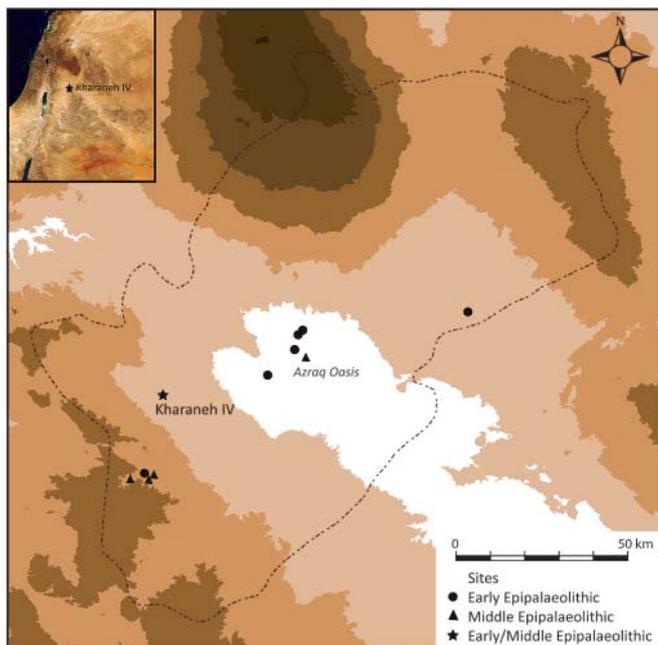


RESEARCH REPORTS

The Origins, Development and Practice of Economic and Social Strategies in the Middle East from Earliest Times to the Modern Day

Exploring Typo-technological Diversity in Chipped Stone from Epipalaeolithic Kharaneh IV, Eastern Jordan

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Map of eastern Jordan showing the boundaries of the Azraq Basin (dashed lines) and the location of Kharaneh IV within the Basin (and inset within the southern Levant) © Lisa Maher

The Epipalaeolithic Foragers in Azraq Project (EFAP) is a collaborative, multi-disciplinary project involving prehistoric archaeologists, human osteologists, and geographers focused on developing a detailed understanding of hunter-gatherer behaviour in the Azraq Basin some 20,000 years ago and placing this within the broader context of cultural transformation in southwest Asia at the end of the Pleistocene. Ongoing work at Kharaneh IV (c. 19,800–18,600 cal BP) demonstrates a high-resolution record of long-term occupation, with evidence for hut structures, hearths, living floors, human burials, and complex long-distance social networks for this 21,000 sq m site. Three excavation seasons and excellent preservation conditions at the site have resulted in an abundance of lithics from *in situ* deposits.

The Chipped Stone Analysis from Karaneh IV

Our approach to tool production explores the role material culture plays in creating, maintaining, and transforming prehistoric societies and sees it within a wider social context and integrated with other technologies (i.e., stone tools are often produced to manufacture something else). Thus, the chipped stone analysis is best understood together with other aspects of material culture and environmental data to reconstruct the activities of Kharaneh IV's occupants.

The goal of this preliminary study was to conduct a detailed typological and technological analysis of the chipped stone material excavated in 2008–10. Since



(L): Overview of the Early and Middle Epipalaeolithic site of Kharaneh IV taken in 2008 (courtesy of Isabelle Ruben). The site appears as a dark-coloured mound in the centre and the back-filled excavation trenches are visible and marked Areas A and B. The modern Wadi Kharaneh is visible on the top right. (R): Close-up of surface of Kharaneh IV showing the high density of chipped stone debris from the site © Lisa Maher

