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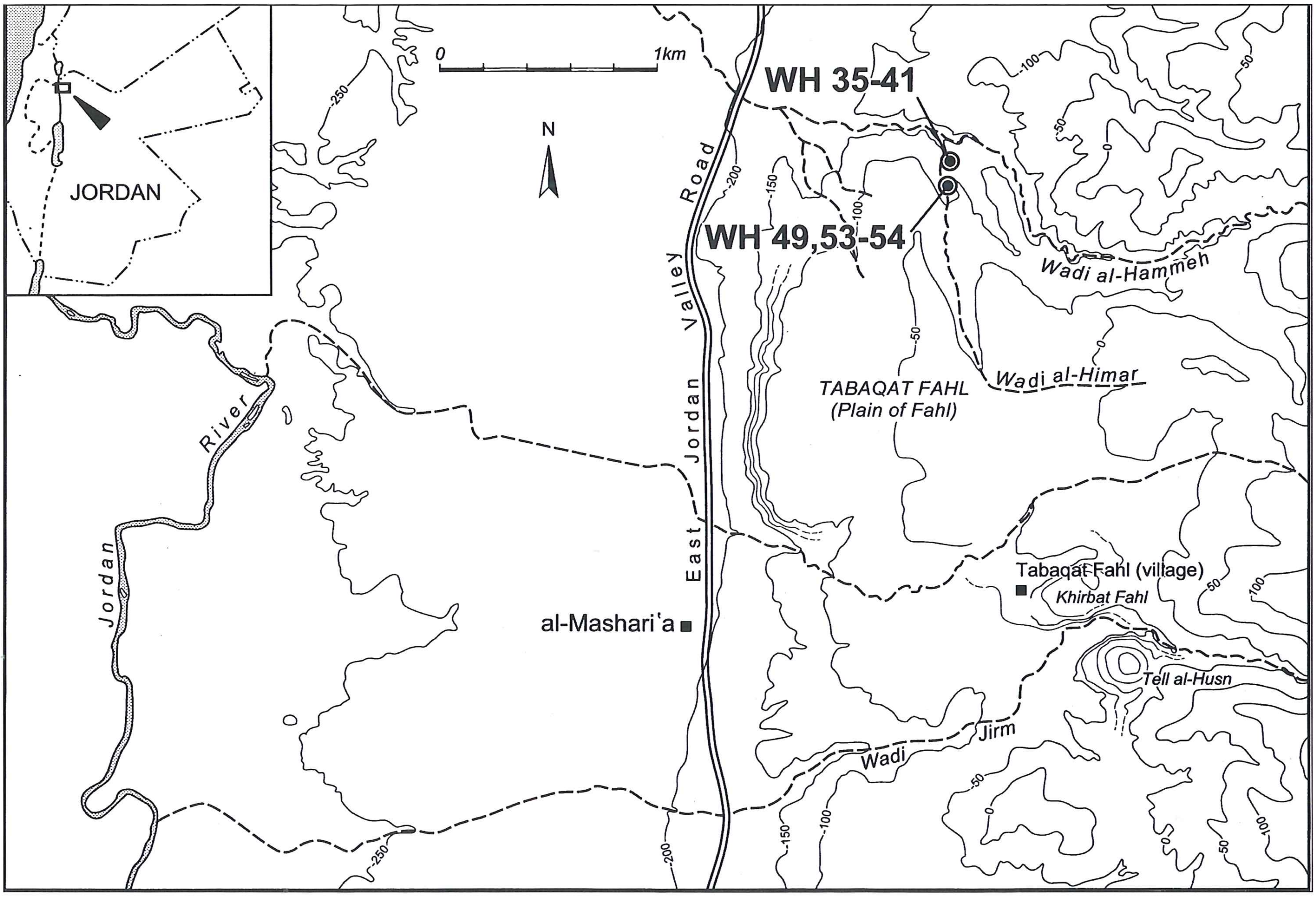
The Formation of Middle Palaeolithic Landscapes in Wādī al-Ḥammah

The landscape and its Setting

An unusually deep sequence of valley-fill deposits in Wādī al-Ḥammah has provided a rare opportunity to investigate Late Pleistocene hominid adaptations in a single open-air locale over the long term. Wādī al-Ḥammah is a westward-flowing tributary of the Jordan Valley (FIG. 1), located opposite Baysan, and 2km north of Ṭabaqat Faḥl, which includes ancient Pella. This paper describes a 20-metre thick section of the 40-60m-thick continental sequence, comprising seven Middle Palaeolithic stratigraphic horizons from sites Wādī Ḥammah 35 (WH 35) down to Wādī Ḥammah 41 (WH 41). The horizons represent a series of buried valley beds, exposed in section in the interfluvial terrace remnant called 'the Plateau'.



