# Domesticating Space

## Construction, Community, and Cosmology in the Late Prehistoric Near East

**edited by**

**E. B. Banning and Michael Chazan**

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# *Structuring interactions, structuring ideas: Domestication of space in the prehistoric Near East*

E. B. Banning and Michael Chazan
University of Toronto

The Neolithic was not only the era of the domestication of plants and animals. During and even before the Neolithic, inhabitants of the Near East increasingly took control over their space, building for the first time substantial structures clustered in what appear to have been base camps, if not villages. If, as archaeologists typically assume, most of these structures were houses, this was a domestication in a quite literal sense. As Wilson (1988) points out, it also fundamentally altered human relationships and perceptions in ways that we could consider "domestication of the human species."

The papers gathered here are relevant to the novel spatial, ideological, and social relationships that this kind of domestication not only allowed but encouraged. Some of them were originally presented at a conference on the theme, Domesticating Space, that took place in Toronto from 19-20 November 2002. The goal of this meeting was to bring together archaeologists actively engaged in excavating Near Eastern sites with early architectural remains to explore the social and conceptual contexts that underlay these constructions. Our sense at the time was that the architectural and spatial component of the origins of agricultural societies in the Near East was due for reexamination. While empirical data from excavations has piled up, interpretation of these discoveries in terms of Neolithic people's lived experiences has lagged behind.

In a way, the results of the conference and the current publication have frustrated our expectations. The new empirical data are impressive and force a fundamental reexamination of ideas about the earliest architecture in the Near East. However, the social and ideological aspects of built spaces remain, for the most part, elusive. Rather than reaching a new consensus on the social context of architecture, the conference and this volume raise pressing and unexpected questions.

Two main orientations for research on early architecture emerge in these papers. The first is to consider architecture as a constructed landscape within both functional and symbolic realms. This orientation has been pursued vigorously by archaeologists working on the Neolithic of Europe (e.g., Bailey 1990; Hodder 1990; Thomas 1999; Tilley 2003), in part because the sheer strangeness of many of the architectural remains there, such as *tumuli* and henges, demands such an approach.

The detailed archaeological evidence presented here, especially in Nadel's paper, draws out aspects of the early architecture of the Near East that we cannot easily reconcile with a strictly functional interpretation. Yet, in general, work on the symbolic or cosmological aspects of early Near Eastern architecture is underdeveloped, and has concentrated on structures that excavators have interpreted as "shrines" or "temples," arguably through the lens of later biblical or Mesopotamian sources. Perhaps the spectacular new discoveries at sites such as Göbekli Tepe (Schmidt 1998; 2000; 2002) will begin to attract the kind of research already seen for Neolithic Europe. Already the monumental wall and tower at Jericho are beginning to find appreciation for their symbolic qualities (Naveh 2003; Ronen and Adler 2001). In addition, perhaps sites other than Çatal Höyük (Hodder 1990: 3-19; 1996; 2000; Matthews 2005) will provide rich sources for symbolic interpretation, particularly with detailed attention to periodic renewal and replacement of artistic elaboration of architecture. Mindful of Wilson's (1988) emphasis on the fundamental rethink-

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ing of space that the earliest settlements involved, we should expect symbolic delineation of spaces, along the lines that Nadel suggests, to have been common in Epipalaeolithic and Neolithic sites. Neolithic houses and settlements were probably steeped in symbolism.

The second orientation involves renewed effort to understand the nature of authority and social organization in these early settlements. If we thought that this was a simple problem, we have been proven wrong. There remains a need to figure out how to identify evidence of authority in the archaeological record. It is striking that, after almost a century of research, we can say little with certainty about the nature, or even existence, of conflict and authority during the fundamental shift from hunter-gatherer to agricultural societies in the Near East. The lack of clear evidence has led to the prevailing assumption that Neolithic villages were either fairly egalitarian (e.g., Goring-Morris 2000: 106; Simmons 2000: 214; but see Bar-Yosef 2001), or showed the beginnings of ranking with an increasingly fictive egalitarian ethic (e.g., Kuijt 1996; 2000a), but these assumptions have left others wondering how their inhabitants managed dispute resolution if the villages were even a substantial fraction of the size that some have estimated (but see Verhoeven, this volume). This problem has led to a focus on mechanisms that may have levelled economic differences or increased community cohesion (e.g., Byrd 1994; Kuijt 1996; 2000b).

An apt introduction to the volume is Trevor Watkins's paper, which, much in the spirit of Wilson's (1988) *Domestication of the Human Species*, emphasizes what a major change to human thinking and behaviour settlement in villages and houses must have been. He tries to identify early signs of "us", in contradistinction to preceding hunter-gatherers. Wilson had already pointed out how we might expect the erection of somewhat permanent, artificial spatial boundaries to have affected people's perceptions of and relationships with one another. Watkins goes on to emphasize important cognitive aspects of this change. Here, he points out ways in which the built environment can codify information, constituting a vehicle of symbolic storage just as important as writing would later be. In this and other papers (Watkins 1990; 2004), he tries to identify early signs of 'us', in contradistinction to preceding hunter-gatherers, a prehistoric 'other'.

**The 'Otherness' of Early Architecture**

Taken together, however, most of the contributions to this volume make a strong case that we also need to pay close attention to the 'otherness' of early architectural remains in the Near East. Beginning with Kenyon's discovery of the tower of Jericho, there has been a strong tendency to try to assimilate early architectural remains into the longue durée of the Near East, as early representatives of the agricultural village societies that have existed in the region over the last few millennia. The romance of this vision is captured in this volume by Garfinkel, when he writes about the women of Neolithic Sha'ar Hagolan going down to the river with jars on their heads, and by Kafafi, when he envisions the people of Neolithic 'Ain Ghazal sitting in the shade, playing Manqala.

While the desirability of such efforts to people the artifacts and walls of archaeological sites is beyond question, there is also a real danger of what Wobst describes as the tyranny of ethnography, missing the reality of the archaeological record by viewing it through ethnographic glasses. In the Near East, the danger is two-fold. On the one hand, as Verhoeven discusses in his paper on Neolithic site size, some of the use of ethnographic analogy by Near Eastern archaeologists, as in other regions, is selective or simplistic. In the Near East, furthermore, archaeology largely developed as an extension of biblical studies. Consequently, one must be wary, not only of the use of ethnographic analogy, but also of the use of biblical analogy and an attempt to see in distant prehistoric societies the origins of the peasant villages described in the Old and New Testaments and in the rich textual legacies of ancient Egypt and Mesopotamia.

The defense against both the tyranny of ethnography and the romance of biblical studies is close attention to the archaeological record. The papers assembled here exemplify such a careful attention to the archaeological record

and, taken together, they shake the sense of familiarity with which early architecture in the Near East is usually treated. What emerges is a series of fundamental questions that offer new perspectives on the emergence of architecture, with its potential for demarcating space.

A number of articles point to aspects of early architectural remains that do not fit well with our ideas of houses and villages. In his paper on the Kebaran site of Ohalo II, Nadel presents fine-grained evidence for the symbolic use of space in the early huts found on the site. Why, he asks, were stones carefully placed below the floors of the huts? Why were huts built repeatedly in the same spot with one floor directly overlying another? Nadel's careful examination of the archaeological record leads him to examine early huts as the construction of a landscape that is at once functional and symbolic. Surprisingly he reaches these conclusions from the excavation of the earliest known architectural remains in the region. This demonstrates that human attempts to wield control over space preceded the Neolithic by a much larger interval than previously suspected. Not only do the hut structures at Ohalo represent human attempts to demarcate living spaces with walls some 20,000 years ago, but repeated use of the same spaces and the patterned placement of certain classes of artifact strongly suggest that symbolic manipulation of space was also operative at this time.

Some of the same themes are picked up in Samuelian et al.'s examination of the Final Natufian structures recovered in recent excavations at 'Eynan, or 'Ain Mallaha. This site has attracted interest from archaeologists interested in the beginnings of village life since Flannery (1972) interpreted a group of huts there as evidence for Natufian social arrangements. It is important to point out that the data discussed in Samuelian et al.'s paper were only visible because of the extraordinary level of care taken in the excavation of these structures. In many cases, the remains of structures consist of only a single course of stones and an associated earth floor. While some of the structures at Mallaha might fit with our expectations of a house, with some open space and a few small installations, others confound simple interpretation.

In these structures, hearths and basins are crowded into the floor space leaving little obvious space for occupation. By extracting patterns in the spatial organization of "minor structures" and "major buildings," Samuelian et al. attempt to discern functional meanings for these differentiated spaces, as they might have been used in the everyday lives of the site's inhabitants. Their analysis shows that buildings varied in their function, and sometimes changed function over time, and careful examination of features indicates that they were not randomly distributed but rather were organized along two primary axes. The interpretation of the architectural remains found at Mallaha are further complicated when the location of burial is taken into consideration. For example, when structure 203, which had been crowded with basins and hearths, entered a new phase of occupation with few installations, thus possibly becoming a 'house', a corpse was deposited on the floor in a box. While Ohalo appears to provide an example of distinct spaces that preserved their meaning over time, 'Eynan, with at least as much differentiation of space, instead shows that the meaning of spaces was mutable, more flexible.

Stefan Kozlowski continues the attack on our expectations by comparing PPNA "villages" to Mesolithic hunter-gatherer settlements in Europe. As Kozlowski points out, we now know that the PPNA is a period of settled hunter-gatherers, not of early agriculturalists. He challenges the predominant interpretation of PPNA settlements as villages or proto-villages, contributing a counterpoint to the sometimes teleological accounts that have followed Flannery's (1972) lead in interpreting changes in house form and community spatial organization. He analyses the differences and common characteristics of a large suite of sites across the Near East, all of which have round or oval structures, in the attempt to discern which, if any, might properly be called villages, rather than something like "base camps." Kozlowski finds many similarities between the PPNA and the European Mesolithic, but there are still aspects of PPNA sites that are distinct and require explanation. The first is the

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tremendous depth of deposits found on some PPNA sites and another is the density of structures. He casts doubt on the prevailing view by showing that a large number of the "villages" are more similar in many respects to Gravettian settlements and even Mesolithic "base camps" in Europe than to Near Eastern "villages," and prompts us to think carefully about what we really mean by such terms as "village" and "sedentism."

Hans Georg Gebel's paper concentrates on the domestication of one dimension of space that archaeologists usually overlook: the vertical dimension. It would be tempting to view the development of multi-storey structures as a response to crowding (cf. Kuijt 2000; Steadman 2000) or simply an early manifestation of some kind of incipient urbanism. However, this paper shows hints that something rather different was going on in some PPNB sites in southern Jordan. Somewhat as has been reported for pueblo sites in the American Southwest (Cameron 1966; Kidder 1958), upper storeys appear to have been added at the same time as lower storeys (or "basements") were abandoned and filled with rubble, the usable rooms sequentially rising over time.

Marc Verhoeven provides a very focused critique of the models for estimating population size for the PPNB of Jordan. Since archaeologists have used these models to draw far-reaching conclusions about the social effects of crowding (e.g., Kuijt 2000a; Gebel, this volume), the ecological effects of population concentration (papers in Rollefson and Köhler-Rollefson 1992), and the role of central places (papers in Bienert et al. 2005), any weakness in the models warrants careful consideration. Verhoeven argues that existing models' key assumptions lack empirical support. He suggests that it is likely that these sites were not occupied year-round across their entire surface. As a result, views of the PPNB that are based on the reconstruction of large population centers are open to question. One might add that the excavators of some large PPNB sites quite reasonably used visible traces of architecture, such as walls in road cuts, to guide their placement of excavation areas. However, this has led to biased estimates of the density of architecture, and systematic underrepresentation of open spaces, at these sites. We might extend Verhoeven's argument by pointing out the assumption, inherent in most of the attempts to estimate Neolithic community sizes, that the fairly high population densities and fairly crowded built environments of Bronze Age and later Near Eastern towns are appropriate analogues for Neolithic situations. Verhoeven instead suggests that Neolithic sites may indeed have had much more open space than later Near Eastern villages did.

**Built Environment and Social Change**

To some extent, the early architectural remains of the Near East have been used as a proxy for social organization, despite recognition that there is no simple equivalence between the structure of built space and social structure (Wilk 1990). Particularly important has been archaeological research into the emergence of nuclear and extended households within the context of the beginnings and entrenchment of agricultural economies.

Many of the papers collected here explore the relationship between built environment and the social changes that took place over the millennia when village life and food production took root and prospered. In this they follow in the shadow of Flannery's (1972) early attempt to use mainly architectural evidence to understand social changes at the end of the Pleistocene and in the early Holocene. A brief review of Flannery's work in this regard is warranted, with emphasis on his Near Eastern, rather than Mesoamerican, examples.

In his ground-breaking original paper, Flannery (1972) proposes the hypothesis that the shift from the Natufian to the early Neolithic involved a major social transformation. Although Flannery associated this shift with the change from rounded to rectilinear buildings (with admitted exceptions), his argument draws on several sources of evidence, including number and size of structures, position of granaries, and patterns in the distribution of artifacts that might indicate activity areas. He argues that hut size in the Natufian and PPNA is consistent with occupation by only one or two people, and interprets groups of such huts as analogous to hut

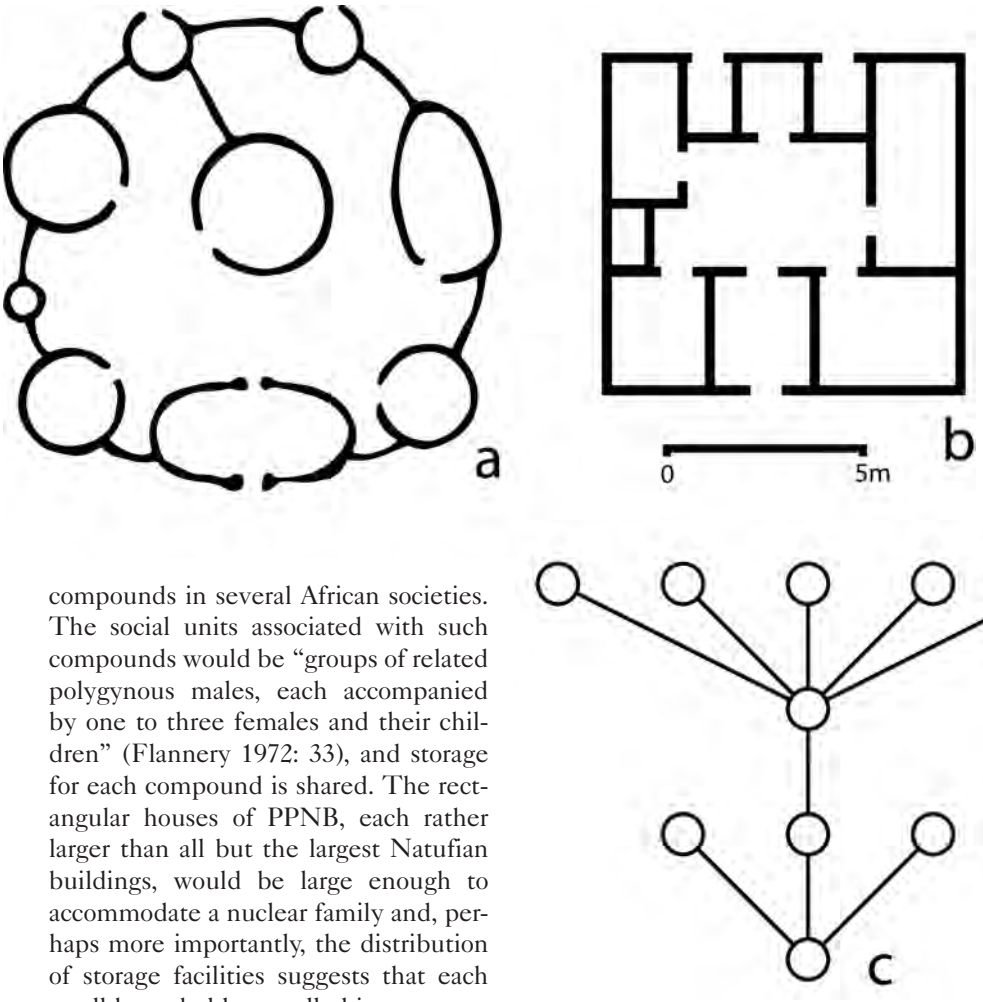


**Fig. 1.: Plans of a Batammaliba house (a) (after Blier 1987) and a fictitious rectangular structure (b) with the same spatial structure (c)**

compounds in several African societies. The social units associated with such compounds would be "groups of related polygynous males, each accompanied by one to three females and their children" (Flannery 1972: 33), and storage for each compound is shared. The rectangular houses of PPNB, each rather larger than all but the largest Natufian buildings, would be large enough to accommodate a nuclear family and, perhaps more importantly, the distribution of storage facilities suggests that each small household controlled its own production, distribution, and consumption. The "basic unit of production [was] not subject to the same kind of obligatory sharing as [in] the compound" (Flannery 1972: 39).

In revisiting this topic, Flannery (2002) updates some of the data and points out a number of improvements to his original paper, while also extending his argument to the origins of extended households. Quite rightly, for example, he recognizes that the compounds of African horticulturists and herders are probably not the best analogues for Epipalaeolithic hut groupings. In fact, one might add that polygynous compound units tend to be most common among societies in which the agricultural labour of women and children is valued (Murdock 1957; Clignet 1970; van den Berghe 1979: 65-67), and not common at all among hunter-gatherers. He also places greater emphasis on the difference between the pooling and spreading of risks and resources in compounds or extended families, and the restriction of sharing in nuclear families.

However, in Flannery's papers and most that have followed in this vein, we must be mindful of problems that inevitably affect our identification of "households" and other social units in archaeological residues. As we have already seen in discussion of Samuelian et al.'s paper, it is not at all obvious, in many instances, what is or is not a "house". We cannot assume that early constructed space constituted houses. Nor is it obvious, especially where architecture is agglomerative, where the boundaries between houses or households should lie. Different rooms of a single structure can belong to different households, while individual households can own space in several different structures (e.g., Banning and Byrd 1987; Byrd 2000: 65; Horne 1980; Stone 1981; Wilk and Netting 1984; Wilk and Rathje 1982: 620).

How we deal with this problem inevitably affects our interpretation of prehistoric social units. Depending on how we look at space, we might interpret a grouping of huts around a common space

as a compound in which each hut is associated with a different adult household member, as in some of the cases that Flannery cited in his 1972 paper. Or we might interpret it as a house with several rooms (huts), occupied by a nuclear family (e.g., Batammaliba houses, Blier 1987). In terms of the organization of space, it should not matter whether the rooms of a house are rounded (huts) or rectangular (figure 1). Creative responses to this problem range from careful attention to renovations, door blockings, and networks of interconnected rooms (Banning and Byrd 1987; Dean 1969), to redundancies and other patterns in the distribution of artifacts, features and facilities (Garfinkel and Kadowaki, this volume).

Like their predecessors in other publications, many of the papers in this volume face this problem of identifying socially relevant units, such as families, households, or even co-resident groups, on the basis of architectural traces. Some focus on small, isolated structures that might reasonably correspond with houses and households, while others deal with buildings or groups of huts in which household boundaries (if that is even an appropriate term) are not particularly clear. Marion Cutting (p. 91), for example, takes the safer route of using rooms and buildings as her analytical units, thus avoiding the need to identify household boundaries while nonetheless admitting the likelihood of "individual household units that were closely associated with particular buildings". She also notes (p. 98) that, at Asikli Höyük, domestic groups each appear to have required use of multiple buildings. Seiji Kadowaki (p. 53) takes a different approach by attempting to identify redundancies in activity areas and disposal areas that might reflect household units. With our ethnographic lenses and, indeed, with the biases we bring from our own culture, it is tempting to equate free-standing buildings with households, yet, as these papers indicate, we must be wary of this equation.

Other problems stem from variation in the way we define the term, "household", itself. This is a problematic term even for social scientists who are able to observe domestic situations directly. Many archaeologists assume that coresidence is an important characteristic of households, but sociologists, social anthropologists, and social historians have often found it necessary to omit coresidence from their definitions, or at least qualify it, in order to deal with households that participate in migratory labour or mercantile activities (e.g., Sanjek 1982). The mediaeval European mercantile "house", especially the Italian *famiglia*, included relatives and even non-relatives economically tied to the household head; indeed the "company" was the group that broke bread together (Latin *cum pane*, Braudel 1986: 436; Origo 1963: 109, 181). One has to ask whether we can take coresidence for granted when we are dealing with prehistoric societies whose members only recently adopted a sedentary way of life, or, for all we know, were not completely sedentary after all. One definition that archaeologists often cite defines households as task-oriented, coresident groups that share in production, reproduction, and consumption (Netting 1982; Netting et al. 1984). In an influential article, Wilke and Rathje (1982) define the household as the social group that shares in production, distribution, consumption, and reproduction, and transmits rights from generation to generation. Archaeologists who have tried to apply this definition to prehistoric cases have tended to assume, for example, that storage facilities, much as in Flannery (1972), are clues to distribution, while ovens and hearths are clues to consumption. Yet other archaeologists clearly are using a quite different definition when they cite buildings with multiple hearths and ovens as evidence for "multifamily" or "extended housholds" (e.g., Flannery 2002: 424, 426; Garfinkel, this volume). At the least, such variations suggest that the reality of social change was more complex than simple dichotomies can express; perhaps some multifamily Neolithic domestic groups shared in the distribution and storage of food, yet prepared and consumed food in distinct, nuclear-family settings. In this vein, Flannery (2002: 427) refers to "an extended household of perhaps three related nuclear families, each of which ground its own grain and cooked its own gruel or bread, but also shared storage and work space with coresidents".

As an example of how uncertain the identification of prehistoric households and their boundaries can be, let us return to the example of Hassuna (Lloyd and Safar 1945), as cited in Flannery (2002). Flannery interprets the excavated architecture of levels IV and V as each representing the house of an extended household. To support this hypothesis, he is able to cite the presence of several storage silos that, taken together, could store enough food for several nuclear families, and duplication of hearths and ovens, which suggests "the presence of several kitchens" (Flannery 2002:427). He also reconstructs fairly large numbers of coresidents for these buildings. But how certain can we be that the residents of these structures constituted households, or even coresidental groups? One way to define the boundaries between households in such situations, itself admittedly uncertain, is to examine the bonding and abutting of walls and the interconnection of rooms (e.g., Dean 1969).

This method can suffer from incomplete publication of evidence and from poor preservation of doorways, but can still be helpful where, as at Hassuna, walls and doorways are fairly well preserved. Principally on the basis of room interconnections, we could conceivably hypothesize three residential units (and parts of others) in level IV (figure 2) and four units in level V. We note that each of these hypothesized units, where sufficiently exposed, has a courtyard, one or two ovens and hearths, and its own storage facilities. Although this reconstruction is no more certain than the one that Flannery offers (and, in fact, does not necessarily contradict the interpretation of extended families), we see no strong reason for assuming that all the storage facilities in these structures were shared by a single household. It would seem serendipitous indeed if Safar and Lloyd's excavation area exposed just the right area to correspond with a household in either level, let alone both.

It is also necessary to reflect on the methods that Flannery, and other others who followed in his footsteps, have used to estimate the number of people who inhabited these structures. If we are to distinguish nuclear from extended-family households, for example, it is critical to have some idea how many people (or, perhaps, how many adults) there were in the coresident group or the economic group that shared in production, distribution, consumption, and transmission of intergenerational rights. Many authors have made use of Narroll's (1962) formula relating the roofed area within settlements to settlement population sizes (roughly $10m^2$ roofed area per person), or modifications to this formula (Casselberry 1974; LeBlanc 1971; cf. Kramer 1982: 162; Sumner 1979; Watson 1982: 35). Yet they have sometimes attempted to apply these formulae to estimate the number of people inhabiting specific structures or even rooms, overlooking the fact that the formulae were explicitly designed to estimate the populations of whole settlements. The ethnographic sample that Narroll employed provided statistics on total roofed area of all domestic structures in a settlement, including their storage, ritual, entertainment, and work spaces, and not only sleeping quarters. Consequently, applying the formula to an individual living room is

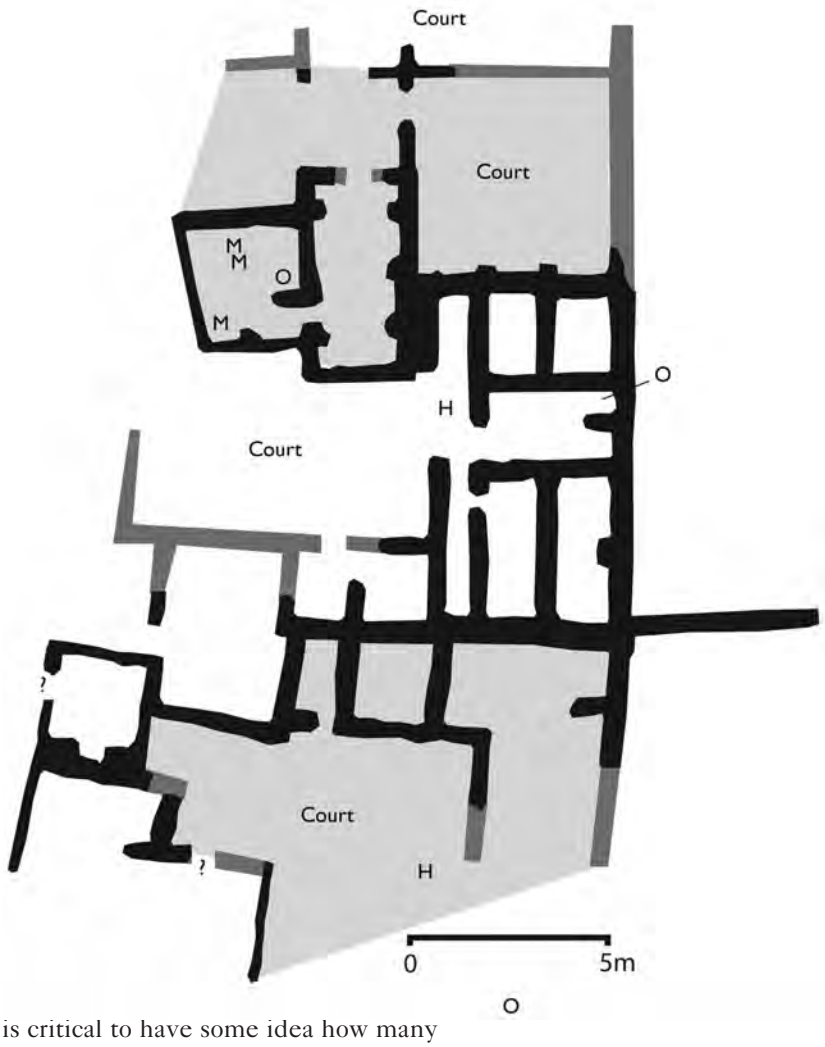


**Fig. 2:**
**Partially reconstructed plan of domestic architecture in Hassuna IV (after Lloyd and Safar 1945). Reconstructed walls are grey, proposed residential or household units are distinguished by shading.**

**O: ovens**
**H: hearths**
**M: milling stones**

*There is a constant danger of falling into the trap of expecting the empirical evidence to speak for itself. Architecture will remain a collection of walls and spaces unless it is animated by questions about social structure, cognitive worlds, and domains of interaction*

likely to underestimate the number of people who could have slept or worked in it, quite aside from the large statistical errors on Narroll's regression and skewness in the distribution (Kolb 1985; Wiesner 1982). That is not to say that there is no way to estimate the number of people who might have made use of such a room (Cook and Heizer 1968; Horne 1994: 150-54; Jacobs 1979; Sumner 1979: 169-170; Wiesner 1974; 1982), only that Narroll's formula, and ones like it, are not the appropriate way to do this. We also need to mindful of the effects of household wealth, mobility, landholding, and other factors on house size (Kramer 1979: 158).

