

ARCHAEOLOGICAL RECONNAISSANCE IN THE AL-JAFR BASIN, 1997

by

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Introduction and Background

This paper briefly describes an archaeological reconnaissance conducted in the arid al-Jafr Basin of southeastern Jordan in the summer of 1997. The reconnaissance is an early phase of the al-Jafr Basin Archaeological Project, undertaken by the Lithic Technology Laboratory, University of California, Riverside, and designed to explore the prehistory of this empty quarter of Jordan. Initial observations showed that a very long prehistory exists in this region, one that is documented almost entirely by lithic technological traditions, the artifacts of which are the primary remaining surface deposits of cultural data.

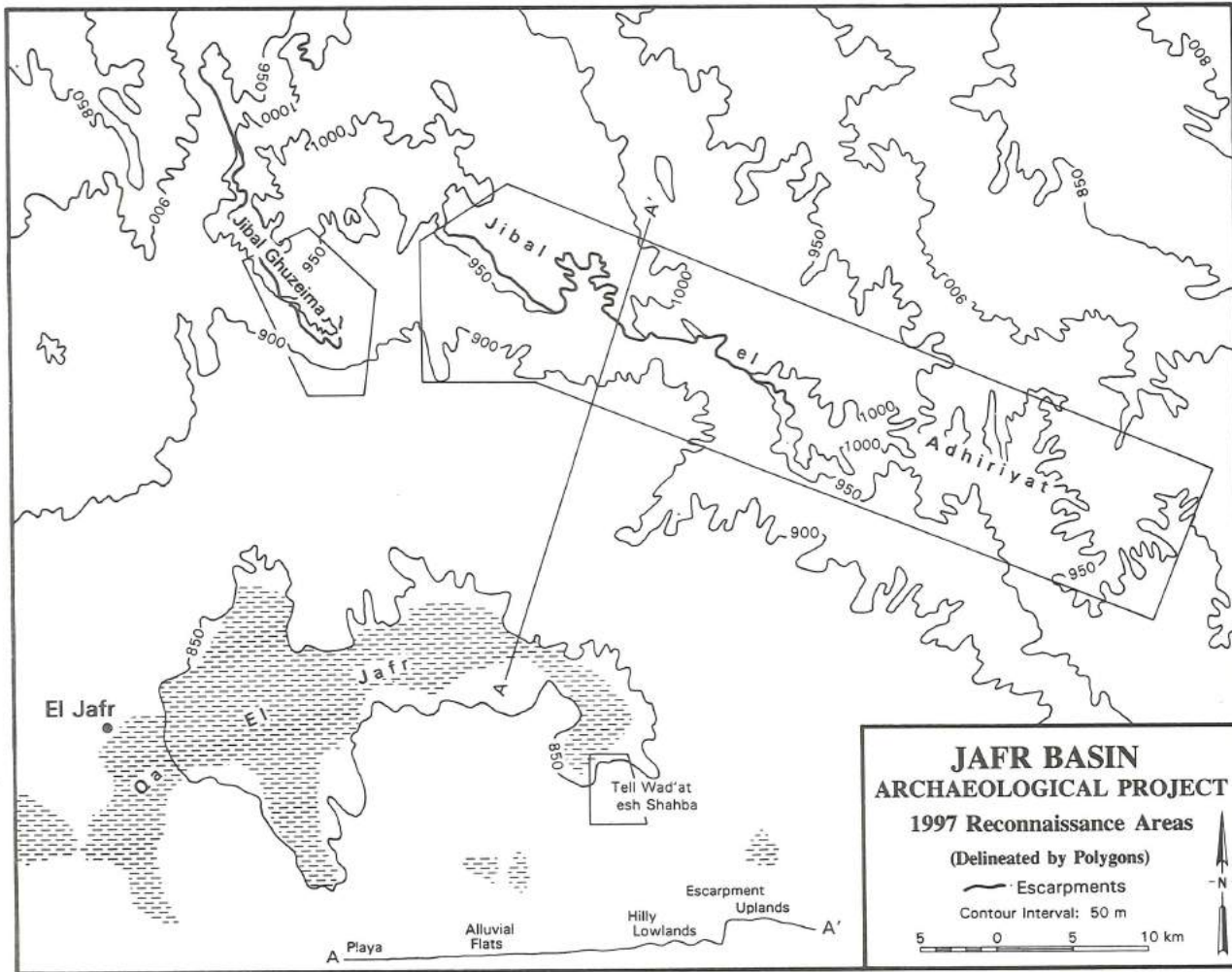
The goal of the al-Jafr Basin Project is to document long-term patterns of human use of the region and their relationships to ancient geomorphic zones, and to explore the significance of these patterns to the broad outlines of the prehistory of Jordan. The project focuses on the al-Jafr Basin because (1) this region provided ancient environments that were likely to have been extensively occupied for long periods of prehistory; (2) the current dryness (<50 mm annual precipitation) and remoteness of the region from most modern influences and economic developments are likely to have shielded archaeological sites from disturbance; and (3) this portion of Jordan remains essentially unexplored and undocumented archaeologically.