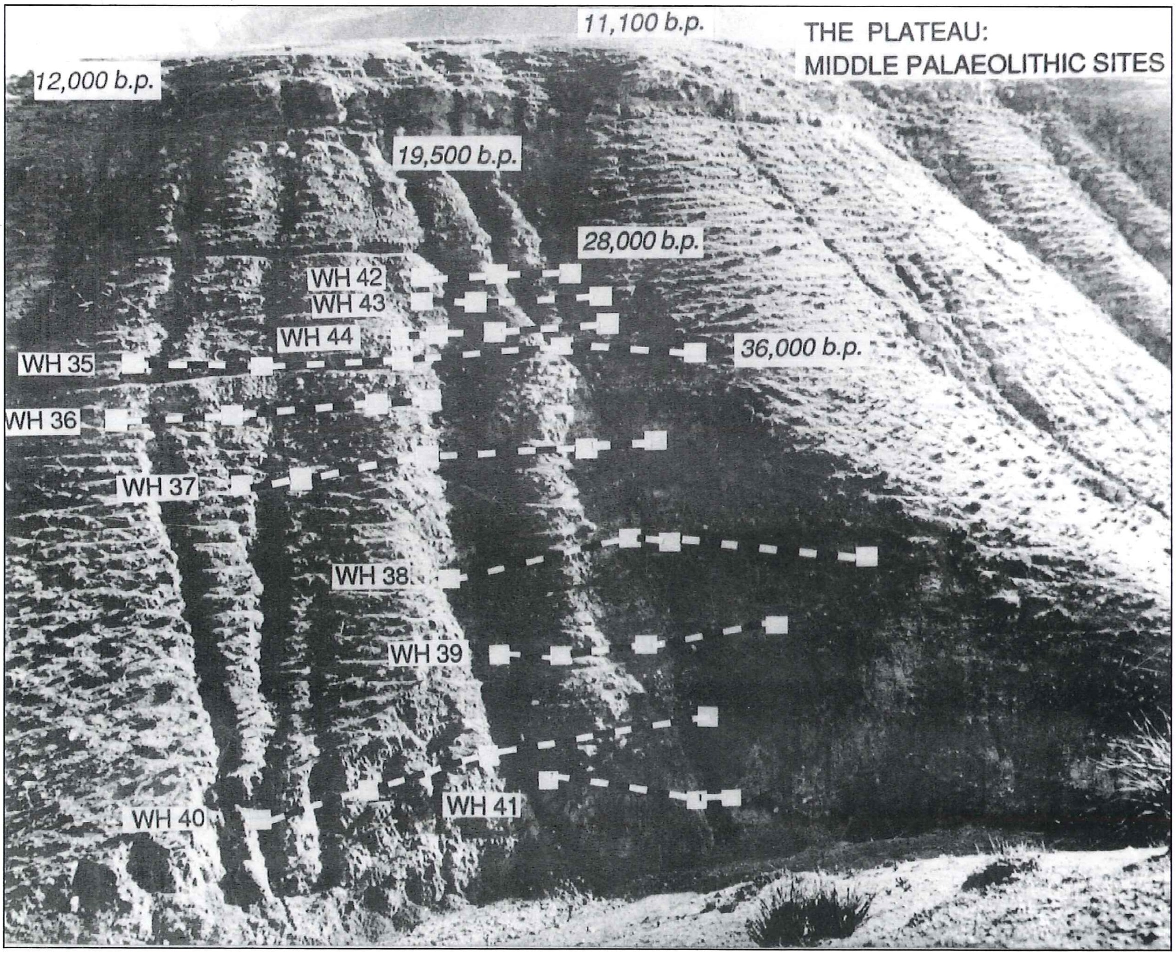
1. Location of excavated Middle Palaeolithic sites in Wādī al-Ḥammah.

This paper emphasizes the long-term formation processes for the open-air 'megasites' which characterize the Pleistocene archaeological record of the Ṭabaqat Faḥl/ Wādī al-Ḥammah region, and discusses their implications for our understanding of the Middle Palaeolithic record. While surface finds of Middle Palaeolithic stone tools are extraordinarily common in Jordan, the wider Levant, and further afield in the Arabian Peninsula, buried and stratified open-air sites are rare. Therefore, their investigation will be important for extending our knowledge of this large region through which Middle Palaeolithic hominines ranged, quite apart from the rich cave and rockshelter scenarios at Mount Carmel (Bar-Yosef *et al.* 1992), the Galilee (Hovers 1998) and west-central and southern Jordan (Clark 2000; Henry 2001). Few stratified and well-preserved open-air Middle Palaeolithic sites are known in Jordan, or at least have been excavated. The few occurrences of stratified open sites include several in Wādī Ḥismā in arid southern Jordan (Henry 1998: 29), a possible occurrence at 'Ayn Soda at al-Azraq (Rollefson *et al.* 1997), and the buried terrace site of ar-Raṣfa (Shea 1998) only a few kilometres south of our study area on the Jordan Valley margin.

