

# Beyond the Jordan: multiformities of the Pre-Pottery Neolithic

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**ABSTRACT** – Recent excavations in Jordan have demonstrated a long sequence of development from the late Pleistocene Epipalaeolithic through the early Holocene Pre-Pottery Neolithic. Superficially, the growing body of social and subsistence evidence suggests Neolithic communities emerged from traditions rooted in the early Epipalaeolithic. However, while developments such as the construction of shelters, population aggregation, and subsistence intensification may be essential for the emergence of a Southwest Asian Neolithic, they are typical of contemporary hunter-gatherer societies and not inherently Neolithic. Notably, the Neolithic in Southwest Asia was not a homogenous entity, but instead supported diverse expressions of subsistence, symbolic behaviours, and cultural trajectories across the region. To understand the emergence and development of the Neolithic, we need to examine this richly diverse history and its many constituent pathways.

**KEY WORDS** – Neolithic; Epipalaeolithic; Jordan; hunter-gatherer

## Onkraj Jordana: raznolikosti predkeramičnega neolitika

**IZVLEČEK** – Nedavna izkopavanja v Jordanski dolini so pokazala dolgo sekvenco razvoja od pozno pleistocenskega epipaleolitika do zgodnje holocenskega predkeramičnega neolitika. Na prvi pogled vedno več podatkov o družbi in eksistenci kaže na to, da so se neolitske skupnosti razvile iz tradicij, ki imajo korenine v zgodnjem epipaleolitu. Medtem ko so pojavi, kot je postavitev zavetij, združevanje ljudi in okrepitev načinov preživetja, ključni za pojav neolitika v jugozahodni Aziji, gre vendarle za tipične vzorce sodobnih združb lovcev in nabiralcev in ti pojavi sami po sebi niso neolitski. Neolitik v jugozahodni Aziji ne predstavlja homogene entitete, ampak vključuje raznolike izraze preživetja, simbolnega vedenja in kulturnih poti na tem območju. Za razumevanje pojava in razvoja neolitika moramo preučiti to bogato raznoliko zgodovino in njene številne sestavne poti.

**KLJUČNE BESEDE** – neolitik; epipaleolitik; Jordanska dolina; lovci-nabiralci

## Conceptualizing the Neolithic

The region to the East of the Jordan Valley has often been cast as marginal to the emergence of farming societies associated with Neolithic lifeways, perceived as located on, or beyond, the fringe of the core Mediterranean zone where intensification in the exploitation of food resources was underway during

the Epipalaeolithic. It lies far away from the early Neolithic 'golden triangle' of the northern Levant associated with the wild progenitors of plant and animal domesticates, as well as culturally rich in symbolic art (Kozłowski, Aurenche 2005). In this context, Neolithic innovations, even populations, have

been often assumed to have arrived east of the Jordan from either west of the Jordan or from the northern Levant (*Bar-Yosef 2000; Cauvin 2000*; most specifically in Late PPNB colonization: *Gebel 2004*). In contrast to such views, recent research has shown that this area east of the Jordan was very much an active part of the Southwest Asian Neolithic transition, populated by indigenous communities who appear to have been experimenting with their own innovations (*Finlayson, Makarewicz 2017*). Here, distinctive local developments engaged with every part of the Neolithic transformation, including subsistence, demography, society, and ideology, providing a useful counterpoint to established narratives and thus highlighting the need for a re-assessment of our perception of the Neolithic as a unitary phenomenon. As such, the region east of the Jordan Valley contributes to our understanding of the fundamental change in the course of human history that is termed the Neolithic.

The conventional and widely accepted idea of the Neolithic is still based on Childe's early 20<sup>th</sup> century definition that it affected all parts of life, a subsistence dimension comprised of a farming economy based on domesticated plants and animals, as well as storage of surplus and a system of delayed return of resources, novel social developments to organise larger, more sedentary populations with new mechanisms for the coordination of collective activities, and an ideological shift to focus on fertility (*Childe 1934; Zeder 2009; Finlayson 2013*). In a European context, where this package largely arrived ready-made, such a definition of the Neolithic as an archaeological phase remains relatively useful. However, in Southwest Asia it has become an increasingly poor match to the Neolithic as phase, a dislocation starting from the mid-20<sup>th</sup> century identification of a 'pre-Pottery' Neolithic (*Kenyon 1959*). Here, the definition provided by Childe becomes the endpoint of a complex autochthonous development process where different elements of the package evolved at different rates and times in different places. Childe himself was more concerned with process and revolution than static endpoint, as he made "no distinction between the origins of agriculture and the spread of farming economies" (*Brami 2019:30*). Several problems arise from the resulting tension between definition and process. Firstly, much of the period described as 'the Neolithic' in Southwest Asia does not fully achieve the definition of the Neolithic as described above, especially regarding a fully developed farming economy. Secondly, having a period defined by its endpoint makes it hard to avoid teleo-

logical approaches that try to identify successful steps in the development process, ticking them off against the shopping list represented by the package of Neolithic traits. Thirdly, it leads to a circularity of argument in many synthetic accounts of the Neolithic, where a 'prime mover', typically demographic pressure, has been argued as both evidence of development and its cause (*e.g., Binford 1968; Cohen 1977; Flannery 1969; Goring-Morris, Belfer-Cohen 2008; Redding 1988; Rindos 1984*).

This dislocation between evidence and narrative has become more evident in the context of a substantial growth in empirical knowledge of the Neolithic in Southwest Asia that has taken place over recent years, with the discovery of new sites, progressively more refined excavation techniques, and the effective deployment of new archaeological scientific analytical approaches. It has become increasingly clear that the process that led to the Neolithic was not simply a single trajectory led by one centre of innovation but entailed multiple pathways that involved numerous geographic *loci* over time, including, for example, the late Epipalaeolithic Mediterranean woodland zone, the early Neolithic Middle Euphrates, and later Neolithic Anatolia (*Rollefson, Gebel 2004*).

This recognition of the importance of regional developments has not been accompanied by any substantive revision to the widely-accepted use of a Childean concept of the Neolithic. Despite over a decade of discussion regarding a multi-centred, polycentric, or uncentred Neolithic (*Rollefson, Gebel 2004*), synthetic descriptions of the Neolithic still focus on the common factors that define the Neolithic as a package. Even where variable local patterns of development are identified, for example in the processes of plant or animal domestication, those that can be classified as components of the Neolithic end-point are prioritized. This is seen, for example, in the recent genomic research on barley domestication, which confirms multiple centres of domestication within a mosaic pattern across the region (*Pankin et al. 2018; Poets et al. 2015*). What does not appear to readily contribute to the existing concept of the Neolithic is downplayed. For example, east of the Jordan, recognition of the ideological component of Childe's package has led to an emphasis on symbolic ritual where it can be identified, as in the shrines and temples of 'Ain Ghazal, but virtually no mention is made of their absence from every other Late PPNB site in the region (*Rollefson 2004; 2005*) (see Figure 1 for a map of all Neolithic

sites east of the Jordan Valley mentioned in text). Similarly, the almost complete absence of plastered skulls east of the Jordan is not taken as an interesting variation on Neolithic behaviour that might cast light on the social and ideological transformations taking place, but has instead been largely ignored within what is described as a broader Levantine development (cf. Kuijt 2000; 2008b; Makarewicz, Finlayson 2018). In both these cases, the absence of overt symbolism is not part of the anticipated package, is therefore not discussed, and thus evades further scrutiny so that important regional variation is smoothed over and even homogenized. This blending of regional developments into the conventional paradigm of the Neolithic in effect subverts the concept of a multi-centric Neolithization process. Our understanding that there were multiple pathways requires that we recognize diversity and do not focus solely on developments that will subsequently coalesce into a Neolithic package. The region east of the Jordan provides a case study that emphasizes the importance of diversity at the local, regional, sub-regional, and even site scales.

