THE ḌĀNA-FAYNĀN-AL-GHUWAYR EARLY PREHISTORY PROJECT, SPRING 2000 SEASON

by

Bill Finlayson, Anne Pirie and Steven J. Mithen

Introduction

The Ḍāna-Faynān-Ghuwayr Early Prehistory Project (DFGEPP) is a study of the early prehistoric settlement of Wādī Ḍāna, Wādī Faynān, and Wādī al-Ghuwayr in southern Jordan. The project involves survey, test-pitting, trial excavations and palaeoenvironmental research. Much of the focus of the project has been around the mouth of al-Ghuwayr, where a PPNA site has been located (Finlayson and Mithen 1998; Finlayson *et al.* 1999). Field survey on the terraces of Faynān have identified extensive Middle Palaeolithic flint scatters. At present there appears to be a gap in the settlement of this lowland area between the Middle Palaeolithic and the PPNA.

The project has been operated since 1996 as a joint Universities of Edinburgh and Reading project, with major contributions by staff and postgraduates of the Universities of Stirling and Durham. At the end of 1999 one of the project Directors moved from Edinburgh to CBRL in Amman. All project members are grateful to the support and assistance of the Department of Antiquities of Jordan, without whose permission the project would not have taken place. For the spring 2000 season we would particularly like to thank Mr Jihad Darweesh, who was both our representative and our landlord. We would also like to thank Samantha J. Dennis for the illustrations.

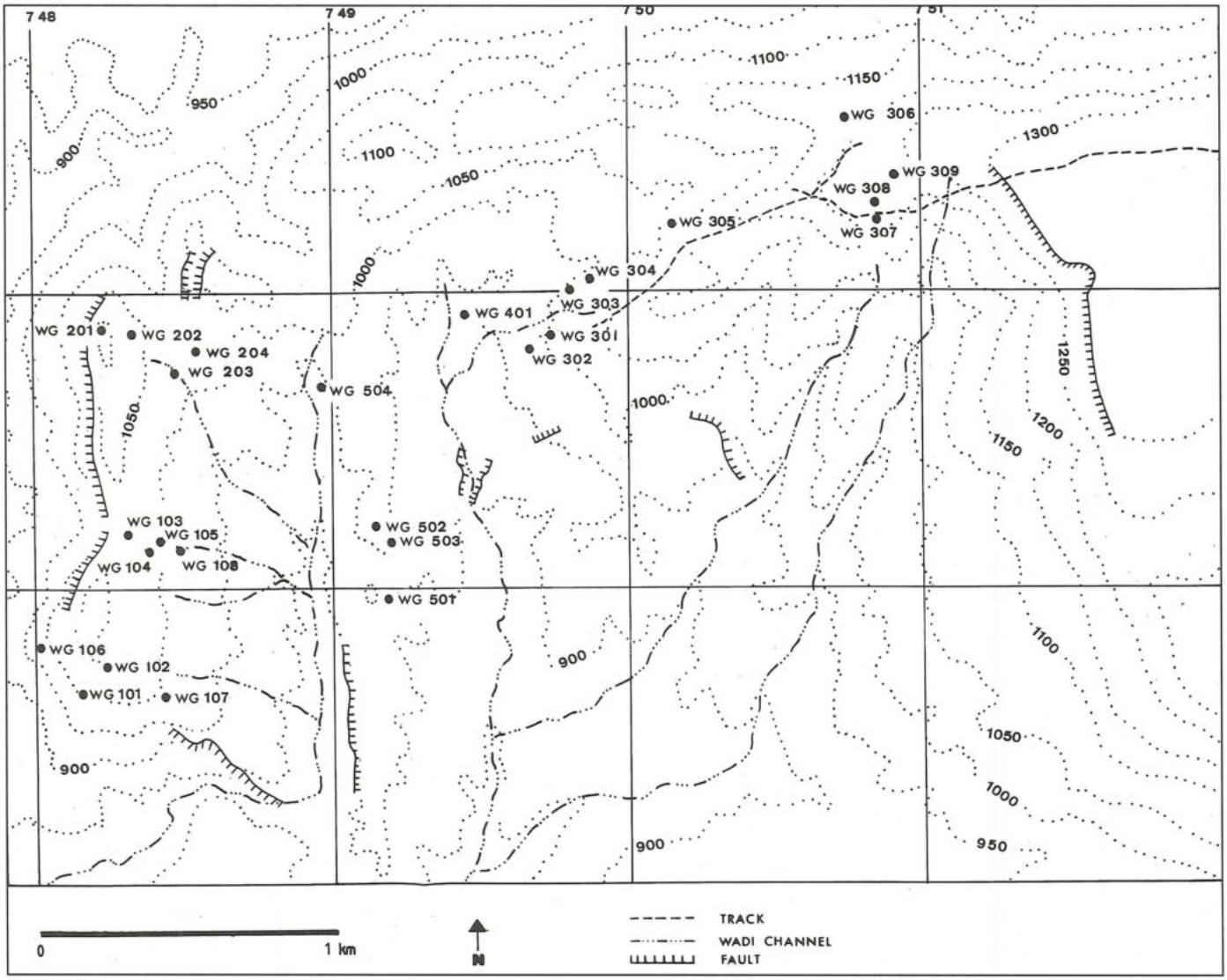
In spring 2000 the survey area was extended to the uplands in the area between Wādī al-Ḥamra and Wādī al-Bustān, lying north of Al-Khurayba and South of Ḍāna village, centre approximately YU 49 89 (Fig. 1). The principal objective of the season was to investigate the exploitation of the flint resources in this area at the top of the Wādī al-Ghuwayr system. This area had been first examined in a rapid walk over in 1998 on a day visit from Faynān. The spring 2000 survey comprised three main elements, firstly recording the nature of the flint sources, secondly assessing the artefactual material, and thirdly collecting artefacts from sites defined by the assessment.

1. Location plan in Jordan.

The main ridges in the study area that contained artefacts were assigned numbers - Wādī al-Ghuwayr (WG) 1 through to 5 (Fig. 2). Individual scatters on those ridges were then given site names according to the ridge, WG101, WG 201, etc.

Raw Material Survey

The main interest in the survey area was based on the premise that this was the most



2. Site location map.

likely source area for flint during the prehistoric occupation of Wādī Faynān and Wādī al-Ghuwayr. The apparently abundant flint in those wadis is now mostly too badly rolled to be useable, although this situation may not have applied in the past, as many cores have been found with rolled and battered cortex. The flint sources in the study area were therefore examined to see whether the range of raw material present matched in terms of colour, inclusions, texture, granularity, cortex, and size, with the material being worked down the wadi.