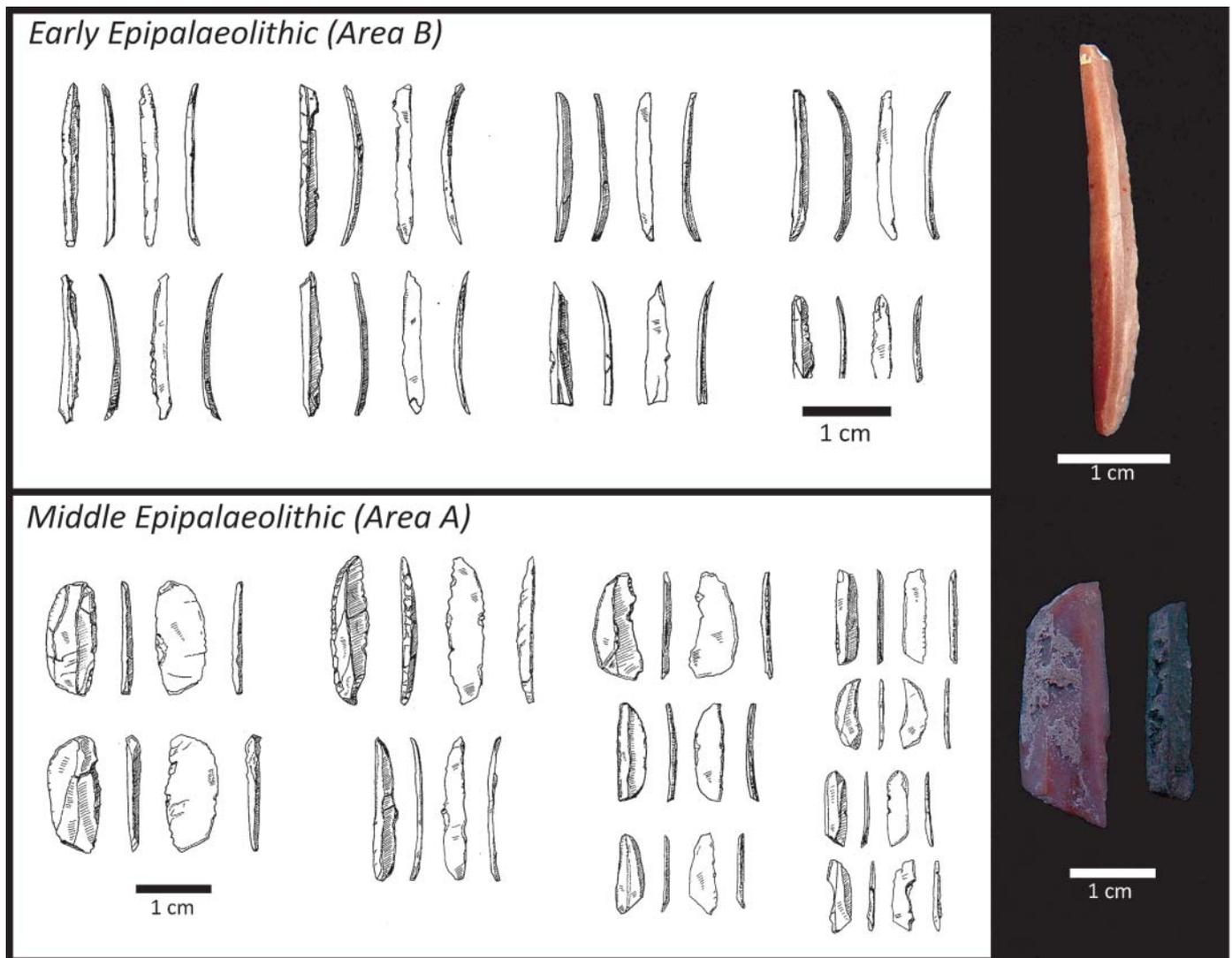
our excavations produce an enormous amount of lithic material (over 2 million to date), particular contexts were sampled to complement the other ongoing faunal, botanical and environmental analyses, including from hearths, huts, middens, caches and occupation surfaces. The work was conducted at the British Institute in Amman during a Visiting Research Fellowship held by Lisa Maher in 2011, and included a team of four graduate students.

Several researchers have argued that the microlith (modified blades less than 5 mm in length) assemblage from Kharaneh IV, particularly from the Middle Epipalaeolithic areas, is notably different from those at contemporary sites in the region, leading to uncertainty about how the occupations here relate to that elsewhere in the southern Levant. With this in mind, we examined the Kharaneh IV material with both a typological and technological approach to lend insights into the nature of the occupation of the site and to view it in its regional context. We explored assemblage variability in two dimensions: looking at

change over time through all occupations at the site, and change within individual occupation levels to detect the types of activities occurring in various parts of the site. As this work is still ongoing, we will focus here on change over time.

The Early EP of Kharaneh IV (Area B)—19,800 and 18,800 cal BP

In the Early Epipalaeolithic area, our work focused on several related hut structures and associated middens and included material from a combination of horizontal and vertical exposures. Over 1,400 tools were studied from Area B. The tool assemblage is dominated by non-geometric microliths that comprise 50% of the overall tool assemblage, a frequency expected in Early Epipalaeolithic sites throughout the region. Very small fragmentary microliths are also very common and likely represent the tips of pointed non-geometric forms broken during production or from use. If we combine the complete and fragmentary non-geometric pieces, non-geometrics reach a total of 84% of all tools from this area. Although it is



Microlith tools from Kharaneh IV. The upper panel shows some of the non-geometric microliths from Area B, including a photograph of an obliquely truncated and backed bladelet. The lower panel shows geometric microliths (trapeze/rectangles) from Area A. The microliths on the left side of the photograph show an atypically wide complete trapeze while the one on the right is a narrow, unbacked trapeze (illustrations by C. Hebron) © Lisa Maher

common for Epipalaeolithic tools assemblages to have a high proportion of microliths, this assemblage is on the higher end of this scale, emphasizing that these microliths were clearly the desired end-product for most on-site knapping events.