The al-Jafr Basin contains the most expansive enclosed drainage system in Jordan, encompassing 15,000 km² of the central plateau of the southeastern portion of the country (Bender 1975). In the center of the basin is Qā' al-Jafr, an enormous (240 km²),

dry mudflat, or playa system, the relict of a Pleistocene freshwater lake that is estimated to have been about 1,800 km² in area at its last high stand ca. 26,000 years ago (Huckriede and Wiesemann 1968; Bender 1975; fig. 1). During the Pleistocene, when favorable climatic periods gave rise to lake-stands, the region provided a rich lacustrine environment for human occupation.

Bordering the basin to the north and east are extensive uplifted sedimentary deposits, exposed portions of which range in age from Upper Cretaceous to Lower Tertiary. The uppermost exposure of the uplifted section consists of Paleocene and Eocene marls and limestones that comprise the Umm ar-Rijām formation (Fig. 2). The upper member of this formation contains extensive deposits of nodular flint. Elsewhere, notably flanking the ancient playa, are low-relief alluvial deposits of Pleistocene to recent age. Nine small and isolated basalt plugs occur along fissures in the uplands north of the playa (Kherfan 1987).

Only sparse archaeological exploration has been conducted in this vast area. It has consisted mainly of modestly recorded reconnaissances and observations, some made in the course of geological studies. Early archaeological field studies in the al-Jafr Basin and surrounding region (e.g., Rhotert 1938; Field 1960) documented the presence of numerous stone tools scattered on the surface of the desert pediments. Later research by Huckriede and Wiesemann (1968) noted a conspicuous Upper Paleolithic human presence in the basin and numerous Middle Paleolithic archaeological sites. Except for these studies, and a limited excursion by researchers from Japan (Fujii 1996),



1. Map of the northern portion of the al-Jafr Basin showing the relationship between the Qā'al-Jafr and the escarpments and associated uplands in the northern and eastern parts of the basin. Also shown are areas covered in the 1997 reconnaissance.



2. Western flank of Jibāl al-Khuzayma (Ghuzeima) showing relationship between uplands, escarpments, and hilly lowlands. Extensive flint deposits outcrop in the upper part of the exposed section comprising the Umm ar-Rijām formation, as seen in the foreground and on the isolated butte. The dirt track crossing the center of the photo ascends Jibāl al-Khuzayma via a low pass (Jibāl al-Khuzayma/Ghuzeima Pass) just to the right.

the archaeological record of the al-Jafr Basin remains almost completely unknown, lacking even a preliminary archaeological sequence. The present work in the al-Jafr Basin began with preliminary reconnaissance trips in 1993 and 1996, and continued with a more in-depth exploration in the summer of 1997 with the intent of expanding on these earlier works.

The 1997 Reconnaissance

The specific objectives of the 1997 reconnaissance were:

- (1) To locate archaeological deposits and examine them with respect to their geomorphic settings, including ancient lakeshore environments, nearby Quaternary landscapes, exposed Tertiary flint-bearing strata, and adjacent uplands, as well as seasonal watercourses that concentrate available rainfall.
- (2) To search for Paleolithic sites that might still be preserved and that attest to human occupation in the region when the Pleistocene lake and its related watercourses enriched the al-Jafr Basin.
- (3) To investigate the extent to which the southern desert region was used during Epipaleolithic times when the last waning, episodic lakestands existed, and during the Neolithic when the environment assumed conditions more like those of today.
- (4) To focus primarily on sites with lithic assemblages, since our expertise is in lithic technology, and on other sites likely to be related to these older manifestations.
- (5) Recognizing our limitations, to record the presence of later sites that might be present, but generally to leave their evaluation and study to others with the requisite interest and training.