Ridges WG1 and WG2 are composed of the Umm Rijam Chert-Limestone, which was considered to be the most likely source of the good quality flints used in al-Ghuwayr-Faynān wadi system based on the geological descriptions (Barjous 1992), although the reported flint bands were not observed in 1998. In 2000 we continued our survey over to the steep western slopes of the ridge, and located numerous bands of flint within the limestone. These bands were recorded in some detail in order to track the variability both horizontally and vertically within the material. A series of 54 bands were recorded in this manner, until the base geology became covered with scree/ slopewash hiding any bands. Fieldwalking undertaken below this area determined that additional bands are present, some of them very substantial, and that the base of the wadi here is made up of a continuous sheet of flint.

During fieldwalking it was noted that oth-

er types of flint are present both as nodules and shattered pieces. The most obvious of these was a chocolate brown colour flint, very homogenous and fine grained. This appears to have been eroding out of higher deposits, probably Ḍāna Conglomerate, which incorporates significant quantities of flint. However, there was no indication that any of these other flints had been exploited for knapping. This may reflect that as elements within a conglomerate they contain too many internal flaws and cracks, much as the rolled wadi cobbles do.

This recording exercise established that there was a considerable amount of variation within the exposed flint, encompassing the variation observed in most of the worked flint artefacts recovered.

SURVEY

Methods

An attempt was made to minimise the quantity of material collected, as there is clearly no great benefit in collecting vast samples of undiagnostic primary debitage in a source area. However, it was realised that if the material mainly represented primary knapping then the samples collected would have to be big enough to allow inferences on the range of techniques present and their likely chronological affinities. Assessment of the artefactual material was achieved in two main ways. Initially it was thought that the extensive spreads of artefacts were going to pose problems in terms of defining individual scatters against a high "background noise", or indeed with a problem of scatters overlapping. To examine this a series of transects were walked, counting artefact densities without collecting any material. The generally low frequencies encountered however demonstrated that the high-density scatters could be easily defined by simply walking over the landscape and identifying concentrations. This simpler and more rapid method was subsequently adopted. Site descriptions are provided in Appendix One, with the lithics quantified in Appendix Two.

WG1

This ridge was the location identified in 1998 as containing a substantial number of pieces of struck flint. The eastern and western slopes were very distinct in character, with the eastern slope comprising a long relatively shallow slope (ca. 45 degree angle), and the western side marked by a much steeper slope angle. None of the flint seams outcropped on the eastern slope, while their presence on the western slope provided much of the structural form of this side, including a number of overhangs above cliffs. The angle of slope on the western face precluded survey by a large team.

Survey commenced with walking a number of transects on the eastern slopes. Initially this involved two people walking either side of a tape, each counting flints by square meter. A series of these transects were undertaken, demonstrating that the density of surface finds across the slope was generally very low. This transect survey was followed by collection from three scatters that had been identified within the transects (WG101, WG102, WG 106).

Following this collection process, a large scatter on the East face of the saddle of the main ridge was gridded in more detail and a walk over survey was carried out in order to identify concentrations across an area comprising two low ridge edges and a wadi system.

This survey worked from a base line running from 380 to 430m on the initial grid system transect 4. Survey was undertaken at 10m intervals, team members walked downslope, pacing out 1m intervals and counting the number of artefacts in a given 1m square. The data was entered in an Excel spreadsheet and on graph paper for field use. Some transects were of different lengths than others due to differing pace lengths. Most notably Transects 0 and 3 ended at 50

m (50 paces) at the same place as Transect 10 ended at 36 and Transect 20 at 60. This is represented on the graph paper annotation by adjustable scaling and scatters are still visible although their definition is somewhat fuzzy. By the second day of walking transects pace length had become more standardised.

This more intensive walking of a large diffuse scatter identified a number of concentrations. These concentrations were then sampled by laying out 4 x 4m squares with all visible surface material being collected (WG103 a and b, WG 104, WG 105, and WG 108).

One further scatter (WG107) was located during the general walkover of the ridge, and a sample of this material was collected.

In addition, as part of the raw material survey, the western slopes of the hill were examined for evidence for flint working. No clear quarry faces could be observed, but deliberately chipped stone was present. One relative concentration was located (WG 106), which contained some very crudely flaked cobbles, but no dense scatters were located. Given the slope angle of this side of the hill it was considered possible that material would have been eroded downslope, and fieldwalking was extended down to the base of the hill to investigate this. Flint scatters were located on the ridges between the erosion wadis above the base of the slopes. Their character was in general similar to those on the eastern slopes, and the only diagnostic pieces observed were Middle Palaeolithic in character, including levallois flakes, or Lower Palaeolithic bifaces. The distance and difficulty of the terrain meant no material was collected.

WG2

WG2 refers to the eastern slopes of the northern end of the same ridge as WG1. This area was surveyed by a walkover with people spaced at ca. 10m intervals. Generally very few artefacts were noted over the hill slope, and what other material there was was generally in low-density diffuse scatters. There was a notable concentration on the erosion wadi at the north end of the ridge (WG203), including a Lower Palaeolithic type chopper. There were also a few small blades/bladelet cores, but not in any concentrations. The summit of WG2 (WG201) contained a small dense and tightly concentrated scatter mostly made up of small debitage with no immediately identified chronologically diagnostic artefacts. A third main area of lithic materials (WG202 and WG204) was on the flat area of the saddle linking WG2 to the ridge bounding the south side of the Wādī al-Ḥamra gorge.

The range of flint materials is interesting, as it included a range of banded flints. The entire range observed was visible in the flint seams outcropping on the western face of WG2.

In general the surfaces of WG2 are very similar to WG1, although with less material present overall. The steeper angle of the eastern slopes may explain this.

WG3

WG 3 refers to the slopes down from the plateau, including the area of the track. These slopes were walked in their entirety, marking scatters with canes and then collecting in the densest areas (WG301-309). Most of the immediately recogniseable material was Middle Palaeolithic in character, however, some of the material from the upper parts of this slope included a wider array of small debitage and certainly relates to more recent periods.