Consequently, Flannery's (1972) assignment of one or two adults to each larger hut in a compound must find its support, not in Narroll's formula, but either in analogy to the recent hut compounds he cites or to some different ethnographically-based formula. In fact, structures of 10 $m^2$ or a little larger can and often do house nuclear families, while, as we already saw above, huts of 10 $m^2$ can also be interpreted simply as rooms that, in association with storage and other rooms or huts, were part of larger domestic units, with total areas of perhaps 25-30 $m^2$. In any case, there is not as great a difference in size between the larger huts of the Natufian and PPNA and the typical "houses" of Middle PPNB as Flannery's analysis implies (Banning 1996; Byrd 2000: 72, 83-85). In fact, the Natufian even boasts some structures that are much larger than a typical PPNB house (e.g., structure 51 at 'Ain Mallaha/'Eynan is 64 $m^2$ in area; Perrot 1966). This has led some to conclude that nuclear-family households probably "characterize domestic dwellings throughout this time frame in the southern Levant" (Byrd 2000: 83, but see comments above and Samuelian et al., this volume).

Seiji Kadowaki's paper exemplifies one approach to the use of built space that helps us grapple with such problems. He focusses on the uses of distinct spaces and how these changed over time, this time in the context of a Middle PPNB site, 'Ain Abu Nekheila, in the more desertic southern range of the PPNB. With emphasis on site-formation processes and ground-stone tools in these spaces, he identifies activity areas related to food preparation, tool manufacture and maintenance, pigment preparation, and other activities and examines their patterning in space. He finds that some kinds of spaces, often containing hearths, were used for multiple activities, while other, small spaces were used for specific purposes, such as storage of ground-stone tools. He goes on to find recurrent associations of such spaces, which he interprets as corresponding with cooperative social groups, perhaps households.

Zeidan Kafafi provides an overview of the changing location of activities at the site of 'Ain Ghazal. In this paper, he uses changes in the location of storage, food preparation, and industrial activities to get at changes in social organization from the Middle PPNB through Pottery Neolithic at 'Ain Ghazal.

Marion Cutting compares the architecture of Asikli Höyük and Çatalhöyük and manages to provide a linkage between animal exploitation and architecture. She argues that the small architectural units at Asikli Höyük might reflect an agricultural society without domesticated animals. At Çatalhöyük, abandonment of the previous agglomerated architecture coincides with the addition of cattle to the previously herded sheep and goats. Like Kafafi, Cutting points to the relationship between wealth and architecture, Çatalhöyük showing evidence for the intergenerational transmission of wealth differences. In light of comments above, it is interesting to examine the implications of Cutting's research for the assumption of household boundaries in what are, after all, quintessential examples of agglomerative architecture. She identifies 26 "buildings" at Asikli Höyük and 39 "buildings" at Çatalhöyük, following Düring (2001: 5) in defining a building as all the spaces covered by a single roof.

However, since the roof here is never intact, the buildings actually appear to be spaces (sometimes interconnected) within a continuously walled (i.e., not abutting) enclosure. Different buildings do not share walls, although their outer walls are often pressed closely together. Having defined the buildings, Cutting compares their areas, degree of partition into rooms, distributions of hearths and ovens at the two sites. Somewhat as with Kadowaki's paper, she notes repetition

of spatial arrangements at Çatalhöyük that might indicate households or other domestic units. Furthermore, she notes that these units seem to persist over stratigraphic levels, suggesting intergenerational transmission of property rights. At the earlier site of Asikli Höyük, however, buildings appear to have varied in function, and some small buildings are clearly not houses. This is reminiscent of Samuelian et al.'s results for the Final Natufian at 'Eynan, as well as ethnographic examples of households spread over two or more "buildings", and cautions us not to be too quick in identifying architectural structures with households.

Yosef Garfinkel focusses the discussion on the world of the Pottery Neolithic. At least at Sha'ar Hagolan, the situation appears to fit rather well our ethnographic expectations of what a village should look like. At this site, structures and storage facilities are built around a central courtyard. These courtyard buildings are built along roads that appear to run through the village. Garfinkel reconstructs the courtyard buildings as the homes of extended kin groups, which he interprets as units in a hierarchical sociopolitical structure. However, even at this site, the nature of the authority that allowed for the maintenance of the streets, which, he argues, lie outside the household realm, remains unclear.

## Conclusions

The contributions brought together in this book all represent elements of works in progress. We are struck by the interplay between gains in empirical knowledge and increasing theoretical refinement in the study of the emergence of agriculture. The discoveries of the past decade, both from new excavations and methodological advances, many of which are discussed here, challenge easy theoretical generalizations. At the same time, there is a constant danger of falling into the trap of expecting the empirical evidence to speak for itself. Architecture will remain a collection of walls and spaces unless it is animated by questions about social structure, cognitive worlds, and domains of interaction. We a grateful to the authors who contributed to this volume, as well as to the participants in the Toronto conference, for rising to the challenge of combining empirical rigor with a lively engagement with theoretical issues surrounding the domestication of space.

In closing, it is a pleasure to recognize the support of the Halbert Exchange Program at the University of Toronto, the Halbert family, and the program's director and administrator, Janice Stein and Joshua Goldstein. The generosity and vision of the Halbert Exchange Program has allowed us to go beyond the initial mandate to include scholars in the conference without regard for modern political boundaries. In a time of intense regional conflict it is liberating to sit and consider how people experienced this landscape thousands of years ago. It is our belief that the kind of intellectual exchange that took place in Toronto and is now embodied in this book makes a small but critical contribution to modern transformations that we hope will lead from conflict to cooperation.

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# *Architecture and the symbolic construction of new worlds*

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A significant change occurred at the beginning of the Neolithic in southwest Asia as far as architecture is concerned. By contrast with preceding periods, communities engaged in a great deal of effort and concern for the architecture of houses, communal buildings, and the organization of whole settlements. There were undoubtedly important social factors at work in the new, permanent, sedentary village communities that emerged in the Epi-palaeolithic period, but there were more significant cognitive and cultural developments that enabled people to develop new frameworks of symbolic representation that were worked out in concrete terms in buildings, their fittings, their use, and the planning of settlements. I propose that systems of non-linguistic, external symbolic representation and storage were devised around the beginning of the Neolithic period, several thousand years before the first proto-scripts. In southwest Asia, there was a fortuitous coincidence of the beginnings of sedentism and permanent villages on the one hand and the co-evolution of cognitive and cultural faculties for external symbolic storage on the other hand. Architecture and the built environment, as we know, frame and help to form our perceptions. They form "theatres of memory", the arena within which social and other relations are played out. And the settlements of the earliest Neolithic in south-west Asia show how, for the first time in human history, people were discovering this power to form, conceptualise and symbolise their living environment. Living in a built environment for the first time constituted inhabiting symbolic worlds of their own construction, opening the way to the formation of new, larger, richer social worlds.

**Figure 1:**
**Sculpted monoliths suc- from Göbekli Tepe have led to the interpretation of the site as a cult centre related to the economic geographer's notion of a "central place". Illustration by Raina Stebelsky**

### "La révolution des symboles au Néolithique"

My starting point is with the work of Jacques Cauvin (1994; revised and updated English edition 2001). The beginning of the Neolithic in south-west Asia, Cauvin argued, presents quite differently from the immediately preceding Epipalaeolithic. For him, it was "la révolution des symboles au Néolithique", and the dominant symbols were of a female divinity and divine male principle. Each year since Cauvin first published these ideas, and particularly each year since his death in 2001, we have seen the discovery of more and more sites with rich sculptural imagery, and we can now see that there is more symbolic representation than just the figuring of a male and female pair of divinities. And more and more of this rich repertoire of imagery is contained within monumental architectural contexts. I want to develop a theory

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concerning the use of architecture in the early Neolithic, whether for single buildings or for structuring whole settlements. I want to develop the thesis that the realization of the potential of architecture for constituting and embodying cultural ideas that framed the way that people lived was a phenomenon that makes the people of the earliest Neolithic in an important sense the first people to be substantially like ourselves. It needs to be made clear at the outset that I am not trying to claim that culture in the Neolithic period was categorically different from culture in the preceding Epipalaeolithic period. The evolution of human cognition and its employment of culture was a gradual process, but, around the beginning of the Holocene period, the evolutionary process passed through a critically important threshold in the emergence of fully symbolic culture, opening the way to a rapid florescence of richly symbolic cultural worlds.

First, let's be clear on the sequence and the chronology. From the transition between the Upper Palaeolithic and the Epipalaeolithic periods (around 20,000 years ago, and before Period 0 in the system developed by Jacques Cauvin and his colleagues at the Maison de l'Orient in Lyon), some hunter-gatherer societies had begun to develop new settlement and subsistence strategies. These involved increased reliance on stored harvests of pulses, cereals and other grasses. Greater reliance on stored harvests implied longer periods of residence in one base-camp. Arguably from the very earliest Epipalaeolithic (for example, at Ohalo II – Nadel, & Hershkovitz 1991; Nadel, this volume; Nadel & Werker 1999; Kislev, Nadel, & Carmi 1992), some hunter-gatherer communities were resident at a single location within an immediately accessible territory of diverse ecological zones that offered richly varied food resources. By the last phase of the Epipalaeolithic, Period 1, equivalent to the Natufian in Israel, Jordan and Syria, it is possible to point to a number of communities that had become fully or effectively sedentary, living in permanent village communities and permanent built environments, employing the proto-types of symbolic architecture.

**Building design, settlement planning**

While there are interesting signs in Period 1 of what was to come, as Cauvin has argued, from the beginning of the Neolithic, Period 2, equivalent to the PPNA of the Levantine region, there was an explosion of symbolic activity. Communities of the earliest Neolithic show a great deal of cultural concern with the architecture of buildings and the organization of whole settlements. This was slowly driven into my consciousness through the experience of excavating Qermez Dere in north Iraq in the late 1980s (Watkins et al. 1991; Watkins et al. 1995; Watkins 1990, 1992, 1996). The small settlement at Qermez Dere had been laid out in two contrasting halves that performed complementary functions. Part way through its life, the village was re-formed, but once again in two complementary halves. This time, the southern half of the site was used for houses that were dug into what had been a dumping area for all sorts of debris and waste in the earlier stage of the history of the village. The buildings were extraordinary for the care with which they were built and the persistent maintenance and renovation that was lavished on them. One house, which we carefully disassembled over several seasons of investigation, had been rebuilt at least three times. And each phase showed repeated replastering and modification of the internal details. Impressed by the expensively repeated rebuildings, elaborate care expended in their maintenance, and the pairs of nonstructural pillar-like features that each contained, I suggested that these houses were more than shelters from the elements; rather, they reminded me of the ways in which we in our cultural traditions have made our houses into "homes" (Watkins 1990). "Home", I should not have to remind you, is a cultural or social construct – an allusion to the work of the American philosopher John Searle (1995), and his discussion of the construction of social reality.

Much more dramatic is the site of Jerf al-Ahmar, on the Euphrates in north Syria (Stordeur 1998a; 1998b; 1999; 2000; Stordeur & Jammous 1995; Stordeur et al. 1996; Stordeur et al. 1997; Stordeur et al. 2000). The site belongs to Period 2, the earliest aceramic Neolithic period, coming to an end at the transition to

Period 3, the beginning of the so-called PPNB of the Levant. Early in the history of the village, there existed a large, fully subterranean building (EA 30) in an open space at the centre of the village. The floor of the structure was more than 2 m below the surface, and the elliptical building ranged between 6.8 and 7.4 m across. Stordeur describes it as "*communautaire*", a communal or public building, and argues that it was "*polyvalent*", or multi-functional. Stordeur believes that it was at the same time a communal food storage facility and a building with religious functions, where meetings and rituals may have taken place. At the end of its life, it was emptied, a human head was placed in it, and in the central area a decapitated body was spread-eagled. And then the structure was destroyed by fire, its burning roof collapsing on the decapitated body. Finally, the structure was obliterated as the cavity left by its destruction was filled with more than 300 $m^3$ of soil. Stordeur (2000: 31, 32, 36) has compared this building with a very similar building at Tell Mureybet, "maison 47", of very similar date. At the very end of the excavations, as the waters were rising, a second, similar, cellular building (EA 7) was found, dating later in the stratigraphic sequence of the eastern part of the settlement. It seems to have been the replacement for EA 30. Two human skulls had been deposited in a recess at the base of one of the post-holes for the posts that supported its roof, a foundation deposit that mirrored the skull and corpse that had been placed in EA 30 at the end of its life.

In the western part of the settlement, at a later date again, another large subterranean building was constructed (EA 53) on the same general scale as the earlier buildings, but internally quite different. Like EA 30, it was a complex construction with a double skin of walls, the inner of which included a number of vertical timber posts. The circular interior had a bench running around the wall, and the bench had a kerb formed of large limestone slabs, decorated with a frieze of pendant triangles in relief. Six large roof support posts of fir (*Abies*), which must have been brought from some distance, were set in post-holes at regular intervals in the kerb. Finally, Stordeur (2000: 40 & fig. 11) mentions briefly another, similar structure that was found only as the waters rose into the excavations. It, too, had a kerb of great limestone slabs, each with a frieze of pendant triangles along its top edge. One of the slabs was also carved with an additional design that seems to have been a schematic representation of a headless human body. And that slab was flanked by two, tall stelae topped with vulture-like heads and a "collar" of pendant triangles at the "neck".

And very recently, excavation of another early aceramic Neolithic site on the Euphrates in north Syria, upstream from Jerf al-Ahmar, Tell 'Abr 3, has begun to reveal a further example of a central, communal, circular building (Yartah 2004). The communal building at Tell 'Abr, of which only a fragment survived, was between 10 and 12 m in diameter, more than 1.5 m below ground level (but, allowing for the above-ground wall, about 2 m from floor to roof), and it had been burnt as part of its abandonment. Like Building EA30 at Jerf al-Ahmar, the Tell 'Abr building had a "bench" around the interior, fronted by a "kerb" of large, limestone slabs. At the front of the kerb, there was a circle of wooden posts that had supported a roof structure, collapsed and burnt mud from which was found on the floor. Several slabs carved with simple, linear geometric designs or schematically drawn animals were found set on edge between the posts and in front of the kerb.

Structured settlements and central, communal buildings are not confined to Syria. A cluster of remarkable sites in southeast Turkey has been brought into the limelight in recent years. Although Robert Braidwood and Halet Çambel began the excavations at Çayönü Tepesi in the 1960s, the extraordinary, non-domestic buildings in the centre of the settlement only began to be brought into focus in the 1990s (Özdogan 1995; 1999; Özdogan & Özdogan 1990). Another small settlement, Nevalı Çori, was excavated before being drowned by the lake behind a major dam. It had monumental domestic architecture like Çayönü Tepesı, but attention has focused on the subterranean cult-building at the centre of the settlement (Hauptmann 1993, 1999). The most remarkable of all the sites, however, is Göbekli Tepe (Schmidt 1998; 2001; 2003; 2004; 2005a; 2005b).

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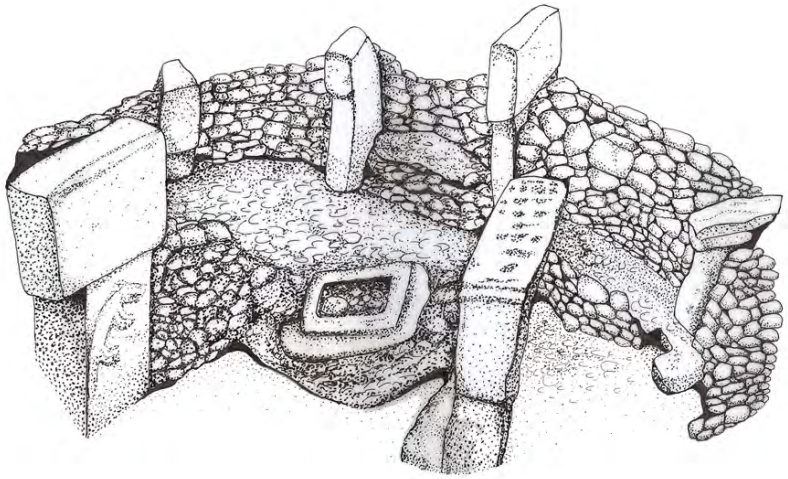

**Figure 2: The raised reliefs of the Steinzeit-Tempel (stone age 'temple') at Göbekli Tepe are almost entirely of wild (and dangerous) animals, large birds, snakes, lizards, and scorpions.**

**Illustration by Raina Stebelsky**

Göbekli Tepe is a mound about 300 m in diameter and more than 15 m high, situated on a prominent ridge in the limestone hills that overlook the plain of Harran, near Urfa. It is not a settlement mound in the normal sense, for it has (so far) produced no domestic houses or anything that resembles the normal stratigraphic accumulation of surfaces and occupation debris. The matrix of the mound seems to be a vast accumulation of deliberately deposited broken stone debris with an admixture of occupation debris, including large amounts of chipped stone, considerable amounts of animal bone and a small amount of carbonised plant materials. Since the mound is composed of a great amount of domestic refuse, but is not a settlement site itself, it would be natural to look for settlement around the mound. All around the mound there are features cut into the bedrock, such as posthole patterns, cisterns (?), large cylindrical features and quarries from which stone monoliths have been cut, and dense carpets of chipped stone. But these features do not constitute a settlement, and extensive survey work has found none closer than about 15 km, under the centre of the old city of Urfa (Yeni Yol - Bucak & Schmidt 2003; Çelik 2000a).

The mound seems to be full of subterranean structures, excavated to depths between 2 and 5 m into the matrix, and formed by massive, dry-stone retaining walls. Every structure so far excavated has been found to have been deliberately and completely refilled with the stony matrix material at the end of its "life". Geophysical survey indicates that there are more than a dozen further subterranean structures just below the surface of the mound. The latest structures, dating to the later aceramic Neolithic, similar in date, therefore, to the Nevalı Çori and Çayönü Tepesı structures, contain the smallest monoliths with the least amount of figurative decoration. The earlier structures are larger, sub-circular, and contain more monoliths that are themselves much larger (up to 5 m tall) and more elaborately carved. In each enclosure, there is an opposed pair of T-shaped limestone monoliths, and the places where they were quarried can be seen on the eroded limestone surfaces all around the mound itself. In the earlier structures, more of the monoliths were erected around the perimeter of the enclosure, set at right angles to the retaining wall with their bases in a stone-built bench (fig.2). Some of the early structures can be seen to have been rebuilt. Their second form was erected within the earlier retaining wall, the space between the old and the new walls being filled with broken stone debris. Some of the T-shaped monoliths seem to have been re-sited, their sculptured animals partly or completely hidden where they have been built into (or perhaps embodied within) a retaining wall. As at Nevalı Çori, there are other sculptured stones that have been found where they were dumped. The T-shaped monoliths were intended to be anthropomorphic, as they share the same features as those from Nevalı Çori, and one or two have arms and hands carved in very low relief. The raised relief sculpted onto the surfaces of the monoliths is almost entirely of wild (and dangerous) animals, large birds, snakes, lizards, and scorpions.

How Göbekli Tepe is related to the communities that built it and made its sculpted monoliths is as yet unknown. Schmidt (2003; 2005a; 2005b) has begun to think of the site as a cult centre that is in some sense related to the economic geographer's notion of a "central place". He has also introduced to his discussion reference to the thinking of the influential urban theorist Lewis Mumford (1961), who speculated that the original cities arose where a permanent settlement was established around a central shrine. While we have so few cult centres like Göbekli Tepe, and while we still know relatively little about the unique site and its functioning, it is impos-

sible to define its role in the settlement landscape – which is one that is very unfamiliar to us, whether from personal experience of reading in the anthropological literature. Setting those difficulties aside, we can at least appreciate that the sites mentioned (and Schmidt 2005b is careful to list them more thoroughly, document what has been reported, and give the appropriate publication details) give prominent and central positions to buildings of elaborate architectural design, with which are associated clear indications of imagery and symbolism, whether in visual form or in the shape of use for ritual activities.

In a paper parallel to Schmidt's (2005b), Rollefson (2005) briefly reviews the evidence for ritual architecture and ritual centres in the southern Levant, fortunately relieving this author of the need to document further the explosion of symbolic architecture that began in the final Epipalaeolithic, and continued through the aceramic Neolithic in that region. Rollefson attributes the growth of ritual activity to population increase both within individual settlements and in the overall density of human population within the landscape. He subscribes to the theory of religion as the social "glue" holding societies together.

While there is general agreement nowadays that what Cauvin (1994) called "la révolution des symboles" occurred at the beginning of the Holocene (presaged, of course, in the Epi-palaeolithic period), there is a poor ability to explain why it should have happened then and not earlier. In what follows, I shall be turning Rollefson's evolutionary perspective on its head. He takes a classic ecological line, supposing that larger co-resident communities and higher population density in general required adaptations that took the form of socio-cultural mechanisms which served as the sociological "glue" holding together the larger, more stressed communities of the aceramic Neolithic period. In his preliminary discussion of the deficiencies of most theories of religion, Pascal Boyer simply undermines the "social glue" theory (Boyer 2001: 26-8). I argue that co-evolutionary processes developed human cognition and culture towards a fully symbolic stage of culture, and that that opened the way for large-scale, permanently co-resident communities to operate within wide-area networks. Having first faced the challenge of devising new ways to conceptualize their condition as members of sedentary, village communities in symbolic form, these hunter-gatherers quickly turned to the exploration of the culturally rich possibilities of this new way of life. Following the leads of Ian Hodder (1990) and Peter Wilson (1988), we may call the result of this co-evolutionary process in southwest Asia "domestication".

## Domestication

In his book *The Domestication of the Human Species*, based on a cross-cultural knowledge of ethnographically documented hunter-gatherers, the anthropologist Peter Wilson argued for a clear difference between the traditional, small-scale, mobile hunter-gatherer band societies and sedentary hunter-gatherer societies, who live in permanent buildings in village societies. Wilson called the former type the "open society", while sedentary hunter-gatherer societies, like village-farming societies, are called "domesticated" societies (Wilson 1988). He considered "domestication" in the same sort of terms as Ian Hodder (1990) in his book *The Domestication of Europe: Structure and Contingency in Neolithic Societies*. Domestication is the effect of living in houses, living in villages. In "open societies" people were constantly aware of each other within the group. He argued that domestication was a significant event in human evolution because it challenged that natural, evolved dependence on paying constant attention to one another. On the other hand, living in houses grouped in villages offered the potential for structuring people's thinking.

*Domestication is the effect of living in houses, living in villages. In "open societies" people were constantly aware of each other within the group.*

Wilson argues that the way that we conduct ourselves is as much in response to sensory inputs as a matter of instincts; thus the adoption of houses and village life – domestication – involved new responses and new thinking, in terms of the development of structure in social life, the elaboration of thinking about structure in the world, and ways of signifying links between structure in domestic life and structure in the world. Wilson's analysis of modern, mobile hunter-gatherers shows that they rely on uninterrupted and unimpeded attention, so that each member of the group is constantly

*The essence of Donald's hypothesis is that the modern human mind has evolved further and further from the primate mind by means of a series of three major adaptations, each of which was driven by the emergence of a new representational system.*

aware of the whereabouts of the others and what they are doing. These "open societies" are marked by an emphasis on "focus" (Wilson 1988: 31), while sedentary "domesticated" societies are distinguished by an emphasis on the "boundary" (Wilson 1988: 57-8). Wilson writes : "Architecture is a materialization of structure, and the adoption of architecture as a permanent feature of life introduces spatial organization and allocation as an ordering visual dimension" (Wilson 1988: 61). It was natural for domesticated societies to form analogues between their built environment and community, between house and household, and between the built environment that they create and inhabit and the world in which they live. Wilson introduces frequent examples of sedentary societies for whom the structure of their villages and their houses expresses the structure of their social lives. And, like other anthropologists, Wilson cites examples of sedentary societies whose ideas about the organization of the cosmos are modelled in the structuring of their houses and their settlement. In another recent publication, I have gone on to mention some of the many writers and thinkers who have noted the significance of the architecture of the house in the representation of ideas about the structure of the world (Watkins 2003).

However, neither Wilson nor Hodder can tell us why the emergence of domestication occurred when it did, around the end of the Pleistocene and the beginning of the Holocene periods. For that, we need to turn to overtly evolutionary theories concerning the evolution of human cognition and culture.