We believe it important to note here that

the area has been used for considerable time by ancient and modern Bedouin groups, whose sacred places and burial cairns, or *rujum*, are to be respected and avoided. The locations and nature of these features are not important to the broader concerns of the al-Jafr Basin Project.

The area examined extended from the west flank of Jibāl al-Khuzayma on the northern rim of the basin southeastward approximately 50 km along Jibāl al-'Udhiriyyāt. A brief examination also was made at Tall Wad'at ash Shahbā (a landform; not an archaeological tall) on the east edge of the Qā' al-Jafr (Fig. 1). Geographically, attention was focused most strongly on two areas, the Jibāl al-Khuzayma region (map Jibal Ghuzeima, sheet 3251 II, 1:50,000), and the landscape along extensive southeast-trending escarpments of Jibāl al 'Udhiriyyāt that flank the northeast side of the basin, especially in the vicinity of Wādī al-Quwayr, the headwaters of Wādī Ukhayḍir al- Matāha, Jibāl al-Ghuwayr, and the crown of Jibāl al-'Udhiriyyāt (as identified on maps Wādī Ukheidir ed Duweimi, sheet 3351 III, 1:50,000, and Qi'ān Wad'a, sheet 3350 IV, 1:50,000).

The procedure employed in the fieldwork was not designed to make an intensive systematic survey, but rather to examine on a regional scale the nature of sites and their relationships to geomorphic features with the goal of delineating specific areas for more intensive survey and analysis in the future. The reconnaissance involved a vehicle survey and a pedestrian search of specific zones to locate archaeological sites and identify their distribution patterns. Site locations were plotted on topographic maps and fixed with a small Garmin global positioning system (GPS); observations were recorded in notes and photographs; official site record forms were not used in this preliminary search, and sketch maps were not drawn of specific sites. Detailed recording of sites will follow in later phases of the research.

RESULTS OF THE RECONNAISSANCE

Geomorphic Zones

The reconnaissance resulted in the identification of several discrete geomorphic zones that are useful for characterizing the occurrence of archaeological sites (Fig. 1, section A-A'). These zones are here recognized as follows: *uplands*, or mesas (generally about 1000 m elevation asl), of uplifted sediments that comprise the head-waters or catchments of wadis, many of which drain into the al-Jafr Basin; *escarpments* of about 950 to 1000 m elevation and about 50 m high that mark the edge of the uplands and provide an abrupt transition to the nearby lowlands; *hilly lowlands* of moderate relief, generally 900 to 950 m elevation, that occur between the elevated uplands and the *alluvial flats*; alluvial flats, 850 to 900 m elevation, that extend from the hilly lowlands to the edge of the *playa* system, or mudflats (ca. 850 m elevation), that mark the former bed of Pleistocene Qā'al-Jafr.

Archaeological Sites

The accessibility of both water and flint for human use are seen as major determiners of the locations of ancient human activity, and hence of the locations of archaeological sites. Deposits of high-quality nodular flint are exposed on the hills, in the faces and at the bases of the escarpments, in the uplands, and in areas of broken terrain near the escarpments. Many preserved sites then relate to the quarrying and reduction of flint for tools in these zones. Such sites attest to a very lengthy human occupation of the region.

Forty-five archaeological sites were recorded. A preliminary evaluation suggests that most of these reflect more than one archaeological expression, or component; only a few appear to be single-component sites. The discussion that follows considers the data in terms of components reflecting general archaeological periods and the geo-

morphic settings in which they were found. The classification of sites in technological stages or periods should be considered tentative and subject to revision based on further studies (Table 1). A significant issue that needs to be resolved is the difficulty of assigning surface assemblages particular chronological and technological classifications in the absence of other dating criteria.