WG4

WG4 is a ridge running from the main ridge that marks the southern edge of Wādī al-Ḥamra gorge. This ridge was not walked systematically, but one flint scatter (WG401) was identified during transit to other plots within the survey area. This scatter was next to a dry stone construction, ap-

parently comprising a large well made block house type construction which had subsequently been incorporated into a small terraced area. The lithics were noted to be eroding from within the soil matrix of the ridge, but not as far as could be seen from any particular horizon. Rather it appears most probable that they arrived with the soil forming the ridge. Lack of significant traces of rolling or movement on the lithics suggests that the movement cannot have been far. The material includes blades and blade cores, although not typically Upper Palaeolithic or more recent in character, probably Middle Palaeolithic.

WG5

WG 5 is the ridge running north south within the study area formed of Wādī al-Bustān Calceranite. Some flint was found eroding within this material, but there was no sign that it had ever been exploited for working. The entire ridge was walked systematically and several scatters were identified, mostly located on the more gentle eastern slopes. Material was collected from two of these scatters (WG501 and WG502), including one sizeable collection of presumably Lower Palaeolithic handaxes which appeared to be associated with large blade cores and blades of a possibly Middle Palaeolithic type. Some Levallois technique was also identified here. Part of the scatter lay close to a dry stone cairn, but it appears most likely that this is a considerably more recent structure, and that perhaps ground disturbance during construction has exposed the material next to the cairn. Much of the rest of the material appeared to have been exposed during recent and ongoing erosion of the soil profile. This suggests that there is some potential for locating material still preserved within the soil matrix. There was little evidence for substantial movement of artefacts.

Discussion

Previous work by DFGEPP had identified the spring 2000 study area as the most likely source for flints being used in Wādī Faynān. It was therefore considered vital that this area be examined to assist in the interpretation of the material from Faynān and al-Ghuwayr. The first reason concerned the assessment of sedentism in the PPNA. Here we needed to establish whether the type of occupation near the lithic source material was slight, relating only to quarrying and initial knapping, or whether there was evidence for more substantial settlement. The other important aspect was to assist the interpretation of the lithic assemblages from the Wādī Faynān area (including those of PPNB date and later). This would be enormously assisted by understanding the nature of the source materials and how they were exploited.

The most immediately striking observation of the fieldwork is the significant quantities of Palaeolithic material recovered. This is despite the relatively steep topography, and indeed most of the material shows very little evidence of any transportation. The hills all appear to suffer from erosion, visible both in the number of gullies present and in the amounts of apparent slopewash at the base of the hills. There is some direct evidence that in places this erosion post dates these Palaeolithic knapping events, for example at WG 401, where the material appears to be incorporated in a thick band of fine silts. The presence of many terracing episodes, especially on WG3, but also at WG401, also indicates that erosion has been a problem in the recent past. Some of the best concentrations of Palaeolithic material, for example WG 106 and WG 501 are currently in clearly eroding situations where the visibility of the material is directly related to their exposure. The overlying soil is shallow. It is possible that recent years of drought are causing the current erosion as the organic binding of the soil surface is lost, but again it is difficult to explain how the Palaeolithic scatters have remained intact until now. Overall, the

chipped stone is in good condition with fairly fresh edges, much of it showing little sign of extensive rolling or abrasion.

There were Middle Palaeolithic assemblages in all survey areas. They contained Levallois points, scrapers, notches, denticulates, and burins. Flakes were often dihedral or facetted, and many showed signs of discoidal previous removals. Many assemblages also had a large blade element. Some including single and opposed platforms cores showing removals of massive blades. This may represent a transitional period from Middle Palaeolithic to Upper Palaeolithic, although there have also been suggestions that the Southern Jordanian facies of the Middle Palaeolithic contains many blades, possibly as a by-product of point production. The alternative is that the blades represent an Upper Palaeolithic element, but on the whole these blades are not typical Upper Palaeolithic products.

Four assemblages, on ridges 1 and especially 5, also contained bifaces, mainly of a moderate size, with straight edges, perhaps suggestive of a Late Acheulian presence. Later periods were very scantily represented, with only two assemblages showing signs of undiagnostic later small flake technology. One of the assemblages contained a Chalcolithic/EB retouched tool.

Many of the assemblages seem complete. Although most assemblages lack chips and chunks, the full range of other types of debitage, as well as retouched tools, are present.

Most of the artefacts were made on similar raw material - although patination made precise comparisons impossible, brown-grey flint seemed to be used throughout. The cortex was orange, although in areas 4 and 5, it was more off-white/creamy coloured.

All survey areas showed Middle Palaeolithic use. Bifaces were present in Areas 1 and especially 5, apparently indicating a Lower Palaeolithic presence as well. There is a surprising lack of evidence for later period use of the landscape. The only exceptions are two sites in Areas 2 and 3. The later period lithics were largely undiagnostic, although they may suggest a Chalcolithic presence. Study of the pottery, especially that from Area 3, might help clarify the limited evidence we have for later period occupation.

On the basis of our current knowledge of WG sites, it is difficult to clarify their chronology or how they compare with other Levantine sites. There have been many finds of Middle Palaeolithic scatters throughout Jordan in recent years (e.g. Besancon *et al.* 1984; Clark *et al.* 1997; Henry 1995; Rollefson *et al.* 1997). Two of the more thoroughly investigated sites in southern Jordan are within the Wādī al-Ḥasa and the Rās an-Naqab surveys. These sites have given some picture of Middle Palaeolithic lithic assemblages in the area, although their chronology and how these sites fit in with other Levantine sites remains a matter of debate (Henry 1998; Clark *et al.* 1997).

The assemblages from both Wādī al-Ḥasa and Rās-an-Naqab are flake-dominated but with a high proportion of blades. At 'Ayn ad-Dufla in Wādī al-Ḥasa, the high proportion of blades is seen as typical of *Ṭābūn*-D type assemblages. At the Ḥisma sites, however, this is seen as a by-product of the production of broad based Levallois points. These assemblages are seen as *Ṭābūn*-B type. The Ḥisma sites' core technology is characterised by unidirectional converging cores for the production of points; while 'Ayn ad-Dufla contains a variety of cores including platform cores and low numbers of Levallois cores. Both areas have a range of retouched tools such as notches and burins, but at 'Ayn ad-Dufla, there are fewer scrapers than other *Ṭābūn*-D assemblages. In both assemblages Levallois points account for high proportions of the toolkit (in this report, Levallois points are not separately identified from flakes, or counted as part of the retouched tools category). 'Ayn ad-Dufla is

dated early for *Ṭābūn* -D - 90-180kya. The Ḥisma sites are more recent - 48-69kya.

