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74 The Upper and Epipalaeolithic of the Azraq Basin, Jordan

BRIAN F. BYRD and ANDREW N. GARRARD

74.1 INTRODUCTION

The Azraq Basin covers 12,000 km of the north-central Jordanian Plateau and currently ranges from moist steppe in the north and west through to desert in the southeast (Fig. 74.1). At its centre are the Azraq oases with their copious perennial springs, which until recently supported extensive marshland. The Azraq Basin Prehistory Project was undertaken between 1982 and 1989, with the aim of reconstructing environments through the late Pleistocene and early Holocene, and looking closely at the record of human settlement and activity in this area through the Epipalaeolithic and Neolithic. There was a particular interest in the degree to which this region, which currently lies at the arid margins of the Levantine corridor, although with an oasis at its centre, was engaged in the major economic and cultural transformations of the later Epipalaeolithic and Neolithic. Following a survey in which over 100 sites were recorded, one Upper Palaeolithic, nine Epipalaeolithic, and eight Neolithic sites were the subject of small-scale excavations. These were mainly located in the Wadi Jilat, Wadi Uwaynid, and around the Azraq oases (Fig. 74.1). Numerous publications emerged from this work, including studies on the lithic technology (Byrd 1998; Wright 1991, 1992, 1993; Baird 1993, 1994, 1995; Byrd & Garrard 2013); on stone bead production (Wright & Garrard 2003; Wright *et al.* 2008); on the structural remains (Garrard *et al.* 1994a); on the use of plant and animal resources (Colledge 1994, 2001; Martin 1994; Garrard *et al.* 1996; Martin *et al.* 2010, 2013); and on the palaeoenvironmental reconstruction (Hunt & Garrard 2013). Summaries are in Garrard *et al.* (1994b), Garrard (1998), and Garrard and Byrd (2013: Section A).

Here the focus is on the development of technology in the region through the Epipalaeolithic (Byrd & Garrard 2013). Eleven sites were studied from this interval with 19 distinctive occupation horizons, which included both short-term and repeated or longer occupation. The largest is at the multi-phase site of Jilat 6 (Fig. 74.2), which covers 19,000 m² and probably represents a seasonal aggregation locality (Garrard & Byrd 1992), analogous to Kharaneh IV (Muheisen 1983, 1988; Maher *et al.* 2012; Maher, Chapter 75 of

this volume). With 26 radiocarbon ages from the Azraq project, we refined our three-part Epipalaeolithic chronology (Byrd 1998), into a four-part sequence including Initial, Early, Middle, and Late Epipalaeolithic (24,000–21,300, 21,300–17,400, 17,400–14,700, and 14,700–12,000/11,600 cal BP, respectively).

74.2 UPPER AND EPIPALAEOLITHIC LITHIC ASSEMBLAGES

In presenting the lithic assemblages and their broad temporal trends, eight late Pleistocene industries are distinguished including: Late Upper Palaeolithic Ahmarian; Initial Epipalaeolithic Nebekian; Early Epipalaeolithic Qalkhan, Nizzanan, and Kharanan; Middle Epipalaeolithic Jilatán; Middle/Late Epipalaeolithic Azraq Mushabian; and Late Epipalaeolithic Natufian. These terms are heuristic devices used to convey spatial-temporal trends in the Azraq Basin, and to focus future research on understanding regional variability and patterning.

74.2.1 LATE UPPER PALAEOLITHIC AHMARIAN (30–24 ka cal BP)

Based on radiocarbon ages, stratigraphy, and palaeoenvironmental context, four Late Upper Palaeolithic occupation horizons were distinguished between 30 and 24 ka cal BP (Azraq 17 Trench 2, Jilat 6 Basal Phase, Jilat 9, and Uwaynid 18 Lower Phase). The lithic assemblages from several of these sites were small but reveal diverse reduction strategies dominated by blade *sensu stricto* and bladelet reduction, supplemented (except at Azraq 17) with flake core reduction. Blade/bladelet core types are most often narrow ended or broad faced. Tools blanks were highly varied, with frequent use of flakes, overshot blades, and primary elements. The most prevalent tool classes were end-scrapers, burins, and non-standardized retouched pieces. Backed or retouched bladelet tools (termed microliths in this study) are present but not dominant, typically made with Ouchtata or marginal retouch (often on the interior side), and only occasionally backed or truncated. As a group, these