Lower Paleolithic Components

Lower Paleolithic components were not abundant, and were identified at 8 sites, located mainly along the escarpments. These Lower Paleolithic deposits are all assigned to the Acheulean tradition, and are identified primarily by the presence of handaxes and cleavers. Isolated artifacts occur on the flanks of the escarpments and at Tall Wad'at ash-Shahbā, an isolated hill at the east end of the playa that marks a high shoreline of the ancient lake (Huckriede and Wiesemann 1968). One cluster of lithic scatters containing handaxes occurs on ancient terraces in a truncated wadi drainage, or box canyon, of Jibāl al-'Adhiriyyāt that probably once contained a spring. Field observations suggest that this canyon was evacuated over a long period of time by a discharging aquifer, rather than by downcutting of the drainage from atop the escarpment, so that Acheulean occupation in this area most likely occurred adjacent to a spring-fed stream. Sites recorded here include al-Jafr-31 (with 10 handaxes), -32 (with 9 handaxes), and -33 (with 5 handaxes, 4 of which are cleavers).

Middle Paleolithic Components

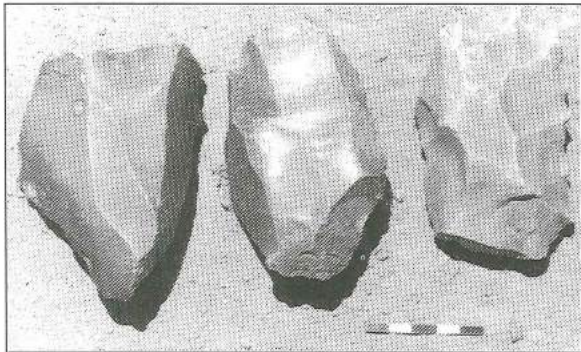
Middle Paleolithic components are abundant, appearing at 37 sites. These expressions are of two types. The first type (as at sites al-Jafr-9, -15, -38, and -43) includes assemblages of clearly recognized Levallois artifacts such as point cores, flake cores, points, etc. These artifacts were apparent as separate lithic scatters and isolates, and also

Table 1. Archaeological sites recorded in the 1997 reconnaissance and their preliminary classification.

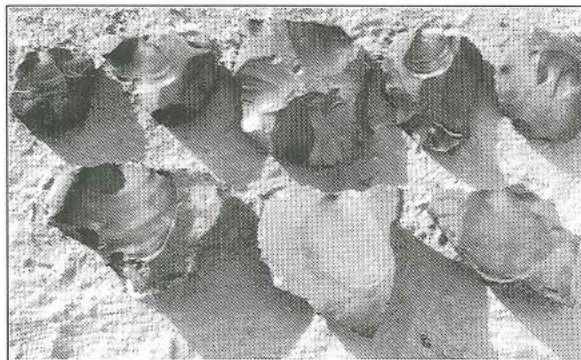
Site Zone	Quarry/ Workshop	Chronological Period						Comment
		LP	MP	UP	Epi	Neo	Other	
1 Escarpment	+	—	+	+	—	—	—	—
2 Hilly lowlands	+	—	—	+	+	—	—	—
3 "	+	—	+	+	—	—	—	—
4 "	+	—	+	+	—	—	—	—
5 "	+	—	+	+	—	—	—	—
6 "	+	—	+	+	—	—	—	—
7 Escarpment	—	—	+	+	—	—	—	—
8 Hilly lowlands	+	—	+	+	—	—	—	—
9 "	—	—	+	—	—	—	—	—
10 Uplands	+	—	+	—	—	—	—	—
11 Escarpment	+	+	+	—	—	—	—	—
12 Escarpment/Uplands	+	—	+	+	—	—	—	—
13 Uplands	—	—	—	—	—	—	+	historic?
14 Hilly lowlands	+	—	+	+	—	—	—	—
15 Uplands	—	—	+	+	—	—	—	—
16 Escarpment/Uplands	+	—	+	+	—	—	—	—
17 Uplands	—	—	+	+	—	+	—	petroglyphs, corral
18 "	+	—	+	+	—	—	—	—
19 "	—	—	+	+	—	—	+	petroglyphs
20 Hilly lowlands	+	—	+	+	—	—	—	—
21 "	+	+	+	+	—	—	—	—
22 "	—	—	+	+	—	—	—	—
23 Escarpment (base)	+	—	+	+	—	—	—	—
24 Hilly lowlands	—	—	+	+	—	—	—	—
25 "	—	—	+	+	—	—	—	—
26 Escarpment (base)	—	+	+	+	—	—	—	—
27 "	—	—	+	+	—	—	—	—
28 Escarpment	—	—	+	+	—	—	—	—
29 "	+	—	+	+	—	—	—	—
30 Escarpment (base)	—	—	—	+	—	—	—	—
31 "	—	+	—	—	—	—	—	—
32 "	—	+	—	—	—	—	—	—
33 "	—	+	+	—	—	—	—	—
34 Escarpment	—	—	+	—	—	—	—	rockshelter
35 "	+	—	+	—	—	—	—	—
36 Escarpment (base)	—	—	—	+	—	—	—	—
37 Hilly lowlands	+	—	+	—	—	—	—	—
38 "	—	+	+	+	—	—	—	—
39 "	—	—	+	+	—	—	—	—
40 Uplands	—	—	+	+	—	—	—	—
41 "	+	—	+	—	—	—	—	—
42 "	+	—	+	+	—	—	—	—
43 Hilly lowlands	—	+	+	+	—	—	—	—
44 "	—	—	—	—	+	—	—	—
45 "	+	—	—	—	+	—	—	—
Total components		8	37	32	3	1	2	