WG sites clearly have similarities with both these areas in the significant proportions of blades present and the presence of Levallois points. Detailed comparison of proportions has yet to be carried out. Like al-Ḥasa site, narrow, elongated Levallois points are present in the WG assemblages, but the overall length: width ratios remain to be analysed. Also like al-Ḥasa site, a variety of core types is present, and at some sites platform cores outnumber bifacial cores. It is interesting that some of the Ḥisma material is interpreted as transitional or very early Upper Palaeolithic on the basis of numerous blades with little platform preparation, and some of the WG material matches this. One of the problems of surface sites remains that there are different ways of interpreting apparently conflicting elements.

Lower Palaeolithic sites have been identified throughout Jordan, especially Late Acheulian ones. In Southern Jordan, Middle Acheulian has been identified at al-Mashāri'a 4 near Dhra (Macumber and Edwards 1997), and possibly Jurf ad-Darāwīsh near aṭ-Ṭafīlah (Bender 1974). The later Acheulian is better represented, with sites in numerous locations in al-Ḥasa (MacDonald *et al.* 1983), Rās an-Naqab (Henry 1995), Fjaje, near ash-Shawbak (Rollefson 1981, 1985) and Wādī Faynān (Finlayson *et al.* 1999) as well as scattered earlier finds. The Fjaje site is situated close to the WG sites, overlooking Wādī al-Bustān, and comprises an extensive spread running over several kilometres, but is confined to a narrow strip no more than 250m wide at the top of the escarpment of the highland plateau at ca. 1200m asl. Although broadly attributed to the Late Acheulian, there are clearly some Middle Palaeolithic and probably Upper Palaeolithic elements present (Rollefson 1981).

The WG sites show more affinities with the Later Acheulian. The bifaces are mainly 90-120mm in length, and are ovate, cordiform, or amygdaloid in shape. Most have straight cutting edges, are worked around the entire piece and have oval or pointed tips rather than cleaver edges. They are usually symmetrical, and many pieces have fine flaking around the edge. There are some exceptions in the more massive pieces, sometimes with cortical butts or more crudely retouched, found in Area 5. The debitage includes small, flat 'biface thinning flakes' with radial removals on the dorsal face. However, the assumed Middle/Lower Palaeolithic artefacts have a similar level of patination, and it would be difficult to differentiate between periods on this basis. This is similar to the situation at Fjaje, but we do not believe we can attribute all of the WG material confidently to a single period.

Despite the apparent taphonomic problems associated with the Palaeolithic material, the presence of so many discrete sites, represents a find of major significance. They show a variety of interesting features such as the number and range of hand axe types, the type of blade technology, the associated use of Levallois technique, and the potential for locating apparently *in situ* material. Coupled with evidence being accumulated in the Faynān area the project will now be in a position to consider the nature of Middle Palaeolithic occupation over the whole wadi system. There appear to be open-air sites with the potential of *in situ* material in both areas, raising the possibility of future invasive fieldwork. It is of interest that in the upper area there may be a Middle to Upper Palaeolithic, or an early Upper Palaeolithic, presence which to-date is missing from the lower area. The sites also raise the question of date attribution to different assemblages, with some material being classifiable into Late Acheulian, Levallois Mousterian *Ṭābūn* -B or D, and possibly early Upper Palaeolithic (but not Ahmarian, rather a flake based Levantine Aurignacian). As surface, or near surface scatters it is possible that all periods may be represented,

but, unlike the enormously extensive spread at Fjaje, we seem to have relatively small, discrete sites, making long time sequences less likely. This appears to conflict with the fact that all sites with bifaces have a Levallois element.

While the recovery of these sites is clearly of great interest, the absence of any easily identifiable material relating to the later occupations down in Wādī al-Ghuwayr and Faynān is at first sight disappointing. It does however appear to provide some evidence in support of the hypothesis that PPNA exploitation of these resources was based on brief visits rather than extended stays. Whether this absence indicates that exploitation of these flints was restricted to collecting and very crude initial knapping, not immediately identifiable, or whether any such material may be buried under slopewash cannot at present be proved. Two strands of evidence will be used to investigate this further. Firstly, the more detailed examination of the non Palaeolithic material may indicate whether the samples collected may relate to the periods in question. Secondly, a consideration of the taphonomy of the Palaeolithic material may help to assess the possibility that later periods may have been removed by erosive processes, or buried under the subsequent slopewash. A detailed geomorphological study of the area is clearly required. Walks by project members over the last two seasons have demonstrated that access between Faynan and the flint sources is relatively easy. A return trip can be achieved in a day. Good quality flint is therefore readily available in large quantities. In addition, given the changes in environment between Faynān and the upper reaches of the wadis, such expeditions could easily be fitted into subsistence activities exploiting different environmental niches. PPNA sites do appear to be hard to locate however and the absolute absence of another site in the nearby plateau area cannot be dismissed out of hand. At present the scarcity of PPNA sites continues to cause problems in understanding settlement patterns, population levels, or indeed how the subsistence economy of this crucial period operated.

Bill Finlayson
CBRL
P O Box 519
Jubaiha
Amman 11941
Jordan

Anne Pirie
Dept of Archaeology
University of Durham
South Road
Durham
DH1 3LE
UK

Steven J. Mithen
Dept of Archaeology
University of Reading
Whiteknights
Reading RG6 6AA
UK

APPENDIX ONE

LITHIC SCATTERS

Notes

GPS readings have been provided for most sites. In some cases it was not possible to obtain good readings, in other cases the proximity of other scatters already well located, or prominent mapped topographic features have made this unnecessary. Where sites had clearly defined boundaries, measurements of overall dimensions have been provided. (In other cases where sites have diffuse boundaries these have not been attempted.) The artefact descriptions are based on identifications in the field.

Site list

WG 101
7 48 161 E
33 88 638 N
1056m asl
23.8m x 10.8m

This is an irregular oval scatter of lithic material on the ridge of WG1. The artefacts are on dark brown-grey flint with orange cortex. The material is patinated, with a small amount of abrasion. It comrpises mainly flake debitage (70% of the assemblage) showing discoidal removals and sinuous, facetted platforms. There are some large, irregular blades. Retouched pieces include mainly scrapers, notches and marginally retouched pieces, as well as four bifaces with straight edges ranging from 78 to 96 mm in length. There are only two cores in the assemblage, both are Levallois flake cores. These, and the general character of the material indicate a Middle Palaeolithic date. The numerous small round flakes may represent biface thinning flakes, and with the bifaces may indicate a Lower Palaeolithic element. The assemblage totals 304, with 5.3% retouched.