**The co-evolution of mind and culture**

The thesis that I want to try and build is that the cognitive and cultural evolution of modern humans, *Homo sapiens*, had reached a stage where it could readily be triggered into the development of powerful new forms of symbolic representation in material form. There are several cognitive psychologists, linguists and neuro-scientists working on the general idea of cognitive and cultural co-evolution – a process in which human minds/brains were stimulated into new ways of thinking and representing ideas in a positive feedback loop where human minds develop new cultural media that in turn engender new ways for minds to think. The most obvious examples of such cognitive-cultural co-evolutionary revolutions are the emergence of a full, modern language capacity, and the development of writing.

Like a number of archaeologists, I have found Merlin Donald's ideas and arguments extremely stimulating and very exciting (Donald 1991; 1998; 2001). The essence of Donald's hypothesis is that the modern human mind has evolved further and further from the primate mind by means of a series of three major adaptations, each of which was driven by the emergence of a new representational system (Donald 1991, conveniently précised in Donald 1998). Each of these new representational systems was added to the already existing faculties: one did not supplant or replace another.

The first representational system to emerge is labelled by Donald "mimetic culture", dependent on mimesis, or non-verbal action-modelling involving gesture including vocal gesturing, non-verbal communication, and shared attention. It is very difficult for us to imagine; it was limited and slow, but Donald is emphatic that it constituted the prototype of human culture, and facilitated some degree of information storage and transmission.

Language, in the form in which we know it around our world, was the second of the modes of representation. Language, Donald explains, gives us humans a powerful means of explicit recall from memory, the ability to address and organize knowledge, and to make it accessible to further reflection. As I have sought to emphasise elsewhere (Watkins 2003; 2004; 2005; in press a; in press b), taking my cue from Terence Deacon's book, *The Symbolic Species* (Deacon 1997), and as Donald also emphasises, full modern language involves much more than the formation of a lexicon, or the emergence of the physical ability to speak as modern speakers do. Crucially, language implies a facility with symbolic representation. If modern humans have had the cognitive and cultural capacity to manage the system of symbolic representation that we call language, they have had the potential to devise other modes of symbolic representation, too. The early archaeo-

logical indications of that capacity for symbolic representation in material form and action antedate the first figurative representations of the European Upper Palaeolithic; they are found associated with the newly emerged *Homo sapiens* in Africa (D'Errico et al. 2003).

However, the greatest change in human culture has been what Donald refers to as the emergence of "theoretic culture", a mode that is supported by systems of "external symbolic storage". And this most recent transformation of culture has found its full realization in the use of alphabetic writing systems. Ideas and information encapsulated in external symbolic storage systems (think of a university library, with shelves full of archaeological journals and all the varied monographs) are accessible to any of us, at any time. We may criticize or reformulate the information that we find, and add to it with our own publications for others to synthesise in their turn. It should not be hard for us to recognize that, while the genetic makeup of our brains may not have changed over the last few generations, centuries or millennia, the ability to link to an accumulating external memory store has afforded our minds cognitive powers that would not otherwise have been possible. Donald speaks of our minds as hybrid minds, dependent on their ability to access external symbolic information. The emergence of external symbolic storage systems is a cultural and not a biological phenomenon, and it changes the cognitive working of the human mind, enabling us to evoke qualitatively new types of representation.

In his more recent book (*A Mind So Rare: The Evolution of Human Consciousness*), Donald expands on the ideas of brain-culture co-evolution (Donald 2001). He discusses at length the process of "deep enculturation" in human learning and the development of individual consciousness. Deep enculturation describes the way that a fully symbolic cultural environment directly affects the way that major parts of what Donald calls "the executive brain" develop from infancy. Symbolic culture effectively wires up functional subsystems in the brain that would not otherwise exist.

If these ideas have huge implications for the ways that the minds of people today have learned to operate in the very different cultural environments within which they developed, they have equally significant implications for the ways that the minds of prehistoric people developed within prehistoric cultural environments. Following Donald's logic, cultures that were fully symbolic and minds that operated within fully symbolic cultural contexts are quite different from less than fully symbolic cultures and less than fully symbolically literate minds. As members of today's Western archaeological community, it is easy to appreciate the importance of the written word as a mode of external symbolic storage. Because of our education and upbringing with its emphasis on literacy and the printed word, it is less easy for us to appreciate the role of other, non-verbal, non-literate modes of symbolic representation. Yet, as archaeologists, we ought to be aware of the importance of both portable artefacts and fixed constructions and buildings as modes of symbolic representation in other cultures (and, indeed, in our own cultures).

I take a similar view to that articulated by Colin Renfrew in response to Donald's view of external symbolic storage and writing (Renfrew 1998). On the one hand, Renfrew rejected the idea of an Upper Palaeolithic revolution as the beginning of human modernity (Renfrew 1996) and, on the other hand, he thought that Donald's concern with alphabetic writing as the beginning of truly effective external symbolic storage missed a significant earlier revolution. Renfrew emphasised the potential of non-verbal, non-literate symbolic culture in constituting modes of symbolic storage and transmission several millennia earlier than the first, non-alphabetic writing systems. In his recent writing, he has developed the view that fully symbolic material culture, emerging before the first writing systems, constitutes a further significant stage in human cultural and cognitive evolution (Renfrew 2003), and he calls these ideas a theory of material engagement (Renfrew 2004). The idea that I wish to develop here and in other recent publications is that architecture is a specially powerful mode of external symbolic storage, that this mode of symbolic representation in architectural form was first realised at the end of the Epipalaeolithic and the beginning of the Neolithic in southwest Asia, and

*This geometric approach to houses, combining curvilinear and straight lines, should be emphasized, since it became part of a tradition, as possibly evidenced by later buildings in Mureybet and Jerf al-Ahmar.*

that this realization of the potential of symbolic material culture accounts for the precocity of southwest Asia from this time on for several thousand years.

### The built environment as external symbolic storage network

The emergence of harvesting, food storage, and sedentary life in village communities came at a perfect time to coincide with human cognitive and cultural evolution. Communities in southwest Asia began to use material culture in the same way that they used language. Language is differential, rather than referential. The signs (words) take meaning from their 'syntactic' and 'semantic' context, in relation to one another. The same may be said for architecture. The built environment of the village offered an arena within which abstract ideas about the structure of the community, the relationship of the community with their world, and even the structure of that world could be articulated in their buildings, and the relationship of buildings to one another. Further, individual buildings constituted arenas within which much more could be symbolically constructed in their fittings and fixtures, and in the rituals conducted within them. In building their houses and villages, they were framing concepts and constructing in symbolic form the most significant aspects of their world and their lives. For us, architecture and the built environment constitute our way of living; architecture materializes our social institutions, frames our perceptions and forms the arena within which social and other relations are played out. Significantly, it provides the framework for the "deep enculturation" of human infants. Growing up in an architecturally expressive environment, surrounded by artefacts with symbolic values, and guided by parents and other seniors who already know this world, makes us who we are.

Anthropologists, architects and social thinkers believe that architecture serves as a structuring device in the thinking of contemporary or recent societies. That most influential of anthropological theoreticians, Lévi-Strauss, has written extensively on the house as a social form, proposing house-based societies – *sociétés à maison* – as a category of social organization, distinct from societies based in kinship, or hierarchically organized societies based on class, status or power. Lévi-Strauss was impressed by the Annaliste historian Georges Duby, who wrote about the institution of noble houses in medieval France. Indeed, house-based societies are to be found widely in the ethnographic literature (I have written more fully on this subject elsewhere; see Watkins 2003). And we may note that post-structuralist and social thinkers such as Bourdieu, Derrida and Giddens also say that the house serves as a structuring instrument. We are clearly in good company.

However widely found the examples of societies, architects, anthropologists, or social thinkers who use the architecture of the house as a mode of structuring their thought or ideas, we cannot assume that contemporary cultural experience can be universalised. What we are seeing at the end of the Epipalaeolithic and the beginning of the Neolithic periods of southwest Asia is the emergence of a new, fully modern mode of cognitive and cultural representation.

What I have sought to suggest is that human cognitive and cultural evolution had reached a point in the final Palaeolithic where external symbolic storage networks became possible. In southwest Asia, where dependence on stored harvests and the trend to sedentism happened to evolve in the Epipalaeolithic, house-building and life in villages were turned into what we know as architecture and the richly meaningful world of the built environment. The new way of life was dramatically different from the whole of human experience living in small-scale, mobile, hunter-gatherer groups of fluid membership. Living in relatively large-scale, permanently co-resident communities within a tightly drawn territory, as Wilson (1988) suggested, presented challenges but also opportunities.

The primary challenge was that of constructing a new sense of community based not only on kinship but also on co-residence. At the same time, the village-community needed to be understood in the context of its neighbouring communities. The anthropologist, Anthony Cohen, has worked for many years on the notion of community and how communities are formed, maintained, and seen by their members and non-mem-

bers. In a small book of primary importance, Cohen described community as:

> 'that entity to which one belongs, greater than kinship but more immediate than the abstraction we call "society". It is the arena in which people acquire their most fundamental and most substantial experience of social life outside the confines of the home... At the risk of substituting one indefinable category for another, we could say it is where one acquires "culture".' (Cohen 1985: 15)

Cohen shows how communities are symbolically constructed and maintained through the manipulation of their symbols in the minds of their members (Cohen 1985: 15). The symbolic construction of community involves great cognitive and cultural complexity. The construct of community became possible for humans only with the emergence of minds that were capable of operating in terms of symbolic culture. This capacity to build and maintain communities that were larger than the circle of immediate kin was necessary for the ability of early Neolithic groups to live together, for the first time in human history, in co-resident groups of several hundred or several thousand people in permanent settlements. Once the challenge of the symbolic construction of community had been met, the opportunities offered by the new facility with symbolic culture could be explored

The power of the built environment resides in the fact that – as we can appreciate – people live within it: it is not an optional extra, like a library, that one can consult when one wants. We inhabit the symbolic world of architecture. It allows us to construct and read meanings at many levels and of many kinds. It allows us to construct environments that enrich other forms of dramatic symbolism played out within them. Here I am thinking particularly of ritual and drama. I am therefore arguing that the first sedentary hunter-gatherers and farmers of southwest Asia recognized the potential of the built environment as a powerful cultural system of external symbolic storage and reference. In the early Neolithic they were literally constructing new worlds of the imagination that they could inhabit and in which their children grew up in a more powerful environment for enculturation than *Homo sapiens* had ever known.

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# *Residence Ownership and Continuity From the Early Epipalaeolithic into the Neolithic*

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**Introduction**

Until the Upper Palaeolithic, direct archaeological evidence for the inner organization of the home space, the dwelling structure, is extremely scarce. Lower and Middle Palaeolithic remains from many cave sites, for example, do not provide details of the built home, but rather demonstrate the use of naturally closed and protected spheres. In several Upper Palaeolithic sites in Europe and the Near East, the remains of built dwellings have been preserved (Goring-Morris and Belfer-Cohen 2003). However, it is only in a few large Natufian sites and many early Neolithic village sites that the walls of dwelling structures were built of stone, and thus past organization of space within camps or villages was better preserved than in most earlier sites (Flannery 1972, 2002; Byrd 1994, 2000; Nadel 2003).

One of the hallmarks of early Neolithic villages in the Near East is the dense building within them, also demonstrated by repeated renewal of floors and structures, and the common construction of new houses exactly above old ones. It has been suggested that such a tradition, already present in early Natufian sites reflects sedentism (Edwards 1989) and the long-lasting ties between people and their specific place within the camp or village (see more on Natufian settlement patterns in Bar-Yosef 1998; Bar-Yosef and Belfer-Cohen 1989; Belfer-Cohen 1991).

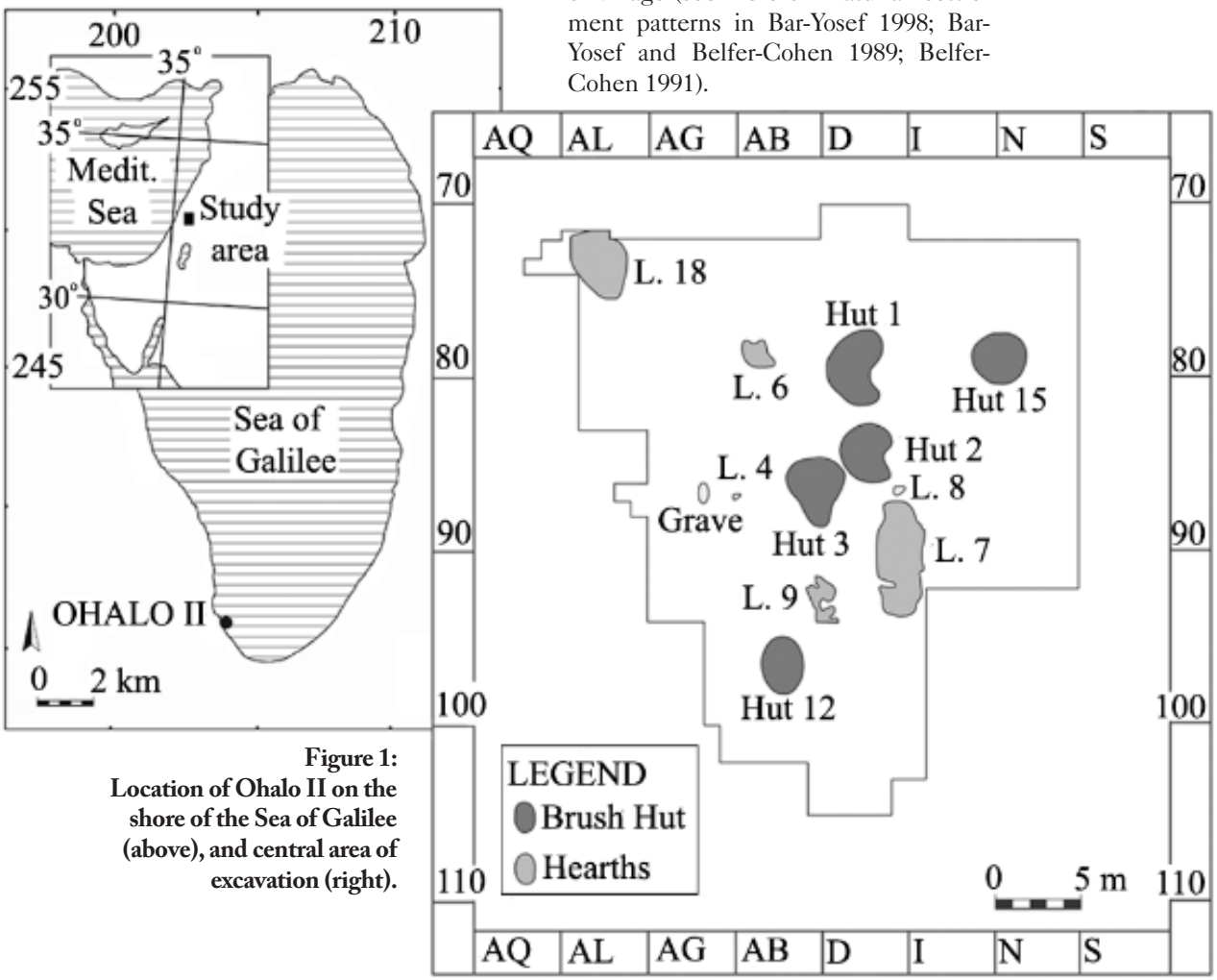


**Figure 1: Location of Ohalo II on the shore of the Sea of Galilee (above), and central area of excavation (right).**

**Figure 2: Excavation of brush hut 1 during 1991 season, looking northwest.**

*Densities of finds are high on the floors, while extremely rare in the deposits around and below the huts .*

The aim of this paper is to present evidence for repeated use of brush huts already by the early Epipalaeolithic period, ca. 21,000 cal BC. The case study is the largest brush hut excavated at Ohalo II, which has three successive floors, and erect stones as well as a probable symbolic stone arrangement under them. The continuous use of the home, in combination with sub-floor stone settings, are two elements commonly reported at Natufian and Early Neolithic sites. The Ohalo II remains indicate that the roots of an ideology that involves viewing the camp in several levels of use, ownership and continuity are to be found millennia earlier.

## The Ohalo II Site

The Ohalo II submerged site is located in Israel on the Lisan marls on the shore of the current Sea of Galilee (Belitzky and Nadel 2002; Tsatskin and Nadel 2003). The site covers a minimum area of 2000 $m^2$, of which more than 25% have been excavated. The exposed remains include floors of six brush huts, six concentrations of open-air fireplaces, a human grave, a pit, a stone installation, and midden deposits (Figure 1). Submerged in anaerobic conditions, organic remains enjoyed excellent preservation. Thus, the bases of brush hut walls (Nadel and Werker 1999), as well as large quantities of charred seeds and fruit (Kislev et al. 1992; Weiss *et al.* 2005) were preserved.

Forty-five charcoal samples retrieved from most loci, as well as from pre- and post-occupation deposits, give an average occupation date of ca. 19,500 BP (ca. 21,500 calBC; Nadel 2002; Nadel et al. 1995). All excavated sediments were wet-sieved through a 2 mm mesh (first season, parts of loci 1,2,3) or 1 mm mesh (all subsequent work)

### The Brush Huts

The remains of six brush huts at the site are the oldest of their kind ever reported (Nadel and Werker 1999; Nadel 2003, 2004, in press). The floors of huts 1, 2, 3 and 13 were fully excavated, while those of huts 12 and 15 were largely sampled (Figure 1). In all cases, sections through and under the floors showed that there were no deeper archaeological layers under the observed floors.

The full contour of five huts was recorded by following a dark line of charred wood and other plant remains, or by documenting the limit of the dark inner sediment, which was always different from the natural clays and sand (Figure 2), or both. In addition, the shape and dimensions of hut 15 were tentatively reconstructed according to sections through the floor remains and

similarities to the other huts.

All huts are more-or-less oval and, in the five fully observable cases, the long axis is in a north-south direction. In two cases, the entrance was clearly located in the middle of the long eastern wall [huts 1 (floor II) and 2].

The lengths of the huts vary between 2.5 and 4.5 m, while their areas range from 5 to 13 m². The floors have a bowl-like section, and are always lower than the surrounding surface. Thus, the first stage of hut construction was to dig a shallow oval depression – at least 20 cm lower than the surface – into the soft bedrock. No postholes were detected in or around any of the excavated huts. Such a simple building technique did not require heavy logs for a central support.

No stone pavement or continuous stone-lined wall bases were documented. In hut 12, however, stones, mostly 10-20 cm long, formed a loose arch along the exposed north-west edge of the floor. Most of them were placed in groups of two or three stones, 20-50 cm apart, and there are broken stone implements among them (Nadel 2003).

The dark cultural deposit within each hut was usually 10-20 cm thick in the center, although thicker in huts 1 and 12, and became thinner towards the walls. It had high densities of charred remains, animal bones, flints, and other daily debris. In all sections, the lower limit of the archaeological layer was clearly distinguishable from the underlying light-colored natural marls, clays and sands (Figure 3; for sedimentological and thin-section details, see Tsatskin 2002; Tsatskin and Nadel 2003).

## Successive Floors

### The floors

In five huts, the anthropogenic accumulation between the walls, composed of thin mud floors and the debris deposited above and into them, exhibited no observable layers, although small lenses and "sub-layers" that did not continue from wall to wall were observed (Figure 3). However, in hut 1 it was possible to distinguish three successive floors (Figure 4). The upper floor (I) was only partially preserved in the southern half of the hut. The middle floor (II) was well preserved and was separated from the upper and lower floors by layers of silt/sand that were 3-5 cm thick in most places. This floor had a high density of finds, including horizontally deposited specimens such as flint artefacts, bones, and a gazelle horn core. A large, flat, basalt stone was set horizontally on this floor (see below). The bottom floor (III) was larger than the middle one. It, too, was rich in flint, bones, and charred remains. No stone installations were preserved within the huts, nor are there built hearths.

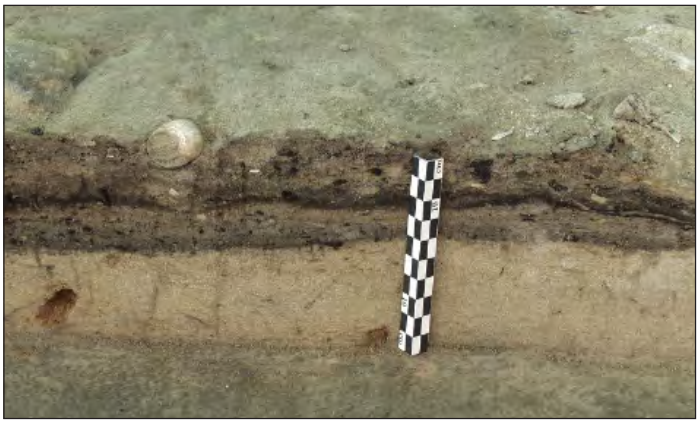

**Figure 3: Section through the floor of brush hut 2, showing dark charcoal-rich lenses on top, and natural lacustrine silty-clay below**

Thin sections through the floors support the floor distinctions reached by field observations. In particular, the floor layer showed *in situ* microscopic features, including horizontal charred fragments of grasses (Nadel et al. 2004; Tsatskin 2002; Tsatskin and Nadel 2003).

The densities of finds are high on the floors, while finds are extremely rare in the deposits around and below the huts (Figure 3). Thus, the color of the anthropogenic layers is always dark, with rich assemblages of charred remains, while the surrounding deposits are light gray, the typical color of silts and clays. Furthermore, counts of flints, for example, amount to several hundred debitage pieces in most units of 0.5 m x 0.5 m x 0.05 m (1/80 of a cubic metre). In the natural bedrock deposits, by contrast, they drop to isolated finds or none at all.

It should be mentioned that, at the Kebaran site of Ein Gev I, the nearest site to Ohalo II with pre-Natufian remains of huts, the "indoor" anthropogenic deposit was thick (up to ca. 60 cm) and divided into several layers (Bar-Yosef 1978). These layers, like the Ohalo II hut 1 floors, could be reflections of long or repeated occupation of the same hut.

*The color of the anthropogenic layers is always dark, with rich assemblages of charred remains, while the surrounding deposits are light gray, the typical color of silts and clays.*

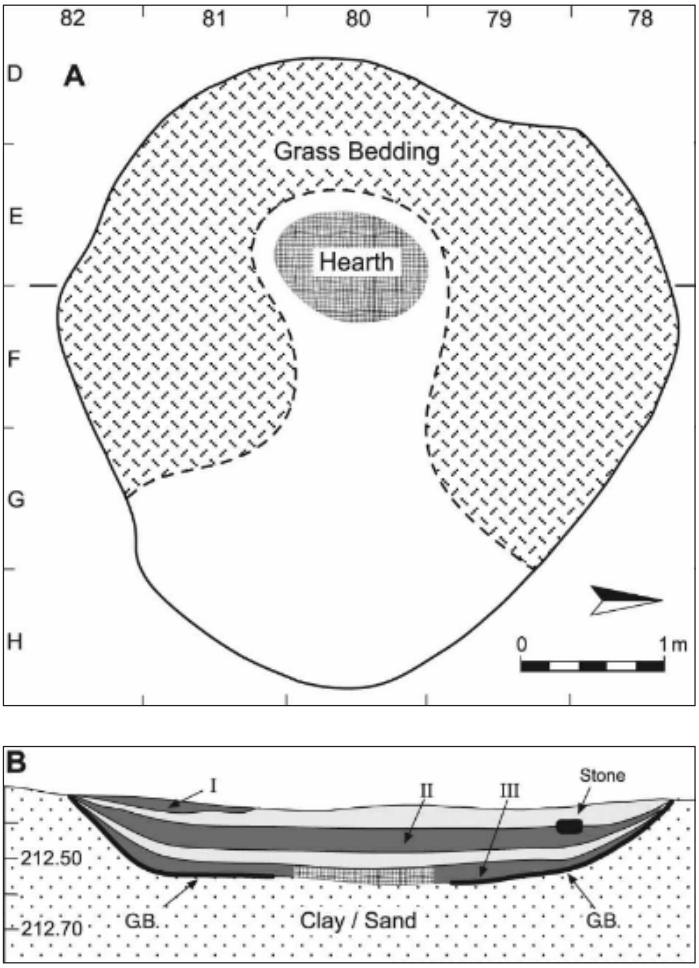


**Figure 4a, 4b: Plan of floor III, brush hut 1, showing location of grass bedding (top), and section through the three floors (bottom). Note different scales: height in figure 4b is given in meters**

### Finds on the floors

All floors were rich with material remains of daily activities, including many thousands of flint products (totaling ca. 45,000 pieces, excluding debris and chunks). Seeds were abundant, and a sample of ca. 60,000 from hut 1 has been studied (Kislev et al. 2002; Weiss *et al.* 2005). Animal bones were also plentiful, and thousands of fish bones, as well as thousands of mammal bones and many bones of birds, were recovered from each brush hut.

Conspicuous concentrations of finds were observed on floors. For example, a small, dense area of flint products, including cores, bladelet blanks and tiny pieces, occupied floor II in hut 1. Around it, numbers of flints were very low, suggesting the interpretation that two or three knappers had sat in a semi-circle while working flint (Nadel 2001).

On the same floor, concentrations of fish vertebrae and other fish bone do not overlap with the flint concentrations (Nadel et al. 1994). Furthermore, high densities of seeds were also documented, again with distribution patterns that differ from those of flints and fish bones. Had natural processes, such as water transportation, been responsible for the observed scatters, the high densities of all small remains should have overlapped. Thus, these independent and non-random distribution patterns appear to represent distinct locations of work, storage, and discard on the floor of the brush hut.

Refitting of flints also provides evidence for knapping on the floors. So far, we have more than 100 refits in hut 1 and more than 60 in hut 2. Furthermore, in hut 13 there were several concentrations of heat-shattered flints. When conjoined, each "pile" of chunks produced a bladelet core. Such evidence points to "indoor" knapping and *in situ* preservation of the flints.

In addition, there are small numbers of conjoinable basalt pieces on some of the floors.

