WADI AL-ḤASA PALEOLITHIC PROJECT-1992: PRELIMINARY REPORT

by
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The third season of excavation and survey conducted under the aegis of the Wadi al-Ḥasa Paleolithic Project (WHPP) took place between 11 February and 8 April, 1992 (see Clark *et al.* 1987 for a summary of previous work). There were three major aspects to the current research program: 1) continued excavation of the 'Ain Difla rockshelter (WHS 634), in Wadi 'Ali, 2) the initial season of survey on the north bank of Wadi al-Ḥasa, and 3) horizontal expansion of the 44m trench at WHS 1065 (E Ḥasa). With the exception of WHS 634, the sites discussed here are located in Fig. 1.[1]

WHS 634

The 'Ain Difla rockshelter (WHS 634) was located by Burton MacDonald's Wadi al-Ḥasa Survey (WHS) in 1982, and was tested previously by Clark in 1984; and by Clark and Rollefson in 1986 (MacDonald 1988; Clark 1984. Clark *et al.* 1987; Lindly and Clark 1987). Three major excavations have been conducted so far at the site, labelled Trenches A, B and C (Pl. I). The earlier tests produced some 12588 artifacts (4159 in 1984, 8399 in 1986) pertaining to a Tabun Type D, elongated Levallois Mousterian assemblage, with lots of points but with almost no retouched artifacts (Jelinek 1983; Marks 1983). These excavations did not penetrate below *ca.* 1 m from the surface of the deposits, which was variable from one unit to the next because of irregularities in the original floor of the rockshelter. A burnt flint sample from the 1984 excavations produced a thermoluminescence (TL) date of 105 ± 15 kyr BP (Oxford University Laboratory for Isotope Geochemistry). It should be noted that this date is from the uppermost levels in the deposit, and can be considered to date only the latest phases of Mousterian occupation. The 1992 campaign yielded an additional 6574 lithic artifacts, bringing the total for all three field seasons to 19132, surely one of the larger Middle Paleolithic assemblages known from 'modern era' excavations in the Levant.

The 1992 excavations sought to deepen the exposure, hopefully reaching bedrock. Combining the three field seasons, we excavated a maximum of 20 levels in 10 cm arbitrary units, for a total depth of 1.10 m. This depth was reached only in Units E49/N52 and E50/N52 in Trench A. In Level 20, we were still recovering a similar kind of Tabun D Mousterian, characterized by the distinctive elongated Levallois points. However, further analysis of artifacts, to be conducted this year at ASU, might show some of the same time trends recorded at Tabun and/or other kinds of vectored changes in blank metrics. As is well known, blank metrics are thought to be temporally sensitive at the Tabun type site on Mount Carmel (i.e., an approximate age can supposedly be assigned to the deposits, using the metrical characteristics of complete flakes and blades >2 cm long). At the urging of project geomorphologist Joseph Schuldenrein (Geoarchaeology Associates, Inc.), a secondary objective was to recover more burnt flint

1. The survey and excavation team was directed by G.A. Clark (Arizona State University), and consisted of J.M. Potter (ASU), M.P. Neeley (ASU), A. Aplin-Curtis (ASU), J.D. Peterson (ASU), C.P. (Molly) Davies (University of Maine), A. Ford (University of London), S. Counce (Southern Methodist University) and S. Randell (University of London). Also participating were M.R. Gonález Morales (Universidad de Cantabria), an expert on the European paleolithic and mesolithic, and J.Schuldenrein (Geoarchaeology Associations, Inc.), the project geomorphologist. B. MacDonald (St. Francis Xavier University) and K.'Amr (Department of Antiquities) analyzed the pottery from those survey sites that produced it. J. Darwish (Buseira) was the Department of Antiquities representative assigned to the project.