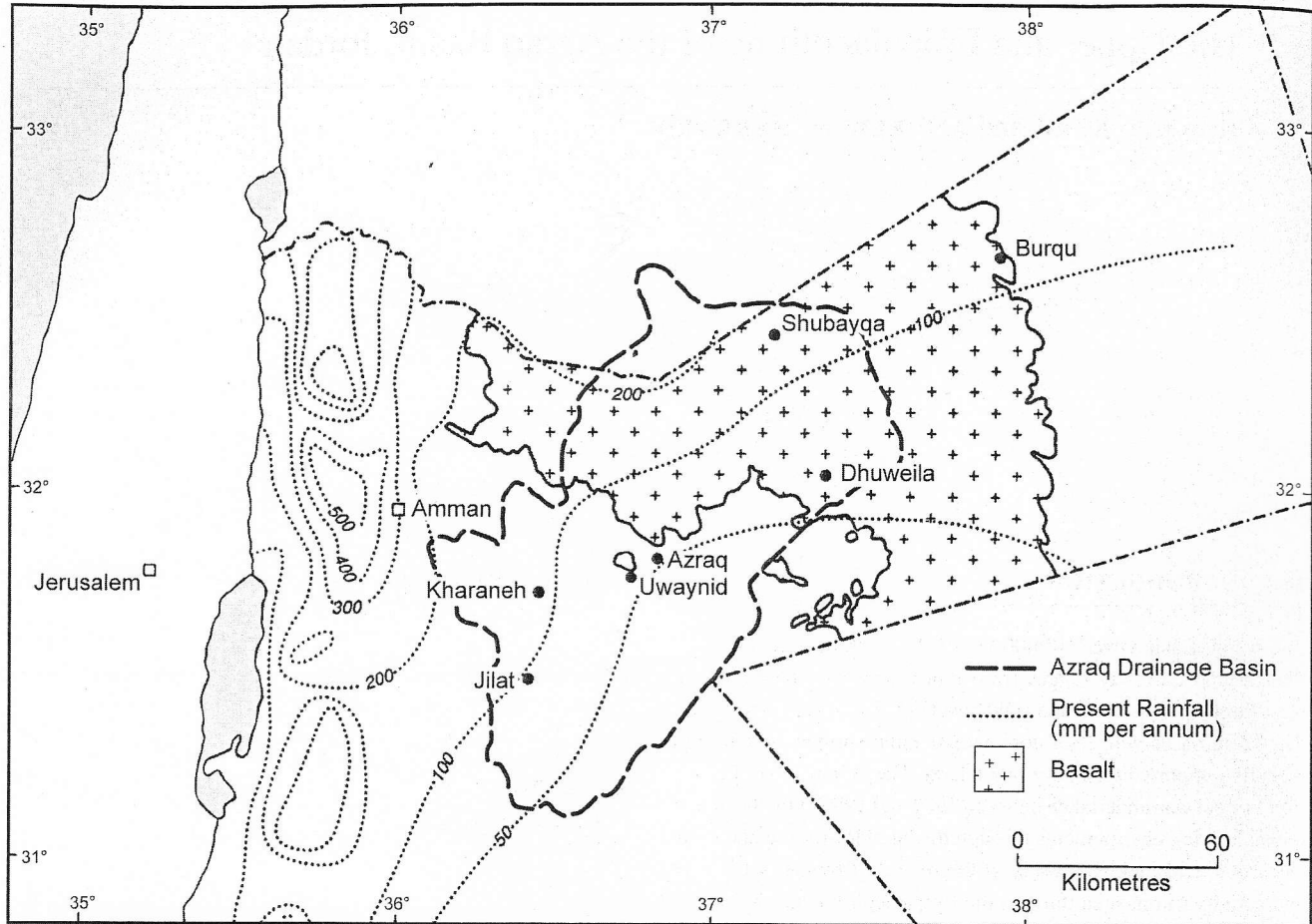


Figure 74.1 Map showing key archaeological localities within the Azraq Basin.

assemblages are most similar to Ahmarian rather than Aurignacian, although there are differences (Belfer-Cohen 1995; Coinman 1998).

74.2.2 NEBEKIAN LITHIC INDUSTRY (24–21.3 ka cal BP)

The Nebekian industry consists of four occupation horizons (Jilat 6 Lower Phase, Uwaynid 14 Lower and Upper Phases, and Uwaynid 18 Upper Phase) that yielded moderate-sized samples and as a whole represent the most homogeneous group of any time interval in this study. Three of these horizons are tightly dated, and the undated Jilat 6 Lower microliths are almost indistinguishable, visually and statistically, from those from Uwaynid 14 Lower. These sites represent the earliest classic manifestation of the Epipalaeolithic in the southern Levant and are referred to as the Initial Epipalaeolithic; they are mainly short-term occupations except at Uwaynid 18, where the occupation is thicker (Garrard & Byrd 2013).