The Plateau Stratigraphy

The Plateau represents the termination of an interfluvial ridge that runs between the perennial, spring-fed Wādī al-Ḥammah and ephemeral Wādī al-Ḥimār (FIG. 1). Despite its elevated outlook, the top of the Plateau lies at the low altitude of 83.5m below sea level. The Plateau and associated terrace remnants are Late Pleistocene in age (Macumber 1992), and contain stratified sites dating from the latter part of the Middle Palaeolithic to Natufian times (FIG. 2). The clearly defined lithofacies and the uniformity of the sedimentary sequence infilling Wādī al-Ḥammah indicate that the adjacent Lake Lisan rose steadily throughout the late Pleistocene, with no obvious evidence of significant fluctuation prior to its drying soon after 11,000 BP (Macumber and Head 1991). The cessation of sedimentation was rapidly followed by deep incision, in response to the fall in lake levels, leading to the deeply dissected modern landscape of the present day.

The Plateau sequence consists of four major units: a basal fine colluvial sediment, a fluvial and paludal suite



2. The Plateau Middle Palaeolithic sequence of sites WH 35-WH 41.

of pebble bands and conglomerates with interbedded red and buff clays and silts (Wadi Hammah Conglomerate), later dark grey clays (Black Clay), and buff-coloured calcareous silts with some reworked tufa (the Knob Limestone). At the confluence with the Jordan Valley, the *wadi* fill sequences merge with boulder beds equated with shorelines of Lake Lisan (Macumber 1992).

The lowermost unit in the Plateau sequence consists of a fine-gained, yellow deposit, possibly of colluvial origin, which thickens visibly from the Plateau's western cliff section in Wādī al-Ḥimār, to its eastern cliff section in Wādī al-Ḥammah. This unit contains the well-preserved WH 41 site. The overlying pebble bands, conglomerates and red clays of the Wadi Hammah Conglomerate formed as a fluviatile valley-fill deposit. This unit contains WH 35-WH 40, the remainder of the Middle Palaeolithic sites examined here. Sites WH 42, WH 43 and WH 44 contained only sparse, undiagnostic rolled lithics, and are not included in this analysis.

Three other productive Middle Palaeolithic sites (WH 49, WH 53 and WH 54) were excavated from a locality about 150m upstream of the Plateau sequence (FIG. 1) These lie low in the *wadi* banks, and are probably time equivalent to sites WH 40-WH 38, but this equivalence cannot yet be demonstrated, so for reasons of brevity these sites are not further included here. Higher up in the Plateau, the *in situ* Upper Palaeolithic site WH 34 (Edwards 1988) lies in a dark clay band intercalated within the Wadi Hammah Conglomerate. The Early Epipalaeolithic sites (Kebaran) WH 26 and WH 33 dating ca.19,500 BP are deposited in the Black Clay (Edwards *et al.* 1996) and finally, the uppermost Natufian site of Wādī al-Ḥammah 27, ca. 12,000 BP (Edwards 1991) is embedded within the Knob Limestone. Macumber (1992) interpreted the base of the Plateau sequence as time-equivalent to the inundation of the adjacent Jordan Valley by Lake Lisan (from c. 80,000/ 60,000 BP) and the Plateau Middle Palaeolithic is post-dated by a radiocarbon date of > 35,3000 ± 1320/-1130 BP (ANU-5831), obtained from strands of *Melanopsis* shells lying three metres above WH 35 (Edwards and Macumber 1995).

Excavating the Vertical Plateau Cliff Face

Following the discovery of the Wādī al-Ḥammah sequence by Macumber in 1980 (Macumber 2001), the author excavated the Middle Palaeolithic sequence in 1989 with a small team on behalf of the University of Sydney Pella project. These were the first open-air excavations of this period in northwestern Jordan (cf. Shea 1998: 48). In order to sample from secure contexts in the eroding and potentially confusing Plateau cliff face, strewn with thousands of shedding lithics, the project dealt only with clay beds that could be tracked beneath marker pebble bands across the outcrops. Seven horizons were sampled in this sector: WH 35, WH 36, WH 37, WH 38, WH 39, WH 40 and WH 41.

Using these methods, a sequence of accumulated landscapes were exposed in profile. The benefit of having superimposed deposits in the same sector of the cliff face was that stratigraphic control could be maintained for the whole sequence. The Plateau's sheer cliff face presented some, though not insurmountable, logistical problems. Loose sediments and materials were initially removed by cleaning and trimming each site. Then, narrow tracks were cut along the cliff face below each site, and traditional local technology in the form of donkey transport was employed to negotiate the removal heavy bags of sediments along the dangerous terrain. Thereupon, all sediments were wet-sieved immediately in Wādī al-Ḥammah below.