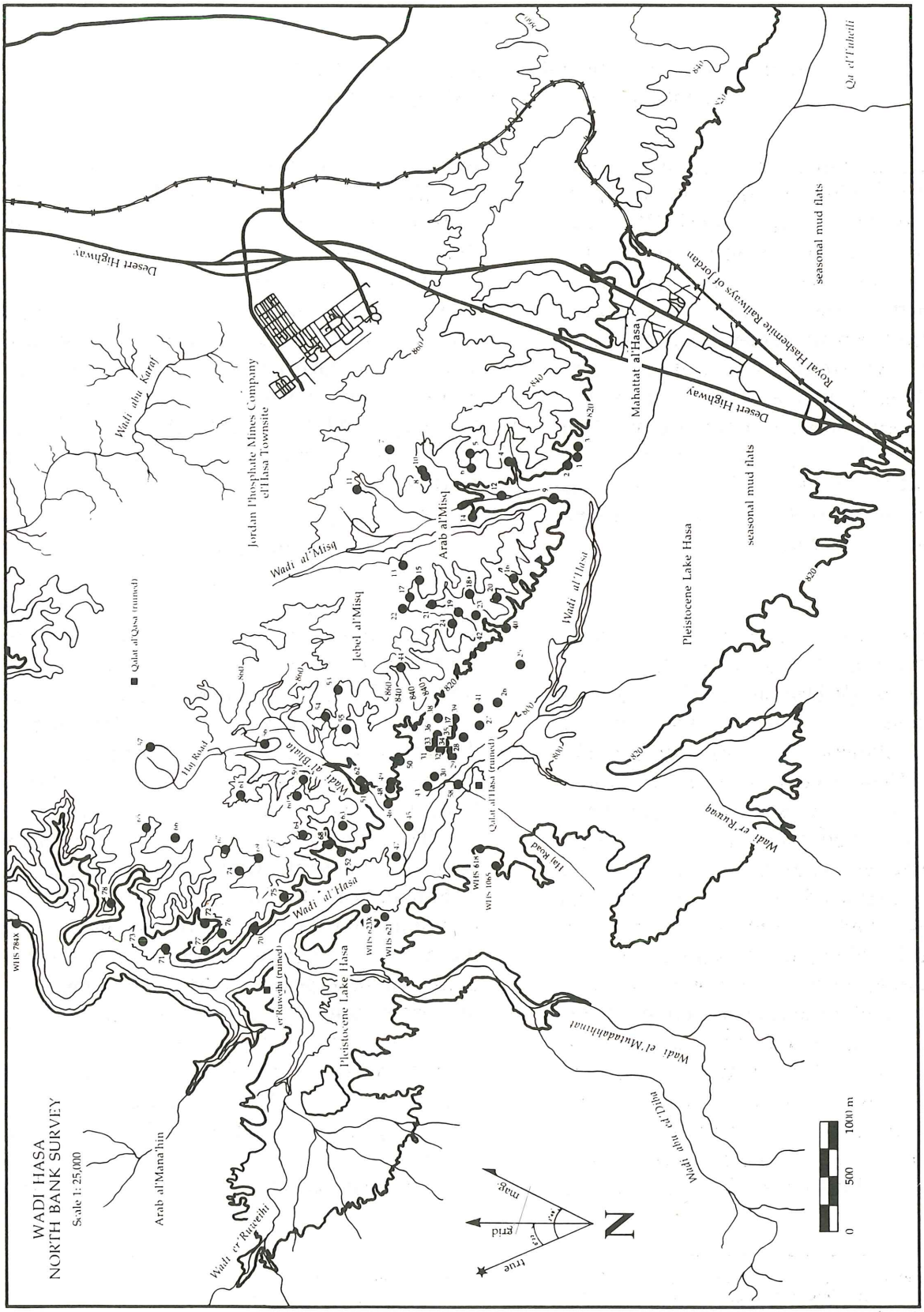

Fig. 1. Sites recorded by the Wadi al-Ḥasa North Bank Survey (WHNBS), 1992. The locations of Wadi al-Ḥasa Survey (WHS) Sites 1065, 618, 621, 623X and 784X, on the south bank, are also shown. Source map is the al-Hamdiya sheet, Royal Geographic Society, 1989 Series (scale 1:25,000, contour interval 10 m).

for additional TL dates. This was done, and we hope to have more dates by the end of the year, either from Oxford, or from Beta Analytic, a commercial laboratory in Florida. *Even with the one determination, however, WHS 634 is the oldest dated site in Jordan.* Its 6 or 7 meter stratigraphic section presents the exciting possibility of a Middle Pleistocene age for the deepest deposits, on the order of 250 kyr BP.

A 7 m long, 4 m deep geological trench (Trench C) was also excavated in the talus slope below the main excavation (Trench A). This revealed a fragment of what is probably the Middle Terrace of Wadi 'Ali (3-7 m above the present wadi bed), and a series of alluvial deposits, overlain by a talus scree. All deposits, including the terrace remnant, produced artifacts, as did Trench B, a 4 m long sounding located in the talus deposit on the right (NE) end of the rockshelter. Here little stratigraphy was discernible, but the deposits continued to yield the same Mousterian assemblage noted elsewhere in the site. No later archaeological remains (e.g., Upper Paleolithic) were noted in any of the three field seasons (1984, 1986, 1992).