In a similar manner, a Neolithic that is largely defined in terms of becoming Neolithic also invites a search for the earliest manifestation of the Neolithic process. As such, any development that with hindsight contributes to neolithisation processes is made part of the process of becoming Neolithic and prioritized in our accounts. Consequently, Epipalaeolithic developments are measured against Neolithic traits to see if they can be incorporated into what is now described as a long or slow Neolithic (Hodder 2018; Watkins 2018). For example, recent research focusing on the early Epipalaeolithic site of Kharaneh IV east of the Jordan Valley has argued that traits conventionally associated with the Neolithic, such as the scale and permanence of community, began to develop over a long period in the Late Pleistocene, suggesting that “this trajectory of intensification culminated, inevitably, in

food production” (Maher et al. 2012:78). By describing such elements of Epipalaeolithic lifeways as precocious elements that inevitably foreshadow the Neolithic, the Neolithic as part of long-term human evolutionary trajectories is, unsurprisingly, confirmed. Furthermore, by extending the chronology of the Neolithic to incorporate these early developments, as proposed in the extended Neolithics of Ian Hodder or Trevor Watkins, risks declaring all change as preparatory to the Neolithic. Instead, thinking about such Epipalaeolithic behaviour should be considered within the context of hunter-gatherer adaptations, as it would be in other prehistoric contexts around the world (and see Maher, Conkey 2019 for such an approach). This would provide more fruitful avenues to understanding human behaviour, rather than a priori inclusion as part of a teleologically framed Neolithic.

Our understanding of the Neolithic transition in the southern Levant, including the area east of the Jordan Valley has been largely directed by ‘prime-mover’ models that invoke demographic pressure, cli-

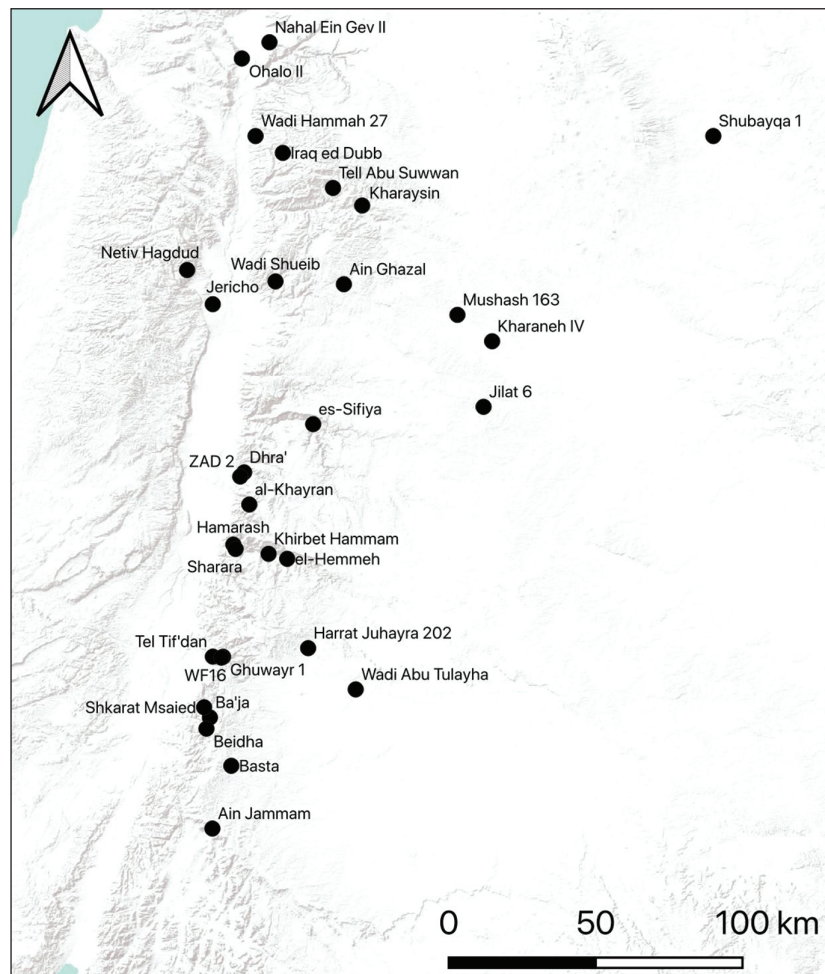


Fig. 1. Map showing all sites east of the Jordan mentioned in text.

mate change, and the solutions adopted to resolve stresses induced by these factors (e.g., *Binford 1968; Cohen 1977; Flannery 1969; Goring-Morris, Belfer-Cohen 2008; Redding 1988; Rindos 1984; Sterelny, Watkins 2015*). Flannery's Broad Spectrum Revolution provided a central model for late Pleistocene hunter-gatherer subsistence intensification, understood as laying the grounds for the domestication of plants and animals in parallel to additional demographic pressure on resources created by increasing sedentism and population. More intensive resource exploitation, which enabled population growth and sedentism, was underpinned by the growth of social complexity within hunter-gatherer societies (*Flannery 1972; Keeley 1988*). The social and ideological components captured by the term 'complexity' therefore became essential aspects of how the Neolithic is conceptualized. The transition to food production which lies at the core of the transformation allows a distinction to be made between complex, intensifying hunter-gatherers on the one hand, and farmers and pastoralists on the other. Unfortunately, most descriptions of complex hunter-gatherer societies treat them as watered down versions of farming societies (e.g., *Bender 1985*). It has been convincingly argued that the terminology has primarily been used to move the boundary between hunting and gathering and farming to absorb intermediate groups as hunter-gatherers (*Smith 2001*). This places them in a transitional evolutionary stage which masks the potential range of behavioural adaptations within hunter-gatherer societies independent of any evolutionary connection to the Neolithic (*Lightfoot et al. 2011*). As argued by Artemova, no hunter-gatherer society in the ethnographic present shows any signs of making the sort of transitions seen in the Natufian or early Neolithic (*Artemova 2020*), placing these past societies outside our common contemporary understanding of hunter-gatherers. Modern hunter-gatherers, part of the modern world, make poor analogues for the earliest developments in food production.

Demographic pressure, whether contributing to resource or social stresses, continues to be employed by many scholars as an underlying causal factor in the development of a Neolithic package. Several recent influential models, developed largely on evidence from the northern Levant and Anatolia, presuppose that the principal drivers of these complex economic and social changes arose from social, ideological, psychological, or cognitive developments, in turn occurring largely as mechanisms to cope with new demographic stresses produced by living close

to so many people (*Cauvin 1994; 2000; Hodder 2005*). Kim Sterelny and Trevor Watkins (*Sterelny, Watkins 2015*) see demographic change pushing all other subsistence and symbolic developments, and they build their idea of cultural niche construction on an understanding of a long-term rise in population density and the scale of co-resident communities spanning the period from 22 000 to 8500 cal BP. They draw heavily on the work of Robin Dunbar (*Dunbar 1998*), who has argued that living together in large groups (over 150 individuals), requires new mechanisms to enable people to manage the complexity of economic and social relations beyond what can be achieved via one-to-one relations.