WG 102
This is an extensive lithic scatter along the edge of a wadi on the east slope of WG1. The edges of the site are diffuse, but this may be an artefact of erosion. The artefacts are on dark brown-grey flint with orange cortex. The material is patinated, with somewhat abraded edges. The debitage is mainly comprised of flakes (85%); and retouched tools include mainly scrapers on flakes and marginally retouched flakes. The assemblage is of a Middle Palaeolithic character, with many facetted and sinuous platforms on chunky flakes. There are no small elements to this assemblage, either flakelets or bladelets, and no chips or chunks. There is a small number of cores, many of which are exhausted. Three are platform cores and one is a Levallois blade core. The assemblage totals 221 artefacts, with 8.6% retouched.

WG 103
This is an extensive dense scatter at the top of erosion features in the saddle between WG1 and WG2. Slope angle is quite shallow. Two samples (WG 103a & b) are of a very large (>30mx30m) diffuse scatter were collected. 103a was collected near the top of the scatter with 103b at its base. The samples were collected from 4 x 4m squares. The two samples are very similar in proportions of debitage categories and in types represented.

WG103A

The artefacts are on dark grey-brown flint with orange cortex which is fresh and chalky. The flint has little abrasion. The debitage is largely flake (62%) with a significant blade element (ratio 1:4.4). There are some Levallois points. Flakes and blades show facetted and dihedral platforms. There is a high proportion of cores, which are bifacial or single/opposed platform cores, as well as one Levallois point core. Retouched tools include scrapers and one biface. The assemblage is possibly Middle Palaeolithic in character. The assemblage totals 59 artefacts, with 8.5% retouched.

WG103B

These artefacts are on dark grey-brown flint with orange cortex. The material is patinated, with slightly more abrasion than WG103A. The debitage is largely flake (66%), but with a significant blade component (ratio 1:4.7). There are some Levallois products including points, flakes and cores, including one Levllois point core and Levallois blade core. Many flakes and blades have facetted or dihedral platforms. The retouched tools include scrapers and notches. The assemblage is Middle Palaeolithic in character, with a significant blade component. The assemblage totals 62, with 8.1% retouched.

WG 104

This site was identified through gridded survey. It is located in the centre of the erosion wadi running from the saddle between WG1 and WG2. The main wadi is cut by many smaller channels providing a very uneven surface. A sample of the scatter from the wadi slopes was collected from a 4 x 4m square. The artefacts are made on dark grey-brown flint with orange cortex. The material is patinated, with some abrasion. The debitage is entirely composed of flakes (76%), many with sinuous platforms showing facetting or dihedral preparation. Many flakes have discoidal renewals on the dorsal face. Retouched tools include a borer, notches and scrapers. There is one bifacial and several platform cores. The assemblage is Middle Palaeolithic in character, but with no Levallois element. The assemblage totals 123, with 7.9% retouched.

WG 105

This is a scatter in the wadi slopes identified through gridded survey. It is located further down the erosion wadi from WG 104, and may derive from that site. The artefacts are on dark grey-brown flint with orange cortex. The material is patinated, and has slightly more abrasion than some of the other assemblages. The debitage includes many flakes (65%), often with facetted or dihedral platforms, sometimes sinuous in shape. There is also a blade component, usually with plain platforms (ration 1:6.9). Cores include Levallois and opposed platforms. Retouched tools are on flakes and blades, and include notches, truncations and scrapers. The assemblage is Middle Palaeolithic in character. The assemblage totals 137, with 8.8% retouched. There was one piece of pottery retrieved.

WG 106

This site consisted of scattered large blocks with irregular flaking and large flakes. It is located on a steep slope on the West face of WG1. The material was photographed *in situ*, and no samples were collected.

WG 107

This is a large scatter (17.5m by 50+ m on the south-east slope of WG1) decreasing in density downslope. The upper edge of the scatter appears to be marked by an erosion edge, and the scatter

is visible where the soil has washed away, suggesting that there may be more material currently preserved below the surviving soil profile. 6 bags of material were collected. The artefacts are on dark grey-brown flint with orange cortex. There is some abrasion. Debitage is largely flakes (61%), many with facetted platforms. There are also some large blades (ratio 1:5). There is a high proportion of cores (11.1%), including Levallois point and flake cores, as well as six discoidal cores (see Fig. 3:1) and a few platform cores. Retouched tools include notches, scrapers (see Fig. 3:4), 2 bifaces and some Levallois points. The material is Middle Palaeolithic in character, but with a substantial blade element. The bifaces may suggest a Lower Palaeolithic presence. The assemblage totals 180, with 6.7% retouched.

WG 108

This site was identified in the gridded survey running from below a break of slope. A sample of material was collected from a 4 x 4m square. The artefacts are on dark brown-grey flint with orange cortex. There is some abrasion. Debitage is only 48% flake, many showing facetted and dihedral platforms, and discoidal removals on the dorsal face, with 32% flakelets, and almost no blades. The high proportion of cores includes one Levallois core and discoidal bifacial cores. There is a high proportion of retouched tools (11.1%) including notches and scrapers, and one notch on a bifacial core. The material is Middle Palaeolithic in character. The assemblage totals 90 artefacts.