In terms of the formation processes at the site, we excavated nearly 20 small, oval hearths in Trench A during the 1992 field season alone, probably indicating ephemeral and sporadic human use/occupation of this part of the shelter over a very considerable period of time. We owe the preservation of the site to a wedge of colluvium that accumulated in the NE corner of the rockshelter, and that protected a small part of its fill (what we call the site) from subsequent erosion by Wadi 'Ali (Fig. 2). It is possible that there was a permanent watercourse in the wadi bed, at least during mesic intervals.

Geoarcheological investigations at WHS 634 offered preliminary indications of a substantial spring in the immediate north-northwest of the site and at its same general elevation. A prominent series of stepped blocks of tufa spanned the colluvial slopes grading down to the general base level of the regional drainages. The tufas are massive and represent remnant springs that appear to be, in part, contemporaneous with the surfaces and occupations at the rock shelter. At present neither the ages nor the duration of spring activity can be determined, but specimens of the calcareous sediment are being prepared for Th/U dating at McMaster University in Hamilton, Ontario, Canada. Estimates of age equivalence between the ancient springs and occupations are bolstered by analogous regional Mousterian site settings in the central Negev highlands, some 100 km due west of site 634. There similar tufa-traverting complexes have been dated to between 258,000 and 85,000 years ago by Th/U methods (Schwarcz *et al* 1979). Research at these Negev sites and elsewhere in the Near Eastern desert plains has suggested that Mousterian age terraces were forming between 85,000-70,000 B.P. (Goldberg 1976, 1981); typically such settings are characterised by tufa and terrace complexes similar to the one identified in the Wadi 'Ali.

Geomorphic inspection of settings along the Wadi 'Ali upstream of site WHS 634 revealed a series of three Pleistocene terraces overlooking the present channel. The highest of these is a semi-continuous fluvial terrace at elevations of 12-20 m above the present channel bed. The terrace typically consists of a series of sandy silts, clays and gravels interdigited with poorly sorted colluvium. The alluvium was also recognized in the basal sediments abutting the mouth of the rockshelter, where it is mixed with roof spall and colluvium associated with the weathering along the mouth of the rockshelter. The intricate sedimentary sequence at WHS 634 represents cyclic contributions of stream and locally weathered cave mouth debris that should, with subsequent analysis, facilitate systematic reconstruction of site formation history and local and regional paleoclimatic changes.

Work at WHS 634 is not finished. We still need to improve the stratigraphic sequence, hopefully excavating Trench A (or parts thereof) to bedrock. The 1992 season should vastly improve the TL chronology for the site, since dating is a high priority. A column of pollen samples was taken in N50/E53; it and