The assemblages are dominated by bladelet production from narrow single-platform cores. Tool assemblages are almost exclusively composed of microliths (75%). These are primarily small, narrow arched backed curved pointed bladelets (mean length <23 mm in all

occupation horizons except Uwaynid 14 Upper) with length : width ≥ 5.4 (Fig. 74.3). There is also a temporal trend towards longer and wider double truncated tools with straighter backed edges and oblique truncations between Uwaynid 14 Lower and Upper. Importantly, Nebekian microliths are made with the microburin technique, with adjusted microburin indexes (aMBI) of 22–60 (Marks & Larson 1977), representing the earliest habitual use of this technique to truncate bladelets in the Levant.

Other occupation horizons within the Azraq Basin and the eastern Levant fit the techno-typological parameters of the Nebekian. These include Layers 6 and 6a from Sounding 3 at the initial excavations at Kharaneh IV (Muheisen 1983: 277–94, fig. 18), Area D at Ayn Qasiyya, in the centre of the Azraq Basin (Richter *et al.* 2009; Richter 2011), Yabrud Shelter II Layers 6 and 7 (Rust 1950: 107–10), and Madamagh Rockshelter A1–A2 (Olszewski 2006, 2011; Byrd 2014).

74.2.3 QALKHAN LITHIC INDUSTRY (CIRCA 21.3–19.7 ka cal BP)

The Qalkhan is represented by Jilat 6 Middle Phase and Azraq 32, both of which lack radiocarbon ages. However, at Jilat 6 the