appeared at multi-component sites (Fig. 3). Levallois artifacts were widely distributed in the uplands and the hilly lowlands, and also at Tall Wad'at ash-Shahbā.

The other assemblage type (20 in number, as at sites al-Jafr-10, -12, -29, -35, and -41) is tentatively assigned to the Middle Paleolithic on technological grounds and consists largely of extensive quarry-and-reduction areas that are situated primarily along the escarpments. The chief characteristic of such sites is production of flakes "side-struck" from large nodules of flint (Fig. 4). Side-struck flakes usually are very broad, often are cortical, and tend to have hinge terminations. Such flakes left at the quarry sites generally are unmodified and very likely were rejected as tool blanks; however, some flakes are present that were retouched as scraping tools (Fig. 5). The nodules, which constitute a form of minimally prepared core, and the

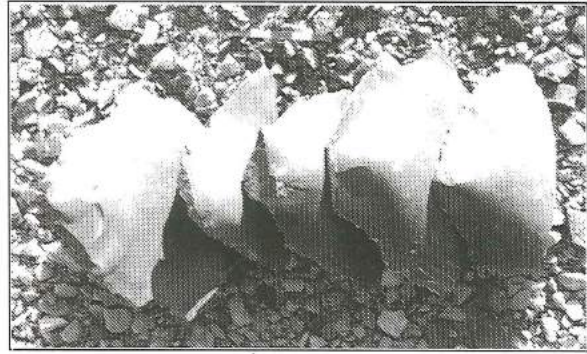


3. Middle Paleolithic cores and heavy scraper at al-Jafr-17. Here and elsewhere, centimeter scale.



4. Large Middle Paleolithic cores from which "side-struck" flakes were removed. Al-Jafr-12. Note scale at left.

1. We recognize the possible association of this technology to Chalcolithic/ Early Bronze "Fan-



5. Ventral view of large side-struck flakes; left and right specimens with faceted, convex platform preparation. Al-Jafr-10.

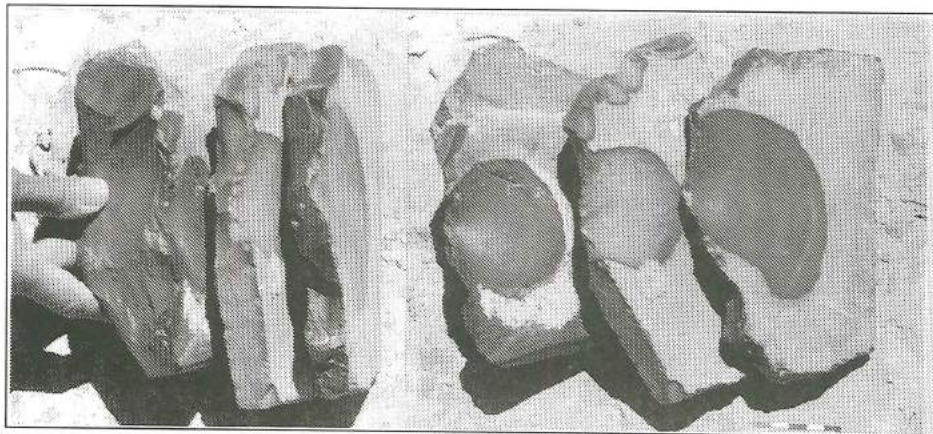
flakes struck from them, often both exhibit faceted convex platform preparation of the Levallois tradition (Fig. 6).¹ At large sites of this nature there are tens of thousands of such examples. Most sites are located at large outcroppings of flint nodules, generally where nodules of high-quality flint are exposed *en masse* on the surface of uplifted strata. These outcrops provided the basis for extensive quarrying and reduction of flint for tool blanks.