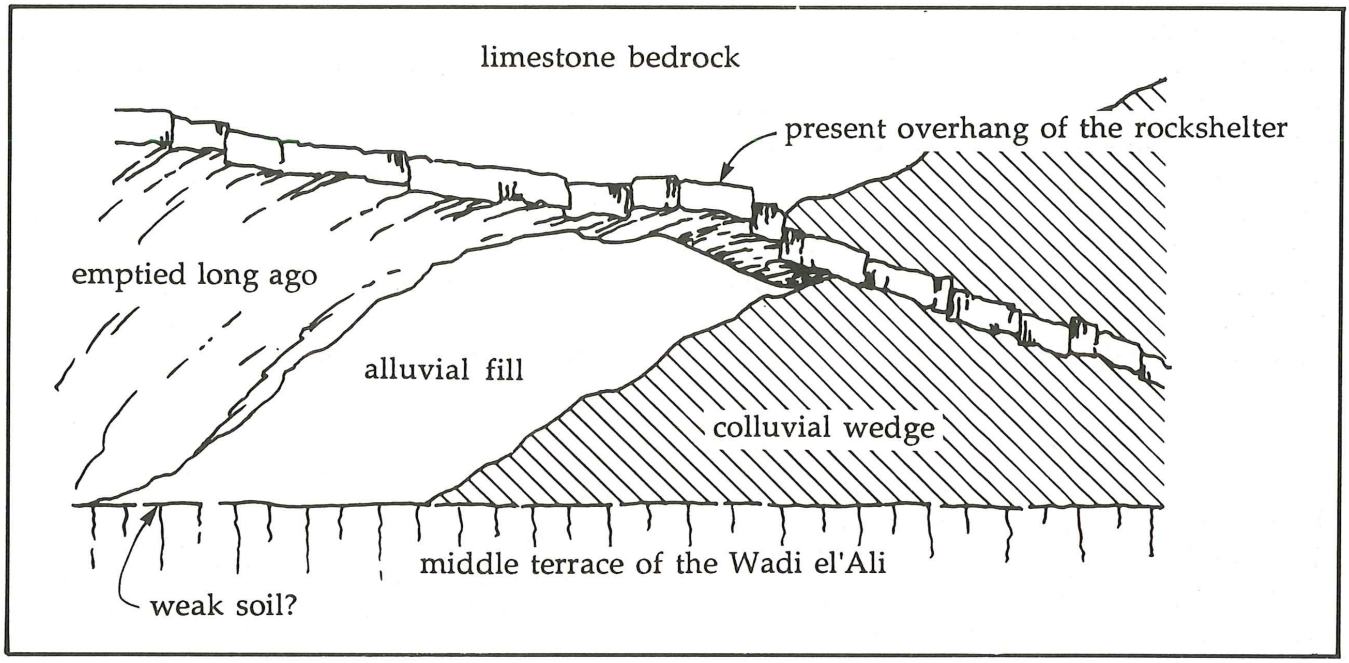

Fig. 2. WHS 634: Schematic diagram of the major depositional units. The site comprises a pocket of interstratified alluvial and colluvial sediments formed in the NE corner of a large, shallow rockshelter, *ca.* 150 m long, most of which was emptied long ago by fluctuations in the course of Wadi 'Ali *(cf.* Pl.I). During the interval of human use/occupation of the rockshelter, the Wadi 'Ali floodplain was probably as much as 12 m higher than at present.

numerous sedimentological samples will be analyzed later by Geoarchaeology Associates Inc. There are, as yet, no clearly defined living floors, but rather a series of small, ephemeral fragments of surfaces, marked by the presence of the casual hearths mentioned above. These hearths testify to the habitual human use or control of fire by *ca* 100 kyr BP. Site contextual integrity is high (i.e., it is possible to refit cores), and there are, in addition to the hearths, a few features (e.g., there is a discernible pit in the E section of E50/N52). Bone preservation is generally poor, but ibex, gazelle and at least two equid species have been identified so far on the basis of teeth.

WHS 634 is one of only two stratified Middle Paleolithic rockshelters in Jordan; the other is Tor Sabiha, located in Wadi Ḥisma, in southwestern Jordan (Henry 1982). Undated Layer C at Ṭor Ṣabiḥa has also produced a Tabun Type D assemblage, thought to be correlated on paleoenvironmental evidence with relatively cool, dry conditions documented in the Negev at about 60-55 kyr BP (Marks 1981a).

Wadi al-Ḥasa North Bank Survey (WHNBS)

With the Department of Antiquities approval, we also initiated an intensive (*ca.* 100%) survey of the north bank of Wadi al-Ḥasa, beginning at its eastern terminus just west of the Desert Highway (Fig. 1). Our intention here was to completely survey about a 16 km^2 area, extending westward some 8 kms from the road, and north at least 2 kms. This effort produced 78 sites, dominated by stone age material. Only 18 sites (23%) produced ceramics and/or had distinctive architectural remains. These were dominated by Late Byzantine/Early Islamic (7 sites, 39% of ceramic total), and a scattering of Roman (2.11%), Nabataean (1.5%), Ayyubid/ Mamluk (5.28%) and Ottoman (3.17%) sites. Many sites with and without architecture were multicomponent. Of considerable interest was an enormous circular stone enclousre (WHNBS Site 57), some 400 m in diameter, that was a possible trading compound *(serat al-heran* - baby camel surround - in Arabic). This structure is so large that it shows up clearly in aerial photographs and 1:25000 scale maps. It is associated with the

Ḥaj road, but was constructed and used much earlier (it has produced Chalcolithic, Early Bronze, Iron Age 2, Roman and Late Byzantine sherds).