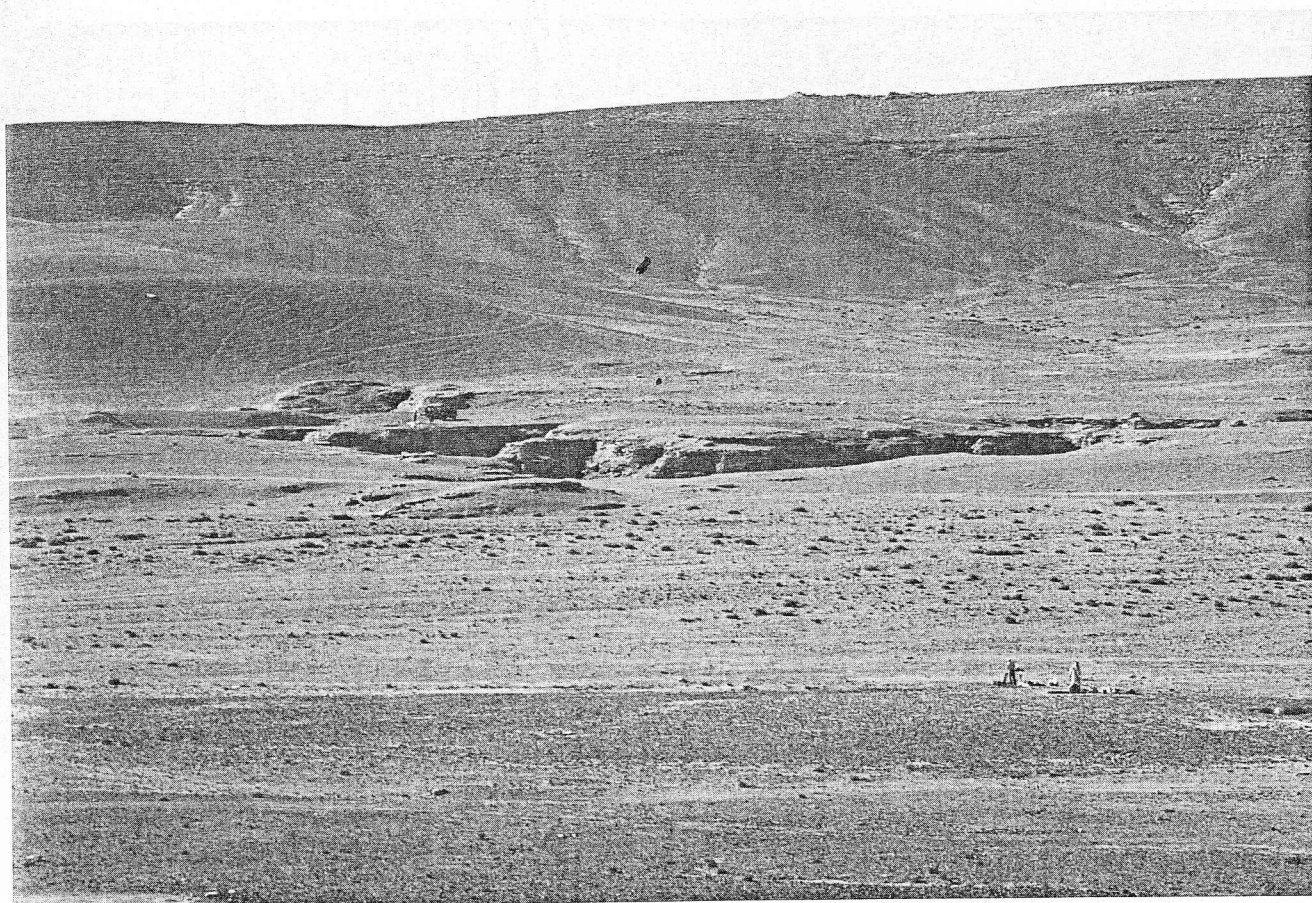


Figure 74.2 View south across Wadi Jilat with a portion of Jilat 6 in foreground.

horizon is stratified between the well-dated Nebekian and Nizzanan. The Qalkhan contrasts with Nebekian assemblages in having blade/bladelet production correlated with significantly larger tool blanks, less reliance on single-platform narrow ended core types (~50%), and a predominance of larger and wider microliths (mean lengths 38.2–24.8 mm, mean widths 8.3–8.9 mm and length : width 4.6–2.8). Both are primarily microlithic (73% and 77%), with regular use of the microburin technique (aMBI 28 and 40), but with significantly fewer arched backed curved pointed pieces and double truncated tools than in the Nebekian. Robust La Mouillah points dominate Jilat 6 Middle, and similarly formed asymmetrical double truncated tools dominate Azraq 32 (Fig. 74.3).

Rather than abandoning the term (see Olszewski 2006; Maher & Richter 2011), we argue that the Qalkhan lithic industry be narrowly applied to encompass the assemblages in the northern Hisma, where it was initially defined by Henry (1983, 1995), and several sites outside this area that meet its criteria, including in the Petra area and El Kowm Basin (Cauvin & Coqueugnot 1988; Schyle & Uerpmann 1988). Distinguishing attributes include: core reduction focused on large blade/bladelet blanks and fewer small narrow ended cores, and a dominance of larger and wider non-geometric microliths (mean dimensions: length ≥ 34.6 mm, width ≥ 8.3 mm, and length : width 2.5–4.6). Microliths are dominated by asymmetric double truncated tools resembling large triangles and large La Mouillah points, along

with large asymmetric triangles and robust double truncated and straight-backed tools (symmetrical and asymmetrical). Their manufacture involved regular use of the microburin technique to truncate at least one end (aMBI is 20–40).

74.2.4 NIZZANAN LITHIC INDUSTRY (20–18.7 ka cal BP)

Two occupation horizons in the Azraq Basin are regarded as having a Nizzanan industry, but their occupation horizons have very different settlement characteristics. Jilat 6 Upper Phase with six dates between 20–18.7 ka BP is a major base-camp of large size with a thick occupation deposit that included the floor of a potential pit structure (Fig. 74.2). Azraq 17 Trench 1 is a small, undated short-term campsite with thin deposits.

These two assemblages are dominated by blade/bladelet production, and many blanks from Jilat 6 Upper are blade (*sensu stricto*) size. Cores are significantly smaller than in Qalkhan assemblages. At Jilat 6 blade *sensu stricto*, bladelet and flake core reduction was well represented, and smaller bladelet and flake core production increased over time. The microlithic tools from these two sites represent 62–78% of the assemblage and are dominated by small and medium-sized symmetrical and asymmetrical triangles (often made with the microburin technique; overall aMBI 51 and 75), along with