WG 201

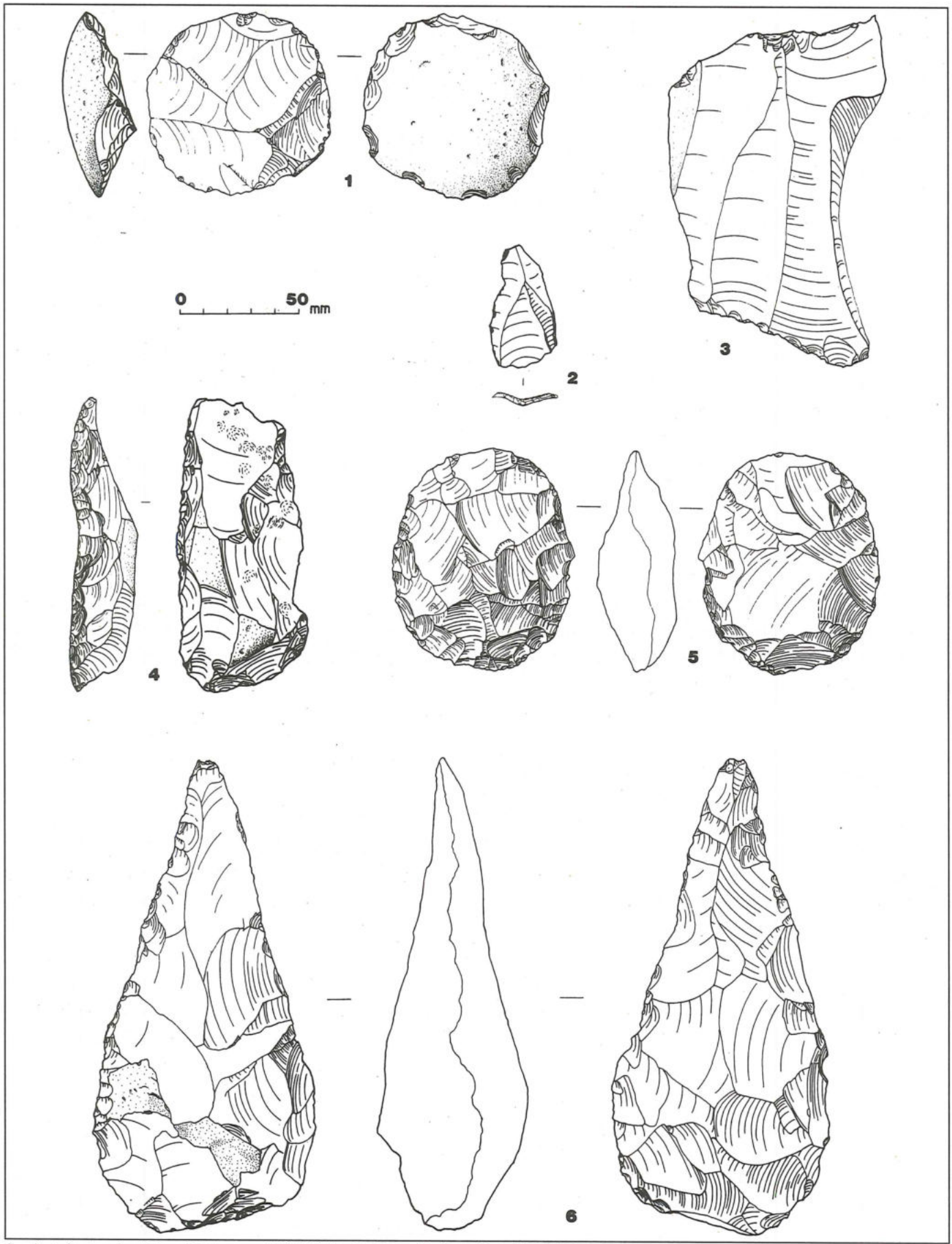
On the summit of WG2 a dense scatter of small debitage with fairly tightly defined edges was located. Total collection of the surface material across the site was attempted by the team walking over the site twice in order to maximise recovery of small debitage elements. The large quantity of debitage is under analysis.

WG 202

This site is located half way down the eastern slope of WG2 on a relatively shallow part of the slope. The artefacts are on dark grey-brown flint, slightly patinated; and also on dark brown flint, and matt black flint. All cortex is orange. Debitage is largely small flakes (flake:blade ratio is 1:33) with small, plain platforms. The assemblage includes chips and chunks. There are only 1.6% of retouched tools which fall into two groups. One includes tools on small flakes and blades similar to the debitage, and includes a borer, some truncations and marginally retouched flakes. The other is made up of retouched chunky flakes including a Levallois point, a notch and some scrapers. While the second group appears to be a small Middle Palaeolithic assemblage not corresponding to any of the debitage, the first is a non-diagnostic later period assemblage which includes debitage, retouched tools and cores (small single and opposed platform cores). This could be assigned to any period from the early Neolithic through Chalcolithic. The assemblage totals 899 artefacts.

WG 203

Within the wadi beneath 201/202 there is an extensive scatter of large material. This was sampled by walking across the wadi with the team spaced at close intervals. The artefacts are on dark grey-brown flint with orange cortex. The material is patinated, and has fresh edges with little abrasion. The assemblage is 60% flakes. Some flakes show sinuous and facetted or dihedral platforms. There is a blade component (flake:blade ratio is 1:8.7), and some flakes are blade-like. There is a very large number of cores (13%), of which five are bifacial, two are Levallois flake cores, two are Levallois point cores, and five are platform cores. There is a fairly low proportion of retouched



3. Artefacts. 1: Discoidal core (WG107); 2: Levallois point (WG502); 3: Blade core (WG501B); 4: Side scraper (WG107); 5: Ovate biface (WG501B); Lanceolate biface (WG501B).

tools (4.4%), which include scrapers and notches, and marginally retouched pieces on chunky flakes. The assemblage is Middle Palaeolithic, but with a blade element and associated platform cores. The assemblage totals 130 artefacts.

WG 204
This site is located on a level area at the north end of WG2. WG 204 is a small concentration within a larger more diffuse scatter. It appears mixed in character, but has not yet been catalogued.

WG 301
7 49 695 E
33 89 865 N
1053m asl
This scatter is located at the end of the track running down from the plateau. The material is largely confined to edges of a level area that has been cultivated. This material has not yet been catalogued.

WG 302
This scatter is located towards the bottom of the slope below the track. The material is on dark grey-brown flint, with orange cortex. Some material is heavily patinated, while some is not. The assemblage is also mixed in technology. The patinated material is made up of chunky flakes, some with facetted or dihedral platform preparation. The rest of the artifacts are smaller flakes with plain platforms. Overall, the assemblage is largely flakes (64%). It also contains chips and chunks. One patinated core is bifacial, and one unpatinated core is single platform. There is only one retouched tool, which is a small chisel made on light grey flint, probably Chalcolithic/Early Bronze Age in date. Thus there are perhaps three periods represented in this assemblage - Middle Palaeolithic, undiagnostic Neolithic or later, and Chalcolithic/Early Bronze Age. The location of this site at the bottom of a slope below a terraced area may explain the mixed material present. The assemblage totals 134, with 0.7% retouched. There were 141 pieces of pottery retrieved.

WG 303
This scatter of material is close to WG 301 at the base of the next terrace up. The artefacts are on dark grey-brown flint, with orange cortex. Some artefacts are patinated, while others are not. It is almost entirely made up of flakes (92%). Some flakes show discoidal removals on the dorsal face, or facetted platform preparation. Retouched tools include a notch and a scraper. Only one core was recovered, a single platform core with bladelet/flake removals. Although many of the flakes are not diagnostic, the assemblage appears to be Middle Palaeolithic. The assemblage is small, totalling 40, with 5% retouched. 7 pieces of pottery were retrieved.

