4
Backed Knives	3	4
Other Retouched Tools	7	9
Total	74	100

Table 3 lists selected Bordian technological indices, the Levallois Index (IL), the Facetting Index (IF), and the Blade Index (I Lam) for ar-Raṣfa and three other Jordanian

Table 3. Bordian technological indices.

Site	IL	IF	I Lam
Ar Rasfa	30.5	49.0	26.7
Tor Faraj	9.3-13.8	46.5	5.4-26.4
Tor Sabiha	4.4	37.5	37.1
Ain Difla	7.0	64.7	41.8

Middle Paleolithic sites, Ayn ad-Difla/WHS 643 (Lindly and Clark 1987:286), and Ṭor Ṣabīhā and Ṭor Faraj (Henry 1995: 60). Levallois preparation is markedly more common at ar-Raṣfa, but in other respects, the ar-Raṣfa assemblage does not differ markedly from the other Levantine Mousterian sites in Jordan.

Discussion

To what extent is the assemblage from ar-Raṣfa similar to other Levantine Mousterian assemblages? In Middle Paleolithic research in the Levant, two metric indices have traditionally been used to establish the cultural affinities of Levantine Mousterian assemblages.

The two metric indices are (1) the variance of the midpoint width/midpoint thickness ratio (W/Th) for whole flakes and (2) the mean value of length to width (L/W) at the midpoint of Levallois points (Jelinek 1982). At Tabun Cave, and for the assemblages listed in Table 4, the variance of the midpoint width/midpoint thickness ratio for whole flakes differs markedly between Early ("Tabun D") and Late ("Tabun B/C") phases of the Levantine Mousterian. The corresponding variance statistic for ar-Raṣfa (2.82) is among the lowest known for a Levantine Mousterian assemblage, suggesting affinities the "Early Levantine Mousterian". This finding is not particularly surprising because assemblages with similar W/Th values are also known from sites in the central and lower Jordan Valley, such as WHS 634 and Abū Sif. However, the mean L/W value for Levallois points from ar-Raṣfa is relatively low (1.65), is uncharacteristically low for an "Early" Levantine Mousterian assemblage, and is instead comparable to those for "Late" Levantine Mousterian assemblages, such as Skhul B, Tabun I, Qafzeh, and Kebara. Thus, the ar-Raṣfa assemblage appears to combine in the same assemblage properties from opposite ends of the Levantine Mousterian cultural succession.

Table 4. Comparison of ar-Raṣfa to other Levantine Mousterian samples.

	Variance of W/Th for Whole Flakes	Mean L/W for Levallois points
Ar Rasfa	2.82	1.65
Early Levantine Mousterian		
Abu Sif C	1.73	2.69
Tabun IX	3.13	2.45
WHS 634 (Ain Difla)	3.24	3.07
Abu Sif B	3.34	2.70
Nahal Aqev 3	3.90	2.48
Tabun II	4.05	2.17
Rosh Ein Mor	4.24	2.41
Mean of "Early Mousterian"	3.38	2.57
SD	0.84	0.29
Late Levantine Mousterian		
Tabun I	5.05	2.16
El Wad G	5.69	1.92
Sukhba D	6.30	2.29
Tabun Chimney I-III	7.10	1.80
Kebara F (3)	7.13	2.12
Kebara F (5)	7.60	1.94
Qafzeh I	7.97	2.17
Kebara F (8)	8.17	2.07
Skhul B1	8.26	1.99
Qafzeh L	9.51	2.18
Skhul B2	11.41	2.10
Mean of "Late Mousterian"	7.65	2.07
SD	1.77	0.14

Sources: Jelinek (1994, 1982).

Recently, a third, non-metric, typological method has been proposed for assessing Levantine Mousterian cultural variability. This method focuses on the alignment of dorsal scar patterns on flakes. Different methods of recurrent core preparation leave correspondingly-different scar patterns on flake's dorsal surfaces. Because a competent flintknapper can produce points, blades, or flakes using any one of several recurrent core-preparation methods, modalities of scar patterns are thought by some analysts to reflect culturally-conditioned choices by prehistoric human knappers (Meignen and Bar-Yosef 1988: 82). Excluding so-called "primary elements" (n = 427 cortical flakes and core-trimming