The remaining 60 sites (as well as some of the ceramic sites) yielded collections of lithic artifacts. These are generally found on top of alluvial fans extending down from the southern slopes of Jabal al-Misq, although they sometimes occur eroding out of the lacustrine marls formed by Pleistocene Lake Ḥasa, which appears to have reached a maximum elevation of *ca.* 815 m asl, probably at some point relatively early in its formation (Fig. 3). The lake is thought to have been in existence between *ca.* 70-12 kyr BP, and was essentially contemporaneous with the Lisan Lake (Schuldenrein 1983). Like the Lisan Lake, it was alkaline throughout much of its existence, and evidently became more alkaline over time. Its end was different than that of Lisan, however, since it was probably breached and drained by headward erosion of the developing Wadi al-Ḥasa system at some point about 15-12 kyr BP. Its disappearance was likely more of an 'event' than a 'process,' and drainage could have occurred fairly rapidly, possibly aided by faulting (a number of shear faults can be observed in the eastern end of the wadi in what would have been the northeastern corner of the lake) (Clark 1984). Although ancient stone artifacts sometimes occur on alluvial fans at elevations below 815 m, sites with some degree of compositional integrity appear to be found *only at or above* that elevation. Moreover, those tested in 1984 do not postdate the Natufian (*ca.* 12.5-10 kyr BP — Henry 1989), implying that the lake had ceased to exist after about 10 kyr BP. The high elevations of Jabal al-Misq are covered in a flint-rich gravel scree in which there is a continuous light scatter of deflated, heavily patinated, wind-polished artifacts. These tend to be ancient (i.e., Lower and Middle Paleolithic, sometimes Upper Paleolithic) and were associated with vanished landsurfaces that existed some 10-20 meters above those of the present day.

It is of some interest to note that Pleistocene Lake Hasa might have been considerably larger than the *ca.* 50 km^2 originally estimated (*cf.*Clark 1984). A reconnaissance of some of the northern tributaries of Wadi al-Ḥasa revealed the presence of thick marl remnants stuck to the valley walls far upstream from those reported earlier. With flat, accordant summits at *ca.* 820 m asl, they correspond almost exactly in elevation to the marls noted at the eastern end of al-Ḥasa, and almost certainly represent the same set of paleogeomorphological processes. Lacustrine marl remnants were noted in the al-Ḥasa drainage as far west as its confluence with Wadi Aḥmar.

The 1992 survey identified 93 components distributed across the 60 lithic sites (x=1.55), with undifferentiated Lower and Middle Paleolithic sites (8 sites, 8.6% of lithic total), and more or less discrete Lower (6.6.4%) and Middle (27.29%) Paleolithic scatters dominating numerically. These frequencies resemble those found in the eastern third of the wadi by MacDonald's Wadi al-Ḥasa Survey (WHS, 1979-1983). In general, the excavation potential of these heavily deflated, derived sites is low to nil, but there are exceptions (e.g., MacDonald's WHS 621 which, although slighly derived, nevertheless represents an assemblage with a high degree of compositional integrity).

Of considerably interest is a respectable number of Upper Paleolithic sites (25, 27%) which were not reported in Jordan until MacDonald's survey (Clark *et al.* 1988), but which have subsequently been shown to be well represented in the al-Ḥasa drainage, and in Wadi Ḥisma (southwestern Jordan) (Henry 1989). Long neglected, the Upper Paleolithic has come under considerable scrutiny in recent years, and a conference at the University of London (24-26 March, 1987) initiated what might be called 'the modern synthesis' of this analytical unit, resulting in the creation of two 'kinds' of Levantine Upper Paleolithic: 1) the Ahmarian (after 'Erq al-Aḥmar, in the Judean Desert), dominated by blades and increasingly microlithic over time, and 2) the Levantine Aurignacian, which corresponds to Garrod's old taxon but which is essentially a flake industry (Bergman and Goring-Morris 1987). Most of the eastern Ḥasa sites are Ahmarian in normative terms, although Levantine Au-