The sampling technique employed was to excavate a series of small pits, called Spots, into a target outcrop at successive intervals, following the method pioneered by Isaac and colleagues to tackle lengthy exposures of *in situ* Plio-Pleistocene sediments at Koobi Fora (Isaac *et al.* 1981). 'Spots' were wholly sieved blocks of excavated matrix, of known volume, sunk into the cliff face. Spot numbers were accorded as each one was started, so their numbers and running sequence vary (TABLE 1, FIG. 2). The motivation to sample in this manner was

Site	Number and relative position of Spots (left to right, cf. FIG. 2)	Altitude (metres below sea level)	Thickness of deposit (metres)	Length of exposure (metres)
WH 35	5 → 4 → 3 → 7	- 102.3	0.30	40.7
WH 36	1 → 2 → 3 → 4	- 105.0	0.35	20.0
WH 37	5 → 4 → 3 → 2 → 1	- 108.2	0.50	27.8
WH 38	4 → 3 → 2 → 1	- 113.3	0.35	28.5
WH 39	4 → 3 → 2 → 1	- 116.1	0.35	19.5
WH 40	4 → 3 → 2 → 1	- 121.4	0.30	27.0
WH 41	3 → 2 → 1	- 122.4	0.15	10.9

TABLE 1. Data for Middle Palaeolithic sites WH 35-WH 41.

borne of the prior conviction, based on observations of the exposures, that Middle Palaeolithic material is widely and consistently distributed throughout the Plateau deposits, but rarely nucleated in discrete sites. This was also the general expectation held by Foley (1981) about the discard behaviour of hominines ranging widely over their foraging territories.

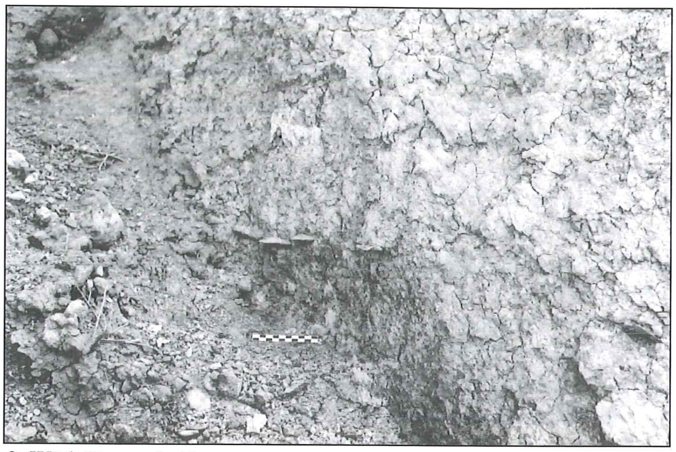
The Plateau Middle Palaeolithic Sites

The seven horizons sampled (WH 35, WH 36, WH 37, WH 38, WH 39, WH 40, WH 41) extended vertically between altitudes of – 102.3 b.m.s.l. at WH 35 and –122.4 b.m.s.l. at WH 41 (TABLE 1). The Wadi Hammah Conglomerate sites (all sites except for WH 41) were contained within red, pebbly clays sandwiched below clear marker pebble bands. Each cultural bed, termed here a site (e.g. WH 35, WH 39), was followed in section for as long as it was visible. Sites were tracked over various possible lengths, from 10.9 metres in the case of WH 41, up to 40. 7 metres for WH 35. For the Wadi Conglomerate sites, clay beds were similar in their broad characteristics, and usually about 0.30-0.35 metres thick. The number and positioning of the Spots depended on a number of factors, including the limits imposed by time and the conditions of access, but an attempt was made to sample each horizon as regularly as possible across its extent. Spot numbers ranged from three for WH 41 to five for WH 37. In (FIG. 2), the clay beds for each site are shown as a white dashed line, and the position of each Spot shown as a white square. The relationship of the individual Spots are also shown in FIGS. 4 and 5, in the same relative order as they appear in TABLE 1.