In addition to side-struck flake assemblages, many of these quarry sites also contain more traditional Levallois artifacts, and most of them also contain abundant blade-core production and reduction debitage. These blade-core assemblages are cautiously assigned an Upper Paleolithic age, as discussed below, but some may well be transitional Middle/Upper Paleolithic deposits.

Upper Paleolithic Components

Upper Paleolithic components are represented at 32 sites widely distributed in the uplands, along the escarpments, and in the hilly lowlands where flint suitable for blade-core production was available. In some cases (as at al-Jafr-1, -14, -27, -29, -30, -36, and -42) it appeared that the deposits were discrete components where one to many blade cores were prepared and reduced, and that the better blades were removed from the assemblages. In most cas-

scraper" production, but reject the possibility at present due to a lack of supportive data.

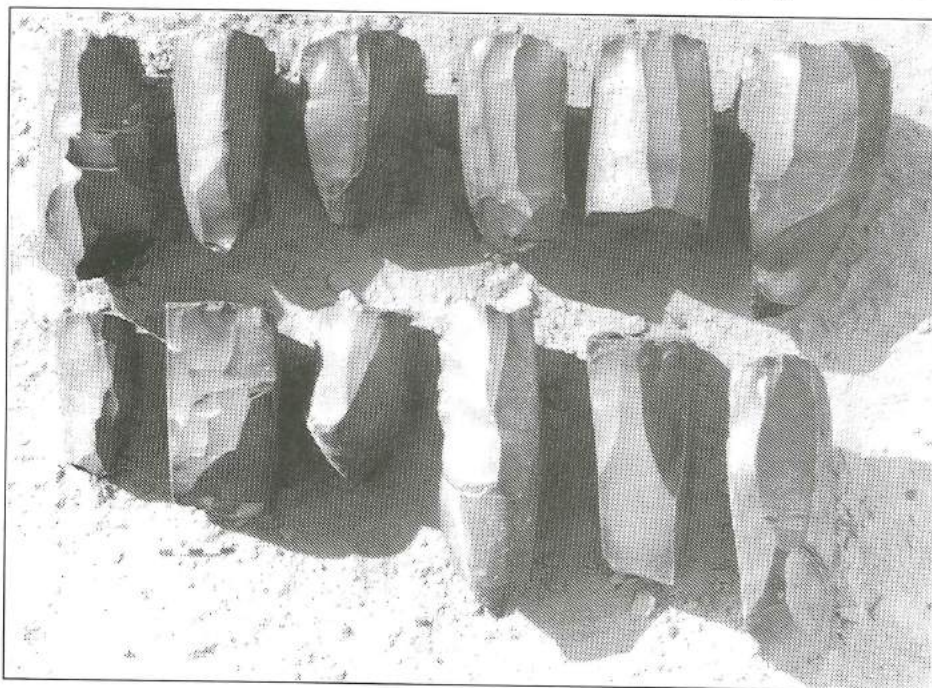


6. Platform and face views of side-struck flake cores showing faceted, convex platform preparation. Al-Jafr-1.

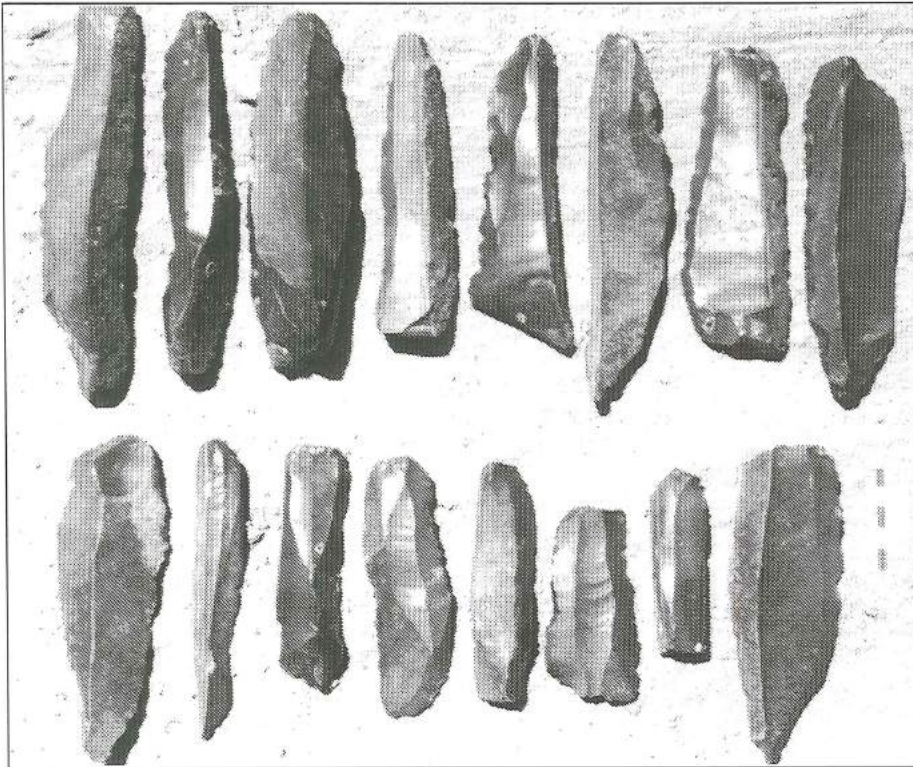
es (e.g., al-Jafr-5, -6, -8, -12, and -20), however, blade-industry assemblages were scattered over a large area otherwise dominated by the debris of Middle Paleolithic side-struck flake production. Assemblages assigned to the Upper Paleolithic include abundant blade-core production and reduction debris, including cores, platform spalls, initial cortical blades, crested blades, and regular blades, as well as flake cores, and tools such as end-scrapers made on blades. Spent blade cores left at such sites usually are single-directional, 10 cm or more long, and have single-facet platforms; some cores are bidirectionally opposed (Fig. 7). Blades usually represent early stages of core reduction, and are quite robust and

broad (Fig. 8). Most show no indication of platform isolation but were detached simply by striking the core platform a few millimeters behind one or two prominent ridges on the working face. Blade platforms are therefore very broad and thick.

It should be stressed that the attribution of these blade assemblages to the Upper Paleolithic remains problematic and requires further clarification. In view of the fact that they are undated surface manifestations, that they have not yet received intensive technological evaluation, that their association is so often with the prominent side-struck flake industry displaying Levallois technological features, and that certain ambiguity exists concerning blade production