On floor II of hut 1, a flat basalt stone had been set in an unusual way (Figure 4; Nadel 2003). First, a patch of yellow sand was spread on the floor, where the stone was to be placed. Then, several pebbles were set in the sand, and the flat stone on top. The stone was thus placed horizontally and firmly, to be used for grinding cereals on its upper flat side (Piperno *et al.* 2004).

The remains of grass bedding were preserved at the bottom of floor III (Figure 4; Nadel et al. 2004). These consisted exclusively of *Puccinellia convoluta* grass, cut above ground and organized in a repeated manner, with bundles placed in the same orientation, like tiles. They originally covered most of the floor, around a simple central hearth. It is probable that similar floor covers were used on floor II in that hut, and in huts 3 and 12, where a thin, dark organic deposit may represent poorly preserved layers of grass.

The wide variety of tiny (seeds, fish bones, certain flint elements) and heavier *in situ* remains indicates that the identified surfaces, rich with remains of daily activities, are indeed true floors, and the level of preservation is such that specific locations of indoor activities are still identifiable.

## Sub-Floor Stones

### Context

Two kinds of stone settings were found below brush hut floors: erect

stones and an enigmatic arrangement under hut 1. Before presenting these, by way of elimination, it will be shown that these stones are very unlikely to have been the result of natural depositional or post-depositional process.

First, it it noteworthy that no stones were found within the natural lacustrine layers. In all trenches opened in and around the site (totaling more than 100 m in length, average 1 m depth) and in sections under the archaeological deposits (Figure 3), no stones of any size were observed. Stones were found only in certain archaeological features, or immediately adjacent to them, as described below.

Second, all the settings discussed here are below floors, at the interface between the natural lacustrine bedrock and the bottom of the archaeological deposit. This repeated pattern of location is not random.

As the floors are *in situ*, and as the underlying lacustrine bedrock does not contain stones, the presence of the stone settings should be attributed to intentional placement by the site's inhabitants.

### Erect stones

Erect stones were found under the floors of two brush huts. In hut 1, near an arrangement of stones (see below), two small, flat, basalt flakes were preserved erect (Figure 5). The thin flakes are 6 -10 cm long, and such finds are rare in the stone assemblage retrieved from this hut.

Five stones were also found under the floor of hut 3 (Figure 6). Here, one elongated oval pebble and four angular basalt stones had been placed erect into the natural clay layers, with only their tops reaching the bottom of the floor. Thus, during most of the hut occupation, the stones were not visible. These stones are 10-20 cm long and thus bigger and heavier than the two basalt flakes from hut 1.

Much larger vertically-placed stones were also found at the site. For example, three were on the floor of brush hut 2, their top ends extending 15-20 cm above the surface. One flat basalt stone, ca. 35 cm long, was almost erect just outside the northeast wall of hut 3. A similar stone, in a similar position and location, was near hut 12. These could have had a functional purpose, like the support of the hut structure.

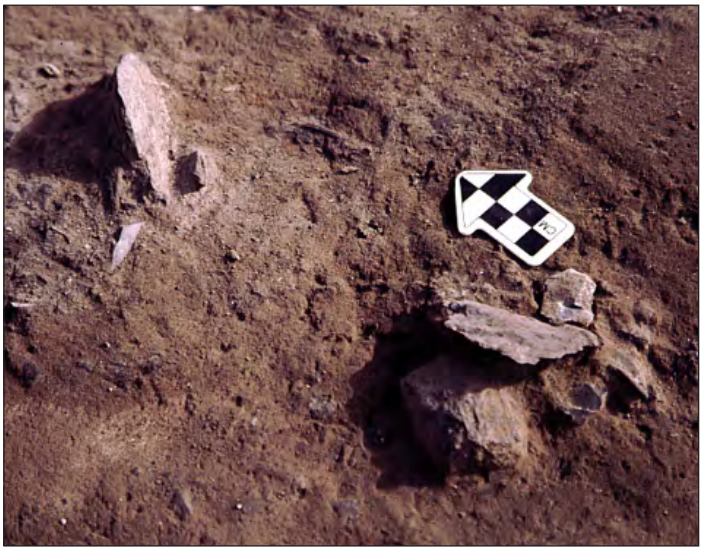

**Figure 5: Two basalt flakes found erect under floor III of brush hut 1**

The small size of the sub-floor erect flakes and stones found under huts 1 and 3, and their deep, unusual locations, bring to mind two tentative interpretations:

1) The stones supported small above-floor wooden or perishable installations, of which nothing else remains. This seems unlikely, as the stones are small and do not appear to have a particular spatial pattern.

2) The stones were set in a symbolic context, like corner stones, during floor construction or at the very beginning of occupation. They may have been related to social behavior in which ownership and continuity of a specific location at the camp were represented on or under the floor.

It should be remembered that a large stone was set erect into the lacustrine fine sediment near the stone circle by the grave (Nadel 1994; 2002). It was placed on a sharp edge created by crude, bifacial flaking, with a north-south orientation. By it and lying parallel, was a large flint blade. Here, again, it appears that the erect stone was not used in a functional manner, but rather set as a symbol in a social context.

### The stone configuration under hut 1

An unusual arrangement of *in situ* stones was exposed under the bottom floor of hut 1. The arrangement is composed of

**Figure 6: Erect stones found under the floor of brush hut 3. Note the dark top of the stone on the right, where it was embedded within the bottom layer of the dark floor**

14 stones, carefully chosen and placed (Figure 7).

The total length of the setting is ca. 45 cm. Ten of the stones are small, round pebbles, very similar in their dimensions (between 44 and 51 mm in length, Table 1). In addition, there are two somewhat larger specimens. The central stone is elongated, and was placed along the main axis of the set. The largest piece, however, is an angular fragment of a basalt implement. Near it is a small, round basalt pebble. The use of ten very similar pebbles, a fragment of a basalt implement and a flint flake, and the general configuration, are not random and could not have resulted from a natural process.

*A round, crude, basalt hammerstone was placed on the pelvis of the dead man, while a basalt tool fragment marks the position of the "pelvis" in the stone configuration.*

The purpose of the exposed arrangement is unclear. If it was intended to depict something, it was very schematic (or some stones or other elements are missing or displaced). One possible, and definitely not exclusive, reconstruction (Figure 8) follows certain similarities to the only human skeleton found at the site (Figure 9). Interestingly, a comparison between the skeleton (see Hershkovitz 2002; Nadel 1994; Nadel and Hershkovitz 1991) and the sub-floor stone configuration from hut 1 shows that:

1. There is a general long axis in both, with a bilateral symmetry.
2. The face of the deceased was directed to the east (rising sun?) with the aid of small pebbles set under the head. The "head" of the stone configuration was directed to the southeast, where the sun rises in winter.
3. A round, crude, basalt hammerstone was placed on the pelvis of the dead man, while a basalt tool fragment marks the position of the "pelvis" in the stone configuration. Furthermore, by this large fragment was the roundest basalt pebble in the figure. An emphasis on the pelvis could have signified fertility or gender.
4. The legs of the buried man were folded, and thus composed a short part of the skeleton. The stone configuration, too, has short "legs," with an extra stone on the right, in the position where the bent knees of the deceased are located.

As there should be no doubt about the grave and its components, the similarities between the stone setting and the burial should be taken as a possible indication of the meaning of the former, namely a schematic depiction of a human figure, probably related to death.

It is well known that anthropomorphic representations are rare in the Levantine Palaeolithic record (Bar-Yosef 1997). The nearest in time and space is the Natufian figure found in structure 26 at 'Eynan (Perrot 1966). The human figure was constructed of seven basalt pestles, with a very high degree of symmetry. Also, one should remember that some of the European Upper Palaeolithic figurines (more-or-less contemporaneous with Ohalo II), as well as many Levantine Neolithic ones, like the pebble figurines from Sha'ar Hagolan (Garfinkel 1999), are hardly recognized as figurines, as

**Table 1: Material and maximum length of the stones in the stone configuration found under floor III, hut 1.**

| Material | Length (mm) |
|---|---|
| basalt fragment | 25 |
| burnt flint flake | 31 |
| elongated limestone | 44 |
| basalt pebble | 45 |
| limestone pebble | 46 |
| limestone pebble | 46 |
| elongated basalt fragment | 48 |
| basalt pebble | 48 |
| basalt pebble | 49 |
| limestone pebble | 49 |
| elongated limestone | 51 |
| limestone pebble | 51 |
| elongated limestone | 55 |
| basalt tool fragment | 90 |

they are very schematic and lack most anatomical details. Had there been no other clearly recognizable anthropomorphic figurines at the same sites, the schematic ones would have been an enigma and a source for many debates and speculations, not always in terms of human depictions.

To summarize this section, the stones under the floor were carefully chosen and set in a specific order. The reason for doing so is unknown, although interpretation as a symbolic act cannot be ruled out. The general shape, the details, and certain similarities to the nearby skeleton of a carefully buried man, as well as the documented 'Eynan human stone figure and the contemporaneous European schematic figurines, suggest that at Ohalo II the stones may have been set to depict a human figure. If so, it could have had something to do with death, fertility or gender.

In addition to the above-described erect stones and stone configuration, several other kinds of unusual sets were found at the site. For example, a gazelle mandible was placed on, and perpendicular to, a large flint blade in two loci more than 15 m apart (Nadel 2002, in press). In both cases, the orientation of the blades was east-west, while the mandibles were found on a north-south axis, with the teeth to the west. The composition of the two sets and their non-random orientation seem to indicate intentional setting, perhaps in a symbolic manner.

The stone configuration in hut 1, the small, sub-floor, erect stones, and other small settings of artefacts should be viewed as aspects of camp perception that are not solely oriented at daily activities, such as food production or tool manufacture. Rather, they should be considered parts of social acts and codes that were related to the perception of the camp in the daily as well as the spiritual realms.

**Figures 7a, 7b: Two views of the stone arrangement under floor III of brush hut 1**

## Discussion

The three successive floors identified in hut 1 represent repeated occupations of the same hut. The duration of each is unclear but, as its floral remains represent all seasons, it is reasonable to state that the hut was occupied at least three times, each episode lasting a year or more. The rich, thick deposit in the 'Ein Gev I hut (Bar-Yosef 1987) could reflect a similar pattern of a long or repeated occupation. The thicker accumulation at 'Ein Gev I could be attributed to different depositional conditions, such as faster accumulation on a hillside location, and length of occupation.

The repeated use of the same structure, by renewing floors, is documented

*These early Epipalaeolithic groups, like their Natufian and Neolithic followers, developed a deep and sophisticated ideological relationship with their camp. The organization of space was far from random. The orientations of dwellings and their entrances were predetermined.*

in several Natufian structures (see Valla 1988, 1991, for structure 131 from 'Eynan as a clear case study). In the same site, there is evidence for construction of new structures exactly above old ones (Perrot and Ladiray 1988). In PPNA Jericho, the phenomenon is well documented (e.g., Kenyon 1981, plate 238). Edwards (1989) has argued that such sequences reflect long-term use of the sites, and that they can serve as evidence for sedentism in the early Natufian.

The case of hut 1 at Ohalo II, as is also probably true for the 'Ein Gev I hut, indicates that the practice of using a specific location at the camp for residential episodes lasting more than one season, and probably for several repeated events, is not a Natufian "invention." It was the practice of opportunistic, semi-sedentary, early Epipalaeolithic populations millennia earlier, and reflects camp organization that is not clearly documented (if at all) for earlier Palaeolithic sites in the Levant.

Such a tradition evolved in groups that settled long enough, and more than once, at a chosen dwelling site. These early Epipalaeolithic groups, like their later Natufian and early Neolithic followers, developed a deep and sophisticated ideological relationship with their camp. The organization of space was far from random and, for example, the orientations of dwellings and their entrances were predetermined. Each basic social unit, or household (Flannery 1972, 2002; Byrd 2000), had one or several huts, similar in dimensions and indoor activities (Nadel 2003). In some cases, "families" renewed the floors or returned to their huts after short spells of abandonment, instead of building new huts. The attachment to the hut and its location is clear, and should be viewed as indicating that perception of camp space by its inhabitants was not random. Social organization at the camp was dictated, among other factors, by ownership and relevant multi-year (and maybe multi-generation) memory of the community as a whole and by each of the social sub-units.

Importantly, some aspects of the dwelling unit and indoor organization, as preserved at Ohalo II, are found in Natufian and even PPNA dwellings (Nadel 2003, 2004). These include the size and shape of the structure, the floor sunk into the

**Figures 8: Arrangement of stones of brush hut 1, cleaned and set in original order. Note similarity to a schematic human figure**

ground, and the common lack of exclusively defined locales (with very few exceptions) for activities such as tool manufacture or food preparation. This continuity of the perception of the "home" transcended through time, and saw relatively little change from the early Epipalaeolithic into the PPNA, even though subsistence, social complexity and community size did change dramatically.

One of the clearest examples of the attitude to camp or village space can be seen in the numerous Natufian and PPNA burials. In Natufian sites, whether early or late, the burials are concentrated in the sites and, in many cases, in specific locations in the camps or caves. This issue has been widely discussed in the literature (Byrd and Monahan 1995), and only a limited number of examples will be presented here.

The repeated use of a chosen locale within the camps for burial is well documented at sites such as 'Eynan (e.g., cemeteries A, B, Perrot 1966; Boyd 1995), Hayonim Cave (Belfer-Cohen 1988),

Nahal Oren (Stekelis and Yizraeli 1963; Noy 1989; Nadel et al. 1997), Hayonim Terrace (Valla et al. 1991), el-Wad Cave and Terrace (Garrod 1937; Belfer-Cohen 1995; Boyd 2001) and Hilazon Tachtit (Grosman 2003). These examples indicate that at least some graves were not located randomly at the site, but repeatedly placed in chosen locations near previous burials. In many cases, new burials damaged older ones, indicating that the exact locale was chosen several times, and that there was time depth in the use of these locations. These concentrations of graves show an ideology also manifest in the remains of structures, namely, that there was a collective memory regarding where structures would be built, reflecting household ownership and continuity in the overall division of the camp space.

In PPNA sites, there is a certain continuation of this ideology, as can be seen in the burials of Jericho, including the 12 at the bottom of the staircase in the tower (Cornwall 1981), and repeated building in the same locations.

Furthermore, the use of stones and stone-carved features in Natufian graves is remarkable. For example, bedrock mortars and portable mortars occurred at various sites, such as al-Wad terrace, Hayonim Terrace and Nahal Oren. These examples illustrate that the Natufians' association of specific artefacts with burial contexts. These symbols, within their systemic context (Byrd and Monahan 1995), have their origins in earlier cultures, one of which is Ohalo II, where a grave contained a set of symbols that includes orientation of the body and face, a stone implement, and an incised gazelle bone.

Within this ideological framework, the above-described remains from Ohalo II reflect a camp concept that was well developed millennia later. The tradition of marking locations in the camp and placing material symbols – especially ones relating to graves and dwelling floors – prevailed for many generations. It is from this angle that the small-scale, although somewhat enigmatic, sub-floor stone settings at Ohalo II should be viewed. When similar cases are found in Natufian and Early Neolithic contexts, they are commonly regarded as reflecting codes of social behavior that concern ownership or other beliefs (Kuijt 1996). Furthermore, enigmatic Natufian engraved items have been interpreted as symbolic, perhaps in the context of rising territoriality (Bar-Yosef and Belfer-Cohen 1999). Therefore, with evidence of continuity present for various levels of camp organization, the more symbolic aspect of the domestic sphere found at Ohalo II should not simply be dismissed as enigmatic or random. We should instead view the relevant remains as we do for later sites, and interpret them accordingly.

**Figures 9: The OHII complete skeleton during excavations, looking west-northwest**

*The more symbolic aspect of the domestic sphere found at Ohalo II should not simply be dismissed as enigmatic or random. We should instead view the relevant remains as we do for later sites, and interpret them accordingly.*

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# *Final Natufian architecture at 'Eynan ('Ain Mallaha) Approaching the diversity behind uniformity*

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The issue of space is critical for understanding the meaning of the Natufian. This is particularly true if one sees Natufian sedentism as a forerunner, and possibly a precondition, for the economic behavior that drove Near Eastern societies toward food production. Indeed, the passage from a mobile way of life to one that includes long stays in the same locality must have involved significant changes in the way space was conceptualized.

Natufian sedentism remains poorly understood. We are still unable to understand what life in a Natufian village was like. How did Natufian villagers experience space (territories, villages, houses) in their everyday life? Moreover, if it is true that human beings always live in a highly symbolically constructed space, how are we to access this mental construct in the case of the Natufian? This is all the more difficult because there is no necessary correspondence between space as trivial experience and space as a symbolic construct. If the data at hand are equivocal about trivial experience, how can we expect it to be conclusive in an even more elusive fields, like concepts and ideas?

Concern with spatial organization at Natufian sites was already evident in the early excavations at al-Wad (Garrod and Bate 1937, Goring-Morris 1996, Weinstein-Evron 1998). Later discoveries at 'Eynan provided for the first time data for the plan and inner organisation of houses (Perrot 1960, 1966). Only in 1972, however, did Flannery inaugurate reflection on the data in terms of village organization and use of space, seen as a historical trajectory from the Natufian to the PPNB. Flannery tried to link archaeological observations in the field with a tentative reconstruction of changing social organization. Meanwhile, "territories" became a subject of interest through the introduction of site "catchment analysis" by Vinta-Finzi and Higgs (1970) and the notion of "base-camp" by Bar-Yosef (1970).

Spatial organization has been a major focus of recent research at the site of 'Eynan (Bocquentin 2003, Bouchud 1987: 98ff., Delage 2001, Perrot et al. 1988, Samuelian in Valla et al. 1998, Samuelian 2003, in prep., Stordeur 1988: 97ff., Valla 1981, 1988, 1991, in press). These analyses have provided insight into the overall layout of the site, showing that buildings were organized in lines along the natural slope.

The intent of this paper is not to deal with every aspect of the problems associated with space, either as experienced in everyday life or as mentally built by Natufian inhabitants. Rather, the paper will focus on presentation of the Final Natufian buildings recently exposed and reflect on the way they were used. In other words, it will pay attention only to a short moment, some time toward the end of the Natufian trajectory, without any attempt at broadening the time scope. Furthermore, it will concentrate on investigating individual buildings in order to discover possible clues to their function.

At the present stage of research, focus on definite examples is needed in order to base hypotheses on data. Finds from the old excavations attributed to the Final Natufian will be avoided because, with few exceptions, their stratigraphic context is controversial. There is no benefit in building interpretations on such shaky basis.

*The issue of space is a major challenge for understanding the meaning of the Natufian in the historical process of cultural change if it is true that Natufian sedentism was a forerunner, and possibly a pre-condition, for the economic behavior that drove Near Eastern human societies toward control of their main foodstuffs*

## The Final Natufian structures: major and minor buildings

Excavations since 1996 of the Final Natufian layer (Ib) at 'Eynan have revealed a series of built structures that can be divided into two main groups. The first comprises major buildings, similar to those called that Perrot called

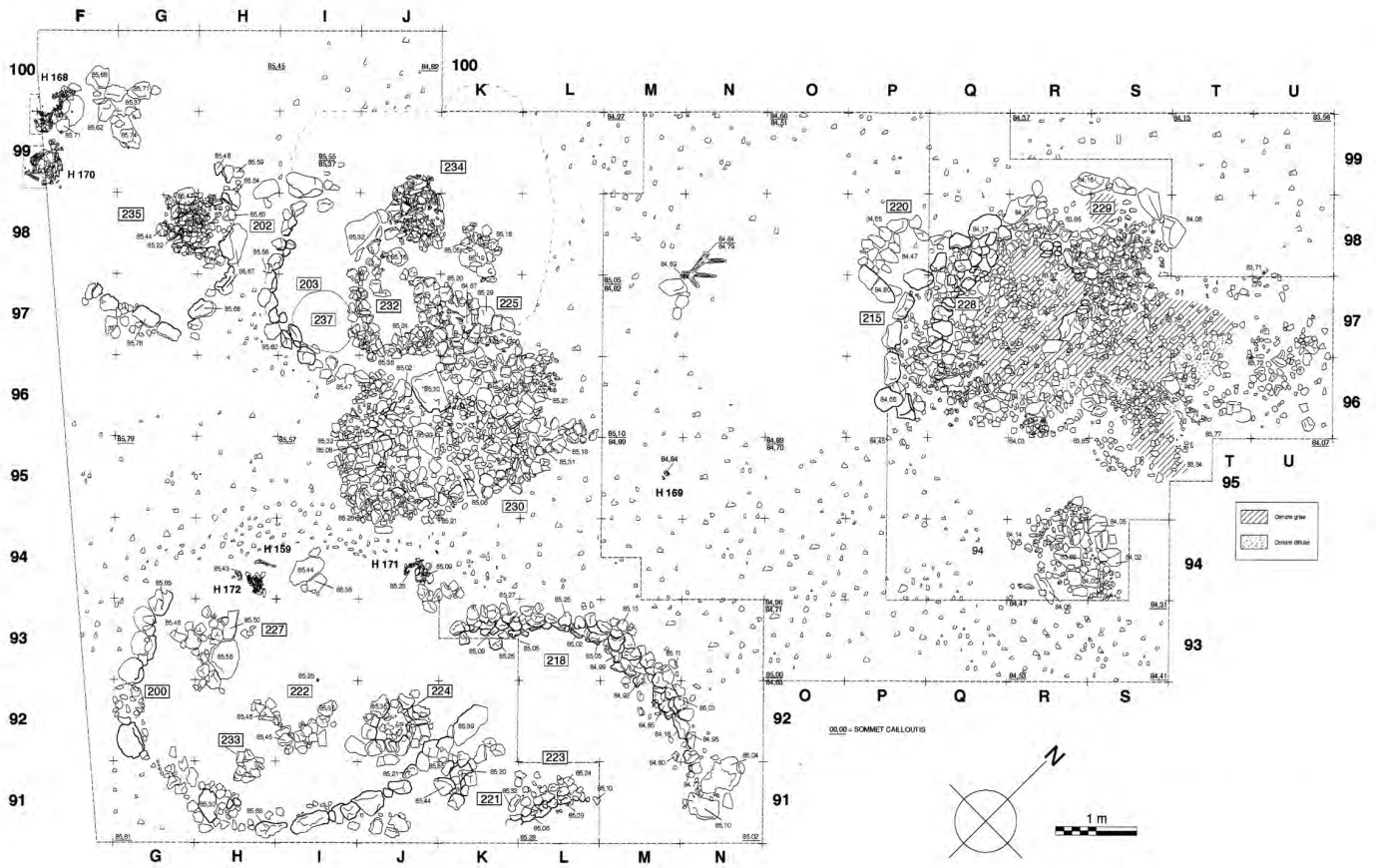


**Figure 1: General map of Final Natufian structures at 'Eynan (excavations 2000-1)**

*The major buildings share their main architectural characteristics with the earlier shelters at the site. They are half buried, settled in pits dug from the natural ground*

"*abris*" (shelters) in the Early and Late Natufian layers. A second group comprises minor structures that are usually — but not always — found in association with shelters. These are post holes, hearths and a variety of stone arrangments for which no functional interpretation can be suggested at the moment. We refer to most of these by the purposely vague term, "basins", because they are concave areas, some oval or circular in plan, some semi-circular. The combination in each specific case of these major and minor structures appears to be the key to a preliminary understanding of the major buildings.

Five major buildings were exposed in the excavated area (fig. 1). They belong to two main stratigraphic levels: one of them (215) is capped with about 20 cm of sediment ( level Ib2) while the others (218, 200-208, 203, 202) are seen, at least *in part*, at the surface of the Final Natufian layer (level Ib1). The excavation of none of these buildings was complete at the time of writing but enough is known of four of them (215, 200-208, 203, 202) for some observations to be made.

These major buildings share their main architectural characteristics with the earlier shelters at the site. They are half-buried in pits dug into the earth. The pits are lined on part of their circumference with a curvilinear stone wall, which does not rise higher than the ground surface. Floors are not coated with plaster or clay. They sometimes have a partial pavement, but usually are indicated only by the minor structures associated with them, and by relatively large objects that may lie on their surfaces. Besides these structural characteristics, each major building exhibits a succession of floors, one on top of another, in a very compact stratigraphy with no sterile layers between them. Compared to the architecture exposed in older layers, the shelters excavated until now in the Final Natufian are somewhat smaller (none of them covers 10 $m^2$) and they are set in more superficially dug pits (walls are no higher than 50 cm).

### Floor organization

Even superficial observations demonstrate that the minor structures are not distributed the same way on every floor in the major buildings. It appears that some floors (Type A) are organized

according to a rough pattern while others (Type B) do not exhibit the same kind of regularity. A closer inspection reveals that the surface of those floors without regular organization are either fully occupied with minor structures, or contain structures that do not seem compatible with the facilities expected in houses. Finally, the outline of the patterned floors can be reconstructed as oval in general shape, while that of the other floors is much less defined in the part not enclosed by the built wall. Based on these observations, two classes of floors in the major structures can be identified, one of which is relatively homogeneous, while the second has a mixed character since it is defined more through negative than positive features.

Two of the excavated buildings have floors of Type A. In one of them (200-208) two successive patterned floors were exposed (fig. 2) and a third floor, still in the process of excavation, seems to share similar characteristics. The other building (203) has two superimposed patterned floors capping at least one older surface with a different organization (fig. 3).

The main features associated with floors of Type A are as follows. The buildings are dug into a sloping surface and are only walled upslope. The wall runs around at most half of the circumference of the floor. In the unwalled area, the edge of the floor abuts the natural surface with only a few centimeters distingishing the dug-out floor surface from the slightly higher, natural surface. As a result, the general aperture of the floor is downslope, looking northward, in the direction of the spring of 'Ain Mallaha. Minor structures associated with these floors are mainly organized on two axes. One of these axes is the chord joining approximately the extremities of the wall. The second axis is a line roughtly perpendicular to that chord and bisecting it. As a result, most of the minor structures tend to be set on two lines that are broadly the main axes of the building. It should be emphisized that the geometrization of the construction is only approximate. No perfect symmetry was reached but the tendency to follow a geometric pattern is clear. Occasionally, minor structures can be set on the prolongation of these axes, out of the building and adjacent to it.