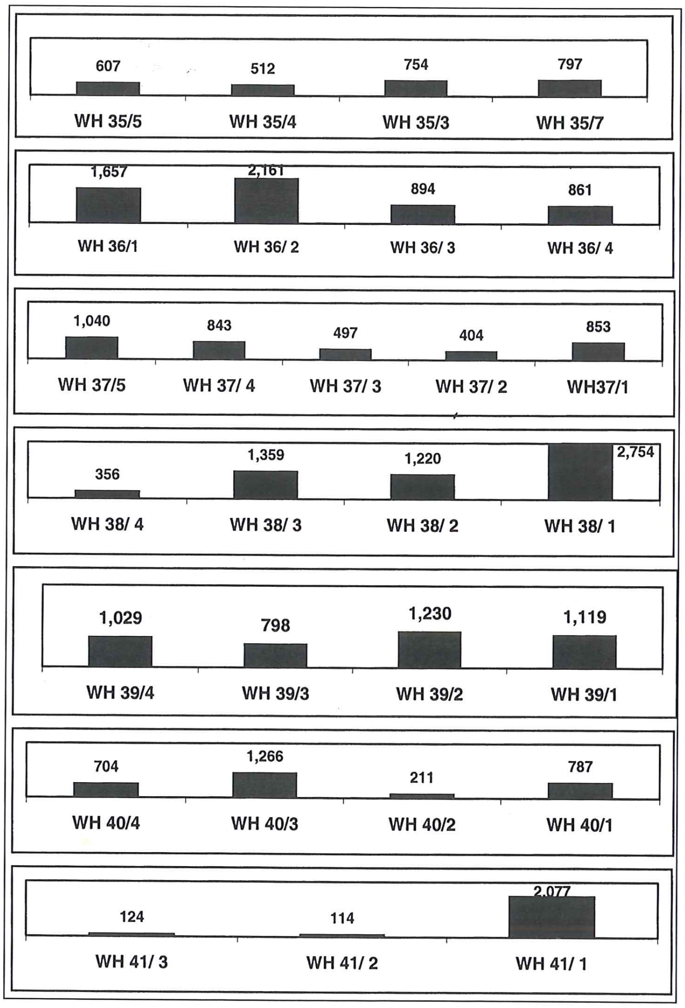
The Uppermost Natufian, Kebaran and Upper Palaeolithic sites were all well preserved; embedded in fine black clays or travertines, deposited by low-velocity groundwater, and accordingly they feature sharp, unrolled lithics. Sites WH 35 – WH 40 are contained in red pebbly clays deposited under higher energy conditions, and so are somewhat more complex, as described below, but the lowermost WH 41 site returns to the conditions of the upper sites; and it is clearly the best preserved of the Middle Palaeolithic series. Significantly, this site is embedded in fine, yellow clay underlying the red, pebbly clays of the Wadi Hammah Conglomerate. Whereas material is scattered throughout the red clays, WH 41 was manifest dramatically in section as a narrow, clustered band of sharp flakes and blades no broader than a metre wide (FIG. 3). The lithics bore razor-sharp edges, formed a coherent reduction series, and most likely represent discarded material from a discreet knapping event.

The Wādī Ḥammah Middle Palaeolithic Assemblages

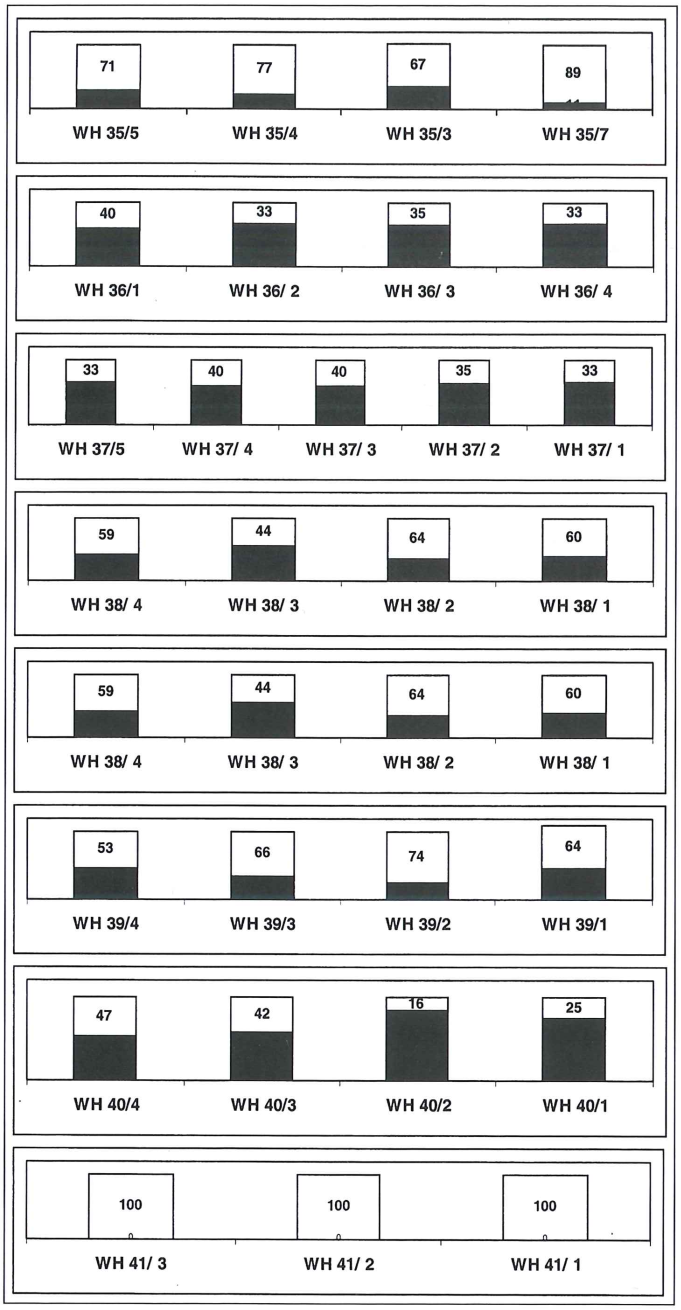
The sites WH 35 - WH 41 yielded a low-density but regular outflow of Levantine Mousterian lithic assemblages, all similar in type, and consistent in proportions across various lithic categories (TABLE 2). Debitage was flake-dominated with high cortical frequencies, apparently resulting in large measure from initial core reduction. Clear-