Evidence for this underpinning demographic explosion has been argued as visible in the apparent growth in number and scale of settlements through the Epipaleolithic and Neolithic, and also in a trend towards more substantial architectural forms generally assumed to equate to greater permanence of settlement (*Kuijt 2000; Goring-Morris, Belfer-Cohen 2011*). Settlement size and the density of sites in the landscape are explicitly treated as proxies for population dynamics in Southwest Asian Neolithic archaeology although it is clear that throughout Southwest Asia, Neolithic settlement distribution densities and architecture varied over time in different areas (*Goring-Morris, Belfer-Cohen 2011*). A fundamental plank of these demographic arguments is the assumption that Neolithic settlements are primarily sedentary residential bases, where the principal architectural components are houses, and that these settlements have good analogues in the modern Middle East, providing straightforward correlations for population size estimates (*Wilson 1988; Byrd 2000*). Recent fieldwork has called into question the assumption that such architecture is predominately residential (e.g., *Kuijt, Finlayson 2009; Finlayson et al. 2011b*), and the conception of the Neolithic as a long transitional period makes any analogy with modern farming communities hard to sustain.

Here, we will use the evidence from east of the Jordan Valley to argue that while this area was an active part of the Southwest Asian transition to farming, for most of the period there is no clear evidence for demographic pressure as either a causal or consequent factor. The size of settlements here, as opposed to their structural permanence, did not markedly increase until almost the final phase of the Pre-Pottery Neolithic. In contrast, we will suggest that settlement concentration at focal points in the landscape was a desired cultural objective from the Natu-

fian onwards. People wanted to enhance their community's place in the landscape and achieved this through a combination of subsistence, social, and ideological strategies. The concept of 'home' and attachment to places in the landscape beyond immediate economic value may have been developing in hearth-centred base-camps for at least 125 000 years (Kuhn, Stiner 2019), but from the Natufian the built environment appears to have been actively used as a mechanism to support this objective. Architecture was employed to support a delayed-return storage economy, and to sustain the social structures that helped this economy function. The stone-built architecture of the Natufian may not necessarily indicate greater sedentism than in the preceding Epipalaeolithic (cf. Boyd 2006), but it indicates a greater permanence of the constructions built not only to serve as containers for stores, but also for the myths and memories of society (Maher, Conkey 2019). Similarly, the ideological changes we can infer from architecture and mortuary evidence may arise as means to bring communities together, rather than as a coping mechanism to survive the accidental demands and stresses of demographic pressure generated by burgeoning populations and settlements.

### From Epipalaeolithic to Neolithic East of the Jordan Valley

The rapid climate changes that characterized the end of the Pleistocene have previously been invoked as a forcing mechanism behind developments of cultural and subsistence change, from the flourishing of the Early Natufian during the warm Bølling-Allerød, the subsequent and putatively more stressed mobile Late Natufian in the cold Younger Dryas, and Neolithic village life and farming starting with the Holocene (Belfer-Cohen, Bar-Yosef 2000; Moore et al. 2000; Byrd 2005a). However, the region to the east of the Jordan Valley is particularly diverse, ranging from Mediterranean woodland to desert and from highland plateau to rift valley, so that global climate change had variable, locally specific effects throughout Southwest Asia at the end of the Pleistocene (Contreras, Makarewicz 2016). Climate change through the Epipalaeolithic and into the Neolithic would have altered the location of the boundaries between some of these zones, most substantially with the eastward extension of savannah over areas now known as arid desert (Contreras, Makarewicz 2016; Richter et al. 2017; Rollefson et al. 2011). Recent analyses have generally downplayed the significance of both Younger Dryas and early Holocene climate change in the region, while our knowledge

of the precise effects of climate change, and its chronological correlation with changes in human diet and society, remains imperfect (Contreras, Makarewicz 2016; Flohr et al. 2016; Stein 2014; Torfstein et al. 2013; Richter et al. 2017). At present the scale, timing, and effects of climate change on human settlement and subsistence remain difficult to assess.

The region east of the Jordan witnessed an Epipalaeolithic to Neolithic succession similar to the rest of the southern Levant, commencing with an early Epipalaeolithic (c. 21000–14900 cal BP), comprised of various cultural or functional components largely identified from chipped stone assemblage variability. The Natufian (14 600–11 750 cal BP), conventionally divided into an 'Early' and 'Late', based on perceived differences in settlement permanence and mobility (e.g., Bar-Yosef 2000), may perhaps be a single, heterogeneous phase east of the Jordan, illustrating local historical diversity, as discussed below. Recent work west of the Jordan has also suggested that the conventional two-fold Natufian division may have been overstated (Barzilai et al. 2017). The first phase that is labelled as 'Neolithic', the Pre-Pottery Neolithic A, appears to commence before the end of the Natufian, especially in the south of Jordan, where the site of WF16 may overlap with the chronological range of the Harifian, a Late Natufian variant located in the Negev desert to the West (Finlayson et al. 2011a). The sub-division of the PPNA into a short initial Khiamian phase, followed by a longer Sultanian (Byrd 2005a), is not visible east of the Jordan. Instead, a long Early PPNA (c. 12 000–10 800 cal BP) appears to have been followed by a relatively short Late PPNA (10 800–10 300 cal BP), chronologically parallel to the Early PPNA, known from a small number of sites (Finlayson, Makarewicz 2017). The Middle PPNA (10 300–9200 cal BP) is represented by relatively few sites east of the Jordan Valley, but there is a dramatic change in settlement visible during the Late PPNA (9200–8700 cal BP) when the number and scale of sites increases significantly.

### Subsistence

A key feature of Epipalaeolithic subsistence is the assumed importance of cereals in hunter-gatherer diets, a development frequently interpreted as a precocious move towards Neolithic subsistence strategies that potentially promoted increased sedentism. Both intensive cereal exploitation and sedentism have been interpreted as critical 'pre-adaptations' leading to farming and village life (e.g., Bar-Yosef 1998; Byrd 2005a). Research at early Ohalo II awar-

ded significance to the use of small seeded grass cereals in Epipaleolithic subsistence on this basis (Piperno et al. 2004). Further reliance on cereals, understood as supported by the purported appearance of extensive stands of cereals in the core Mediterranean zone during the warm Bølling-Allerød, has been argued to have underpinned Early Natufian (14600–13700 cal BP) sedentism, followed by increased mobility returning as the climate cooled – and cereal stands decreased – during the Younger Dryas (Bar-Yosef 2000). Unfortunately, evidence to support this presumed dependence on cereals during the Natufian has always been scant, with only sparse palaeobotanical remains so far recovered. Furthermore, queries have been raised over such proxy evidence as glossed ‘sickle’ blades (alternatively used for cutting reeds: Maeda et al. 2016), grinding stones (perhaps used for grinding acorns: McCorrison 1994; Mason 1995; Olszewski 1991), and the possible absence of cereal stands from the Mediterranean woodland ‘core’ zone (Olszewski 1993).

Recent excavations at the Natufian site of Shubayqa 1 (14 600–12 000 cal BP) in north-eastern Jordan provide clear evidence that the Natufian emerged well to the east of the Jordan Valley at the same time as it appeared in the woodland ‘core’ zone. The Natufian was spread across diverse landscapes and environments from its inception (Richter et al. 2017), confirming that Natufian communities were not dependent on any individual habitat or specific plant food source. Instead, they developed locally appropriate strategies of food procurement that enabled them to use multiple resources while at the same time maintaining low mobility. Along these lines, the exploitation of clubrush tubers, but not cereals, at Shubayqa 1 points to heterogeneity in Natufian subsistence strategies (Arranz-Otaegui et al. 2018). The limited direct archaeobotanical evidence from the Natufian indicates subsistence was not (and certainly not uniformly) reliant on cereals or legumes, the ‘founder-crops’ of Neolithic farming. Less than 10% of the palaeobotanical remains identified represent elements of the founder-crops, indicating that Natufian strategies did not provide an early stepping stone on a direct route to cereal domestication (Arranz-Otaegui et al. 2018). On the contrary, the Natufian patterns of intensified resource exploitation of selected plants and animals are similar to those adopted by hunter-gatherers around the world (Woodburn 1982; Rowley-Conwy 2004; Yeomans, Richter 2018) and as described explicitly, for example, by Andrew M. T. Moore et al. (2000) and Brian Hayden (2004).