Over 48,000 non-retouched pieces (debitage) have been analysed from this area. The raw material selection seems focused on naturally thin, small nodules of dark brownish-grey flint found within the immediate vicinity of the site. Narrow flint nodules appear to have been targeted to allow for the production of small microliths from carefully-prepared narrow-faced cores. These narrow-faced cores are the most prevalent type found in Area B. A great deal of pre-planning went into the production of microliths from these cores, and the shape of the core was maintained throughout knapping to ensure the consistency of microlith blanks being removed. This is a blade-rich assemblage with a flake to blade ratio of 1:3, and blades were clearly the targeted product throughout the reduction process. These would then be retouched into microliths, scrapers, and backed blades.

The Middle EP of Kharaneh IV (Area A)—c. 18,800 and 18,600 cal BP

The Middle Epipalaeolithic deposits contain a series of compact occupation surfaces, each associated with hearths and several surrounding postholes that may represent ephemeral structures placed near fireplaces, perhaps as cooking or meat drying racks. To date, more than 3,500 retouched tools have been analysed from the Middle Epipalaeolithic deposits. Again, microliths dominate the assemblage at 75% of the tools. Of these, geometric microliths (both complete and incomplete form) are most common. These geometric microliths are primarily trapeze-rectangles, but they exhibit a wider range of forms than is usual for other contemporary Middle Epipalaeolithic sites. Although variable in their form, it is important to note that each of these trapeze and rectangle varieties can be found at other Middle Epipalaeolithic sites in the region—none are a new type specific to Kharaneh IV. Furthermore, although variable in size, they fall within the range of trapeze/rectangles known from sites in the north, Jordan Valley and Coastal Plain and Negev. The difference between Middle Epipalaeolithic Kharaneh IV and contemporary sites elsewhere

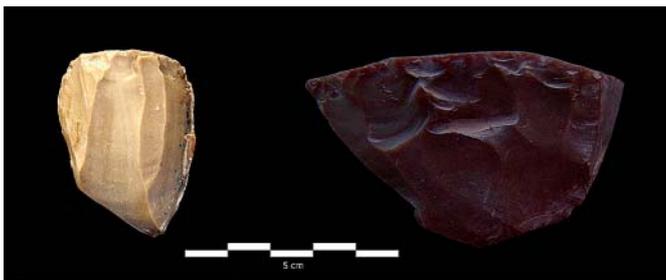
is that the Kharaneh IV trapeze/rectangles show great diversity.

Over 100,000 pieces of debitage have been analysed to date. The raw material selection is much more variable than that of the Early Epipalaeolithic, with a greater diversity in the choice of flint colour, quality and shape of the nodules. Rounded nodules are introduced as knapping materials along with the narrow tabular nodules preferred in the Early Epipalaeolithic. The majority of the raw materials are still collected from the local landscape, within 5–20 km from the site. The cores include both narrow- and broad-faced cores probably reflecting the addition of rounded raw materials into the knapping repertoire. In terms of knapping, the most notable difference between Early and Middle Epipalaeolithic occupations is in the shift from emphasis on core shaping to core maintenance. The Middle Epipalaeolithic reduction strategy is more heavily focused on corrective removals rather than initial preparation.

Putting It All Together... Changes over Time

While the Early and Middle Epipalaeolithic occupants were both focused on microlith production, they went about achieving these goals in different ways. Middle Epipalaeolithic knappers chose raw material from a wider range of flint sources and more time and effort was invested in core shaping during the Early Epipalaeolithic in comparison to the Middle Epipalaeolithic and this is reflected in a greater range of core types over time. Earlier occupations at the site invested more energy into core shaping prior to removals, whereas the later occupations maintained the removal face through correction pieces instead of initial shaping. The different investments in core preparation relates to the types of microliths being produced during the Early and Middle occupations. The non-geometric microliths are very minimally retouched and therefore required standard-sized blanks in order to fit into hafts. In contrast the geometric microliths used in the Middle Epipalaeolithic are heavily retouched; therefore, the shape of the initial blank was less important.

The reasons for this shift in microlith production remain elusive. However, possible changes in hunting strategies and intensified gazelle use may have influenced the change in lithic technology. There is also evidence for increased trade and exchange in the Middle Epipalaeolithic as witnessed by the increased frequency and travelling distance of long distance items at the site (i.e. marine shell). This places the people of the Middle Epipalaeolithic into more regular and active interaction networks with other Levantine communities. Interactions with communities and the potential aggregation of new peoples from outside of the Azraq Basin to the site may have influenced changes in lithic technology in Kharaneh IV. Perhaps most importantly, changes in the lithic technology from the Early to the Middle Epipalaeolithic are not a reflection of resource availability, but of the different choices made by the inhabitants of the site.



Examples of cores from Kharaneh IV showing a typical narrow-faced core from the Early Epipalaeolithic Area B and a typical broad-faced core from the Middle Epipalaeolithic Area A

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