3. Wādī Ḥammah 41.



4. Densities of lithics (artefacts/cubic metre) in Middle Palaeolithic sites WH 35-WH 41.



5. Distribution of rolled and unabraded lithics in Middle Palaeolithic sites WH 35-WH 41. Each bar sums to 100%. White segments represent unabraded lithics; black segments represent rolled lithics.

ly the ubiquitous local *wadi* flint cobbles were used as cores, and most of these only minimally reduced before they were discarded. Most of the debitage bore unidirectional scar patterns. Radial cores were non-existent and flakes with radial scar patterns negligible. There is a high incidence of platform faceting on cores, points and other debitage categories. Levallois Point cores are mostly small and broad, and the resultant Levallois points similar in proportion, though there are also some long thin Levallois points, because blank size and shape was overwhelmingly dictated by the size of the cobble used as the core blank. The tool assemblage was characterized by a predominance of unretouched Levallois points, mainly struck from unidirectional, convergent, point cores. The others tools included small numbers of retouched flakes, burins and scrapers, though retouch proportions are essentially very low, and tools of any type other than Levallois points scarce.

The technological and typological characteristics of these assemblages; the approximate 60/80 – 40, 000 BP date range; the demonstrated rapid aggradation of Wadi al-Hammeh's Pleistocene valley fills, and the stratigraphic proximity of the uppermost Middle Palaeolithic site WH 35 to the overlying Upper Palaeolithic site WH 34 are all factors which point to the same conclusion; that the Plateau sequence belongs somewhere within the latest 'Tabun B-type' Middle Palaeolithic regional phase (Henry 2001).

The Distribution and Nature of Artefactual Materials in the Middle Palaeolithic Sites

A more detailed assessment of the Middle Palaeolithic assemblages will be provided elsewhere. The main purpose of this discussion is to examine the nature and formation of these sites, and then move on to consider the implications of this for our understanding of Middle Palaeolithic ranging and settlement behaviour. To begin with, the lowest and earliest site, WH 41, resembles the uppermost Natufian, Kebaran and Upper Palaeolithic sites as being firmly *in situ*, due to its deposition in fine sediments. The extracted materials from WH 41 were principally composed of large cortical flakes, and while no pieces were conjoinable, the assemblage appears to track the process of decortication of a large flint cobble. Further flakes were then detached, including an attempt at a Levallois point, but which only yielded a large, asymmetrically shaped flake with the dorsal Y- pattern of flake scars oriented askew from the flaking axis.

Middle Palaeolithic artefacts are ubiquitous in all Spots of the Wadi Hammah Conglomerate sites (WH 35-WH 40), occurring at densities ranging from 114 artefacts/ cubic metre in WH 41, Spot 2, to 2,754 artefacts/ cubic metre in WH 38, Spot 1, and representing continuous scatters of archaeological material distributed across distances up to 40.7 metres in the investigated sector of the Plateau (FIG. 4). Moreover, similar proportions of lithics occur in all Spots, implying standard kinds of knapping strategies. Large amounts of snapped flakes indicate treadage and reoccupations of the landscape, and consistent traces of burnt lithics imply the lighting of hearths over discarded lithic materials. Only a few faunal fragments were found. The similar results from the WH 49 – WH 53 sites located upstream (FIG. 1), implies that the Wādī al-Ḥammah palaeo-landscapes contain a more or less continuous record

TABLE 2. Wādī al-Ḥammah Middle Palaeolithic artefact assemblages.

ARTEFACT TYPES	WH 35 N	WH 35 %	WH 36 N	WH 36 %	WH 37 N	WH 37 %	WH 38 N	WH 38 %	WH 39 N	WH 39 %	WH 40 N	WH 40 %	WH 41 N	WH 41 %	Total N	Total %
Chunks	38	15	14	6	6	2	16	6	13	7	6	7	0	0	**93**	**7**
Chips	218	85	222	94	241	98	230	94	167	93	76	93	11	100	**1,165**	**93**
Sub-total	**256**	**100**	**236**	**100**	**247**	**100**	**246**	**100**	**180**	**100**	**82**	**100**	**11**	**100**	**1,258**	**100**
Flakes	124		60		35		81		80		67		28		**475**	
Broken flakes	299		156		100		163		135		104		44		**1,001**	
Blades	71		6		7		4		9		3		4		**104**	
Broken blades	59		11		13		5		5		5		9		**107**	
Crested blades	4		1		0		1		1		0		0		**7**	
Core tablets	3		0		0		0		0		0		1		**4**	
Spalls	0		5		1		0		3		3		0		**12**	
Sub-total	**560**	**94**	**239**	**97**	**156**	**93**	**254**	**98**	**233**	**98**	**182**	**97**	**86**	**96**	**1,710**	**96**
Single platform blade core	2		0		0		0		0		0		0		**2**	
Single platform flake core	2		1		0		0		1		0		0		**4**	
Single platform Levallois pt core	4		1		3		2		0		0		0		**10**	
Opposed platform Levallois Pt core	0		0		0		1		0		0		0		**1**	
Opposed platform flake core	0		1		0		0		0		0		0		**2**	
Core fragment	2		0		0		1		0		0		0		**3**	
Sub-total	**10**	**1**	**3**	**1**	**3**	**2**	**4**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**22**	**1**
Levallois point, unretouched	11		4		4		2		2		1		4		**28**	
Levallois point, retouched	0		0		1		0		0		0		0		**1**	
Levallois blade, retouched	2		0		0		0		0		0		0		**2**	
Endscraper	1		0		1		0		1		1		0		**4**	
Burin/ scraper	0		1		0		0		0		0		0		**1**	
Burin on natural surface	1		0		0		0		0		0		0		**1**	
Burin on snap	0		0		1		0		0		1		0		**2**	
Burin on concave truncation	0		0		1		0		0		0		0		**1**	
Retouched flake	13		0		0		0		0		2		0		**15**	
Sub-total	**28**	**5**	**5**	**2**	**8**	**5**	**2**	**1**	**3**	**1**	**5**	**3**	**4**	**4**	**55**	**3**
Total (Debitage + cores + tools)	**598**	**100**	**247**	**100**	**167**	**100**	**260**	**100**	**237**	**100**	**187**	**100**	**90**	**100**		