Additional evidence for the origins of a delayed return plant food economy, transitional to food production, has also been sought in storage technology. However, it remains unclear how far storage had developed in the Natufian. Storage pits have been reported from a number of sites, including Nahal Ein Gev II east of the Jordan (Grosman et al. 2016), but it is generally accepted that early estimates of Natufian storage were considerably overestimated (Bar-Yosef 1998; Olszewski 1991). Taking into consideration these aspects, the ‘Early’ and ‘Late’ Natufian were not so much different adaptations to hypothesized climate change, but more likely at least partially contemporary variations resulting from Natufian adaptations to local resources. Intensification of local food procurement, supported by the new technology of large mortars, appears as part of a wider strategy that reflected choices in ways of inhabiting the landscape that involved a stronger commitment to specific locations rather than food sources.

The PPNA palaeobotanical record suggests that people inhabiting landscapes east of the Jordan Valley were active in the development of new skills and technologies that are seen widely throughout early Neolithic Southwest Asia, by now increasingly converging on cereal exploitation. From early within the Neolithic east of the Jordan Valley there is evidence of a new local and indigenous move towards food production, with a notable increasing focus on cereals (Colledge et al. 2018). Cultivation of wild cereals in the Early PPNA is also strongly suggested by the installation of granaries, as seen at Dhra’, which contained cereal phytoliths, and at WF16, as well as the volumes of chaff used as temper in mud constructions at Dhra’ and possibly at WF16 (Kuijt, Finlayson 2009; Flohr et al. 2015). The presence of both small- and large-sized barley (*Hordeum* sp.) grains with a smooth abscission scar present on barley rachis remains recovered from Late PPNA el-Hemmeh and Zaharat edh Dhra’ 2 (ZAD2), and seeds from potential weedy taxa, suggest pre-domestication cultivation had become established by the Late PPNA (Edwards et al. 2004; Meadows 2004; White, Makarewicz 2012). The relative importance of founder-crops was variable between PPN communities, representing less than 10% of the palaeobotanical remains at ZAD2, but almost 60% at el-Hemmeh, followed by a general increase throughout the Levant during the Early PPNB, when on average these plants represent just over 40% of recovered palaeobotanical remains (Arranz-Otaegui et al. 2018).

The construction of buildings designed for storage and food processing in the PPNA (*Kuijt, Finlayson 2009*) illustrates the development of storage economies, and hints at new social pathways for food, where use of collective storage facilities suggests an emphasis on the sharing of foods. Sharing is considered as archetypal hunter-gather behaviour, usually rigorously enforced especially with high value hunted foods (*Woodburn 1982; Bird-David 2005*). The construction of collective storage may indicate the transfer of this hunter-gatherer sharing ethos into the delayed-return economies of early low-level food producing communities. The shift of emphasis onto the sharing of plant foods may also indicate that in the Neolithic the new harvests gained the dietary and social value previously held by meat.

Intensification in plant husbandry developed further throughout the PPNB (10 500–8700 cal BP) east of the Jordan Valley, as evidenced by wheat remains bearing domesticated phenotypes alongside pre-domestication cultivation of barley (*White, Wolff 2012*), and the replacement of PPNA cup hole mortars by PPNB querns that more efficiently process cereals in bulk. Storage features were increasingly internalized within PPNB residential structures, eventually becoming hidden in small basement compartments by the Late PPNB, showing that the unit of sharing had changed to the household, rather than the entire community (*Kuijt 2008a*). This shift in the nexus of storage has been discussed in the context of delayed-return hunter-gatherer economies, allowing for the control and accumulation of goods, and is not a practice limited to farming societies (*Hayden 2004*). The potential for control of subsistence stores provides an equivalent potential for the development of social stratification and the rise of ‘aggrandizers’ within the community (*Hayden 2004*), but so far no PPN sites east of the Jordan have provided any evidence for such social stratification. One recently discovered burial at Late PPNB Ba’ja may indicate the presence of individuals with non-hereditary influence within what has been interpreted as an increasingly heterarchical society (*Benz et al. 2019*).

In southern Jordan during the PPNA, there was a unique focus on hunting goats rather than gazelle, which were heavily exploited elsewhere in the southern Levant. The extent to which this reflects adaptation to local animal availability, or cultural choices, is unclear. By the Middle PPNB there is a notable change in animal exploitation, as at Beidha, where ongoing work by Cheryl Makarewicz suggests that age and sex-specific goat-harvesting practices are con-

sistent with those of managed herds (also see *Hecker 1982*). By the Late PPNB domestic breeds of goats and sheep, likely imported from the northern Levant, were heavily exploited, although morphologically wild forms of goat were still hunted (*Makarewicz 2013*). Recent analysis of faunal assemblages from Late PPNB sites, including es-Sifiya, el-Hemmeh, Tel Tif’dan, Ba’ja, Basta, and ‘Ain Jammam, indicates a varied and complex pattern of caprine management strategies were employed, with people not only using their animals for meat but possibly also for dairy and potentially for wealth accumulation (*Makarewicz 2009; 2013*). The Late PPNB expansion of people dependent on domestic animals into eastern Jordan illustrates how the new technology was being developed and adapted to new environmental contexts (*Fujii 2009*), although it is likely that hunting continued to be an important activity in the badia long after the development of pastoralism, as can be seen in the numerous desert kite hunting traps (*Abu-Azizeh, Tarawneh 2015; Wilkinson 2003; Helms, Betts 1987*).

Subsistence strategies east of the Jordan were tuned to local environmental conditions and resource availability, with an increasing management of food resources over the course of the Epipalaeolithic and Neolithic. However, it is not clear that any change in subsistence before the end of the Natufian can be interpreted as on an inevitable track to the Neolithic. Intensification, delayed return, and the possible limited use of storage are not uniquely Neolithic traits but are all aspects that are present within the range of hunter-gatherer behaviours. In contrast, in the PPNA there are clear developments in the production and storage of plant foods. The development of granaries in Jordan is at the cutting edge of Neolithic subsistence economic developments. The extent to which PPNA communities depended on these new cultivated and stored resources is less clear. In the PPNB the focus of subsistence innovation moves to animal resources when, after initial innovation in herd management, domesticated breeds are introduced to the area. Again, the moment when people began to depend on domesticates and food production remains uncertain.

### **Society and settlement**

The Neolithic transformation entails major changes in society, the novel social mechanisms required to structure life facing the demographic challenges of the larger and more sedentary settlements assumed to emerge in parallel with the development of farming (*Sterehny, Watkins 2015*). Our understanding of

social change is closely entangled with evidence for settlement, sedentism, architecture, and population.