flakes), the predominant dorsal scar patterns in the remainder of the ar-Raṣfa assemblage are unidirectional-parallel (34%) and bi-directional-opposed (30%). A predominance of unidirectional-parallel and bidirectional-opposed dorsal scar preparation typifies "Early" Levantine Mousterian assemblages, such as Tabun D and Hayonim E, Abū Sif, Nahal Aqev 3, and Rosh Ein Mor (Bar-Yosef 1995). Unlike these assemblages, however, ar-Raṣfa features high percentages of facetted striking platforms and relatively few elongated Levallois points and blades. Moreover, radial/centripetal and unidirectional-convergent patterns are present in substantial frequencies, 22% and 13%, respectively. This last observation, in particular, suggests that the ar-Raṣfa Levantine Mousterian assemblage exhibits considerably more variability than can be summarized merely by noting its affinities to one or another Levantine Mousterian assemblage group.

Conclusion

The 1997 excavations at ar-Raṣfa established that there are substantial and intact Middle Paleolithic sites in Northwest Jordan. The first of these to be excavated, ar-Raṣfa, appears to represent an "Early" phase of the Levantine Mousterian, although this characterization is complicated by the apparent late survival of "Early" Levantine Mousterian flintknapping traditions in the interior and southern parts of the Levant. At present, it is impossible to tell if ar-Raṣfa is chronologically-equivalent to such "Early" Levantine Mousterian assemblages from Mount Carmel and the Galilee as Tabun D and Hayonim E, which date to between 200,000-240,000 BP (Mercier *et al.* 1995), or if it is instead more closely related to sites from southern Jordan and the Negev, for which dates suggest an antiquity of 45,000-100,000 BP (Schuldenrein and Clark 1994; Schwarcz *et al.* 1979). Future work planned at this site will employ either radiometric methods to estimate its antiquity with precision.

What was the nature of the human occupation at ar-Raṣfa, and how was it related to regional patterns of human adaptation? Today, ar-Raṣfa is perched on a bluff overlooking the intersection of the Wādī az-Zagh and the al-Ghawr and the heavily-cultivated floor of the Baysān basin of the Jordan Rift Valley. During Late Pleistocene times, the Baysān basin would have been part of the Lake al-Lisān, an enormous, and probably brackish, body of water that filled much of the Jordan valley to a maximum elevation of -180 m bsl (Begin *et al.* 1974). Wādī az-Zagh and Wādī al-Yābis, which are now seasonal streams, would then probably have flowed perennially, charging the brackish lake edge environment with fresh water, and creating a highly-productive plant and animal communities analogous to marine estuaries. (Probably the nearest modern analogues for such conditions would be those in the Jordan River Nature Park, located at the northern end of the Sea of Galilee or the 'En Gedi Park, located on the western side of the Dead Sea.) Such trophically-rich micro-environments would have obvious attractions to human hunter-gatherer groups. Situated on a south-facing slope at least 140 m above the highest lake stand, and thus far above the insect "cloud", ar-Raṣfa would have been a favorable place from which to monitor game movements near the lake edge, and a convenient place at which to produce stone tools.

The occupation of the ar-Raṣfa site itself, and other sites nearby, may also have been related to the high quality of the Cenomanian flint outcropping near the site. The al-Lisān marls in the al-Ghawr contain rather small and low-quality flint nodules, mostly pebble-sized clasts near dry wadi courses. While suitable for microlithic tools, these nodules are poor media for the production of Middle Paleolithic tools. Moreover, a high lake stand would have

concealed many of the raw material sources near the lower reaches of wadis and in the al-Lisān marls. Groups frequenting the lake margins, and/or groups making seasonal residential movements between lowland and upland foraging areas may have visited sites like ar-Raṣfa to "stock up" on tools and tool materials. Future research in this area will need to examine other sites from similar altitudes as ar-Raṣfa as well as sites from higher altitudes in order to obtain a more complete picture of Levantine Mousterian lithic raw material economy.

General ecological and geographic considerations suggest that northwest Jordan should have been a major focus for human settlement during the Middle Paleolithic period. In terms of the Middle Paleolithic "cultural" landscape, northwest Jordan also occupies a key position between the more humid Mediterranean coastal lowlands and the steppic interior of the Transjordanian plateau. Ar-Raṣfa is but one of several other prospective sites in the Wādī al-Yābis and in other parts of the 'Ajlūn District. Future investigations of the Middle Paleolithic in this area will doubtless shed much-needed light on the character of Neanderthal and early modern human activities in Jordan.

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