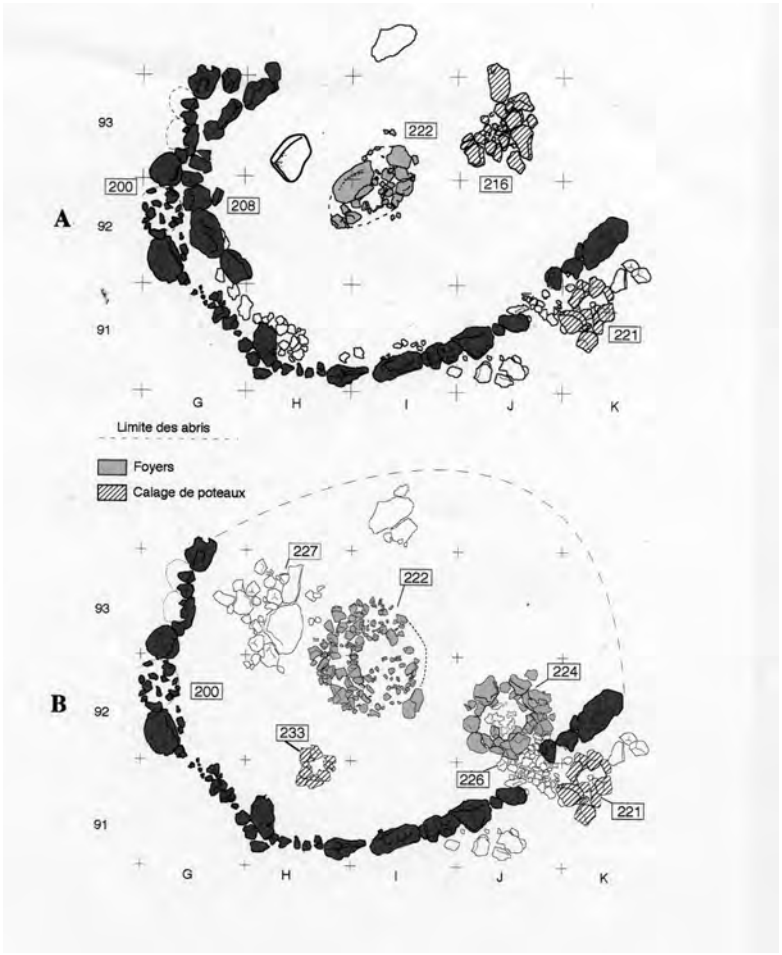


**Figure 2: Schematic maps of building 208 (A) and 200 upper floor (B). Example of superimposed floors that may indicate a house. Minor structures, mainly hearths and post holes, are set on the main axis of the buildings. (Crosses shown are at 1m intervals)**

Hearths and post holes are the most easily understandable minor structures associated with these floors but other features were also observed. Hearths of two kinds were found: cylindrical pits lined with stones, and shallow basins with some stones along the edge. On one floor, in structure 200, hearths of these two types occur side-by-side. Post holes are always lined with stones. They apparently suported vertical posts. Other features include flat limestone slabs and standing stones, which may have served a variety of purposes.

Floors are only relatively flat: no systematic attempt was made to erase slightly protruding earlier structures, and there was apparently no effort to make floors horizontal. Post holes suggest that the stone wall served as a foundation for a superstructure of lighter material, possibly reeds available from the nearby Lake Hula shore. It also seems likely that these structures were roofed. It is more difficult to assess the extent of these superstructures. Was only the inner part of the buildings (between the stone wall and the minor structures

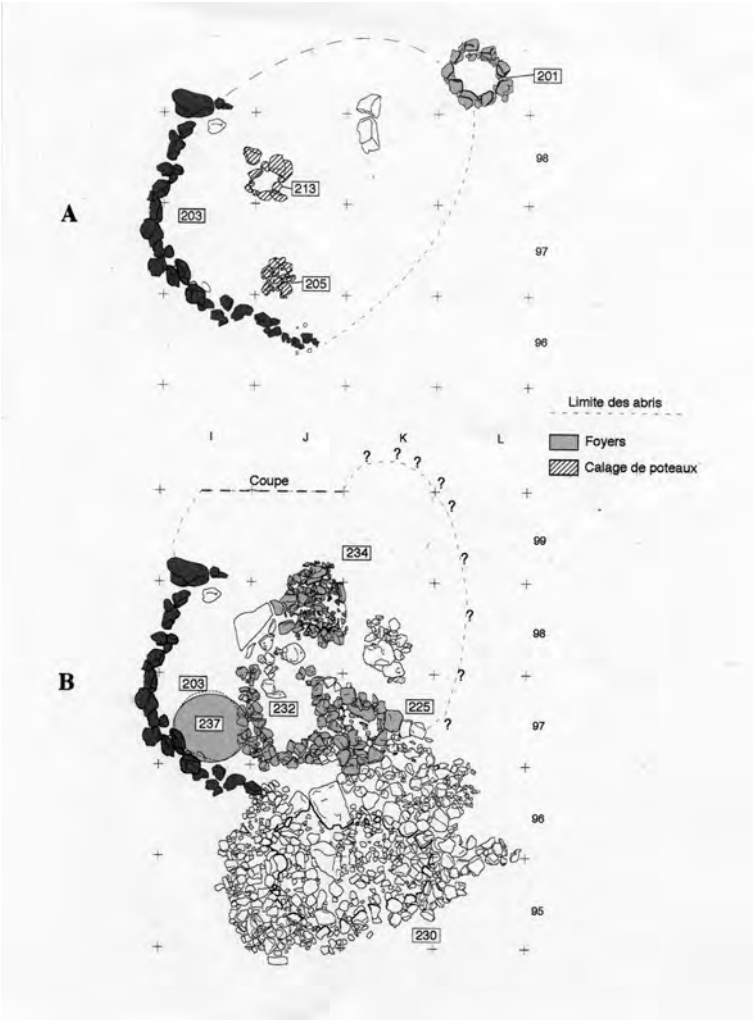


**Figure 3: Schematic maps of floors in structure 203**

**A — upper floor in the same building, with hearth and post holes**

**B — the oldest floor exposed at the time of writing shows minor structures with no clear patterning**

**Note 'basin' 230 adjacent to the building**

on its chord) walled and roofed? Or did the superstructures enclose the oval buildings entirely? The relatively clear limits of the floors may be considered an indication of some kind of obstacle along most of the circumference of the buildings.

As analysis is still in progress, it is premature to discuss the spatial distribution of the abundant small debris and objects found on these floors. Preliminary results indicate that the two floors under study may bear the same range of objects — mainly flints and fauna — in similar proportions. Basalt tools and unworked fragments also occur. In one case, it seems that the limestone slabs on the floor attracted concentrations of flint waste and bones, which may suggest knapping and processing areas. It is also important to stress that the distribution of the objects varies with their weight and with their nature (cores versus different kinds of tools, bones, etc.).

The major buildings associated with floors of Type B do not differ from the buildings associated with the floors just described in that they are pits partially lined with curvilinear stone walls. Furthermore, they exhibit similar successions of occupation levels. Nevertheless, their size range is probably greater and the openings in the walls show a variety of orientations: westward in 202, eastward in 215. But the main differences lie in the kind and organization of the minor structures associated with these floors.

Hearths and "basins" are the main minor structures found in association with these floors. In some cases, these hearths, and the refuse they produced, occupy the entire surface enclosed in the major structure, leaving no space for any activity other than those connected with the hearth. This is the situation of hearth 235 (an oven?) in building 202 (fig. 4B) and hearth 228 in structure 215. The earliest known floor in building 203 is crowded with three hearths, each of them with different characteristics (225, 232 and 234), and a depression filled with ashes and some stones (237, another hearth? figure 3B). Stone-lined "basins" are found either in the major structures (206 in 202's last use, where it covers most of the available space — see figure 4A), or out of the major structures and adjacent to them (220 in relation to 215; 230 adjacent to 203's earliest known floor — see figure 3B). The last use in 215 is related to a set of two standing blocks maintained with slabs set into the ground.

Until now, no post holes have been recognized in Type B floors. This cannot be understood as a general rule, given the limited number of examples at hand. It is nevertheless a distinctive feature, and may have important implications in the analysis of the particular cases under examination.

Altogether, the variety in minor structures and in their organization on Type B floors prevents any common interpretation for the uses of these floors and consequently for the functions of the major buildings at the time they were used. Besides the characteristics common to each of the major buildings, one of the few shared features associated with these floors is a lack of evidence for superstructures. The feeling that no superstructure was attached to the major buildings when associated with these floors is reinforced by the "basins" adjacent to some of the walls and by the diffuse limits of the floors wherever it was possible to follow them

out of the walled areas. On the other hand, phytolith analysis revealed a concentration of reeds and canes outside wall 215 that could be indicative of a mat, either standing as a wall, or laid on a surface (Rosen-Miller in Valla et al. 2004). Further difficulties in the interpretation stem from the possible relation between the successive phases of occupation in each building. Meaning may be very different if the successive uses were conceived at once for a series of events over a short time or if they were taking place independently over a prolonged period. Again, both cases may well have occurred.

Despite the diversity in the minor structures, it is of interest that during many, but not all, stages of occupation, floors of Type B are associated with hearths. As mentioned above, these hearths are very different from one another. Sometimes only one hearth is found (235 in 202, 228 in 215), which appears as the center of activities in the building. In one case (on 203 earliest known floor), several hearths are clustered together and seem to correspond with a variety of activities, probably at least in part contemporaneous and maybe complementary in function. One of these (225), associated with lumps of burnt clay (March in Valla et al. 2001), may have served artisanal purposes. It is also worth noting that the large "basin" (230) linked to the same stage in the building occupation also exhibits signs of the manipulation of burnt material: small burnt stones and ashes. The remaining "basins" do not show any obvious clues to the purposes of their builders.

Detailed analysis of the objects associated with these floors is too preliminary for any observations at this stage.

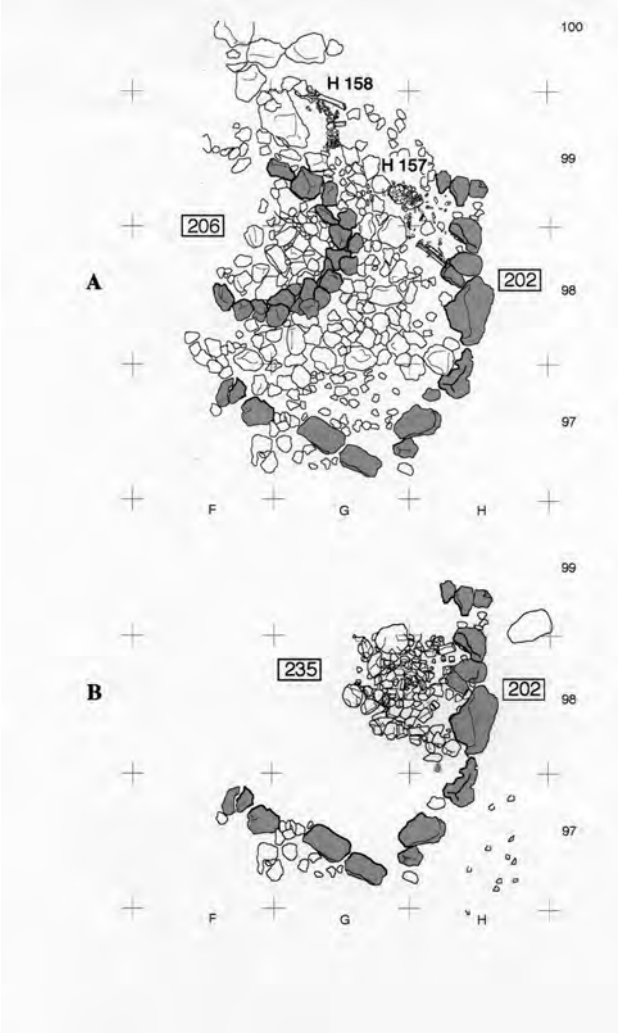


**Figure 4:**
**Schematic maps of building 202**

**A — Late stage, with "basin" 206 on top of which is grave H157**

**B — Early stage with hearth 235, in which refuse (mainly stones and ashes) occupy all the space in the building**

## Discussion

At this moment, with the research admittedly far from complete, how can we provisionally interpret the data at hand?

It seems that the differences between the nature and organization of the minor structures in the major buildings, as described above, are significant enough to warrant differences in the way these buildings were used. Type A floors are patterned in a way that is not inconsistent with use as houses. On the other hand, Type B floors do not seem appropriate for this function. The fact that these floors have little space in the buildings around the minor structures seems to prevent such a use. Moreover, the meagre indications at hand do not support their interpretation as houses in any of the examples with sufficient documentation for a preliminary conclusion to be attempted. The first known floor in building 203, which is the most equivocal, with its three or four hearths, shows some indication of artisanal activities. Altogether, it is apparent that hearths are an important feature on most of the floors in this class, which suggests a variety of activities related to fire, including perhaps a developed pyrotechnology far beyond cooking of foodstuffs. When no hearth appears, the function remains unknown. This is the case with the last use of structure 202, when a stone-built "basin" set in an artificial pile of blocks was arranged. It is also the case for the last activities in structure 215, when standing blocks were erected in the building.

As already mentioned, interpretation cannot be limited to observation of each floor in the different buildings without

*It seems that the differences between the nature and organization of the minor structures in the major buildings are significant enough to warrant differences in the way these buildings were in use. Floors in the first class are patterned in a way not inconsistent with a use as houses. On the other hand, floors in the second class do not seem appropriate for t his function*

at least considering the possiblity of short sequences of successive events making sense in relation to one another. Unfortunately, the time duration is not easy to estimate. In building 203, according to present data and understanding, a building without housing facilities turned into a house with two distinct phases of floors, separated by a grave, and using the same post holes. Remnants of the artisanal activities resting on the early surface were only slightly disturbed by the users of the succeeding house. Occupation of the house resulted in nearly total burial of the underlying occupation debris. In the final stage of occupation, after the post holes were dug, a corpse was deposited on the floor in a box of some kind (Bocquentin in Valla et al. 2001 and Valla et al. 2002). Later, the bones were rearranged when the house was again inhabited. This sequence seems to warrant some duration between the successive occupations in the building. The situation in buildings 215 and 202 is more equivocal. In building 215, there are at the moment no data to help us decide whether the last two stages constitute one brief sequence or independant events. In building 202, it is not clear if the building was conceived for a series of actions ending with the deposition of a corpse, or if the grave closing the sequence there is just an opportunistic use of a preexisting hollow between "basin" 206 and wall 202, which is perhaps more probable.

Provisionally, the following conclusions may be suggested. First, the exposed major buildings were not all designed for a similar purpose. On the contrary, they show evidence for a variety of functions. Second, these buildings all exhibit a succession of activities of variable duration, including in some cases periods of abandonment. Third, the same building may have been converted from one function to another. Fourth, it is not impossible that some of these buildings, but not all of them, were houses. It is worth noting that a building could be turned from another function into a house. Fifth, among the minor structures, a variety of hearths testify to a number of manipulations involving fire, including some artisanal transformation of clay. Sixth, among the minor structures are also a variety of "basin-like" buildings, the functions of which elude us, but which are further indication of the diversity of the needs of the Final Natufian inhabitants at the site.

Turning back to Flannery's (1972) paper, it is may be of interest to compare the Final Natufian "shelters" to observations made in some modern African villages. In both cases, constructions that may look similar at first glance have a diversity of functions. Parts of the buildings in the African villages are kitchen and storage facilities. Natufian examples suggest a somewhat different set of functions. Storage is not clearly evident. Kitchens appear possible, but although hearths in houses may have been primarily devoted to cooking, more technical purposes cannot be ruled out. As for houses, the finding of two hearths in one of them seems to argue against the notion that the smaller ones (less than 10 $m^2$) were inhabited by only one individual. Admittedly, there is still room for debate on this point (see Byrd 2000). Finally, no indication of a circular compound-like organization can be traced.

It is often argued that the first "villages" resulted from small agglomerations of partially buried, rounded buildings. This statement, probably correct, broadly speaking, needs some qualification. Long ago, it was already suggested that some Early Natufian houses may have been semi-circular in plan rather than fully circular (Valla 1988). Later on, houses in PPNA Netiv Hagdud and Hatula have been shown to follow an elongated oval model (Bar-Yosef and Gopher 1997, Lechevallier and Ronen 1994). Final Natufian "shelters" at 'Eynan are curvilinear in plan but demonstrate a relatively wide range of variability. A tendency toward geometrization can be observed in the planning of houses. The general plan is a relatively well-designed, elongated oval. The setting of the minor structures is organized according to some sense of symmetry as well, even if the result is far from perfect regularity. This geometric approach to houses, combining curvilinear and straight lines, should be emphisized, since it became part of a tradition, as possibly evidenced by later buildings in Mureybet and Jerf al-Ahmar (Cauvin 1977, Aurenche 1980, Stordeur et al. 2000). Search for regularity is less evident in the "shelters" not intended to be houses. The wall from "shelter"

202 is somewhat ogival, that from shelter 215 shows a marked asymmetry. To what extent this has to do with care in the building procedure is hard to determine. Building 202 may have been hastily made (only one course of stones was set at the mouth of the pit) but 215 looks relatively well built.

Study of the Final Natufian architecture at 'Eynan is still at a preliminary stage. This report can only be an exploratory note. For the sake of simplicity, we have not referred to graves except when their presence is directly relevant to the questions with which we are dealing. But their relation to the village, and especially to houses, adds another dimension to the meaning of the buildings that we should not ignore if we are to gain a broader understanding of Natufian architecture.

It is hoped that further study will allow us to elaborate on the social meaning of the variety in buildings found at 'Eynan. Among the excavated buildings, none can be considered "public" or "communal" in the political connotation of the term. It is not clear either how the division of space by the observed buildings reflects subdivisions in the human group. Perhaps no topic in Natufian studies is more elusive than social organization. Larger exposures may help document the question, but they should not be attempted at the cost of the study of floors and minor structures, since these appear to be clues to the interpretation of the diversity of the buildings.

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# *The hunter-gatherer "villages" of the PPNA/EPPNB*

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**Introduction**

The understanding of the earliest Near Eastern aceramic Neolithic (PPNA and EPPNB, 10,200-8,000 cal. BC) has benefited greatly from the past twenty years of research. Much new data, not the least on sites, planning, size and architecture, has come under scholarly consideration. The investigations concern settlements not only in the Levant (Jerf el-Ahmar, Netiv Hagdud, Gilgal), but also in territories lying farther to the north (Hallan Çemi, lower layers at Çayönü, Nevali Çori and east (Nemrik, Qermez Dere, M'lefaat).

Let us then analyze this new data region by region, concentrating with little exception on settlements that feature circular buildings (rectangular or sub-rectangular plans are seldom encountered in this period). It should also be understood that the settlements in question were almost exclusively inhabited by hunting-gathering peoples that were *de facto* non-Neolithic in their economies (the sole exception is the EPPNB Nemrik 4, but it is later in time).

**The Southern Levant (Figs. 1, 2)**

The settlements in this region are characterized by an exceptional thickness of cultural deposits, up to many meters (2.5m at Gilgal, >3 m at Netiv Hagdud, and 4-8 m at Jericho PPNA), corresponding to numerous occupational levels accumulated over a rather short (?) period of time. This suggests considerable settlement instability of the "*aller-retours*" or "come-and-go" type (e.g., series of floors in Gilgal I dwellings), indicating that life here was perhaps not quite sedentary. Oval houses with "pinched" extremities and low base walls are featured on all of these sites. Base walls are never structural or supporting walls; they consist of from one to three courses of stones, large bones, bricks, or mud, rising no more than 0.5 m above the ground, and perhaps, but not necessarily, suporting a lighter screen wall made of a different building material, but not of stone or mud.

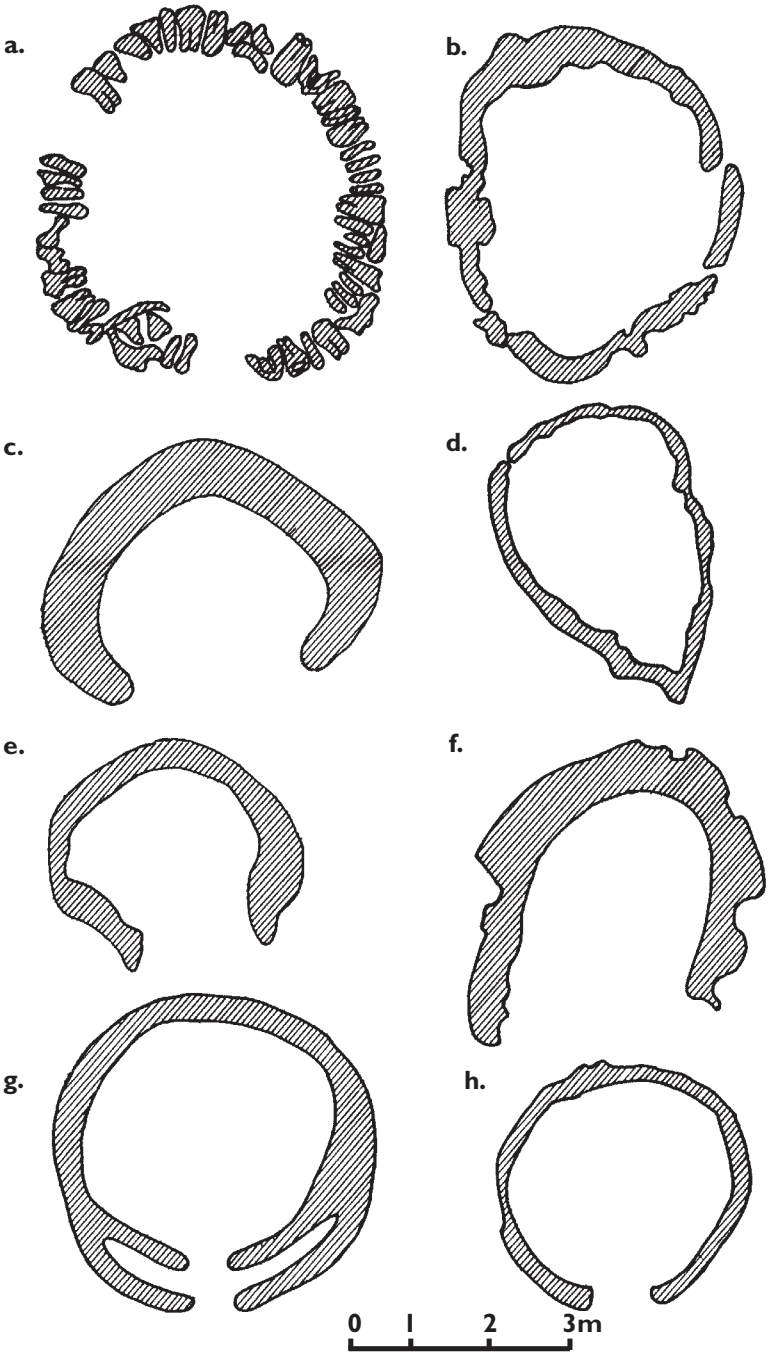



**Figure 1. The base-wall type of circular dwellings of the European Upper Paleolithic (a. Mezin in the Ukraine, b. Dolni Vestonice in the Czech Republic, c. Poggenwisch in Germany) and Near Eastern hunter-gatherer 'Neolithic' (d. Gilgal I, e. Mureybet, f. Çayönü, g. Hallan Çemi, h. Nemrik)**

The Southern Levant has yielded a number of PPNA "villages", and the best explored sites are Nahal Oren, Netiv Hagdud, Jericho, Gilgal I, 'Ain Darat and Hatula. Nahal Oren was excavated

*Available data from Hallan Çemi and Çayönü suggests the existence of two different Early Holocene settlement models. At Hallan Çemi, the area occupied in the youngest phase could not have exceeded 0.15 ha and the number of dwellings stood at three or four. The two oldest phases at Çayönü exemplify a bigger agglomeration of perhaps 0.25 ha.*

in its entirety, revealing ca. 14 large circular structures, dwellings rising in terraces on sloping terrain. The buildings, which spread over 0.04 ha, are crowded together, although it is not quite clear whether they were all contemporary. At Netiv Hagdud, the top of the tell is flat and is built over quite densely. Here, the area covered by the structures amounts to perhaps 1.3 ha, the buildings are set barely 7-9 m apart, and the cultural deposits are very thick. It is difficult to be sure how many of the buildings were actually contemporary. The 3 ha site at Gilgal I consists of buildings that rise on the slope, perhaps in terraces, following a very complicated and intricate plan, the distances between particular buildings reaching 1-4m. At Jericho, the settlement must have covered ca. 2 ha, to judge by the run of the defensive walls. However, only a small area with very dense architecture has been explored archaeologically. The thickness of PPNA deposits was 4-8 m and the lower "Proto-Neolithic" layers yielded mostly shelters rather than houses. The data from 'Ain Darat appears to suggest a concentration of at least a few houses. Hatula in both phases had small houses (2-3 m in diameter) located far apart. The round buildings continued in the southernmost (Beidha village) and desert regions (camps) into the PPNB period.

### The Middle Euphrates and Northern Syria (Fig. 1)

Jerf al-Ahmar is one of the best known sites in this region (the second is Djaade, but it has mostly rectangular houses, except for the lowermost layer). Mureybet and Qaramel have not been investigated as thoroughly. The thickness of occupational layers on these sites is comparable to those known from the south (Jerf 3.5 m, Mureybet 6.5 m, Qaramel 2.0 m). At Jerf al-Ahmar, which is a multi-layer site, the settlement was obviously split into two by a small wadi but, even including in the wadi, it did not exceed 0.03 ha in area. The houses, which appear to have been numerous (4-6 in level I East, more than 7 in II West) were crowded together and rising on terraces. In the middle, there was a "communal" special structure, obviously separate from the dwelling space. With regard to Mureybet, the data (Cauvin 1978; van Loon 1968) suggest a heavy concentration of houses. As for Qaramel in North Syria, R.F. Mazurowski is of the opinion (personal communication) that the maximal extent of the settlement was no more than 4 ha, according to the surface material, and that the architecture was very congested, much as in the south. The circular-dwellings phase ends in the region much earlier than in the south. The parameters of Djaade are comparable (E. Coquequinot, personal communication).