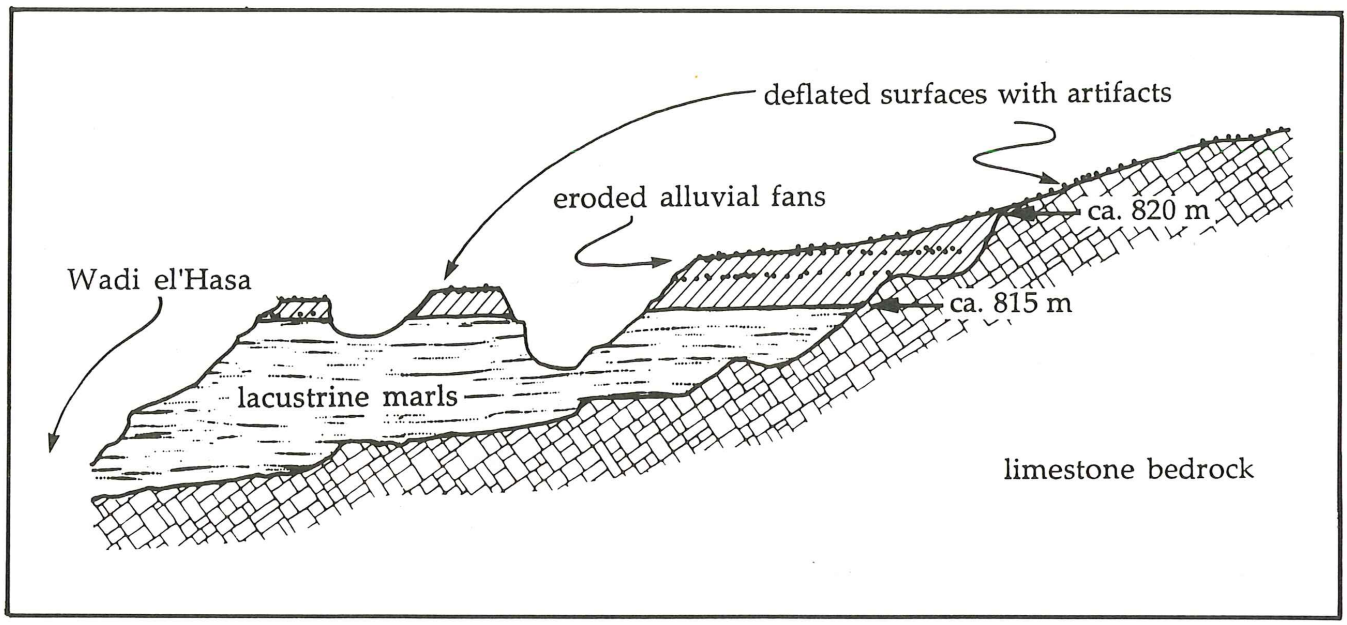

Fig. 3. Schematic diagram of the major stratigraphic units in the eastern end of Wadi al-Ḥasa along a NE/SW transect that runs through Qal'at al-Ḥasa, and that parallels the Ḥaj road.

rignacian sites are known from the MacDonald survey, and also from Marks' work in the central Negev Highlands (although they were not recognised as such at the time they were discovered in the late 1960s — Marks 1981b; 1983).

The survey also produced 10 (11%) Epipaleolithic and 14 (15%) Pre-pottery Neolithic (PPN) sites. Work at WHS 1065 (see below) has identified a multicomponent Kebaran and Natufian site radiocarbon dated to 16.9-15.6 kyr BP (Clark *et al.* 1987). One of the epipaleolithic, and two of the PPN sites discovered this year appear to have stratified *in situ* deposits that would probably repay excavation or testing. Epipaleolithic systematics were essentially developed and refined on the Levantine coastal plain (e.g., Bar-Yosef 1970 *et seq.),* and work in Jordan has already gone a long way toward changing the conventional picture of patterns of variability in this interesting analytical unit (Wadi al-Ḥasa, Wadi Ḥisma, Azraq Basin, Wadi Jilat) (Olszewski 1991; Henry 1991; Donaldson 1991). As for the PPN, the 1992 discoveries include the first PPN site (WHNBS 8) in the easternmost reaches of the wadi, although the 1979-1983 survey located a few of them on the south bank in the middle course of al-Ḥasa (Widyan Ja'is, Anmayn, 'Ali). As was true of the Upper Paleolithic sites, those of the epipaleolithic and PPN tend to be closely associated with Lake Ḥasa, and with fossil springs the remnants of which can be found around the northern end of the lake at *ca.* 820 m asl. The sites seem to occur stratified in the marls (usually within about 5 m of their summits, (i.e., 815-810 m). They are not common on the alluvial fans. WHS 1065 is associated with a collapsed rockshelter, and is found in interstratified colluvium and lacustrine marls. At the rear of the rockshelter remnant is a classic tufa, characteristic of a fossil spring.