WG 304
This is a scatter of material east of the terrace above the end of the track. The material has not been catalogued yet.

WG 305
7 50 184 E
33 90 233 N
1162m asl
This is a substantial extensive scatter adjacent to the track on a gentle slope. The material appears

to have been exposed by erosion. The gentle slope is part of an area of former cultivation. The artefacts are on dark grey-brown flint, with orange cortex. Most pieces are patinated, although some are not. All pieces have fairly fresh edges. The assemblage is dominated by flakes (75%), often with sinuous platforms and dihedral or faceted platform preparation. There is a substantial blade component (ratio 1:7), and some flakes are blade-like. There is also a small part of the assemblage that is made up of smaller, less patinated flakes. There are six bifacial cores, including two Levallois and one with massive blade removals. There are also several platform cores. Retouched tools include scrapers, a retouched Levallois point, a borer and two burins. The assemblage is Middle Palaeolithic in character, with a later element of non-diagnostic flakes. The assemblage totals 173, with 6.9% retouched. 18 pieces of pottery were retrieved.

WG 306
7 50 741 E
33 90 575 N
1125m asl
This is a thin scatter on the edge of the terrace below cliffs made of conglomerate containing flint nodules. WG 306 is the lower of two terraces that have been deliberately enhanced for agriculture. The material has not yet been catalogued.

WG 307
7 50 852 E
33 90 215 N
1271m asl
This is a low density scatter on a saddle forming a very level area with a Bedouin camp. It contains scrapers and cores and appears mixed in character. The area cleared for a Bedouin tent has obviously altered the surface. The materials has not been catalogued yet.

WG 308
7 50 852 E
33 90 215 N
1271m asl
Downslope and to the north of WG307, this is a low density scatter, possibly comprising material eroded from WG307. It now lies within a series of three small agricultural terraces. The material has not been catalogued yet.

WG 309
7 50 989 E
33 90 304 N
1295m asl
This is a large medium to high density scatter with much small debitage visible. Four 4x4 m samples were collected. The site lies on a knoll at the edge of the plateau. The samples have not been catalogued yet.

WG 401
7 49 487 E
33 89 908 N
978m asl

This is a small scatter eroding from within a colluvial ridge near the bottom. The lithic material, although generally fresh does not appear to be heavily rolled, so presumably movement has been small. However, there was no sign of a buried surface and the lithic material appears to be distributed substantially through the thickness of the deposit. This suggests that it has arrived as part of a rapid movement of soil downslope. The artefacts are on dark grey flint, with orange to off-white cortex. The material is lightly patinated, and has fairly fresh edges. The assemblage is dominated by flakes (77%), often with dihedral platforms, or discoidal removals on the dorsal face. There is a blade component as well (blade:flake ratio is 1:7), and some blade-like flakes. Most blades have unprepared platforms. Cores are mainly single platform, with a blade or flake removals. Retouched tools include burins, notches and scrapers. The assemblage has a Middle Palaeolithic character, but includes blades and platform cores. The massive blade technology is even more prominent here than at the other sites. The assemblage totals 191 artefacts, with 5.8% retouched. 26 pieces of pottery were retrieved.

WG 501
7 49 204 E
33 88 961 N
951m asl
This is an extensive scatter near cairns at the south end of the central ridge (WG5). Within this scatter was a large area dominated by Middle Palaeolithic material (WG 501B). WG 501B is mainly in erosion scars, and there is a possibility that part of the site is still buried. WG501 itself carries on over the top of the cairns. The material from WG501 has not been catalogued yet.

WG501B
The material is on dark grey-brown flint, with light orange to creamy off-white cortex. It is somewhat patinated, with fairly fresh edges. The assemblage is dominated by flakes (70%), many with discoidal removals on the dorsal face, and sinuous platforms. Most flake platforms are plain. There is a blade component as well (blade: flake ratio is 1:8.7), many with facetted platforms. There are several Levallois points, and one Levallois point core as well as a Levallois flake core. Most of the cores are opposed or single platform blade cores, some of them with massive removals (see Fig. 3:3). Retouched tools include sixteen bifaces, notches, scrapers and burins. The bifaces range from 91-200mm in length, but half are between 110-120mm. Their morphology varies (see Fig. 3: 5-6). While the bifaces may suggest a Late Acheulian date, many of the blade cores suggest a late Middle Palaeolithic date. 205 pieces of flint were collected, with 5 pieces of pottery.

WG 502
7 49 077 E
33 89 210 N
982m asl
This site is located on the east facing slopes of WG5 near WG 501. This may be part of the same site becoming visible through erosion. The material is on dark grey-brown flint, with light orange to creamy off-white cortex. It is lightly patinated, and slightly abraded, more than WG 501. The assemblage is dominated by flakes (72%), many with discoidal removals on the dorsal face and dihedral or facetted platform preparation, and including Levallois points (Fig. 3:2). There is also a blade component (blade:flake ratio is 1:8). Cores are either bifacial or single platform (many of the latter being irregular). Retouched tools include four bifaces, notches, burins and scrapers. The assemblage has a Middle Palaeolithic character, with a possibly Late Acheulian element in the bi-

faces. The blade element together with blade cores may suggest a late Middle Palaeolithic designation. The assemblage totals 209, with 12% retouched. Two pieces of pottery were retrieved.

WG 503
An additional scatter similar in character to WG 501 is located ca. 200 m north on the same ridge. No material was collected.

WG 504
7 48 960 E
33 89 709 N
1018 m asl
This is a small scatter in a steep heavily eroded area above the wadi. It contains only large material. No material was collected. A broken but well made handaxe was observed with blades and flakes present.