of Middle Palaeolithic discards, extending over several square kilometres in area.

Rolled and Sharp Flakes Together: Clues to the Formation of the Middle Palaeolithic Landscapes

When analyzing the artefacts from the WH 35-WH 40 sites, a curious feature was noticed. This was the persistent co-occurrence of sharp and unabraded flakes (like the WH 41 specimens) and rolled and battered flakes from the same excavation Spots. The two sorts were intermingled and lying right next to each other. Rolled flakes are easily distinguishable from retouched or utilized ones – they bear comprehensive but uneven bifacial retouch on all edges, abraded flake scar margins, and sometimes have polish or abrasions on flakes scars. Just as site WH 41 provides a local archetype of *in situ* sharp flake margins, so the stone-choked bed of Wādī al-Ḥimār, lying right beneath the sites, provided a local referent for rolled and battered flakes.

Experiments by Harding and colleagues (1986) have demonstrated the dramatically rapid development of edge-damage on fluvially transported flakes. Their experiments done in the shallow Afon Ystwyth, a gravel-bed River in Wales, showed that bifaces could lose up to 2cm off all margins, after only 150m of water transport. Therefore, it was evident that there were cases in the Wādī al-Ḥammah sites where fresh, unabraded artefacts lying at or neat to their *loci* of discards were intermingled with artefacts rolled in from some distance upstream.

After noticing that the two types co-occurred consistently in sites WH 35-WH 40, which are located in high energy deposited beds, the amounts of fresh versus rolled artefacts were summed for each Spot (FIG. 5). A regular pattern emerged for each site, reflecting the consistent energies of deposition in the individual sediment beds. For example, WH 35 has a consistent majority of unrolled artefacts occurring at similar frequencies across all Spots (between 71% and 89%), whereas WH 36 has similar proportions of rolled artefacts in the ascendancy across all Spots (between 60% and 67%). Conversely, where depositional energies were lowest (WH 41), site preservation was best. Intriguingly, the highest quantities of animal bone fragments, albeit at very low absolute levels, were found in the Wadi Hammah Conglomerate sites carrying the highest proportions of unabraded lithics: namely WH 35 and WH 38. Lesser amounts were found in WH 39 and

WH 40, but none in WH 36 and WH 37.

Given that such fluvial depositional contexts are widespread, this type of complex site accumulation is probably quite common. Another Jordanian case is from al-ʻAzraq, where Rollefson and colleagues (1997: 51) demonstrated a similar pattern by analyzing edge-rolling on Acheulian artefacts; further afield in Kenya, fresh and rolled artefacts lay side by side in the East Turkana Oldowan site of FxJj43 (pers. comm. N. Stern 2002).

These dual formative processes operated in Wādī al-Ḥammah while the valley bed lay open to occupation over long time periods. During the Middle Palaeolithic, archaic or modern humans repeatedly visited and crossed Wādī al-Ḥammah, undoubtedly for its attractive resources of fresh spring waters, abundant flakeable stone, and the easy approaches leading from the edge of Lake Lisan up onto the Jordanian Plateau. Summarizing the range of evidence available from the sites, it can be concluded that the visitors occasionally engaged in short knapping events, using the many local cobbles to hand. They also stopped to build fires and sat around them while scanning the impressive views across Lake Lisan and down the Jezreel Valley to Mount Carmel for game and the approach of other peoples. At these times also, they retooled their spears and discarded used projectile points. Aside from issues of preservation of organic materials, the Wādī al-Ḥammah lithic assemblages appear to represent a different functional block of activities than do the rich and varied cave sites of Mount Carmel and Galilee. The latter represent Middle Palaeolithic people 'at home', whereas the Wādī al-Ḥammah sequence, with its stochastic soup of short-term stays, represents people 'on the move'.