The WHNBS recorded detailed elevational data, site dimensions, name (if any), how a site was collected (i.e., sampling strategy), specimen numbers coded to individual collection units, UTM and Palestine Grid map coordinates, site functional categories (28 types), site cluster types (if applicable — 7 types), features (i.e., isolated structures — 13 types), surrounding terrain (12 types), present surface characteristics (7 types), drainage rank (4 types), nearest water sources (8 types), culture/stratigraphic (temporal) affiliation (24 periods), and the presence/absence and characteristics of any stratified deposits. These data have not been analyzed yet.

WHS 1065

During the last two weeks of the 1992 season, test excavations were undertaken at WHS 1065, an epipaleolithic site in the eastern Wadi al-Ḥasa located by the MacDonald survey in 1982. This site had been previously tested by a series of eight 5 m, and one 4 m step trenches that bisected the site and ran from the marls below it to the collapsed rockshelter and spring with which it is associated (Clark *et al.* 1987; Coinman *et al.* 1989). The 1992 excavations planned to use information from these trenches to structure our research questions. The aim of the 1992 excavation was twofold: 1) we hoped to open up some horizontal areas of the site, with the possibility of identifying living surfaces or structural remains, and 2) we thought that additional excavation might enable us to discern discrete phases of epipaleolithic occupation (i.e., the Kebaran and Natufian components identified by means of *fossiles directeurs* in Clark's 1984 excavations).

In order to address these issues, two 2×2 m units were opened on either side of the 1984 trench. One was situated off Step B (5-10 m from the top of the trench) while the other was off Step C (10-15 m from the top). It was thought that areas further downslope probably consisted of deposits derived from upslope and that the uppermost areas comprising Step A (0-5 m) would not contain sufficient depth of deposits. In both units (B,C) we were able to use the stratigraphy from the trench as a guide to excavation. This enabled us to identify natural breaks in the stratigraphy. Each of the units was to be excavated in 10 cm arbitrary levels, although the changes visible in the trench profile often resulted in levels less than 10 cm in thickness. Seven levels, ranging in thickness from 55 to 70 cm in Area B, and from 60 to 70 cm in Area C, were excavated. A brief discussion of these units is given below.

The downslope unit, Area C, contained very little evidence of *in situ* deposits. The stratigraphy was very homogeneous and appeared to represent several episodes of colluviaiton. This suggests that most of this material was derived from upslope, a conclusion also reached by Coinman and her colleagues in a paper published in 1989. Artifact densities were high in the upper levels, as would be expected of slighlty derived colluvial deposits, and declined steadily in the lower levels. Bone preservation was poor in this area of the site. Of some note was the presence of big, fat 'lunates' in these deposits; lunates are believed by some (e.g., Bar-Yosef 1982; Henry 1982; 1989) to be temporal indicators of the Natufian (*ca.* 12.5-10 kyr BP). Unfortunately, no datable material was recovered in Area C.

Area B, located upslope, was much more intact. At least four different stratigraphic levels were present, and the amount of colluvial disturbance is minimal. Two of the strata were heavily organic and the amount of bone in them suggests the presence of a midden. The density of material increases as one moves down through the deposits. Bone preservation is better in the lower levels and 13-15 charcoal samples were collected for radiocarbon dating. Additionally, one small feature, an ash pit, was excavated. Although lithic analysis is yet to be completed, some interesting trends are apparent. Lunates are all but absent in Area B, which contains numerous backed bladelets — the hallmark of the Kebaran. The 1984 radiocarbon dates (16.9-15.6 kyr BP) fall squarely within the Kebran time range (20-12 kyr BP) and thus tend to support this conclusion. Of note is the increase in the frequency of microburins in the basal levels of the unit. Microburins mark a technique for snapping bladelets that appears in Mushabian industries *ca.* 14 kyr BP and that is also present in later Natufian sites (Henry 1989). If the radiocarbon dates are reliable, then there are strong indications that the systematic use of the microburin technique existed earlier in Jordan than elsewhere in the Levant, and that the systematics used to classify Levantine epipaleolithic sites need to be re-evaluated.

In summary, our original aims for expanding excavation at WHS 1065 have only been partially met. To date, we have not been able to identify unequivocal living surfaces or architecture, but we believe we have been able to isolate a Kebaran component of the occupation. In addition to a midden-like

deposit, we have also noted some differences in the technology, which should be further elucidated given additional laboratory analysis at ASU during the summer and fall of 1992. If these stand up to further scruitiny, they could have a substantial impact on the traditional notions of the Kebaran, and of epipaleolithic industries in general.