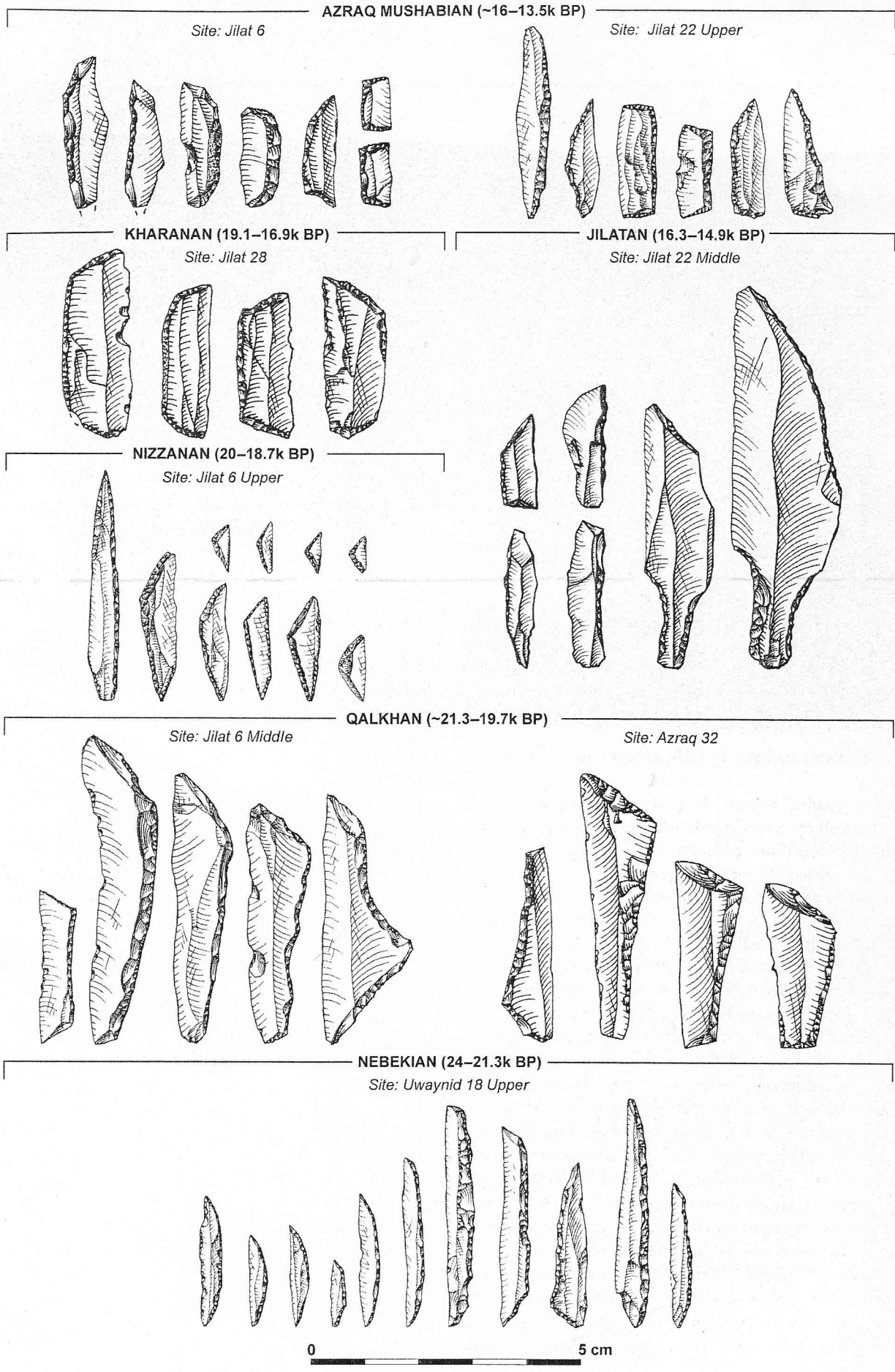


Figure 74.3 Characteristic tools from different lithic industries within the Azraq Basin.

small numbers of microgravette points or pointed pieces. At Jilat 6 Upper, asymmetrical triangles and arched backed curved pointed pieces are more frequent in the lower deposits, while very small symmetrical triangles and microgravette points are more prevalent in the upper deposits (Fig. 74.3). Associated non-microlithic tools are diverse, with burins common.

Assemblages with numerous small and medium-sized triangles made with the microburin technique are documented in several settings in the southern Levant including the Negev, east Jordan Valley, Sea of Galilee, and possibly Kharaneh IV in the Azraq Basin (Bar-Yosef 1970: 126–30; Muheisen 1983: 210; Goring-Morris 1987: 147–200; Edwards *et al.* 1999). Some sites in the coastal Levant have low frequencies of small triangles but lack the use of the microburin technique (Valla 1988: 318).