Most early Epipalaeolithic sites are small, relatively temporary campsites. This confirms exactly what would be expected of the ‘simple hunter-gatherers’ assumed to represent human societies before the intensification of subsistence associated with complex hunter-gatherers, or low-level food producers (*i.e.* *Smith 2001*). Field survey in the Jordanian badia, where flint scatter sites are readily visible on deflated desert surfaces, has located numerous small Epipalaeolithic sites (*Betts 1999*). Only two sites, Kharaneh IV and Jilat 6, have a markedly different, larger footprint. These sites are widely understood as aggregation locations with extended periods of intermittent but repeated occupation (*Richter et al. 2011*). There are brushwood shelters at Kharaneh IV, containing renewed floors and hearths, that have been argued to represent a growing relationship to place (*Maher et al. 2012*). The duration of their periodic use is even more marked than their overall size. Kharaneh IV extends to *c.* 2ha and was repeatedly occupied for over a thousand years during the Kebaran and Geometric Kebaran, while Jilat 6, extending to 1.8ha, contains Nebekian, Qalkhan, and Nizzanian cultural material with occupation lasting thousands of years (*Richter et al. 2013*). The full areal extent of the occupations at any given moment is unknown, but was probably considerably smaller than the full surface area of the sites, which accumulated as long-term palimpsests. These large aggregation sites with their shelters are comparable to examples ranging from the Palaeolithic to the ethnographic present, such as the !Kung San aggregation sites of the Kalahari (*Lee, DeVore 1968*), or the construction of log dwellings by the Yamana of Tierra del Fuego, despite their previous description as the most ‘primitive’ of hunter-gatherers (*Lothrop 1928; Vidal 1999*). As such, neither aggregation sites nor shelters indicate any significant, or inevitable steps on a trajectory to the Neolithic in the early Epipalaeolithic. They are examples of common patterns of hunter-gatherer residence and mobility, often seasonal, where flux in the composition of residential groups is common, and while the same people rarely occupy one location permanently, long-term occupation of a site is relatively common (*Ingold 1999; Steward 1955; Turnbull 1968*).

The subsequent late Epipalaeolithic Natufian is considered a ‘complex hunter-gatherer’ society that, despite its long duration, is implicitly understood as inherently unstable due to the deteriorated climate

conditions associated with the Younger Dryas and has acquired the status of a temporary transitional period in the Neolithic process (*Belfer-Cohen, Bar-Yosef 2000*). Natufian sites remain rare east of the Jordan Valley, and the excavated examples including Early Natufian Wadi Hammeh 27, multi-phase Shubayqa 1, and Late Natufian Nahal Ein Gev II, are all small, between *c.* 1200 to 2000m<sup>2</sup> (*Edwards 2012; Richter et al. 2014; Grosman et al. 2016*), although a halo of artefactual material around the main mound of Shubayqa may indicate the site was larger (*Richter et al. 2014*). While other small sites have been identified around the Qa’ Shubayqa, there is no indication they were occupied simultaneously (*Betts 1999*). These rare, small sites that between them span the entire Natufian period provide no evidence of either an increase in the scale or frequency of sites in the landscape, or any indication of rising demographic pressure during the Natufian east of the Jordan. Population appears unlikely to have been driving social change at this time.

However, while population may not have increased, the sharp change in the form of architectural construction at Natufian settlements from the earlier Epipalaeolithic shelters suggests a transformation in the nature of settlement was taking place, which may indicate that social changes were occurring. Natufian sites exhibit a range of architectural forms and construction techniques, but all share substantial stone-built circular architecture. The presence of one very large building at Wadi Hammeh 27 (*c.* 13m diameter) with standing stones and one decorated stone slab, and at Nahal Ein Gev II, where benches were installed along with well-constructed hearths and storage features internal to the structures, together indicate that these structures served as much more than the simple shelters of the earlier Epipalaeolithic. Whilst recognizing that earlier populations undoubtedly lived in highly socialized landscapes, returning to the same places both many times and potentially for extended periods (*Maher, Conkey 2019*), the amount of labour required from the Natufian onwards to prepare the building sites, procure construction materials, build, and maintain the structures, represents a significant increase over the investment in the earlier shelters. There has been a long-standing debate on the nature of sedentism in the Natufian, and in general there is no reason to assume it must have been significantly greater than in the earlier Epipalaeolithic (see *Boyd 2006* for a summary of the debate). However, the emergence of stone architecture in Natufian settlements is combined with new large, non-portable, stone grinding



tools, potential storage features, cemeteries, and even monumental constructions, such as at Wadi Hammeh 27. Together, these suggest a shift in how people associated with places, their conception of themselves in the landscape, and in their ability to engage collectively in long-term projects. They have gone beyond the assumed anticipation of the long-term, repeated use of locations seen in the earlier aggregation sites, apparently deliberately making their mark on the landscape more permanent through the use of stone architecture, and at the same time tying themselves more closely to these locations, not only in a practical sense but also potentially through the association of communal kinship to place provided by cemeteries. These traits all continued to develop in the PPNA, when architectural complexity becomes remarkably commonplace.

Most Early PPNA settlements east of the Jordan were relatively small, with little evidence for either greater concentrations of population, or overall demographic pressure. WF16 is similar in size to Natufian settlements, with the main phase of occupation encompassing an area of *c.* 2000m<sup>2</sup>, while Iraq ed Dubb located in northern Jordan is *c.* 500m<sup>2</sup> in size (*Kuijt 2004*). The overall dimensions of the site of Shara-ra, located in the lower reaches of the Wadi Hasa, have not yet been precisely determined, but again the site appears less than 2000m<sup>2</sup> in size. Dhra', located close to the Dead Sea, is the largest Early PPNA site known east of the Jordan Valley; it is not only under a hectare in size, but also only supported a relatively low density of occupation with open space between buildings (*Finlayson et al. 2003*).

Structures in PPNA settlements are generally thought to have served as places of residence, and there is a considerable literature on the Neolithic development of house and home (*e.g., Wilson 1988; Watkins 1990*). PPNA sites to the west of the Jordan Valley, such as Netiv Hagdud, are typically characterized by numerous near identical structures, assumed to represent nuclear family residences (*Finlayson, Makarewicz 2017*). However, the assumption that domestic shelter was the primary force driving developments in early architecture does not appear to hold true east of the Jordan Valley, where architecture has a much more diverse and complex history. A particular feature of this diverse architecture is that much of it appears to be communal in nature – from shared storage structures to larger public architecture (*Finlayson et al. 2011b*). This is not present at most sites to the west, and at Netiv Hagdud the evidence for the construction of storage features is li-

mitted to some small, stone lined pits, with no direct evidence for how they were used (*Bar-Yosef, Gopher 1997*). In the small part of Dhra' that has been excavated, three building forms have been identified, one for storage, one for food processing, and one by default assumed to be residential. If this pattern of varied building function were maintained across the site, it would indicate that the residential density, and presumably associated population, was low. At WF16 there is no obvious residential form, or standard 'house' type, and almost every structure appears different from its neighbours. The proportion of the site taken up by a single large structure (O75) at WF16 suggests that the space available for residential purposes would have been only a fraction of even this small site. These Early PPNA sites continue the pattern emerging in the Natufian, of changes in the built environment that relate to social organization, and the emergence of food storage economies, but not of demographic pressure.

Late PPNA sites were also relatively small. Mushash 163 located in the steppe east of the Jordanian plateau edge is under 3000m<sup>2</sup> in size (*Tvetmarken, Bartl 2015*), and the settlement of ZAD2 encompasses only 2000m<sup>2</sup>, dominated by a single large structure with its major axis 7m long (*Edwards, House 2007*). Kharaysin by the Zarqa river is a large site, but its Late PPNA component is only known from two adjacent semi-subterranean structures (*Ibanez et al. 2015*). The Late PPNA occupation at WF16 remains approximately the same size as the earlier phase of settlement.

Although settlements mostly remained small east of the Jordan Valley during the PPNA, the architecture at these sites has an increasing focus on non-residential buildings, a pattern that appears to have roots in the Natufian, with examples both to the west at Mallaha and east of the Jordan at Wadi Hammeh 27. Stone, or well-built pisé, architecture, communal storage, and the presence of ritual and performative buildings all suggest these architectural developments east of the Jordan Valley are not the result of a simple process of people settling down to tend or store cultivated crops but contain a strong element of social signalling to bind the community together. Furthermore, the presence of unique communal buildings at most of these small PPNA sites east of the Jordan provided distinctive features which were specific to individual settlements, emphasizing the individual identity of each community and its relationship with place (Fig. 2). This again has historical roots in the Natufian relationship between site and

landscape, where the settlement became an increasingly fixed node between land and people.