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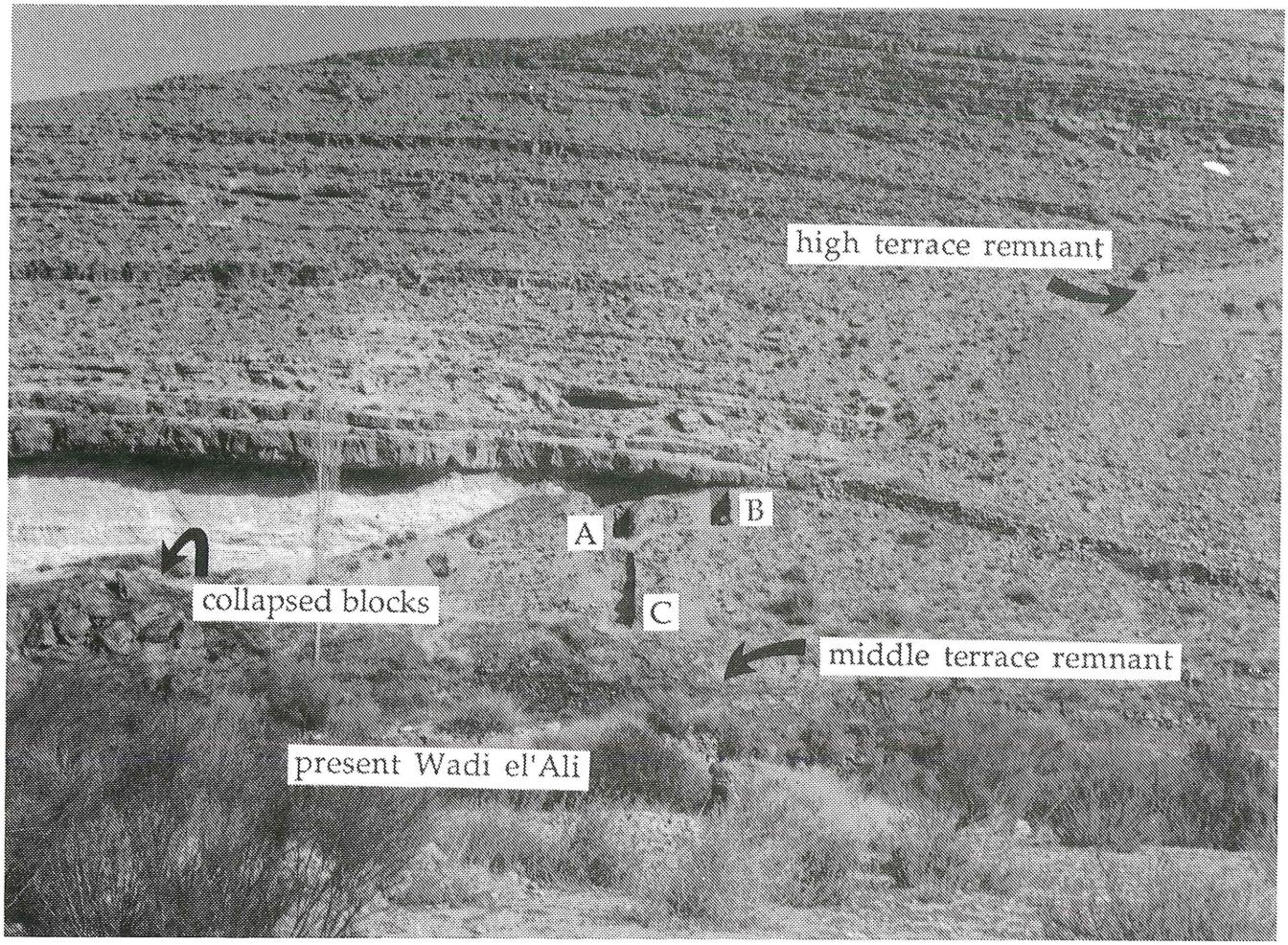

Photograph of WHS 634 taken from the south bank of Wadi 'Ali (April, 1992), and showing the locations of Trenches A-C, the High (27m) and Middle (3-7m) Terraces, and the present wadi flood plain (foreground). A large pile of boulders from a major episode of collapse of the shelter overhang can be seen at the left. The position of these rocks indicates that this particular collapse occurred during the period of Mousterian occupation, and that the shelter overhang extended at least 10 m beyond its present location.