7. Spent blade cores typical of Upper Paleolithic components. Al-Jafr-12.



8. Discarded, mostly early-stage, Upper Paleolithic blades. Al-Jafr-12. Table 1.

in transitional contexts, the possibility that some or all of the occurrences of this blade industry actually date to the Middle/Upper Paleolithic transition cannot be discounted.

Epipaleolithic Components

Components provisionally classified as Epipaleolithic were noted only at 3 sites (al-Jafr-2, -44, and -45) during the reconnaissance. One of these sites was located in the hilly lowlands near Jibāl al-Khuzayma/Ghuzeyma; while the latter two at the east edge of the al-qā' at Tall Wad'at ash-Shahbā are significant in that they occur along the last high mark of the Pleistocene lakeshore, as projected by Huckriede and Wiesemann (1968: map). It is noteworthy that two other Epipaleolithic sites located by Huckriede and Wiesemann during their geologic survey also occurred along this projected Pleistocene lakeshore. Assemblages observed in the present reconnaissance include small (bladelet) and large blade cores and many finely made, straight blades and bladelets. Large blades generally were detached from single-direction blade cores

made on thin, tabular pieces of flint. Bladelet cores are of both single-direction and opposed-platform configurations. A few burins on blades were noted also.

Neolithic Component

A single Late Pre-Pottery Neolithic B encampment (al-Jafr-17) was located in the uplands at the head of a tributary of Wādī al-Quwayr. The site is in an area of current Bedouin pasturage on the divide between the al-Jafr Basin and the drainage of Wādī Bāyir to the north. The main portion of the site contains a dense lithic assemblage that includes many naviform cores and single-direction blade cores, debitage from production and reduction of blade cores, burins, and other informal tools. There are indications that a buried structure may be present. About 100 m from the lithic scatter is a low rock corral about 10 by 20 m in size built into the slope of the tributary wadi. The corral is associated with a small assemblage of flakes of undetermined age, and its attribution to the Neolithic period is at present uncertain.