74.2.5 KHARANAN INDUSTRY (19.1–16.9 ka cal BP)

The term Kharanan was proposed to designate a lithic industry characterized by wide symmetric and asymmetric microliths that are morphologically most similar to trapezes and lunates. We argue that subsuming these assemblages under the broad rubric of the Geometric Kebaran masks clear variation in metric and formal attributes. A single Kharanan assemblage was obtained from the surface of the small site of Jilat 28. It includes very distinctive pseudo trapeze-lunates not present in any other assemblages from the Azraq Project (Fig. 74.3). Technically non-geometric in form, they often have a slightly convex backed lateral or convex truncation, and are not always fully backed. Abruptly retouched and not made with the microburin technique, they are long and wide, associated with truncations of similar size, and with narrow and long backed bladelets.

The Kharanan industry is best documented in the thick Phase D occupation deposit in Area B at Kharaneh IV (Muheisen 1988; Muheisen & Wada 1995). The microlithic assemblage is dominated by trapezes and pseudo-trapezes (similar to trapezes in form and size, but with one end obliquely snapped rather than truncated) along with some lunates and proto-lunates, which are more frequent in the upper levels. Moreover, significant percentages are not backed on the short end and hence could be termed double truncated tools. Made by abrupt to marginal exterior retouch and without the use of the microburin technique, they are typically more than 10 mm wide and nearly 20 mm long. This industry has also been documented at Tor al-Tareeq in the Wadi Hasa (Neeley *et al.* 1998; Donaldson & Olszewski 2000: fig. 15.2; Clark *et al.*, Chapter 37 of this volume; Olszewski, Chapter 72 of this volume). Based on dates from Kharaneh IV, this industry does not appear to be temporally contemporaneous with the currently defined Geometric Kebaran (Muheisen 1983; Richter *et al.* 2013). It dates to the latter half of the Early Epipalaeolithic and postdates the Nizzanan triangle industry.

74.2.6 JILATAN LITHIC INDUSTRY (16.30–14.9 cal BP)

The distinctive Jilatan lithic industry is documented only in Jilat 22 Middle and Lower occupation horizons. Core reduction strat-

egies are primarily characterized by large blade *sensu stricto* production (along with some bladelet production), generally from single-platform or opposed-platform cores. Notably, the tool assemblage is dominated by large blade *sensu stricto* tools. Distinctive tools are hafted Jilat knives (50%), strangulated tools, burins and infrequent microliths (<10%) (Fig. 74.3). The Jilat knives are a unique, tanged and truncated multipurpose tool made on a blade (Garrard & Byrd 1992). The non-tanged end was typically retouched along one lateral edge to create a point, which was most commonly fashioned by oblique retouch or backing and occasionally the remnant of a negative microburin scar has remained visible. Microliths include a variety of non-geometric forms (often truncated) and occasional small geometric trapezes. The microburin technique was habitually used to truncate microliths, truncations and Jilat knives (aMBI 49.0 inclusive of Jilat knives).

The industry in Jilat 22 Middle and Lower is from the end of the Middle Epipalaeolithic with four dates between 16.3 and 14.9 cal BP. The presence of a non-microlithic, blade dominated assemblage from the Epipalaeolithic is not unprecedented. For example, Jilat 10 (with three Middle Epipalaeolithic dates) is dominated by massive non-standardized retouched pieces, burins, scrapers, and truncations made on large blades, along with occasional microliths (10%) that include finely retouched bladelets and backed truncated fragments. However, it does not contain Jilat knives, strangulated tools, or microburins. There are also other examples of Epipalaeolithic sites not dominated by microliths including Initial Epipalaeolithic Wadi Hammeh 52 (Edwards *et al.* 1996; Edwards 2001), and the likely Middle Epipalaeolithic Falitian at Yabrud Shelter 3 Layer 3 characterized by numerous blade points *sensu stricto* termed Falitian points, which are backed on one side (Rust 1950). Such sites potentially provide novel insights into variation in technology, site function, settlement patterns, and group territorial ranges (al-Nahar 2000) that should not be overlooked (e.g. Maher 2010: 37–8; Maher & Richter 2011).

74.2.7 AZRAQ MUSHABIAN (DATES UNCERTAIN BUT CIRCA 16–13.5 ka)

Two assemblages not fitting easily into existing lithic industry categories are Jilat 8, which has a series of thin artefact lenses in aeolian sediments with a Middle and a Late Epipalaeolithic age (ca. 15.8 and 12.5 ka cal BP), and Jilat 22 Upper Phase, which has a thick ashy cultural deposit with a single Late Epipalaeolithic age (ca. 13.8 ka cal BP). These tool assemblages are similar as both are microlith-dominated (69% and 45%, respectively), habitually using the microburin technique (aMBI of 30 and 52, respectively) and had more non-geometric than geometric forms (ratios of 2.3:1 and 1.2:1, respectively). There are no microgravettes or Qalkhan points or use of bifacial retouch.