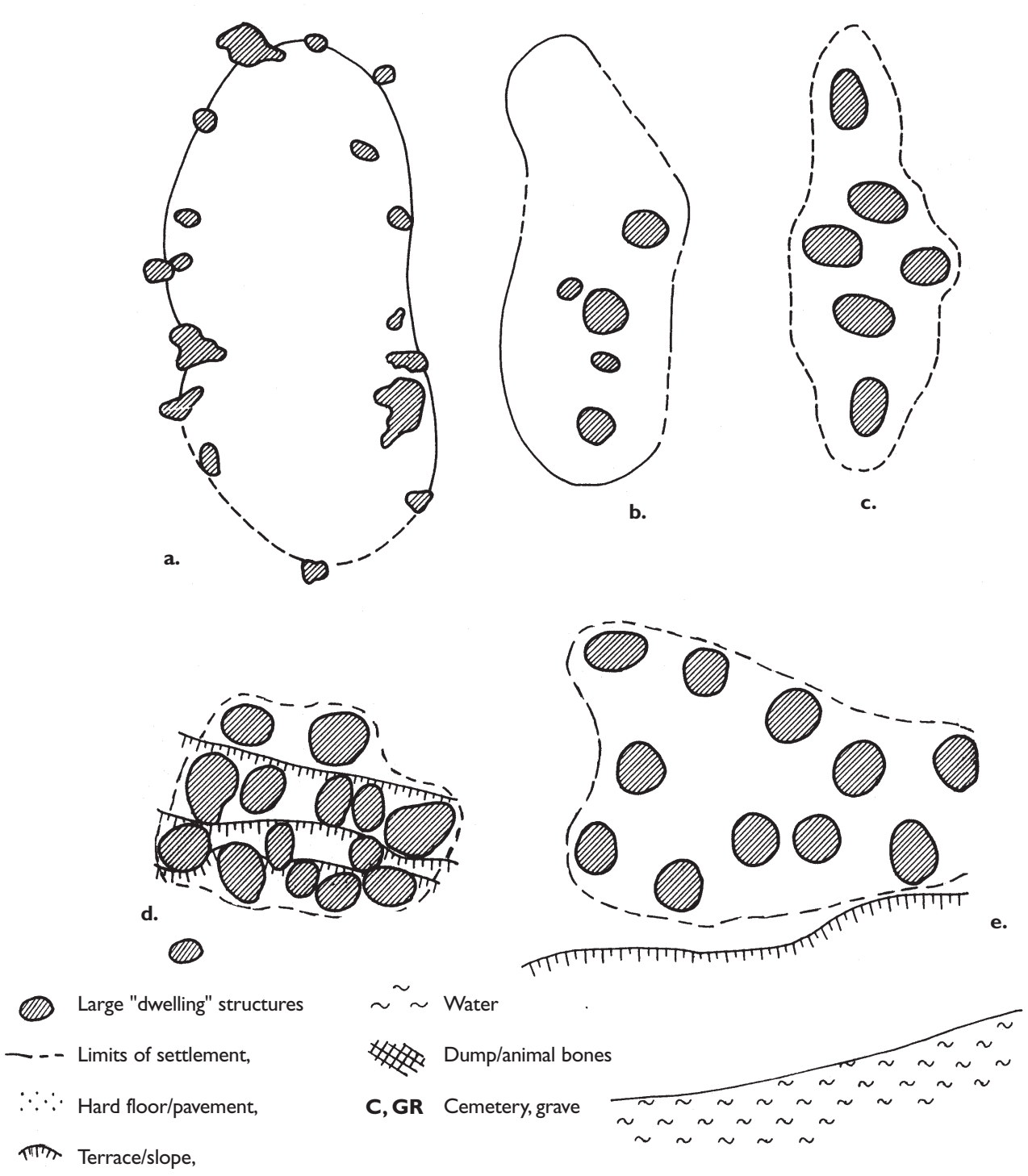
### The High Valleys of the Tigris and Euphrates (Figs. 1, 2)

Available data (Hallan Çemi, Çayönü-base: r3 and r4) suggests the existence of two different Early Holocene settlement models. At Hallan Çemi, the area conceivably occupied in the youngest phase could not have exceeded 0.15 ha and the number of dwellings stood at three or four (only two were actually explored). The centre of the settlement remained open and revealed two concentrations of cracked rocks and bones. In turn, the two oldest (base) phases at Çayönü exemplify a bigger agglomeration that spread from 0.1 to perhaps 0.25 ha, the latter assuming the buildings from the two trenches — E and W — are contemporary. The better explored eastern trench revealed a concentration of 10 or 11 dwellings arranged around almost circular open spaces, the structures set not far apart (1.5-10 m). In the r3 phase, a fairly large open area adjoined the buildings on the west, whether it actually extended all the way to the western trench is not known. After a chronological hiatus, rectangular architecture appeared at Çayönü and at Nevali Çori.

### The Iraqi Jezirah (Figs. 1, 3)

Nemrik, Qermez Dere and M'lefaat are multiphase settlements characterized by an insubstantial depth of the occupational layers. All three sites date to the PPNA (except for Upper Nemrik).

Nemrik with its five phases of occupation has yielded the most evidence. Its total area can be reconstructed between 0.5 and 0.7 ha, depending on the phase, the settlement being smallest in the earliest period and largest at the end. The number of houses existing contemporaneously oscillates between 3 and 4 to 6. The distances between the houses




ranged from 10 to 40 m. With the exception of phase 1, the dwellings occupied a repeatedly renovated surface of tamped earth for phase 2 and of cobbles for phase 4. The dwellings actually occupied only a small part of the village area (15-20%), the remaining space around them being used for other purposes (burial ground, garbage disposal, economic activities using big stone implements – querns and mortars, etc.).

In the least known and hitherto unpublished phase 2, the settlement at Nemrik covered ca. 0.3 ha. Its dirt surface was furnished with concentrations of pebbles and big stone implements, and it was cut with pits that followed an oval plan. Four structures were excavated from this phase, including three houses. The total number of houses was as much as twice the number excavated. The houses appear to have been arranged around a dirt surface, ca 25m in length, with a large grave and a sarcophogus at its centre.

The EPPN Nemrik 4b has 0.6 ha of cobbled space and three or more highly

**Figure 2: Arrangment of dwellings from: European Palaeolithic a. Kostienki I b. Mezin; European Mesolithic c. Bergumermeer; Near Eastern PPNA d. Nahal Oren e. Çayönü**

dispersed dwellings and a cemetery.

*The plan of the settlement was another differentiating factor, with houses built in greater or lesser degrees of congestion, and with "central places," such as squares or "markets".*

At Qermez Dere, where the site has suffered heavily from recent quarrying, the area investigated archaeologically covers 0.3 ha. Even if twice that area is added to it on the north, the total size of the settlement would still fall within the standards for the period. At least three houses of the late phases were grouped in a small area in the southern part of the site, apparently separated from a stone structure of non-domestic (?) nature by a cobble floor, free of big structures.

The last example to be analyzed here is the two-phased "village" at M'lefaat, covering a total of 0.7 ha. It features the same elements of architecture – a dirt floor covered with "islands" of cobbles, furnished with large stone implements, fireplaces and pits. The center of this floor was presumably left open, with dwellings arranged around its circumference in a congested pattern. Eight houses were preserved in the upper layer and three in the lower layer.

**Discussion (Figs. 1-3)**

Data from the earliest (PPNA-EPPNB period) "villages" found in different regions of the Ancient Near East supports a few general statements.

*Equally important for planning were such factors as the nature of the space between the dwellings, whether paved or unpaved, and the functional zoning of each settlement.*

These settlements were small as a rule (0.1-1.3 ha, Jericho's alleged 2 ha is an exception), and contained few dwellings (4-14), which would imply that the communities inhabiting these "villages" counted no more than a few dozen people (assuming one nuclear family per dwelling).

The morphology and situation of the space occupied by these hunter-gatherer "villages" varied from the edge of a valley or slope, with dwellings in terraces to a fairly flat area situated on a terrace edge or on some exposed terrain forms, such as a peninsular terrace, "island", or monadnock. The plan of the settlements also vary, with houses being built with greater or lesser degrees of congestion, and with "central places" (squares/zones/"markets") that can be present or not. In extreme cases of congestion, such as at Hayonim cave and later PPNB desert campsites, these settlements are "glued" together. Equally important for the planning were such factors as the nature of the space between the dwellings, whether it was paved or unpaved, and the functional zoning of each settlement.

Two models can be defined for the organization of PPNA/EPPNB settlements:

1. It seems that the PPNA/EPPNB "villages" of the eastern Jezirah, despite being differentiated, followed a more or less uniform regional pattern that was characterized by location on flattened remains of terraces and the presence of either clay or stone pavements or floors that covered large "empty" spaces (squares), on which, but also around or next to which, the life of the "village" and its associated dwellings was organized. These villages tend to be large.

2. The opposing model is a more densely or even heavily congested space with a larger number of houses. This pattern seems to be more characteristic in the west (Nahal Oren, Jerf al-Ahmar, Gilgal I, and earlier 'Ain Mallaha, or Hayonim-cave). In the Jezirah, it appears only in lower M'lefaat. Other patterns not described here are also highly likely.

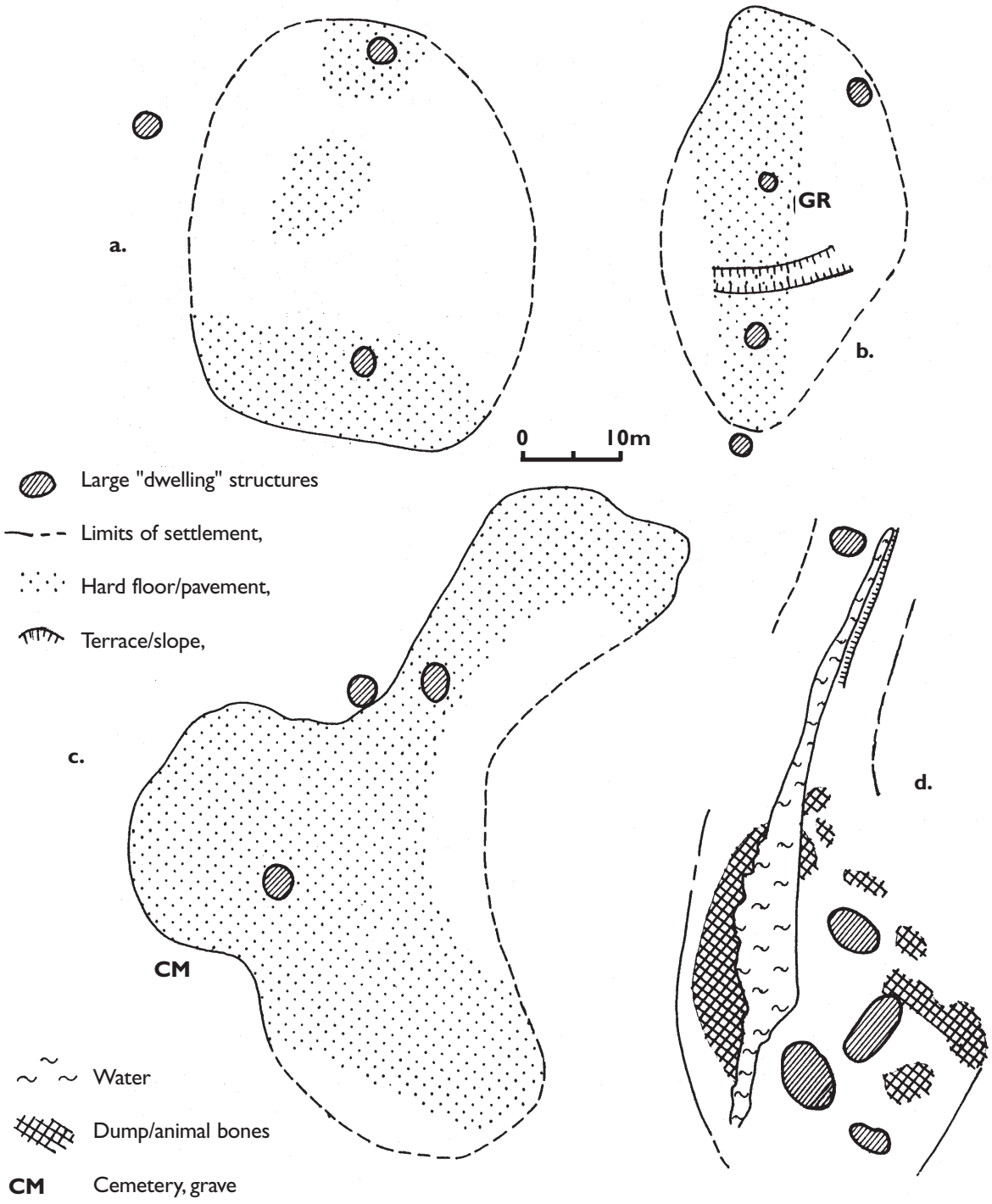
A matter to be resolved is the potential correlation of various types of houses with the described types of settlements.

One type of house is simple, evidently a hut or shelter, sunk shallowly into the ground, surrounded or not by low base walls (Çayönü, Hallan Çemi, Mureybet, Nahal Oren, Netiv Hagdud, Gilgal I, Zahrad adh-Dhra, Nemrik 3A). Its entrance is at floor level, marked in the base wall, or there is no visible entrance at all (with poles sunk into the floor).

The other and much more sophisticated type was a house that was more or less sunk into the ground, big and soundly built, with developed interior architecture, such as benches, solid and regularly disposed posts or pillars, pits, and large stone implements (Nemrik, M'lefaat, Qermez Dere, Jerf al-Ahmar – central buildings, Mureybet III, etc.). Occasionally this type has a heavy roof but no standing walls (except for one example from Jerf al-Ahmar). There are transitional forms, as well as other unique designs (e.g., the sub-rectangular, multi-room constructions from Jerf al-Ahmar).

These two architectural forms standing in opposition appear to be differentiated in various ways:

First, they differ chronologically, because the first form is generally, although not exclusively, earlier than the




second one. This is clear in the stratigraphy of Jericho-PPNA and Nemrik, while also consistent with the development toward architecture of the upper levels of Jericho PPNA, later lower Beidha, PPN desert camps, and phases IIIB and IV at Nemrik.

Second, the first form is an obvious continuation from the Natufian and Harifian.

Third, the first form (hut with base wall) may have been more popular in the Levant than in the rest of the Near East, where it appears more often in "well" form, as in Karim Shahir and lowermost Jarmo, than as a "base wall".

Fourth, base-wall dwellings have their chronological continuation in the Levant in the desert installations of the PPNB.

In many respects, the Levantine settlements described here, especially those containing the lighter building forms, resemble those of the the Natufian and Harifian ('Ain Mallaha, Rosh Zin, Abu Salem, Hayonim Cave, etc.) or desert PPNB ('Ain Abu Nekeileh, Jilad, Azraq, Dhobai). Similarities include morphology, size, number of dwellings, zoning, presumed population size, structure of dwellings, and economy.

**Figure 3 : Arrangment of dwellings from: Near Eastern PPNA a. M'lefaat-upper b. Nemrik 2 c. Nemrick IVB; European Palaeolithic d. Dolni Vestonice**

**For sources, see bibliography.**

*The other and much more sophisticated type was a house that was more or less sunk into the ground, big and soundly built, with developed interior architecture, such as benches, solid and regularly disposed posts or pillars, pits, and large stone implements.*

| Site | Flint pieces |
|---|---|
| Dolni Vestonice | 10,000+ |
| Amvrosiyevka | 10,000+ |
| Kostenki I | 101,000 |
| Dolni Vestonice | 82,000 |
| Mezin | 113,000 |
| Netiv Hagdud | 162,000 |
| Nemrik | 70,000 |
| Mureybet* | 70,000 |

*Van Loon's excavations

On the other hand, they are also similar to the European Upper Paleolithic, Gravettian pattern (Vigne Brun, Dolni Vestonice, Pavlov, Mezin, Mezirichi, Dobranichevka, Kostenki I upper, Avdeevo etc.). All these patterns are characterized by a relatively sedentary character, as indicated by the kind and size of kitchen waste.

In a few cases, the soundness (and labor investment) of the dwellings both in the Upper Palaeolithic of Estern Europe and the the Natufian of the Levan (Mezin, Mezirichi, Yudinovo, Dobranichevka, 'Ain Mallaha, Hayonim) suggests a sedentary character. Last but not least, there is careful settlement planning and the structural pattern of the dwellings is surprisingly similar to some of the Near Eastern examples (circular plan, dimensions, base walls, the latter also known from the Late Paleolithic - Poggenwisch, Germany. In the case of Gravettian base camps, there is a considerable number of art objects, seldom-encountered large stone implements (Molodova V, Kostienki IV), burials (as in the Near Eastern "villages"), and even cemeteries located inside the settlements (Predmosti in the Czech Republic).

The riverbank Mesolithic "village" of Lepenski Vir in Serbia seems to be of a similar nature, with its solid dwellings, raised on a trapezoidal plan, constructed dwelling floors, graves between dwellings and the famous objects of mobile art. Neither does the base camp from Bergumermeer B in Holland depart from the standard (six huts, fireplaces, pits).

Should all this be confirmed, it then becomes valid in this context to ask: What is it that differentiates the Near Eastern "Neolithic villages" (at least the earliest Levantine installations) of the PPNA from the Paleolithic/Mesolithic base camps of Europe or Near Eastern PPNB desert camps?

**First doubts**

Scholars refer to the Near Eastern settlements described above as "villages". In other words, these settlements are alleged to be permanent, all-year settlements occupied by a sedentary population. The following aspects could stand in favor of such an interpretation:

1. Solid houses (suggesting considerable investment of labor and resources) occurring in one phase/layer, meaning they are more or less contemporary. However, actual contemporaneity of these often intersecting dwellings cannot be proved without meticulous micro-stratigraphic analyses and extremely precise dating.

2. Developed settlement planning.

3. Flint material on a massive scale (proving long occupation or several re-occupations).

4. Presence of large and small stone implements (mortars, querns, cupholes, vessels, celts, pestles etc.). They should have rather "sedentary" status (but they did not necessarily serve as food-producing installations), especially the big, heavy ones.

5. Presence of graves (ownership of "village" space).

6. Presence of very numerous animal remains (suggesting long-lasting occupation).

It is possible to observe a certain logic in this line of reasoning, yet it does not satisfy the conditions of exclusivity or uniqueness for "villages" of the PPNA/EPPNB period (settled by hunter-gatherers, let us not forget!) for a number of reasons.

First, similar space-planning solutions are presented by some Gravettian settlements from Europe (25,000 –

15,000 BP), as well as Natufian and Harifian settlements from the Near East (below), as well as PPNB desert camps from Sinai to Azraq.

Second, some of these display similar architectural designs.

Third, their permanent/long-term/all-year occupation is just as well (or not well) confirmed (successive stages of rebuilding, thick cultural deposits, new floors inside and outside the dwellings, for example). Finds from Netiv Hagdud, Jericho, and Gilgal could suggest that the periods of permanent occupation there were not very long, maybe even seasonal, like the possible seasonal occupation of camps with circular huts from the desert PPNB.

Finally, burials and even groups of burials are known from Gravettian sites, as are large stone implements. To be sure, these occur more frequently in the Natufian, but still they occur at Kostienki IV, Molodova V in Russia, and Moldova. In the Gravettian, these are accompanied as a rule by a wealth of mobile art, indicating stability.

**Next doubts**

Our experience of contemporary villages is that they usually have dwellings that feature standing walls and sound roofs. These are usually inhabited permanently, but we should also be mindful of seasonal villages of pueblo type.

Do the villages of the PPNA period in the Near East show the characteristics? Not quite, apparently. For one thing, these circular dwellings never had, with the possible exception of upper Jericho PPNA, solid, standing walls. What is more, these non-existant walls never supported roofs of a structural kind. The "walls" were most frequently just layers of stone, brick, mud or plaster that lined the foundation pits (for the last, e.g., lowest Jarmo, Nemrik house 2A) and extended above surface as base walls. Sometimes they went deeper (Mureybet, house XLVI; Nemrik, house 4; M'lefaat house 8) but, overall, they were shallowly founded, frequently not vertical but leaning outward, without any sort of structural bondwork. This was more like a form of separation or isolation than anything else. Hence, it is easy to understand why there are no solid walls known from circular houses. Instead, there were low base walls barely rising above the ground (Gilgal I, Nemrik, houses 1 and 9) characterized by a "smoothed" (unbroken) top and possibly supporting a lighter pole structure that rose above it (e.g. Beidha). These base walls could top or end the lined wall, as in contemporary light African constructions, but could have been self-contained constructions, present in dwellings sunk only slightly into the ground and even standing directly on the ground (Hallan Çemi, Çayönü-base, Gilgal I, Netiv Hagdud, Nahal Oren). They were of clay, stone, or both.

Neither did the majority of structures of this type have a sound roof, meaning a roof made of clay. Such roofs did not appear until the Nemrik 3B phase (ca. 8100 years cal BC), when a developed system for supporting them, that is, four huge posts and later pillars, also made an appearance.

However, had not a similar solution already appeared earlier at Qermez Dere with its pillars? And what about the roofs of the rectangular structures at Jerf el-Ahmar? Danielle Stordeur insists that she has found a collapsed structural standing wall there. In any case, the system of light poles supporting light roofs, known from Nemrik 2-3A, Gilgal I, Netiv Hagdud, and presumably also Çayönü, right from the beginning of this period, was gradually displaced by more "solid" constructions.

In the light of this discussion, one is tempted to ask what are the differences between these earliest structures with low base walls and no solid roof, and the Paleolithic and Mesolithic huts of Europe or the Epi-Paleolithic remains known from the Near East. It seems that the difference, if it exists at all, is minimal, for these structures all repeated a circular or oval plan (as is natural for the huts/shelters from the beginnings of humanity), featured similar dimensions, were more or less deeply sunk in the ground, had low base walls, and, finally, a similar, light roof-supporting system, as well as a light or non-structural wall construction. The enclosed figures illustrate some surprisingly similar constructions.

One should rather ask whether some of the PPNA "villages" (the earlier rather than the later ones) were not more like the permanent/semi-permanent/seasonal European Gravettian settlements of

*What is it that differentiates the Near Eastern "Neolithic villages" of the PPNA from the Paleolithic and Mesolithic base camps of Europe or the Near Eastern PPNB desert camps?*

*Were some of the earlier PPNA "villages" more like the permanent or semi-permanent, or seasonal European Gravettian settlements of the cool steppe zone, or the Natufian or Harifian settlements, and possibly even the European Mesolithic base camps, than real villages of the later Neolithic?*

the cool steppe zone or the Natufian/Harifian settlements, and possibly even the European Mesolithic base camps, than real villages of the later Neolithic. The answer is self-evident as objects from both groups are characterized by:

1. More or less similar size (Gravettian 0.04-0.7 ha; PPNA – 0.04-1.3 ha).

2. Approximately similar settlement solutions (dwelling zone vs. economic zone, garbage/dump zone, burial zone);

3. Approximately similar number of dwellings (mostly 4-6, but with exceptions, like Çayönü) and hence a similar population size.

4. Dwellings similar in size and structure (circular, sunk in the ground, low base walls, poles, light walls and roofs).

5. Presence of burials inside the settlement area.

6. Large quantities of lithic material (tens of thousands of pieces).

Differences are also observable, however. At least some of the Near Eastern settlements (Qaramel, Gilgal I, Netiv Hagdud, Jericho, 'Ain Mallaha) differed from the Gravettian "villages" in a few key elements. The considerable thickness of Near Eastern occupational deposits, and the overlap or intersection of objects of different age are both indicative of many re-occupations.

Finally, the evidence for floor renovation inside and outside the dwellings, leaves a distinct impression of occupation that was rather less permanent (in the long-term anyway), drawing us even further away from the conception of a real village. On the other hand, the Near Eastern settlements had a developed and rich heavy stone industry, which should indicate sedentary life (considering the scale of invested work), seldom encountered on Gravettian sites (Molodova V in Moldova, Kostienki IV in Russia).

Other Near Eastern settlements (M'lefaat, Nemrik 2, Qermez Dere, Jerf el-Ahmar) that are of equally early date, however, offer elements that were evidently characteristic of true villages This incudes pavements, a huge labor investment, and community buildings, which brought them closer to the Gravettian "villages" (one floor, thin cultural layers, numerous finds).

Even if a long-term stability cannot be established, there could have been short-term stability, like one human lifetime, a single generation, or perhaps even a single year. Unfortunately, serious arguments are lacking to resolve this issue. To date, neither the taphonomic data on seasonality, nor the actual variety of meanings of the terms "sedentism" or "village" has been considered. Thus, we remain in the sphere of impressions rather than facts.

A key question that we should ask in closing is, at what moment in time and in which regions of the Near East can we start to speak of villages or permanent or all-year hunter-gatherer settlements of the para-village type? Conversely, until which moment in time (cf. PPNB desert circular structures of Sinai, Negev and the Black Dessert without heavy stone implements) and in which of the regions in question did the big, seasonal base camps with circular huts continue to exist?

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The present list of references has been divided by territory into (A) Near Eastern Epi-Paleolithic and Neolithic, (B) European Paleolithic and Mesolithic, and (C) references for Figures 1,2,3.


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*Figure 3*

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# *Ground-Stone Tools and Implications for the Use of Space and Social Relations at 'Ain Abu Nukhayla, a PPNB Settlement in Southern Jordan*

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The demography and social organization of early agricultural communities are among major research problems in archaeological investigations of the Neolithic Levant (e.g., Banning 1996; 2003; Byrd 1994; 2000; Flannery 1972; 1993; 2002; Garfinkel 2002; Kuijt 2000a; 2000b; Saidel 1993; Verhoeven 1999; Wright 2000). These sociological approaches to Neolithic communities have successfully added new insights into the developmental processes of early agricultural communities from a different perspective than those that emphasize ecological factors (e.g., Köhler-Rollefson 1988; 1992; Moore 1985: 52; Moore et al. 2000; Rollefson et al. 1992).