There is extremely rare evidence for an Early PPNB (10 950–10 300 cal BP) entity east of the Jordan, most convincingly at the recently discovered site of Harrat Juhayra 202, identified mainly by the presence of Helwan points (Fujii et al. 2020), but also at the site of Jilat 27 (Garrard, Byrd 1992), and possibly in the final phase of Mushash 163 (Tvetmarken, Bartl 2015). This Early PPNB presence does not appear to represent a short-lived transitional phase, nor the eventual arrival of the Early PPNB from the northern Levant as part of an externally generated PPNA-PPNB transition. The radiocarbon dates from Harrat Juhayra 202 suggests it is early in the Early PPNB phase and is contemporaneous with the Late PPNA phase in southern Jordan (Fujii et al. 2020). The lack of a time lag in the appearance of the Early PPNB in Jordan, and the apparent continuity at Mushash from the Late PPNA to the Early PPNB, both argue against the introduction of the Early PPNB after it fully developed in the north. Equally, recent radiocarbon dates place Shkarat Msaied early in the Middle PPNB sequence and overlap with the conventional chronology of the Early PPNB (Kinzel 2013). Continuity in developments in chipped stone technology in the south of Jordan and elements of architectural continuity direct from the Late PPNA to the Middle PPNB further confirm there is a local development that is distinctly different to the Early PPNB stage (Finlayson, Makarewicz 2017; Smith et al. 2016; 2019). Two distinct historical sequences appear to be emerging, representing the simultaneous presence of communities with distinct cultural affilia-

tions. This is significant for our growing understanding of Neolithic society as being far from homogeneous, with markedly different communities living in close geographic proximity.

Our knowledge of the Middle PPNB east of the Jordan Valley is limited to a few, albeit extensively excavated, sites. In the south, both Shkarat Msaied and Beidha are small settlements, characterized by densely clustered substantial architecture. Byrd estimated that Beidha extended between 1500 to 3600m<sup>2</sup> in size, depending on the degree of erosion of its western edge (Byrd 2005b). Recent work has suggested that erosion was not as extensive as previously proposed, however, and the lower size estimate may be more accurate (Makarewicz, Finlayson 2018). Shkarat Msaied is c. 1000m<sup>2</sup> in area (Kinzel et al. 2011). The architecture at Shkarat Msaied and the earliest phase (Phase A) at Beidha is circular and single roomed. In the subsequent (and still Middle PPNB) phase at Beidha, while the buildings remain single roomed, they become more rectangular, although still with rounded corners. This is similar to the earliest Middle PPNB phase at 'Ain Ghazal in the north of Jordan. By the end of the Middle PPNB at both Beidha and 'Ain Ghazal, these structures had been replaced by multi-roomed rectilinear buildings. A similar process appears to have taken place at Ghwayr 1, although the multi-roomed (and probably two-storey) buildings there are likely to be Late PPNB in date (Simmons, Najjar 2006). Rollefson has argued that 'Ain Ghazal is the only source of evidence for population growth in the Middle PPNB, but that even here the site remained smaller than 4–5ha (Rollefson 2001). Preliminary reports regarding Kharaysin

suggest this site may have been very large during the Middle PPNB, but so far excavations have not confirmed whether occupation covers the whole site area at any one time (Ibanez et al. 2015).

There is no sign of a substantial increase in population, nor of demographic pressure, with sites remaining relatively rare, and most small, until the end of the Middle PPNB. What the settlement evidence does indicate is continuing change taking place in community organization. The highly diverse, specific function buildings of the PPNA are replaced in the Middle PPNB with more standard architectural forms replicated



**Fig. 2. Large communal structure being excavated at WF16. Note the curved benches around the edge of the structure, internal features, including inset mortars near the apex of the building.**

within the settlement, including both circular and rectangular forms. Such standardization has been widely assumed to represent common residential forms (although see *Banning 2011* for a discussion of the difficulties in defining residential structures), and suggests that during this period residential 'houses' may be emerging east of the Jordan Valley. However, strong elements of community level organization were maintained, suggested by the continued use of unusually large buildings as seen at, for example, communal Building 37 at Middle PPNB Beidha, which served as an arena for daily practice, central practice, and a focal point within the village (*Makarewicz, Finlayson 2018*).

A dramatic shift in settlement size and density took place around 9200 cal BP in the Late PPNB, evidenced by the appearance of numerous large settlements exceeding 10ha in size, including 'Ain Ghazal, Wadi-Shu'eib, es-Sifiya, Khirbet Hamman, Basta, and 'Ain Jammam (*Rollefson 2004; Simmons et al. 1989; Mahasneh 1997; Rollefson, Kafafi 1985; Gebel et al. 2006; Waheeb, Fino 1997*). Somewhat smaller Late PPNB settlements including el-Hemmeh, Hamarash, al-Khayran, Ba'ja, (*Makarewicz et al. 2006; Sampson 2012; Kroot et al. 2012; Gebel, Bienenert 1997*) and settlements in the Jafr basin such as Wadi Abu Tulayha further filled out the landscape (*Fujii 2009*). Within these settlements, larger structures become more prevalent, often with internal compartmentalization and private storage in basement cells, with at least one residential floor above the storage. This may reflect the continuing increase in importance of households within the community, where concealed household accumulation becomes possible as storage ceases to be public. The larger, multi-compartment buildings may indicate multi-family households. The ubiquitous use of rectilinear architecture and the frequent use of second storeys reflect a greater density of architectural packing within a settlement (*Banning, Byrd 1987*). Altogether, the increase in the number of sites, their size, and the density of architecture within them suggest that population levels finally and dramatically rose during the Late PPNB. While it has been argued that this population rise was the result of immigration from the west (*Rollefson 2004; Gebel 2004*), the massive stone architecture of most of these sites appears strikingly similar to the construction methods of indigenous Middle PPNB sites.

The multi-compartmented buildings that characterize Late PPNB settlements east of the Jordan Valley absorbed and internalized many of the functions pre-

viously conducted publicly in separate, but shared facilities. Late PPNB domestic architecture is dominated by private space, private storage, and concealment (*Byrd 1994*). Such privacy and concealment would have reduced the opportunities for enforced sharing that arise from visible storage, and would have enabled each household to become more independent within the community, potentially indicating the rise of the household as an organizational unit within the community.

### ***Ideological change***

Ideological change is part of the Childean package, and the increasing materialization of ideology and ritual reported in Neolithic material culture has been described as a symbolic revolution (*Cauvin 2000*). This phenomenon has been interpreted variously as representing the beginning of religion, a greater materialization of relationships between people and things, and a cognitive revolution (*Cauvin 2000; Hodder 2005; Watkins 2005*). The evidence from east of the Jordan Valley is distinctive, lacking the naturalistic symbolism well known from the northern Levant, and containing a diverse series of mortuary practices, which raises two questions regarding the role of symbolism in the Neolithic transformation. Firstly, do synthetic accounts conflate multiple strands of symbolic behaviour evidenced from different regions and periods into a constructed 'Neolithic' symbolism made more dramatic by selecting the most spectacular examples (plastered skulls in the southern Levant, naturalistic symbolism in the northern Levant, painted walls at Çatalhöyük)? And secondly, does this readily apparent, symbolically charged material culture, the immediate focus of most research, reflect a genuinely widespread and central Neolithic phenomenon?