The two lithic assemblages differ significantly. Jilat 8 is dominated by short, broken fragments of backed bladelets with straight backing. Complete microliths are thin, small to medium in size, and include La Mouillah points, asymmetric double truncated pieces, arched backed pieces, lunates, and small trapezes (Fig. 74.3). Jilat 22 Upper has more flake core reduction, and its non-geometrics vary

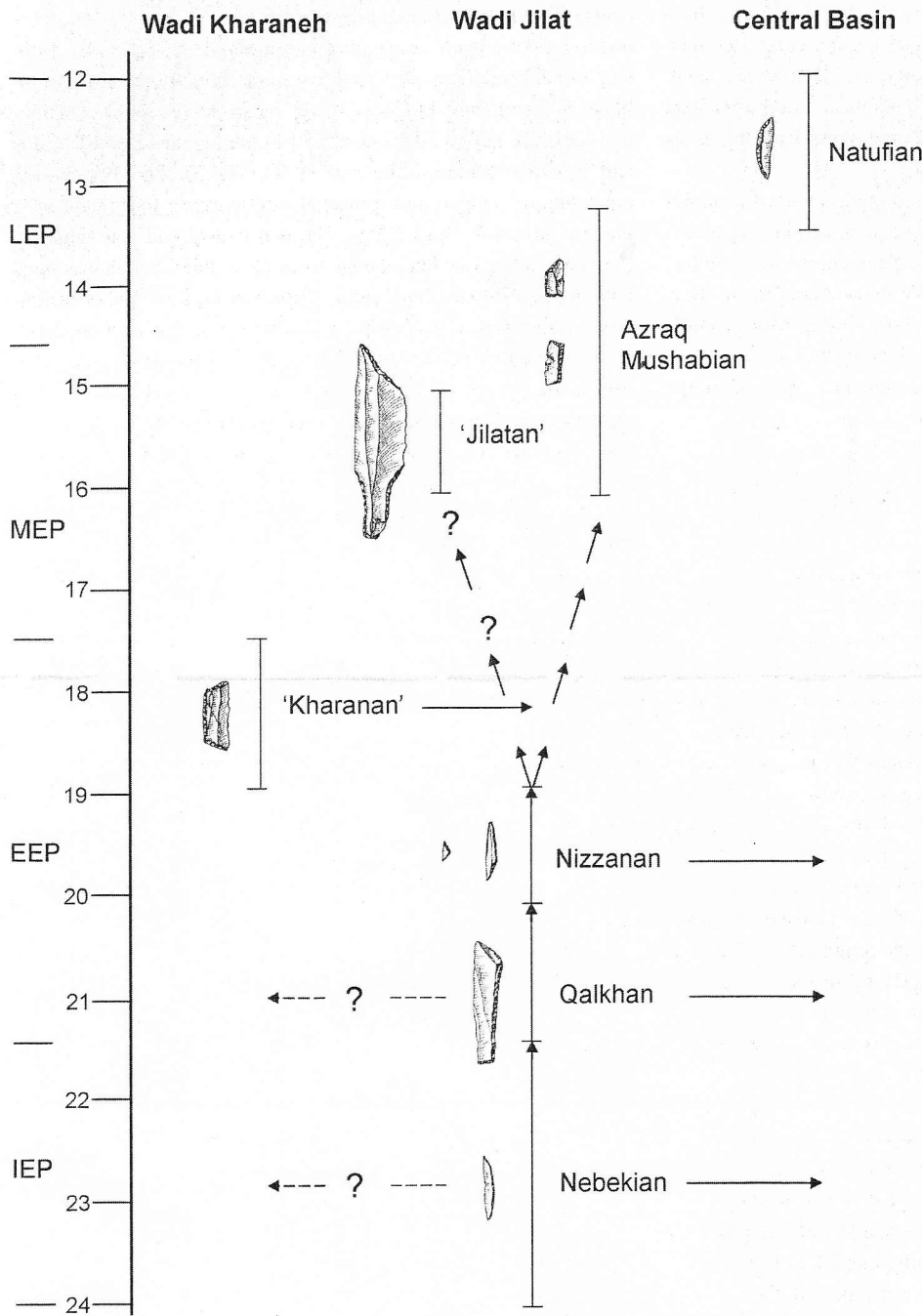


Figure 74.4 Timeline showing relationships between lithic industries in Azraq Basin. LEP, MEP, EEP, IEP indicate Late, Middle, Early, Initial Epipalaeolithic.

more in size and types, with one truncation and arched backed curve pointed pieces most common. Geometrics are represented by small to medium-sized lunates, rectangles, and trapezes (trapezes include both symmetric and asymmetric varieties, which are similar to those from Jilat 22 Middle). Straight backed microliths are commonest, but there are also convex backed forms.