APPENDIX TWO

DFGEPP 2000 Chipped stone

Survey no	101	102	103A	103B	104	105	107	108	202	203	302	303	305	401	501B	502
Flakes	215	188	37	41	94	89	111	44	711	82	87	37	131	147	144	152
%	70.7%	85.1%	62.7%	66.1%	76.4%	65.0%	61.7%	48.9%	79.1%	60.3%	64.9%	92.5%	75.7%	77.0%	70.2%	72.7%
Flakelets	56	0	5	3	11	18	12	29	0	17	0	0	0	0	0	0
%	18.4%	0.0%	8.5%	4.8%	8.9%	13.1%	6.7%	32.2%	0.0%	12.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Blades	14	10	7	8	4	15	23	1	2	11	3	0	19	17	18	16
%	4.6%	4.5%	11.9%	12.9%	3.3%	10.9%	12.8%	1.1%	0.2%	8.1%	2.2%	0.0%	11.0%	8.9%	8.8%	7.7%
Bladelets	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0
%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cores	2	4	5	5	5	3	20	6	4	18	2	1	9	2	14	13
%	0.7%	1.8%	8.5%	8.1%	4.1%	2.2%	11.1%	6.7%	0.4%	13.2%	1.5%	2.5%	5.2%	1.0%	6.8%	6.2%
CTEs	1	0	0	0	0	0	2	0	4	2	0	0	1	2	0	2
%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	0.4%	1.5%	0.0%	0.0%	0.6%	1.0%	0.0%	1.0%
Chips	0	0	0	0	0	0	0	0	82	0	4	0	0	0	0	0
%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.1%	0.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chunks	0	0	0	0	0	0	0	0	56	0	10	0	1	12	0	0
%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.2%	0.0%	7.5%	0.0%	0.6%	6.3%	0.0%	0.0%
Total debitage	288	202	54	57	114	125	168	80	876	130	133	38	161	180	176	184
Ret'ed flakes	11	15	2	3	9	10	8	9	20	5	1	2	11	7	13	17
Ret'ed blades	1	4	2	2	0	2	2	0	1	1	0	0	1	4	0	4
Ret'ed b'lets	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
Core tools	4	0	1	0	0	0	2	1	0	0	0	0	0	0	16	4
Total ret'ed	16	19	5	5	9	12	12	10	23	6	1	2	12	11	29	25
% ret'ed	5.3%	8.6%	8.5%	8.1%	7.9%	8.8%	6.7%	11.1%	1.6%	4.4%	0.7%	5%	6.9%	5.8%	14.1%	12%
Total	304	221	59	62	123	137	180	90	899	136	134	40	173	191	205	209
Blade:flake	1:18.8	1:14.5	1:4.8	1:4.7	1:28.5	1:6.9	1:5	1:43	1:33.2	1:8.7	1:29.3	0	1:7.1	1:7.3	1:8.7	1:8.5
Core:deb.	1:143	1:49.5	1:9.8	1:10.4	1:21.8	1:40.6	1:7.4	1:12.3	1:218	1:6.2	1:65.5	1:37	1:16.9	1:89	1:11.6	1:13.2
Pottery	0	3	0	0	0	1	0	1	0	0	141	7	18	26	5	2

References

Barjous, M.O.

1992 *The Geology of the Ash Shawbak Area: Map Sheet No. 3153 III.* Ministry of Energy and Natural Resources, Natural Resources Authority, Geology Directorate, Geological Mapping Division; Bulletin 19. Amman.

Bender, F.

1974 *The Geology of Jordan.* Berlin: Gerbruden Borntaeger.

Besancon, J., Copeland, L., Hours, F., Macaire, J. and Sanlaville, P.

1984 The Lower and Middle Palaeolithic of the Upper Zarqa and the Khirbet Samra area of Northern Jordan, 1982-83 Survey results. *ADAJ* 28:91-141.

Clark, G.A., Schuldenrein, J., Donaldson, M.L., Schwarz, H.P, Rink, W. and Fish, S.

1997 Chronostratigraphic contexts of Middle Palaeolithic horizons at the 'Ayn ad-Dufla rockshelter (WHS634), west-central Jordan. In H.G.Gebel, Z. Kafafi and G. Rollefson (eds), *Prehistory of Jordan II*, SENEPSE 4 ed. Berlin: *ex orient.*

Copeland, L.

1998 The Lower Palaeolithic of Jordan. In D. Henry (ed.), *The Prehistoric Archaeology of Jordan.* BAR Int. Series 705.

Finlayson, B. and Mithen, S.J.

1998 The Ḍāna-Faynān (South Jordan) Epipalaeolithic Project: Report on Reconnaissance Survey, 14-22 April 1996. *Levant* 30: 27-32.

Finlayson, B. and Mithen, S.J. with Austin, P., Carruthers, D., Dennis, S.J., Kennedy, A., Pirie, A., Roberts, C. and Tipping, R.

1999 *The Ḍāna* Faynān *Ghuwayr Early Prehistory Project, Third Interim Report, 1999 Field Season,* Unpublished report, CBRL. Amman.

Garrard, A., Betts, A., Byrd, B. and Hunt, C.

1987 Prehistoric Environment and Settlement in the Azraq Basin: an Interim Report on the 1985 Season. *Levant* 19:5-25.

Henry, D.

1998 The Middle Palaeolithic of Jordan. In D. Henry (ed.), *The Prehistoric Archaeology of Jordan.* BAR Int. Series 705.

Henry, D.

1995 *Prehistoric Cultural Ecology and Evolution: Insights from Southern Jordan.* New York: Plenum Publishing Corporation.

MacDonald., B., Rollefson, G., Banning, E., Byrd B. and D'Annibale, C.

1983 The Wādī al-Ḥasa Archaeological Survey, 1982: A Preliminary Report. *ADAJ* 27: 311-323.

Macumber, P. and Edwards, P.

1997 Preliminary Results from the Acheulian Site of Mashari'a 1, and a New Stratigraphic Framework for the Lower Palaeolithic of the East Jordan Valley. In H-G Gebel, Z. Kafafi and G. Rollefson (eds), *Prehistory of Jordan II*, SENEPSE 4 ed. Berlin: *ex orient.*

Rollefson, G.O., Schnurenberger, D., Quintero, L., Watson, R. and Low, R.

1997 'Ainsoda and 'Ain Qasira: New Later Pleistocene and Early Holocene Sites in the Azraq Shishan Area, Eastern Jordan. In H-G Gebel, Z. Kafafi and G. Rollefson (eds), *Prehistory of Jordan II*, SENEPSE 4 ed. Berlin: *ex orient.*

Rollefson,G.O.

1981 The Late Acheulean Site at Fjaje, Wadi el-Bustan, Southern Jordan. *Paléorient* 7/1:5-21.

Rollefson, G.O.
1985 Late Pleistocene Environments and Seasonal Hunting Strategies: A Case Study from Fjaje, Near Shobak, Southern Jordan. Pp. 103-108 in *SHAJ* II. Amman: Dept of Antiquities.