Mortuary practice, often the most easily observed form of ritual behaviour, certainly appears heterogeneous east of the Jordan throughout the early Neolithic. For example, in the PPNA at WF16 most burials were placed in a flexed sleeping position, but there was some special treatment of skulls, sometimes buried separately, occasionally painted. Secondary burials were also present, notably not following a standard practice (*Mithen et al. 2015*). At WF16 burial appears closely linked to the buildings, with both subfloor burial and burials cut through walls, with the latter practice echoed at Dhra'. This pattern of diversity between and within sites continues with variation in burial practice during the Middle PPNB. At 'Ain Ghazal, there are three main burial types, decapitated subfloor or courtyard burials,

'trash burials' of entire skeletons, and infant burials (Rollefson 2001), while at Wadi Shu'eib burials were commonly composed of multiple inhumations (Simmons et al. 1989). In the earliest phase at Beidha, most burials were placed intact on stone slabs in the accumulating rubbish inside an abandoned building (Building 41) apparently dedicated to this purpose (Byrd 2005b), while the most striking feature at Shkarat Msaied is a mortuary structure (Building F) containing numerous multiple burials and a stone cist containing many unplastered skulls (Kinzel 2013). Adults and infants are all present in the burial record, and there is no evidence of any distinctive association with grave goods. The communal burials of Shkarat Msaied may represent the role mortuary practice held in holding at least some communities together. The variation in important symbolic acts between sites suggests considerable variation in ideological belief among communities, and such distinctive belief patterns would have been an important mechanism to enhance and maintain the independent identity of the individual community. Distinct community ideologies emphasize the importance of local practices and histories in underwriting the many different Neolithic development processes that occur.

One of the most iconic images of the early Neolithic in Southwest Asia is the plastered skull. The role of these plastered skulls in mortuary practice and the nature of the complete mortuary cycle to which they belong have been subject to extensive analysis and variously interpreted as evidence of skull cults and as ritual designed for social integration (Kuijt 2000; 2008b), generally assumed to be central to PPNB life. However, plastered skulls are largely limited to the southern Levant and were in use only during the Middle PPNB, a phase of about 600 years duration, but only a small part of the long-term regional Neolithic process. Furthermore, even within this geographically and chronologically circumscribed practice, Kuijt has noted that there are locally distinct patterns to skull processing techniques (Kuijt 2008b). East of the Jordan Valley, evidence for plastered skulls has only been found at 'Ain Ghazal and Tell Abu Suwwan in the north of Jordan, indicating not only local variation, but also that within Neolithic diversity there are multiple levels of local and regional connections (Makarewicz, Finlayson 2018).

Apart from the mortuary data, the Neolithic east of the Jordan Valley has appeared relatively impoverished in terms of obviously symbolically charged artefacts, with the exception of the Middle PPNB plas-

ter figurines from 'Ain Ghazal. The naturalistic symbolism found widely through the Middle Euphrates region in the Late PPNA/EPPNB, most dramatically at Göbekli Tepe, and continuing through the PPNB to the extensive use of art in the later Neolithic site of Çatalhöyük in Anatolia has been brought together as evidence of a symbolic revolution (Cauvin 2000; Hodder 2005; Schmidt 2005). Both the Middle PPNB mortuary practices of the southern Levant west of the Jordan river and the plaster figurines of 'Ain Ghazal have been absorbed into this dominant narrative of a Neolithic symbolic revolution (e.g., Cauvin 2000). The situation east of the Jordan is in reality rather different. Here, from Natufian Nahal Ein Gev II, Early PPNA WF16, and Late PPNA ZAD II the decoration of portable objects is dominated by patterns of lines and perforations on small pebbles, or bone plaques (Grosman et al. 2016; Edwards, House 2007). This minimalistic decoration is a long way from the naturalism of material culture to the north, although it may still have held significant symbolic value. In the Middle and Late PPNB, with the exception of 'Ain Ghazal most sites east of the Jordan only contain limited numbers of small, simple, animal figurines of uncertain ritual significance (Rollefson 2001). The materiality of symbolism is not strongly represented in the Neolithic transformation east of the Jordan Valley.

Despite the rich architectural record of shared and communal buildings, there are very few structures that appear overtly symbolically charged through decoration. Where architecture is decorated east of the Jordan, it is done so in a relatively simple manner; for example, the use of parallel wave lines moulded around the bench of structure O75 at WF16 (Finlayson et al. 2011b), or the red plastered floors found in some PPNB contexts, such as Ghwayr 1 and Kharaysin (Simmons, Najjar 2006; Ibáñez et al. 2015). There are exceptions, such as the probably Middle PPNB cluster of small buildings outside the main settlement at Beidha (Finlayson, Makarewicz 2018). The presence of standing stones in the centre of one structure, upright stone basins in the walls, stone-paved floors, and a large stone basin beside the building cluster have all been used to argue that this is a ritual complex (Rollefson 2005). In the Late PPNB at 'Ain Ghazal, there are two forms of buildings that have been identified as ritually important. Inside the settlement there are unusual circular buildings with subfloor channels, and outside the settlement large rectilinear buildings with possible altars surrounded by 'temenos' walls (Rollefson 2005). Both the so-called shrine at Beidha and the

larger structures described as temples at 'Ain Ghazal, are highly partitioned, limiting access to the activities conducted to a small number of people, possibly signalling a change from the preceding shared communal architecture.

Special purpose ritual structures have been argued as essential to maintain community-wide values and identities to balance the emergence of powerful, independent households in the Neolithic (*Banning, Byrd 1987; Byrd 2000*). The 'Ain Ghazal and Beidha structures are thought to have met this need, but there are no similar structures known from any other Late PPNB settlements located east of the Jordan. Extrapolating the social significance of these few large structures to the wider Late PPNB is therefore difficult. Despite the limited scale of excavation at most sites, the scarcity of such buildings suggests such formal ritual structures were not typical of Neolithic society east of the Jordan Valley and therefore neither a critical nor essential part of the Neolithic transformation.

## Discussion

Changes in subsistence east of the Jordan appear to have followed locally divergent pathways, with the relative importance of cereals, legumes, tubers, and other plant foods appearing to vary widely on a site-by-site basis until at least the end of the PPNA. The exploitation of animals suggests that there was much local innovation in animal management until the Late PPNB, when domesticates were likely imported into the region and added to the subsistence repertoire, although hunting continued to be important, and management of the new domesticates continued to follow local practices. This combination of local developments and practices, combined with the interaction with other regions indicated by the arrival of the new domesticates, is at the heart of the role played by the multiple pathways of the Neolithic.

The built environment appears to have played a very visible role in structuring society and community, and it became important to inscribe the settlement in the landscape. Elsewhere in the early Neolithic, as at Göbekli Tepe and Jericho, this inscription is developed into monumental architecture (a pattern seen in low-level food producing societies around the world – from the megaliths of Atlantic Europe to mound building in North America, *Bender 1985*). PPN settlements east of the Jordan mostly consist of tightly clustered buildings, with apparently sharply defined limits. This is seen, for example, at Beidha

where the site boundary is further emphasized by a wall, separating it from the surrounding landscape, and emphasizing the transition to a built landscape, something that appears to commence in the Natufian. Several of the sharply defined PPNA sites in the South of Jordan, WF16, Dhra', Sharara and el-Hemmeh are placed beside major landscape features, in dramatic landscape positions (Fig. 3). Societies with delayed-return subsistence economies may have found it increasingly important to mark territorial ownership of resources, and east of the Jordan the role of visible monuments in the landscape may have been fulfilled by the settlements themselves, made more marked by increasingly sharply defined clusters of solid and elaborate architecture. The built environment of settlements also provides a novel means to manifest social relationships, manipulate kinship history, and fix a socially constructed past in the landscape (*Gosden, Lock 1998*). In this region, architecture may be more important in changing ideology and society than the elaborate naturalistic symbolism of the northern Levant. This built environment provides the framework for the daily practices that maintain the structures of society and which can be used as an important means to negotiate change (*Bourdieu 1977; Bell 1997; Weismantel 2014*). The symbolic presence of the community in the landscape is further emphasized by the presence of cemeteries within these settlements.