Nonetheless, these social investigations have tended to focus on settlements in the Mediterranean environmental zone, or "Levantine Corridor", where a number of early agricultural communities cluster. In contrast, such social examinations have been underdeveloped for settlements in arid, marginal areas. There, archaeological research has focused on investigation of the ecological aspects of prehistoric occupants (Bar-Yosef 1984; Goring-Morris 1993; Simmons 1981) and hunting strategies (Betts 1998; Rosen and Perevolotsky 1998; Tchernov and Bar-Yosef 1982).

Little is known about the social aspects of Neolithic communities in the arid regions except for brief remarks occasionally made by some researchers. They suggest that community organizations in the arid regions may have been composed primarily of small groups that were similar to those of preceding periods, based on the small, seasonal occupations of the sites, the abundant evidence for hunting and foraging activities, and the paucity of evidence for agricultural practices (Bar-Yosef and Meadow 1995; Byrd 2000; Gopher and Goring-Morris 1998; Simmons 1981).

However, recent re-investigations at 'Ain Abu Nukhayla, a Middle to Late PPNB site in arid Wadi Rum, southern Jordan, have recovered archaeological evidence for an extensive distribution of residential buildings and diverse subsistence practices, including cereal cultivation and animal herding as well as hunting and foraging (Henry et al. 2003). The site is densely covered with continuous architectural remains, most with curvilinear stone walls arranged in a so-called "beehive structure" (Goring-Morris 1993) or "honeycomb" layout (Kirkbride 1967) (Fig. 2). The walls are preserved up to a metre in height and enclose various features and archaeological deposits with remains such as chipped-stone tools, ground-stone tools, fauna, and botanical materials (Henry et al. 2003). These new archaeological finds from the arid zone may require us to reconsider the socioeconomic variability of Neolithic inhabitants in this zone. The aim of this paper is to obtain insights into the social relations at 'Ain Abu Nukhayla through an examination of how ground-stone tools are distributed in architectural spaces. During excavations at the site, archaeological remains were systematically collected with an emphasis on accurate recording of spatial information, which provides critical database for the spatial analysis in this paper.

*Recent re-investigations at 'Ain Abu Nukhayla have recovered archaeological evidence for extensive distribution of residential buildings and diverse subsistence practices, including cereal cultivation and animal herding in addition to hunting and foraging*

Using the results of the spatial analysis of ground-stone tools, I will infer how domestic spaces were used by the inhabitants of 'Ain Abu Nukhayla. Although it is difficult to infer the entire range of domestic activities from the analysis of ground-stone tools, they do suggest several key domestic activities, such as food preparation, tool production, and tool maintenance.

Finally, I will interpret patterns in the use of space with regard to social relations at the site. In particular, I will

*The basis for examining both architecture and activities lies in anthropological theory about the recursive relationship between architecture and human behaviour.*

*Adherents of this approach assume that architecture and human behaviour are mutually influential, so that architecture constraints human activities to some degree, while human behaviour also contributes to the formation of various aspects of architecture.*

discuss the relations among the groups of people who cooperatively conducted several domestic activities associated with ground-stone tools. The discussion focusses on uniformity and variability among the activity groups in terms of architectural traits, the range of domestic activities, and the intensity of food-processing activities. The results of this examination will provide a basis for inferring the social implications of these activity groups.

**Approaching prehistoric communities through architecture and behaviour**

As I point out in the introduction, Near Eastern archaeologists have often investigated social relations in Neolithic communities by examining architecture and the spatial organization of activities. The architectural attributes they have examined include histories of construction and modification of buildings (Banning and Byrd 1987), floor areas (Banning 1996; Byrd 2000), arrangements and accessibility of spaces (Banning 1996; Banning and Byrd 1989; Flannery 1972: Garfinkel 2002), and compartmentalization of spaces (Kuijt 2000b). The spatial analysis of activities usually involves examining how certain activities, such as tool production, storage, and food preparation, were spatially organized in settlements. The spatial organization of tool-production activities is usually discussed in the context of craft specialization (Conolly 1999; Quintero 1998), while the spatial organization of storage and food preparation is often regarded as indicating inter-household relations or household organizations (Byrd 1994;2000; Flannery 1972; 1993; Wright 2000).

The basis of examining both architecture and activities lies in anthropological theory based on the recursive relationship between architecture and human behaviour (Rapoport 1990) that assumes that architecture and human behaviour are mutually influential. From this perspective, architecture constrains human activities to some degree, while human behaviour also contributes to the formation of various aspects of architecture. I employ this approach to understand and explain the dynamic relationship between archaeological evidence (architecture and ground-stone tools, in this case) and human behaviour (social relations).

**Formation processes of architecture and ground-stone tools**

Aims of the examination of formation processes

In examining the association between architecture and artifacts, it is critical to separate “floor assemblages” from “house fill”. It is more likely that "floor assemblages" represent direct remains of past activities, while "house fill" probably includes dumped refuse or artifacts tumbled down from a second storey (Cameron 1990; Ciolek-Torrello 1984, Jorgensen 1975; Lowell 1991; Scarborough 1989; Schlanger 1991). However, a number of ethnoarchaeological studies of site-formation processes suggest that various accretion and depletion processes can alter archaeological remains before and after the abandonment of buildings (LaMotta and Schiffer 1999; Schiffer 1972; 1983; 1987). For example, “floor assemblages” can include secondary refuse or structure collapse in addition to de facto or primary refuse, while the “house fill” can contain de facto or primary refuse that resulted from the reuse of abandoned buildings (LaMotta and Schiffer 1999). Moreover, when house floors are made of penetrable materials, such as sand (the case at ‘Ain Abu Nukhayla), the ambiguity of floor surfaces and the artefacts’ vulnerability to post-depositional disturbances makes the spatial delimitation of “floor assemblages” difficult (Schiffer 1983: 690).

To this end, three datasets were examined to delimit “floor assemblages” and to assess their integrity (Fig. 1): (1) the morphological data of ground-stone tools, (2) the vertical and horizontal spatial data of ground-stone tools, shells, and charcoal, and (3) the architectural remains, including the location of hearths, the bottom level of walls, and cobble-pavement floors. In the architectural dataset, the spatial distribution of rubble, which represents collapsed walls or roofs, was also taken into account.

The following section only presents summarized results of this examination of formation processes for two reasons. The first is that analysis of the formation processes of house deposits appears elsewhere in detail (Kadowaki in press). The second is that the focus

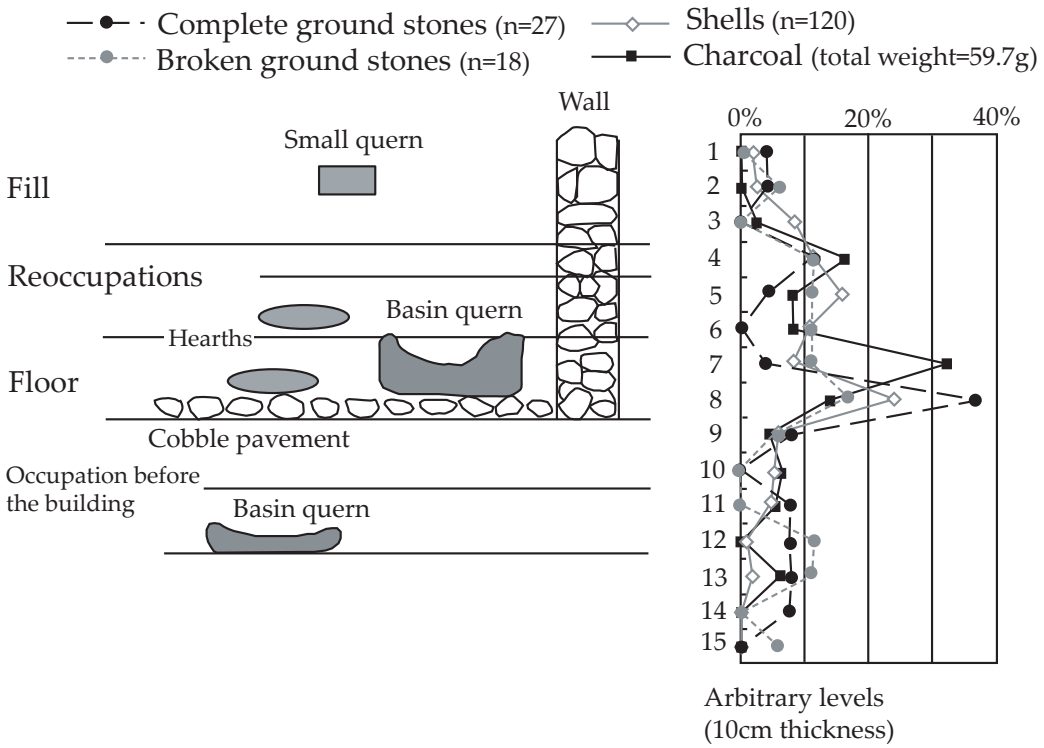


**Figure 1: Stratigraphic diagram of house deposits in Locus 20**

of this paper is on the next stage of analysis: examining the use of space by analysing the distribution of ground-stone tools that are likely to represent activities performed in the spaces.

### Delimitation and assessment of "floor assemblages"

Figure 1 illustrates the stratigraphy of house deposit in Locus 20. On the left of the diagram are depositional phases that were identified through examination of the above three datasets (Kadowaki in press). The three main depositional phases are floor occupation, reoccupation, and fill. However, only the floor occupational phase, described here, is directly relavant to the present study.

Although floors are defined by architectural features, such as pavement, hearths, and the bottom level of walls, the "floor assemblages" need to be delimitated by examining the formation-sensitive attributes of refuse. The refuse recovered in floor levels is generally characterized by a high density of refuse, as seen in the stratigraphic diagram of Locus 20 (Fig. 1). Other characteristics of the refuse in the floor levels are a size-sorted distributional pattern, a high proportion of complete ground-stone tools, and the functional coherence of ground-stone tools (e.g., milling toolkits or pigment-processing toolkits).

However, these characteristics sometimes suffer distortion by several cultural factors, such as subsequent scavenging (at Locus 5), relaxed cleaning activities before the anticipated abandonment of the building (at Loci 5 and 25), or the dumping of refuse into abandoned rooms (at Loci 5 and 25). The close examination of the formation-sensitive attributes of refuse allows us to identify these kinds of depositional events and to assess their influence on the integrity of remaining tool assemblages.

*The close examination of the formation-sensitive attributes of refuse allows us to identify these kinds of depositional events and to assess their influence on the integrity of remaining tool assemblages.*

In the next section, I infer the use of space at 'Ain Abu Nukhayla by examining the ground-stone assemblages recovered in the floor levels. When interpreting the use of space, I will also take into account the possible distortions of original ground-stone assemblages during the life-histories of buildings.

## Approaching the use of space from ground-stone tools

### Activities indicated by ground-stone tools

For this study, it is critical to know the functions of ground-stone tools. Although it is difficult to reconstruct the specific functions of all the ground-stone tools, some tool types are likely to indi-

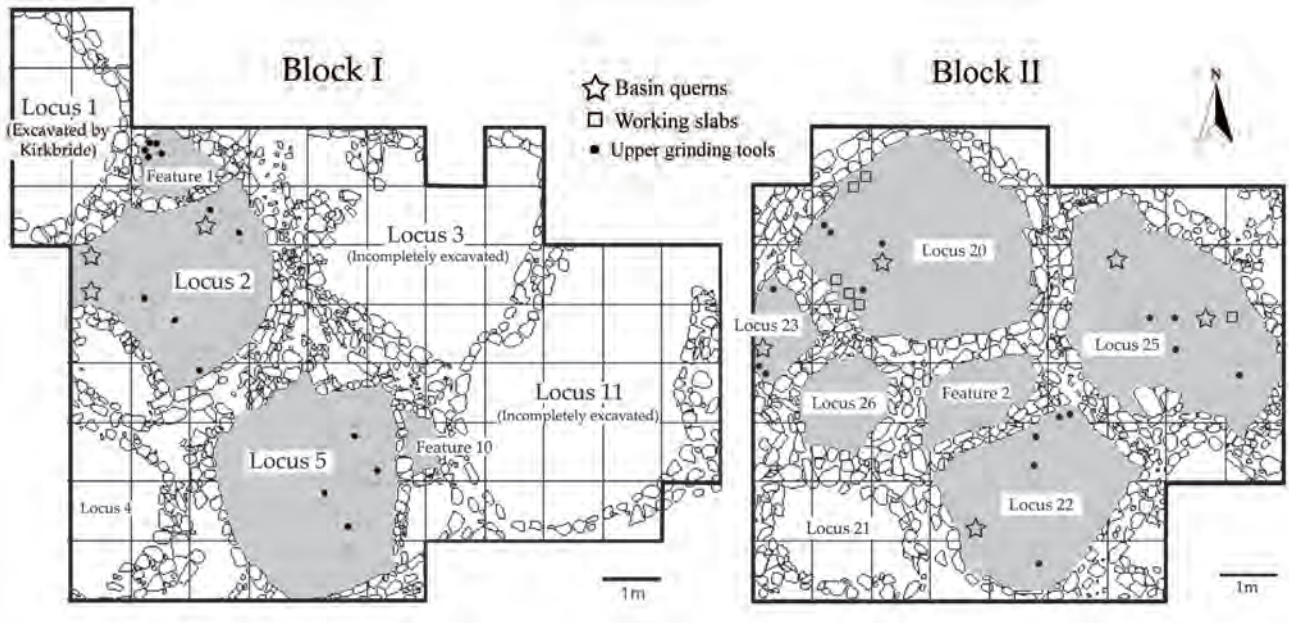


**Figure 2: The distributions of complete food-processing tools in loci 2, 5, 20, 22, 23, 25, and features 1, 2, and 10**

cate general categories of activities. This analysis classifies ground-stone tools into the following four categories of activities: (1) food preparation, (2) tool manufacture and maintenance, (3) pigment processing, and (4) others.

Food-preparation activities are indicated by several tool types: grinding querns, handstones, mortars, and pestles. The use of these tool types for food processing can be found in a number of ethnographic and archaeological examples (Bartlett 1933; Eddy 1964; Fullagar and Field 1997; Kraybill 1977). Although these tool types can be used for other purposes, such as processing hide (Adams 1988), for pulverizing temper and clay for pottery manufacture (Euler and Dobyns 1983; Rye 1981), for processing pigment, and for sharpening bone artefacts (Schneider 1993), it is reasonable to consider their principal use to have been food preparation. First, these ground-stone tool types developed in the Levant from the late Epipalaeolithic through the Neolithic period, coincident with an intensified exploitation of plant resources and the emergence of agriculture (Wright 1992; 1993; 1994). Second, the frequencies and morphologies of the above tool types at 'Ain Abu Nukhayla show strong similarity to those of food-processing tools at contemporary agrarian villages (Kadowaki 2002). The grinding querns and handstones at these Neolithic agrarian villages are likely to have served for processing plant foodstuffs (Miller 1992; Wright 1992, 1993, 1994).

Tool manufacture and maintenance are indicated by chopping tools, pounders, shaft straighteners, cutmarked slabs, preforms of handstones, and flaked debitage. Chopping tools and pounders are likely to have been used for flaking and pecking activities during the production and maintenance of ground-stone tools. The use of chopping tools and pounders for the production and maintenance of ground-stone tools is supported by ethnographic observations (Hayden 1987; Cook 1973), archaeological remains at prehistoric workshops (Hersh 1981; Hoffman and Doyel 1985; Roubet 1989; Runnel 1981; Schneider 1996), and the experimental manufacture of ground-stone tools (Hersh 1981; Wilke and Quintero 1996). In fact, various ground-stone tools from 'Ain Abu Nukhayla show traces of flaking and pecking on their lateral sides and working surfaces, indicating that flaking and pecking techniques were employed to modify blanks or to rejuvenate grinding surfaces to regain rough texture (Wright 1992: 134-5). This observation is also supported by the recovery of preforms of handstones and flake debitage.

Pigment processing is suggested by the presence of small, red sandstone tablets that show wear facets and abrasive scratches on surfaces. Red pigment is attached to the surfaces of some handstones and other ground-stone tools that were probably used to pulverise pigment.

Functions are unclear for the rest of ground-stone tools, such as ground knives, perforated stones, and worked cobbles and pebbles.

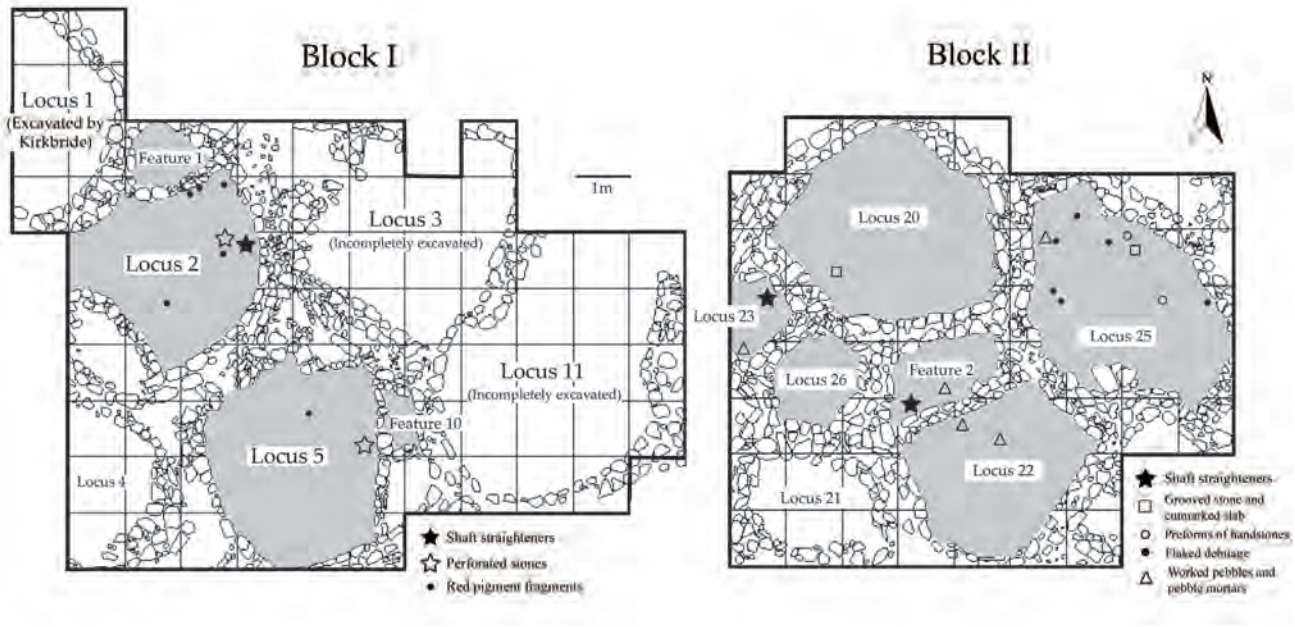


**Figure 3: Distributions of various ground-stone tools that indicate activities such as tool manufacture, tool maintenance, and pigment processing**

### Distribution of ground-stone tools in architectural spaces

Figures 2 and 3 show the distributions of ground-stone tools associated with floor occupations of the buildings. The distributional maps do not include probable secondary refuse (Kadowaki in press). Figure 2 shows the distributions of complete food-processing tools. These tools are distributed in Loci 2, 5, 20, 22, 23, 25, and Feature 1 of Locus 2. The concentration of handstones in Feature 1 of Locus 2 likely represents a cache of handstones. In contrast, no food-processing tools occur in Loci 26, Feature 10 of Locus 5, and Feature 2 of Locus 22.

Figure 3 shows the distributions of various ground-stone tools that indicate activities such as tool manufacture, tool maintenance, and pigment processing. The figure shows that red pigment tablets were recovered in Loci 2 and 5. In the latter locus, the pigment tablet was associated with a broken, perforated stone that was partly covered with stains of pigment, indicating that the tool was used to process the pigment. Locus 2 also contains a perforated stone and a shaft straightener that suggests tool-production activities. Tool production and maintenance are also indicated at Locus 25, which contains flaked debitage and preforms of handstones. Other loci, such as 20, 22, 23, and Feature 2 of Locus 22, also contain some ground-stone tools that indicate tool production and maintenance or other unknown activities. Locus 26 does not contain any ground-stone tools.

Table 1, which summarizes the ground-stone tools recovered at floor levels of various loci, indicates that multiple activities were practiced at some loci, while other loci contain very scarce traces of activities. In the next section, these occurrences of ground-stone tools will be examined in light of architectural attributes, such as floor areas and the occurrence of hearths.

### Patterns in the use of space

Figure 4 examines the occurrence of complete ground-stone tools relative to two architectural attributes: floor area and the presence of hearths. This allows us to group the loci into three categories.

The first group of loci includes Loci 2, 5, 20, 22, and 25. These loci are characterized by relatively large floor area, the presence of hearths (except for Locus 5), and large numbers of ground-stone tools that indicate food processing and other kinds of activities, including tool production and pigment processing. These characteristics suggest that this group of loci is likely to represent general activity areas.

In contrast to the first group, loci of the second and third groups are both small in size and lack hearths. These two groups differ from each other in the density of ground-stone tools; the density of ground-stone tools is higher in the second group of loci (Locus 23 and Feature 1 of Locus 2), while loci of the third group (Locus 26, Feature 2 of Locus 22, and Feature 10 of Locus 5) contain only a few or no ground-stone tools. The high density of ground-stone

tools in the second group may represent caching or storage of tools, while the use of the third group of loci is difficult to identify with available data. Two loci in the third group (Locus 26 and Feature 10 of Locus 5) also contain very few chipped-stone tools. The small quantity of refuse from these loci and their small floor areas may indicate their use for storage of other (perishable) materials.

The three groups of loci can be described in terms of their use of space. Spaces of the first group have a relatively large floor area, usually have hearths, and were used for multiple activities, including food preparation, tool production, tool maintenance, and pigment processing. Spaces of the second group are small, lack hearths, and were used for storage of groundstone tools. Although spaces of the third group are also small and without hearths, the small amount of artefacts at these loci suggests their use for storage of other materials.

To summarize, Figure 5 shows the spatial arrangement of loci by function. The three types of loci are spatially arranged in such a way that general activity areas are usually associated with storage, creating recurrent spatial units for multiple activities. For example, Locus 2 and Feature 1 of Locus 2 constitute one unit, while Locus 5 and Feature 10 of Locus 5 belong to another unit. In addition to these relatively clear examples, another unit of loci is formed by Loci 20, 23, and 26. Locus 22 and Feature 2 of Locus 22 also clearly constitute another unit. Locus 25 also appears to constitute a spatial unit with two small loci that are located on its northeastern side.

## Implications for social relations at 'Ain Abu Nukhayla

### Do recurrent spatial units of domestic activities represent household units?

As pointed out earlier, this paper employs the view that architecture and human behaviour are mutually influential (Rapoport 1990; Steadman 1996). Employing this framework for understanding material culture, the following discussion will focus on the implications of the identification of patterns in the use of space for our understanding of the social relations among the site's inhabitants.

The use of space at 'Ain Abu Nukhayla is characterized by recurrent spatial units of domestic activities, including food preparation, tool production, pigment processing, and storage (Fig. 5). These repetitive spatial units likely represent multiple cooperative groups of people who conducted particular kinds of activities.

These corporate activity groups may correspond to households, which are generally characterized by the practice of various cooperative activities (Wilk and Nettings 1984; Wilk and Rathje 1982), including residence, production, distribution, consumption, inheritance,

**Table 1: Inventories of groundstone tools from floor levels; Number of complete tools / Total number of tools on floor**

| | | Activity units | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Activities indicated by groundstone tools | Groundstone tool types | 2 | 2/F01 | 5 | 5/F10 | 20 | 23 | 26 | 22 | 22/F02 | 25 |
| **Food preparation** | Grinding slabs and querns | 3/4 | 0 | 0/1 | 0 | 4/6 | 1/1 | 0 | 1/1 | 0/1 | 3/4 |
| | Handstones | 5/7 | 5/5 | 4/6 | 0 | 3/7 | 2/3 | 0 | 4/6 | 0 | 1/6 |
| | Worked cobbles (upper grinding tools) | 0 | 0 | 1/1 | 0 | 1/1 | 1/1 | 0 | 1/1 | 0 | 3/3 |
| **Tool production and maintenance** | Grooved stones (shaft straightners / cutmarked slabs | 1/1 | 0 | 0 | 0 | 1/1 | 0/1 | 0 | 0 | 1/1 | 1/1 |
| | Debitage / handstone preforms | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4/8 |
| **Pigment processing** | Red pigment fragments | 5/5 | 0 | 1/1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Perforated stones (used in processing pigments) | 0 | 0 | 1/1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Other unkown activities** | Perforated stones | 1/1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Pebble mortars | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1/1 | 0 | 0 |
| | Worked pebbles | 0 | 0 | 0 | 0 | 0 | 1/1 | 0 | 1/1 | 0/1 | 1/2 |
| | TOTAL | 15/18 | 5/5 | 7/10 | 0 | 9/15 | 5/7 | 0 | 8/10 | 1/3 | 13/24 |
| **Numbers of complete food processing tools** | | 8 | 5 | 5 | 0 | 8 | 4 | 0 | 7 | 0 | 7 |
| **Floor area ($m^2$)** | | 7.6 | 1.2 | 8.9 | 0.45 | 10.4 | 1.4 | 1.8 | 6.9 | 1.9 | 9.8 |
| **Density of food processing tools (number per $m^2$)** | | 1.1 | 4.2 | 0.6 | 0.0 | 0.8 | 2.9 | 0.0 | 1.0 | 0.0 | 0.7 |

and child-rearing (Wilk and Nettings 1984; Wilk and Rathje 1982). However, in contrast to this cooperative and homogeneous aspect of households, they also have a conflictive and heterogeneous aspect that is characterized by their internal diversity and dynamic organization (Blanton 1994; Goody 1969; Steadman 1996; Tringham 1991). This heterogeneous aspect is often detectable in the use of space, labour organization, and power relationships among different genders and ages within households (Blanton 1994; Goody 1969; Oetelaar 2000; Tringham 1991). In this way, households can be understood from two contrasting viewpoints: cooperative vs. conflictive or homogenous vs. heterogeneous.