Sometimes the small resultant sites were covered rapidly, as in the case of WH 41, and fastened in safe, sedimentary envelopes. At other times, the accumulating sprinkles of artefacts were left exposed for long periods, and merged into landscapes of semi-continuous materials. Eventually, these sites were disturbed and reorganized by rolled material washed in during fierce rainstorms. The deep and narrow Wādī al-Ḥammah is situated immediately below the highlands, and periodically received prodigious amounts of run-off. Artefacts, along with other sediments were washed down valley from upstream, and *in situ* clusters of artefacts were disturbed. In each case the process lasted at least decades and centuries; our average rate of sedimentation in the Plateau implies that the process of site burial usually occurred over millennia.

Interpreting Large Sites Formed Over the Long-Term: the 'Time Perspectivist' View

The Wādī al-Ḥammah sites appear to be almost coterminous with the deposits which envelop them. In this kind of environment, it was impossible to excavate a pit devoid of human artefactual traces. Given enough time, the landscape has filled up with debris. While the Middle Palaeolithic landscapes are hundred of metres long, attain hectares in area, and probably contain millions of artefacts, there is no need to visualize them as representing extremely high rates of occupation. Literally, one needs to add only time to the slow, cyclical movements of small groups of people, to envision the creation of these large, extensive sites. A similar pattern characterizes the even-larger Acheulean sites (Edwards *et al.* 1998; Edwards 1995), which are embedded in the highest Ṭabaqat Faḥl formation terrace, against which the lower Wādī al-Ḥammah, Late Pleistocene terraces have formed.

The issue arises as to how sites which are formed through accumulations of material over long time spans can be modelled in behavioural terms. The sites that form are composed on lag deposits, or during sedimentary still stands, on which material accumulated serially over long time spans. Even where adjacent hearths, conjoinable lithics, or other activity areas can be delineated in these mosaic super-sites, it needs to be recognized that stratigraphic articulation of the separate 'time instants' is not automatically possible. Rather, the separate elements just merge, and are themselves overlaid and intermingled with other discards. The conjoinable knapping event, that paragon of the ethnographic instant, may be subsumed into the stochastic soup of the long-term refuse accumulations (Murray 1997).

Nikki Stern (1993) has argued that long-term discard of artefacts and refuse in extensive open air sites may lead to aggregations which are not behaviourally interpretable in the ethnographic time frame. In other words, repeated reuse of a site can lead to the formation of patterned concentrations of refuse, even where discards concerned were deposited years, centuries, or even millennia later than neighbouring ones, and owe nothing to them in behavioural terms.

Her analysis challenges the conceptualization of the majority of Pleistocene sites as series of ethnographic time slices. Even where microstratigraphy or techniques such as conjoin analysis can establish the superposition or the adjacentness of events, we can't link them behaviourally in serially accumulated sites, because resolution of their temporal relationship is limited by the standard error inherent in radiometric dates. For the majority of Pleistocene sites these, of course, weigh in the order of millennia.

The Wādī al-Ḥammah sites embody small time instants, and long time frames, both in a single stratum. Reconstructions of seasonality, as are often suggested for sites of this antiquity in the Levant, are inappropriate here. These concerns often induce frustrated responses among archaeological practitioners, but I urge an optimistic outlook. In the long run, even finely divided sequences in caves or rockshelters suffer the same temporal constraints, but we are generally satisfied that these sites retain their ability to provide powerful diachronic summaries of temporal developments in regions, even though temporal resolution of a single unit remains well outside the ethnographic time frame experienced by the original site occupants (Bailey 1981).

Rather than prompting disquiet, the solution seems to be to alter the temporal focus of interpretation for massive sites formed over the long term. Fletcher (1992) has discussed how the biological sciences have successfully integrated highly divergent scales of observation, from the micro-second rates of chemical reactions in the cell (molecular biology), to the decadal rates of a mammal's lifespan (physiology), up to the million-year records of taxonomic change embedded in the fossil record (paleontology). Of course, the biologists are united in their explanatory approach by the overarching theory of organic evolution, and so are blessed with a disciplinary unity which we anthropologists and archaeologists lack. Nevertheless, long-term archaeological sequences provide us with powerful tools. A more profitable interpretation of Pleistocene open sites will often be to eschew the ethnographically conceived behavioural analysis, open up the focus of investigation wider, and to track archaic and modern dispersals on regional and continent-wide bases (Gamble 1993). Analysis of long-term trends in hominine evolution should ultimately provide not only just a picture of dispersal, but a fuller picture of pulses of regional colonisation and abandonment, and the order at which people were able to cope with and utilise differing and challenging habitats. Notwithstanding much of the rhetoric of the ethnographic-scale reconstructionists, this is what Pleistocene archaeologists have been doing all along very successfully, and what they will continue to do in the future.

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