Communal architecture, in its many forms, ties communities together by providing the places and spaces that form the architectural scaffolding that frames every shared activity undertaken by members of the community. This focus grew out of the historical context created in the Natufian. From the Natufian onwards investment in settlement, and the creation of community at a focal point in the landscape, is increasingly evident. This new development does not arise out of large Epipalaeolithic hunter-gatherer aggregation sites that might have been part of a long-term process of demographic pressure (*Kuijt 2000; Goring-Morris, Belfer-Cohen 2008*), but emerged out of small settlements, and consequently appears unlikely to be driven by demographic pressure or resource stress. The generally small Early Neolithic settlements east of the Jordan Valley appear to have been closely integrated communities, indicating that such communal architecture did not arise as a response to large communities requiring new ways to manage their social relationships, but rather architecture was used to help foster community solidarity, at a time when populations were still small. The strong centrifugal force continued to bring

people together at an even greater scale in the Late PPNB, and the attraction of focal places in the landscape outweighed the resource and social stresses that would have been created by this dense and intimately clustered population. Increasingly static communities would have had to develop their subsistence strategies to avoid the resource stresses that their chosen communal way of life had created.

The contribution the Natufian most obviously makes to the Neolithic narrative is in what the PPNA inherits: the step away from the richly social landscape inhabited by most hunter-gatherers to a new way of living in that landscape (Boyd 2006). More permanent architecture not only enhanced fixed points in the landscape but also created a new built environment that gradually eroded the flexibility of previous architectural forms and more tightly constrained social interaction and daily practice, encouraging the development of social structures that led to community establishment. While not setting any inevitable development trend, the Natufian creates the historical context that sets the stage for the Neolithic.

Permanent architecture does not necessarily equate to full-time sedentism (Boyd 2006; Ingold 1999), but it clearly marks specific places. Landscapes are not simply topologies of resources they contain networks of meaning (Thomas 1993), and this engagement with places across landscapes is part of hunter-gatherer social history, often marked by natural features (Bradley 2000), including the dramatic landscape features that emphasize the positions of some PPNA sites. This engagement can be further recorded and inscribed by the placement of monuments (Bradley 1998), and this appears to have been one of the factors at work in Neolithic settlement. The different temporalities of everyday living and cosmological experience are informed by daily practice, where biographies become enmeshed in the landscape (Gosden, Marshall 1999). Settlement construction appears to have served to inscribe history in the landscape in the Natufian and early Neolithic east of the Jordan. The settlements not only served to mark territory and ownership but they also radically changed the nature of engagement with place. The built and fixed settlements become historically situated, not only enculturating the landscape but also providing a venue where performance could be used to produce history and change the relationship between the community and the landscape (Kuchler 1993). The construction of venues provides new boundaries and structures for ceremonial acts, creating a new spatial narrative that can produce a new

ancestral and mythic history (Randall, Sassaman 2010). Many of the actions performed in the communal structures east of the Jordan will have been mundane daily practices, but the venues will have transformed these into public, ceremonial acts, giving them greater weight to integrate the community (Makarewicz, Finlayson 2018; Gosden, Lock 1998; Connerton 1989). The elaboration of architecture and settlement that emerges from the Natufian appears to reflect a new world order.



**Fig. 3. Dramatic landscape positions of WF16 (3a), Dhra' (3b), and el-Hemmeh (3c). All three sites are located in the right-centre of the images. WF16 is visible as a light patch on the top of the last gravel knoll before the volcanic rock formations behind; Dhra' visible by the green sunscreen, before the vertical rock face of the edge of the rift valley; el-Hemmeh as excavation trenches open below, to the right of the striking black volcanic cone.**

## Conclusion

East of the Jordan, settlement, subsistence resources, and ideology are intertwined within a long historic cultural context. The numerous new excavations in Jordan over the last decade have demonstrated a long and continuous sequence of development that runs from the late Pleistocene Epipalaeolithic through the early Holocene Pre-Pottery Neolithic. The intensification of subsistence economy, the increasing management of resources, and the adoption of components of delayed-return economics went hand-in-hand with the development of architecturally more permanent settlements marking place in, and ownership of, the landscape, as well as providing facilities for storage and processing to support subsistence developments. Within the same context, the built environment was used to stress the importance of community, local community identities, and community relations among landscape, resources, and sharing. The increasingly large body of architectural, social, and subsistence evidence suggests Neolithic communities east of the Jordan Valley emerged out of indigenous traditions rooted deep in the early Epipalaeolithic (Sterelny, Watkins 2015). That “many ‘revolutionary’ features of the Natufian and subsequent Neolithic” are now recognized as earlier Epipalaeolithic developments (Maher et al. 2012: 79) does not, however, mean that we should extend the Neolithic backwards to form a long or slow Neolithic, as we tick off boxes on a list of Childe’s Neolithic traits. The construction of shelters, patterns of population aggregation, and subsistence intensification including modification of the environment to increase the resource base are all known from recent and modern hunter-gatherer societies. While such developments may be essential for the subsequent emergence of a southwest Asian Neolithic way of life, they are neither inherently nor inevitably on track to the Neolithic. While recognizing that some ‘in-between’ societies have been labelled as ‘complex hunter-gatherers’ (Smith 2001), such societies have emerged at various points in time around the world, and generally they do not pre-empt the development of sedentary farming but represent a range of adaptations within hunter-gatherer repertoires, which cannot be interpreted as transitional (Rowley-Conwy 2004; Finlayson 2009). The common identification of the Natufian as a complex

hunter-gatherer society may actually be misleading and draw attention away from its unique characteristics.

In terms of long-term evolutionary development, it remains harder to identify the developments that were critical to the Neolithic, those that made it truly revolutionary, and those that created the runaway process that is widely recognized. Although significant changes are evident from the Natufian onwards, much behaviour can still be described in terms of hunter-gatherer societies. Leaving aside subsistence, and the precise balance between domesticated and wild foods, the large and complex houses of the Late PPNB, and its associated social structures, might prove a better analogue to the multi-family co-resident households of the hunter-gatherers of the north-west coast than their more common comparison with the Natufian (Hayden 2004). The Late PPNB did not represent a stable farming society, and the large Late PPNB sites of the Jordanian plateau, once perceived as proto-urban (Nissen 2004), were not sustainable, and largely decline at the end of the PPN.

Late Pleistocene and early Holocene populations east of the Jordan appear to have adopted diverse trajectories within their hunter-gatherer palette, and it is only relatively late in the Neolithic sequence that these coalesce to create what we might begin to see as a farming-based society. A great variety of lifeways are accepted as integral components of contemporary hunter-gatherer societies, and we should be cautious in identifying such components in the past as inevitable evolutionary steps to the Neolithic. The Neolithic of Southwest Asia is a period of radical change, not forced along any particular route by a prime mover but where there were multiple locally contingent paths that innovated, interacted, and began to diverge from the possibilities of hunter-gatherer ways of life.

## ACKNOWLEDGEMENTS

*The authors wish to thank Trevor Watkins, whose kind invitation to a workshop on the “Long Revolution: Becoming Neolithic in Southwest Asia” inspired this paper, to the participants at that workshop for excellent discussions, and to Tobias Richter, who made insightful comments.*

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