Nonetheless, the appearance of an LPPNB encampment in the southeastern desert of Jordan is most unexpected, and is suggestive of an early pastoral adaptation to the arid environment. About 200 m down the tributary of Wādī Quwayr is a group of petroglyphs, some of which may portray ibexes. Also at the same site is an Upper Paleolithic component marked by blade-core production and reduction debitage and many large blades, as well as a Levallois point core.

Other Finds

Additional undated sites and cultural features noted during the reconnaissance include many unrecorded burial cairns, or *rujum* (many with Safaitic [?] and Arabic inscriptions), usually on prominent topographic features such as the edges of escarpments, some of which may be of quite recent age, petroglyphs (at al-Jafr-17 and -19) of undetermined cultural association in the uplands, and some enigmatic rock structures.

Most notable of the sites with structures is al-Jafr-13, inconspicuously positioned in an upland drainage basin on Jibāl al-Khuzayma/Ghuzeima. It is a very large building complex distributed over perhaps 6-8 ha. Surface features include 12 low, rectangular, stone enclosures containing about 30 apparent dwellings, many of which are semi-subterranean with very low walls made of irregular blocks of limestone and large flint nodules. Also present are two large rectangular pavements of massive flint nodules, a stone corral, at least two structures for communal functions (?), one of which appears to be a "desert mosque." The mosque is a rectangular enclosure a single tier of rocks high that contains a niche in the middle of the south side with Arabic inscriptions on prominent stones. An apparent entrance to the structure is on the opposite wall. There is also a small rectangular building with well-preserved rock walls about one meter high. The site is devoid of artifacts, and there are

indications that in the past it was accessible only via a camel track. It is possible that this site represents a military encampment used in the recent past prior to the appearance of modern vehicles.

Concluding Remarks

Future work of the al-Jafr Basin Project will include additional observations on the sites located during the 1997 reconnaissance and a detailed recording of them; technological analysis of the lithic assemblages discussed above, and more detailed archaeological surveys of selected geomorphic zones. This next phase of the project is scheduled for the spring of 1999.

Specific investigations will focus on patterns of settlement adaptation within the geomorphic zones in the basin, including their relationships to the recurring appearance of the ancient lake and associated watercourses, and to exposures of tool stone. Lower Paleolithic settlement patterns in the al-Jafr Basin are essentially unknown, and more intensive search will be necessary to augment the number of known sites and their distributions. An important aspect of future work will be the search for sites with buried components, especially single-component sites and those with intact stratigraphy, possibly preserved in rockshelters or exposed in cutbanks, that will help to sort out the chronological problems associated with the Middle and Upper Paleolithic periods. Also of concern are the conspicuous exploitation of flint for side-struck flakes and for blades, and verification of the cultural periods to which these industries are currently attributed. Clarification is needed on the significance of the nearly complete co-occurrence of currently classified Middle Paleolithic and Upper Paleolithic components at quarry sites in the region. Detailed technological analyses of these assemblages will be of value in this regard. The apparent sparse Epipaleolithic occupation of the northern basin in general, and the limited as-

sociation of Epipaleolithic sites with ancient lakeshores and watercourses in the al-Jafr Basin remain problematic and require further inspection of these regions. Early pastoral adaptations in the northern uplands during the Neolithic period are suggested at al-Jafr-17, and it is hoped that additional related sites can be found with more intensive surveying. Finally, the cultural affiliations of rock art and the many inscriptions in the uplands bordering the al-Jafr Basin require documentation and analysis.

Our success in locating archaeological sites in the al-Jafr Basin was enabled by the extraordinary conditions of preservation. There has been little economic development, modern land-use has not heretofore been intensive, and the region is remote and relatively inaccessible. Because of the abundance of flint on the surface in many places, ancient archaeological surface assemblages appear not to have been gleaned as resources for tool production by later peoples. Combined, these factors have left an ar-

chaeological record that is largely unchanged and essentially frozen in time. These circumstances make the al-Jafr Basin a very unique and important region for studies of the earlier periods of prehistory.

Acknowledgements

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