These two sites are more similar to Mushabian than to Geometric Kebaran assemblages (Bar-Yosef 1981; Goring-Morris 1987; Henry 1989, 1995; Fellner 1995). This includes moderate to heavy use of the microburin technique, the higher frequency of non-geometrics versus geometrics, the presence of La Mouillah points,

the size of non-geometric microliths, and the relatively narrow widths of the microliths. Much more work is required to determine their spatial-temporal relationships.

74.2.8 NATUFIAN LITHIC INDUSTRY (CIRCA 14-13 ka cal BP)

The thick occupation deposit with burials at Azraq 18 is the only Natufian site (Garrard 1991). Blades and flakes have almost equal proportions, but the latter were not used as tool blanks. They typically used small and wide bladelets. Microliths dominate (87%)

the assemblage with microburin technique infrequently used (aMBI 10). Lunates (20.5 mm mean size) and probable lunate fragments constitute the vast majority of the assemblage and triangles are infrequent. The occasional non-geometric microliths (most with truncations and modified bases) are generally long and narrow. Bifacial retouch is most frequent on lunates (33.5%), followed by steep abrupt, alternate series and semi-steep interior retouch. Bipolar retouch is also common. Non-microlithic tools are typically non-standardized retouched pieces, end-scrapers, and truncations, while notches and denticulates are rare. Based on microlithic attributes and comparisons with other sites (Byrd 1989; Betts 1991, 1998; Byrd & Colledge 1991; Richter & Maher 2013), the site is estimated to lie between the mid-Early Natufian and the early-Late Natufian (ca. 14–13 ka cal BP).

74.3 SUMMARY OF DEVELOPMENTS IN LITHIC TRADITIONS

Analyses of late Pleistocene Azraq Basin lithic assemblages have documented a series of techno-typological trends significant to perceptions of how the Levantine Epipalaeolithic evolved, as well as to the temporal and geographical extent of its various industries (Fig. 74.4). These have implications for interpreting hunter-gatherer interactions. Much of the Azraq Basin Epipalaeolithic sequence is represented by regionally distinctive industrial traditions, with only the Natufian having strong similarities with southwestern Levant assemblages.

The Azraq Project has provided ages and technological data to assert that the onset of the Epipalaeolithic (defined by the shift to a heavy reliance on backed bladelets) is at least 24 ka cal BP. The backed bladelet assemblages from the Initial Epipalaeolithic Nebekian industry represent the best evidence for the origins of the Epipalaeolithic (Goring-Morris *et al.* 2009). The contemporaneous site of Ohalo II (Nadel 2003) is dominated by finely retouched bladelets rather than backed bladelets, indicating that such changes in composite tool technology had yet to be adopted or developed west of Lake Lisan.

The Azraq Project has also revealed that the microburin technique was used for truncating backed tools earlier than previously recognized, starting by 24 ka cal BP (see also Byrd 1988, 1994). The technique was then employed routinely throughout the Epipalaeolithic in a number of different ways depending on the tools being manufactured, which included the untanged ends of Jilat knives. However, it does not occur in some assemblages, such as the Kharanan industry. Currently, this technological trait is widely considered a seminal attribute in distinguishing social groups and tracking movements between the eastern and western portions of the southern Levant (Stutz & Estabrook 2004; Goring-Morris *et al.* 2009; Richter *et al.* 2009).

Another notable finding is the consistent use of several different core reduction strategies within many occupation horizons. The use of separate blade *sensu stricto* and bladelet reduction trajectories was widespread, occurring at all post-Nebekian sites except in

the Natufian. Flake core reduction also had a particularly prominent role at the larger base camps from various periods.

A number of the repeatedly used residential camps from the latter part of the Early Epipalaeolithic onwards have moderate frequencies of larger, non-microlithic tools indicative of diverse activities (this is in contrast to the short-term hunting camps that appear to have characterized most Initial Epipalaeolithic occupations). The presence of several Epipalaeolithic occupation horizons with very few microliths demonstrates the complexity and wider range of site types from the late Pleistocene of the Azraq Basin.

Overall, the high-resolution evidence derived from this project suggests that trends or styles in microlith production were relatively short-lived. The study has documented at least six prominent changes and, with further field research, it is likely that several more shifts in microlith production patterns will be revealed within this long temporal sequence.

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