In light of this potential ambiguity in household organization, the archaeological evidence examined in this paper does not allow us to determine whether recurrent spatial units of domestic activities correspond to household units at 'Ain Abu Nukhayla. One spatial unit may represent a single household unit, or one household may be composed of multiple spatial units of activities.

We cannot be certain that the recurrent spatial units of domestic activities directly correspond with household units. The observed spatial units do allow us, however, to approach the groups of people who cooperatively conducted certain kinds of domestic activities, including food preparation, tool production and maintenance, pigment processing, and storage. The occurrence of these activities in architecturally delimitated spaces indicates that different groups conducted tasks autonomously. The group size seems quite small, as indicated by the mean floor area (ca. 8.7m$^2$) of activity spaces (excluding storage). In addition, these small groups of people appear to have had restricted networks for sharing domestic activities with other groups, as doorways were not preserved, at least in the remaining walls (preserved to heights of 25 to 100 cm).

## Comparison among the activity groups

In order to understand the relations among activity groups, it is useful to examine the degree of variation among them on the basis of three material and behavioural characteristics:
(1) architectural traits, (2) the range of domestic activities, and (3) the intensity of food-preparation activities.

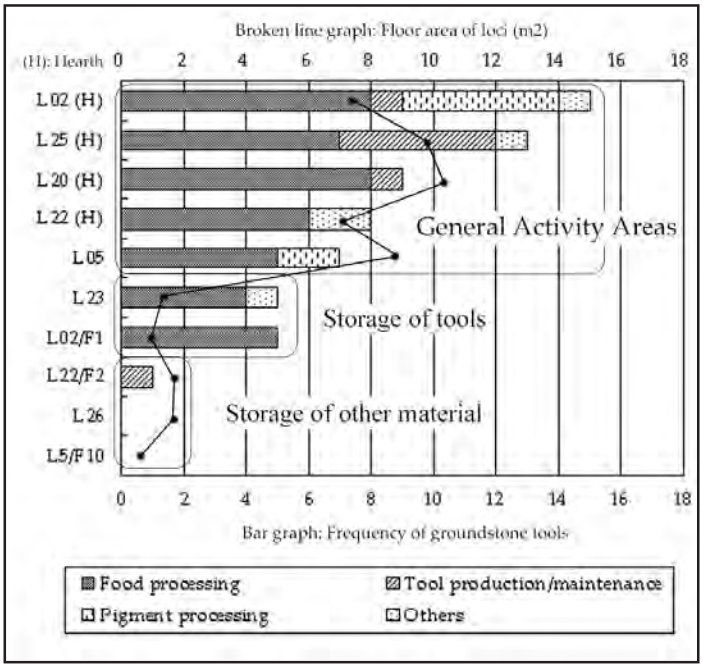


**Figure 4: Comparison of the occurrence of complete ground-stone tools with two architectural attributes: floor area and the presence of hearths**

### *Architecture*

Several architectural traits indicate uniformity among activity groups. First, most activity areas are delimited by curvilinear stone walls that constitute contiguous rooms of round to semi-circular shape. These rooms are similarly characterized by the absence of doorways, even in walls preserved as high as 100 cm. In addition, the spatial units of activity groups are routinely composed of rooms of two different sizes. The larger rooms may be main activity areas (mean = 8.7 m$^2$, s = 1.5 m$^2$), while the smaller rooms likely served for storage (mean = 1.4 m$^2$, s = 0.6 m$^2$).

In contrast to these similarities, architectural differences are observable on floor surfaces and internal compartment walls. Cobble pavement occurs at Loci 4, 20, and 25, while others have loose sand floors or a flagstone pavement (Locus 26). Internal compartment walls only occur at Loci 2, 5, and 22.

### *Range of domestic activities*

Although the range of domestic activities indicated by ground-stone tools is limited, food preparation and storage are the primary activities practiced by the groups identified in this study (Table 1). Other activities, such as tool production and pigment processing, were also practiced by the same groups. These activi-

*Uniformity in activity groups is observable in house shape, floor size, the absence of doorways, storage, practices of food preparation and tool production, density of food-processing tools, and the design and efficiency of lower grinding tools.*

ties are indicated by certain ground-stone tool types, such as shaft straighteners and red pigment fragments, recovered from general activity areas or storage spaces (Table 1). Tool production took place in all activity units except Locus 5, while pigment processing was restricted to Loci 2 and 5.

### Intensity of food-processing activities

In order to evaluate the intensity of food-processing activities, I examine the density and the grinding efficiency of food-processing tools, which consist of upper grinding stones (handstones and worked cobbles) and lower grinding stones (grinding slabs and querns). The density of food-processing tools (the number of tools per square metre of floor in the locus, Table 1) is high in storage areas, as seen at Feature 1 of Locus 2 and Locus 23, but these loci are excluded from this analysis because these areas presumably represent tool curation, rather than food-processing activity. I assess the efficiency of food-processing tools by examining the size of grinding areas and the morphological traits of the tools. Experimental uses of manos (upper grinding tools) indicate that larger grinding surfaces allow greater grinding efficiency (Adams 1998; Mauldin 1993). In addition, flat working surfaces of grinding slabs allow more efficient grinding than concave surfaces of basin querns (Adams 1998; Eddy 1964). I assume that the intensity of food processing is proportional to the efficiency of the tools (Adams 1996: 35-6).

### Density of food-processing tools

As Table 1 shows, the densities of food-processing tools vary little among the general activity areas, ranging from 0.6 to 1.1 tools/$m^2$. Among these, Loci 5 and 25 have the lowest densities of food processing tools (0.6 and 0.7 tools/ $m^2$).

However, the analysis of formation processes suggest that some food-processing tools are likely to have been removed from Loci 5 and 25. Two grinding querns appear to have been scavenged during the subsequent reoccupation at Locus 5 and relocated to the upper levels. With these two grinding querns included, the density of food-preparation tools in Locus 5 increases to 0.8 tools/ $m^2$. Likewise, the recovery of only one handstone at Locus 25 may have resulted from the removal of handstones after occupation. Post-depositional disturbance of Locus 25 is indicated by the shallow deposit above the floor levels and the random distribution of tools in the floor levels (Kadowaki in press). To summarize, the food-processing loci appear to have a uniform density of food-preparation tools.

### Design and grinding efficiency of upper grinding tools

Table 2 shows the proportions of the various types of upper grinding tools recovered from the food-processing loci. Here, I assume that worked cobbles and irregular handstones are less efficient than regularly shaped handstones, such as loaf-shaped, oval, rectilinear, and discoidal handstones. Locus 2 is distinct from other loci in the use of only regularly shaped handstones, while other loci include both regular and irregular handstones or worked cobbles (Locus 5, 20, 22, and 25). The higher proportion of regular handstones in Locus 2 may indicate more efficient food processing at this locus than in others.

Differences in the size of upper grinding tools among the loci also suggests different grinding efficiency between Locus 2 and other loci (Table 2). Handstones from Locus 2 are longer than those from other loci, although this difference does not show statistical significance.

In sum, the design of upper grinding tools varies between activity groups. In particular, the upper grinding tools of Locus 2 are larger and more regularly shaped than those of other loci, indicating greater grinding efficiency at Locus 2.

### Design and grinding efficiency of lower grinding tools

Basin querns are associated with all the food-processing loci, except for Locus 5, where the querns were probably scavenged after its abandonment. Loci 20 and 25 also include working slabs. As shown by a t-test, the working surfaces of the slabs in Loci 20 and 25 (Mean area = 1731 $cm^2$, s = 495.5 $cm^2$) are significantly larger than those of the basin querns in other loci (Mean area = 763 $cm^2$, s = 204.8; t = -5.56, df = 13, $p < 0.01$). Thus, these working slabs may have allowed more efficient grinding at Locus 20 and 25 than in other

| | | L 02 (n=5) | L 05 (n=5) | L 20 (n=4) | L 22 (n=5) | L 25 (n=4) |
|---|---|---|---|---|---|---|
| **Worked cobbles** | | 0 % | 20% | 25% | 20% | 75% |
| **Handstones (irregular forms)** | | 0 % | 20% | 0% | 20% | 0% |
| **Handstones (regular forms)** | **Rectilinear** | 0 % | 20% | 0% | 0% | 0% |
| | **Discoidal** | 60 % | 20% | 25% | 20% | 0% |
| | **Oval** | 20 % | 20% | 50% | 40% | 0% |
| | **Loaf** | 20 % | 0% | 0% | 0% | 25% |
| **TOTAL** | | 100% | 100% | 100% | 100% | 100% |
| **Length (mm)** | **Mean** | 126.8 | 99.2 | 112.0 | 114.3 | 102.5 |
| | **Standard deviation** | 36.0 | 33.0 | 24.1 | 23.8 | 43.7 |

**Table 2: Proportions of various types of upper grinding stones recovered at food-processing loci**

activity areas. However, these working slabs are scarcely modified, while the basin querns show extensive production traces, such as flaking and pecking scars. In addition, the flat surfaces of the working slabs do not show clear grinding traces, such as striations that are clearly visible on the working surfaces of the basin querns. These observations suggest that the primary use of the slabs was not for grinding food. Thus, despite their large size and flat surfaces, the working slabs from Locus 20 and 25 do not indicate a significant difference in the grinding intensity between these loci and the other food-processing loci.

To summarize, the design of lower grinding tools appears fairly consistent among the activity areas except for the occasional occurrence of working slabs. However, these slabs do not seem to have contributed primarily to food preparation.

### Summary

The above examination compared the activity groups by focusing on three aspects: architecture, the range of domestic activities, and the intensity of food processing activities. The analysis identified several differences among the activity groups in floor surfaces, compartment walls, evidence for pigment processing, and the design and efficiency of upper grinding tools.

Despite these points of variability, uniformity among the groups appears more prominent. This uniformity is observable in house shape, floor size, the absence of doorways, the occurrence of storage, practices of food preparation and tool production, the density of food-processing tools, and the design and efficiency of lower grinding tools.

In sum, the activity groups identified through examination of the use of space is characterized by strong uniformity but some variation with regard to architectural traits, the range of domestic activities, and the intensity of food preparation.

### Social implications of the activity groups

At 'Ain Abu Nukhayla there were fairly uniform groups for certain domestic activities, including food processing, tool production and maintenance, pigment processing, and storage. This inference is based only on ground-stone tools recovered in domestic spaces, which do not reflect all the activities that the site's inhabitants conducted. Other archaeological remains indicate a wider range of activities, including hunting, animal herding, cereal cultivation, production of chipped-stone tools and shell beads, and building construction. Some of these activities may have been carried out by the same activity groups identified in the examination of ground-stone tools, while others may have involved different social grouping.

Despite this limited view of activities practiced at the site, the autonomous practices of some domestic activities could be explained in terms of social processes in two ways: (1) the privatization of activities and (2) the fission of activity groups.

The first explanation involves a shift in the organization of activities from communal work to practices by individuals or small groups. This privatization process involves several domestic activities, including food preparation and storage. Some authors suggest that this process progressed during the Pre-

*The patterns detected in the use of space may allow two possible explanations regarding the social processes at the site: the privatization of activities and the fission of activity groups.*

Pottery Neolithic period in the Near East (Flannery 1993, 2002; Wright 2000). Moreover, this process is consistent with Byrd's argument that social networks for sharing domestic activities decreased among households at the PPNB settlement of Beidha (Byrd 1994). A similar process of social change may explain the autonomous practices of some domestic activities by small activity groups at 'Ain Abu Nukhayla.

In contrast, the second explanation suggests that the activity groups may have resulted from periodic fission of groups in their developmental cycle (Goody 1969). Based on his ethnographic observations, Goody suggests that groups of people who share a residence or certain activities split periodically in accordance with changes in their composition due to the birth, aging, and death of group members (Goody 1969). Banning and Byrd (1987) used this anthropological observation to explain the sequence of architectural renovations at 'Ain Ghazal in the Middle PPNB. This developmental cycle of domestic or activity groups might also explain the repetitive occurrences of spatial units for domestic activities at 'Ain Abu Nukhayla.

Thus, the patterns detected in the use of space allows for two possible explanations regarding the social processes at the site: (1) the privatization of activities and (2) the fission of activity groups. These two explanations operate over different time scales. The privatization process occurred over the PPNB period, while the fission of activity groups occurred over a shorter time, such as a generation. Therefore, it is possible that both social processes took place concurrently among the inhabitants of 'Ain Abu Nukhayla.

These social explanations need to be substantiated with more evidence in future research. For example, the privatization process of activities will need to be re-examined by analyzing the labour organization of a wider range of activities, including animal herding and the production of chipped-stone tools. In addition, we could obtain deeper insights into the developmental cycle of domestic groups through closer examination of the sequences of the construction and modification of residential buildings.

When conducting these further analyses, it is also important to consider the prehistoric built environment at a single moment. This built environment can be approached through examination of the site-formation processes and life-histories of building remains. For example, at 'Ain Abu Nukhayla (Kadowaki in press), some abandoned buildings were later reused as outside activity areas. Moreover, the proposed presence of outdoor activity areas implies the patchy distribution of contemporary houses in the settlement (see also Verhoeven, this volume). This suggestion is particularly significant at 'Ain Abu Nukhayla because of its settlement layout with a so-called "beehive structure" (Goring-Morris 1993), in which curvilinear buildings are densely distributed with no spaces between them. Despite this dense distribution of houses as archaeological residues, I suggest that the prehistoric built environment at 'Ain Abu Nukhayla was characterized by a patchy distribution of occupied houses with outdoor areas that facilitated movement and interaction among inhabitants. In sum, the high compartmentalization of space at the site is likely the result of the accumulation of successive building phases over a long period of time, while the prehistoric inhabitants of the site probably experienced a more open built environment.

## Conclusion

This paper examines the use of space at 'Ain Abu Nukhayla, a PPNB settlement in the arid marginal zone, through the spatial analyses of architecture and activities inferred from ground-stone tools. The proposed use of space is characterized by the repetitive occurrence of spatial units for several domestic activities, including storage, food processing, tool production and maintenance, and pigment processing (Fig. 5). It is difficult to determine the relationship of these recurrent spatial units for domestic activities to household units because of the potential variability of household organizations. However, these recurrent units of spatial activity, delimited by architecture, still indicate that groups of people autonomously conducted certain kinds of domestic activities.

Finally, the social implications of these uniform activity groups are that two social processes were at work: (1) the privatization of activities, and (2) the fission of activity groups. The former

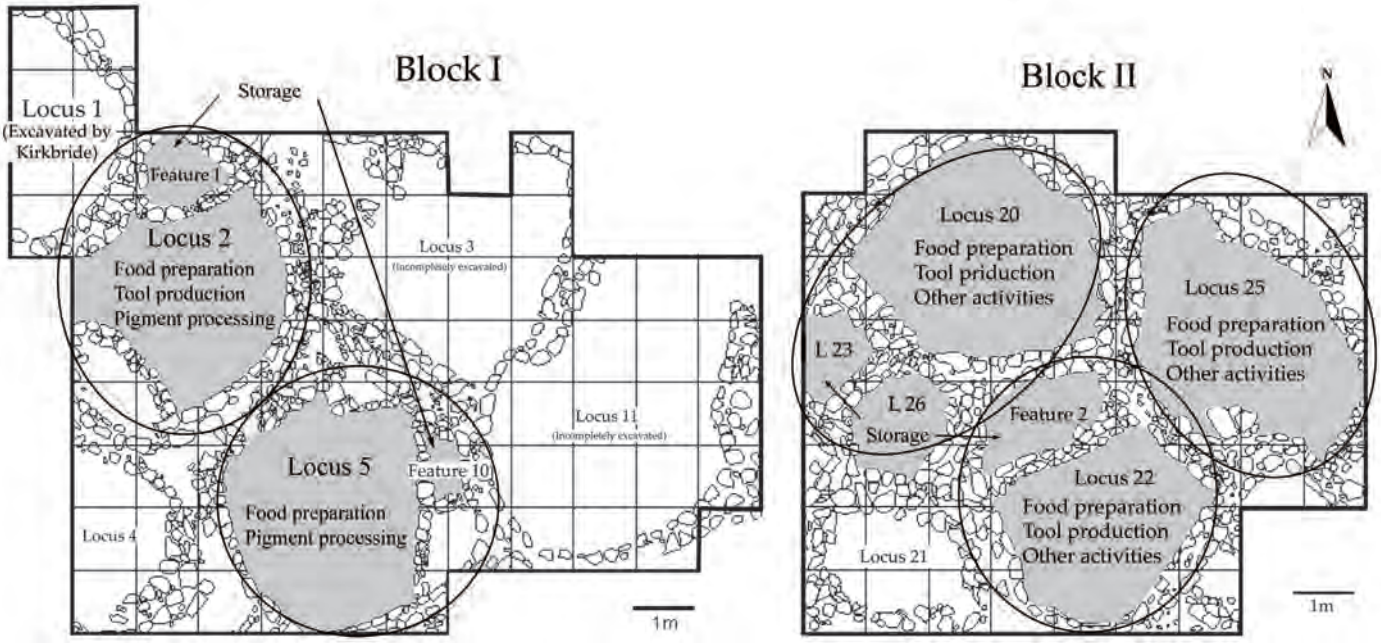


**Figure 5: Domestic activities include storage, food processing, tool production and maintenance, and pigment processing**

process principally represents long-term change in labour organization for production and consumption, and has been suggested by several archaeologists who examined the spatial organizations of architecture and domestic activities in Neolithic sites in the Levant (Byrd 1994; Flannery 1993, 2002; Wright 2000). In contrast, the fission of activity groups occurred over a shorter period, such as a generation, according to the developmental cycle of domestic groups (Goody 1969).

These two social implications need to be further examined in future. It is particularly necessary to continue research on the labour organization of other activities, such as the production of chipped-stone tools and animal herding, and on the sequences of the construction and modification of residential buildings. It is also important to consider the prehistoric built environment at a single moment by examining the life histories of buildings (Kadowaki in press). Several lines of further research are necessary better to illustrate social relations at 'Ain Abu Nukhayla and compare them with those at other Neolithic settlements in the Mediterranean zone. To this end, examinations of architecture, the use of space, and site-formation processes may remain useful analytical methods.


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# *The Domestication of Vertical Space: The Case of Steep-Slope LPPNB Architecture in Southern Jordan*

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In the LPPNB of southern Jordan, intrasite social and spatial pressure forced the use of vertical space. As domestic space became more and more restricted through progressive community or family growth, two storey domestic structures developed in steeply sloped sites. In settlements like Ba'ja, natural boundaries gave birth to use of vertical space.

Developments in the Early Near Eastern Neolithic are dominated by a range of agglomeration processes, leading to the domestication of beings, abiotic resources, material and immaterial spaces and spheres. These rapid initial agglomeration processes appear to have progressed in geographically varied and polycentric ways, determined by regional environmental conditions, and by the increasing role of interaction between regions. One must state that these early sedentary agglomeration processes also established the socio-spatial ethology of our modern life, or formed the sedentary ethology of human space (Gebel 2002).

The groundplans of buildings and settlements indicate that the "Mega-Site" Late PPNB (hereafter LPPNB, Fig.1; Gebel 2004) of the Jordanian Highlands consisted of corporate family and community structures. In these LPPNB milieus, social and spatial agglomeration continuously triggered cooperative structures, and cooperative structures in turn triggered more agglomeration processes. It appears impossible to separate either element in these developments.

This contribution presents the material evidence of one type of early spatial agglomeration, that of two-storey or multi-storey housing, which developed in southern Jordan during the 8th millennium cal BC. Rarely are all elements of real two-storey architecture preserved together on LPPNB sites. Before we discuss this evidence, we must consider the agglomeration and territoriality of space under early sedentary conditions.

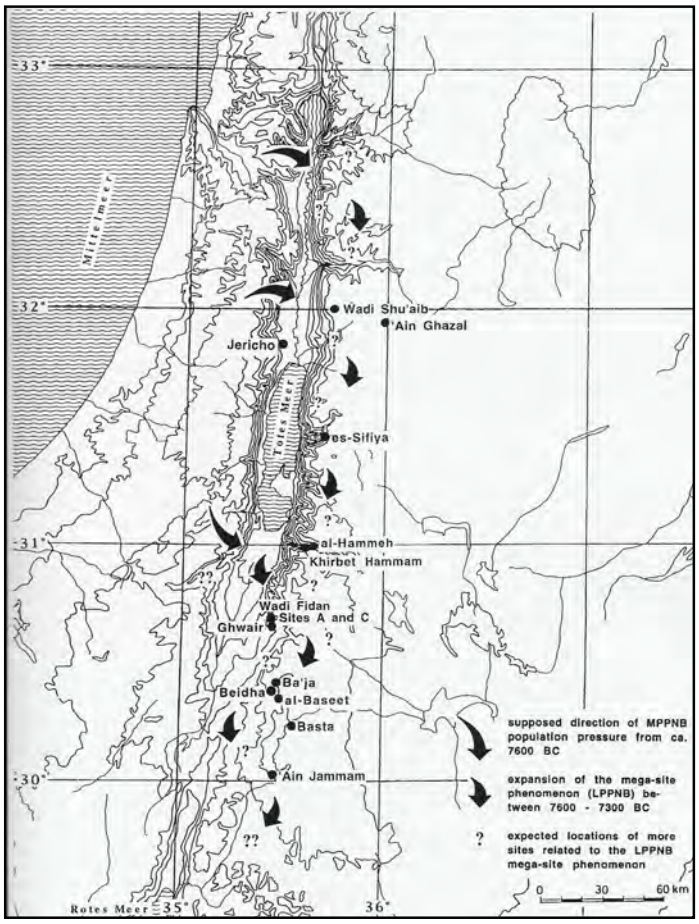



**Figure 1: LPPNB sites in discussion for the use of two-storey architecture, with information on the mega-site expansion (from Gebel 2004)**

## Sedentary Space

Settled life demanded a fundamentally different human territoriality than did mobile, foraging life. This different understanding of space resulted from a growing territorial inflexibility, determined by the new sedentary spatial orientation, progressive population dynamics and new socio-economic production modes and structures.

Habitational and natural spaces were reconceived and redefined in all aspects of life and human expression. This resulted in hitherto unknown and increasingly complex types and levels of conflict, countered by adaptations to more complex social and socio-economic structures that helped balance interests. Warfare over habitats or aggression over

**Figure 2: Panoramic view of a LPPNB mega-site on a shallow terrace, reconstructed as a two-storey settlement. (reconstruction by M. Kinzel)**

Discussion of LPPNB architecture demands clear definitions of the specific terms in use, without which mutual understanding would fail. The following list of definitions must be considered preliminary and incomplete, but may serve as a start for a common LPPNB architectural terminology for storeyed architecture. Terraced architecture requires different definitions of "basement", "groundfloor", and "storey" than those used in common understanding. Here, for clarity, a storey above a basement is addressed as a second storey.

**Basement:** A storey below an upper storey. In Ba'ja, basements were created from upper storeys by building a new storey on top of them. Basements can have a cellar-like appearance. Substructures are not basements, although they can be used (e.g., as a burial ground, as at Basta).

**Building terraces:** Building lots created by terraces dug or built into slopes, extending their space by off-slope substructures, or both.

**Floor:** This term should be reserved for an actual floor (and not used as "storey").

**Ground floor:** A neutral term for the lowermost storey, whether it carries an upper floor or not. Some ground floors can be basements.

**Level:** An ambiguous term to be avoided in the discussion of storeyed buildings (but see "split-level" below).

**Rising-floor structures:** An architecture in which storeys "move" upwards by the vertical extension of walls and by raising the floors with room fill, often related to split-level architecture (cf. evidence from pueblos in the American Southwest, e.g., Cameron 1996a: 199; 1996b: 79-80; Kidder 1958: 122-124).

**Raised floors:** Floors on substructures that do not form a storey (e.g., substructures to create an even building ground or to provide ventilation or insulation).

**Pillars:** Posts serving to support main beams of ceilings, (e.g., 'Ain Jammam, Ba'ja, as-Sifiya).

**Roof:** The unsheltered open-air space on top of any storey that does not have one above it. It should not be considered as a "storey" itself. Several connected roofs (as in pueblo-like LPPNB architecture) can form a communal space or roof "landscape" for intra-settlement traffic.

**Roofment:** A new term for a partially sheltered, open-air space on top of a building. Roofments can be any unroofed structures on a roof, e.g., parapet walls or any physical, spatial division on a roof. Isolated room-like structures that were roofed (penthouses), however, should be considered a storey, even when built on a roof.

**Split-level structures:** Architecture in which neighbouring rooms with floors at different heights share walls. Split-level rooms are connected by passages.

**Storey:** A closed room or group of (interconnected) rooms with ceilings built above them.

**Strengthening buttress:** Attached (abutting) or originally built (bonded) to strengthen a (long) wall and possibly to support a main ceiling beam.

**Substructures:** Various types of sub-floor structures below a basement or groundfloor (e.g., the LPPNB channel-like or grill-type network of dry-stone masonry that created an even building lot on a slope, and vertical stones supporting floors as at Dhra', Finlayson et al. 2003: 18-19; Kuijt and Finlayson 2002). Substructures support raised floors.

**Subterranean:** Sometimes an archaeologically ambiguous term, this should be reserved for buildings dug into the natural or cultural sediments and be distinguished from buildings with outside levels that rose through sediment accumulation.

**Support gap:** A gap in a masonry wall to support beams (e.g., for lintels, staircases, ceilings, or roofs).

**Support wall:** Any wall built to support beams, including wall ledges.

**Twin buttresses:** Buttresses located in opposed position to support a main beam in the ceiling and possibly to strengthen walls. Attached (abutting) twin buttresses indicate a secondary need to carry extra weight.

**Two-storeyed:** A building with two ceilings and one roof, located directly above one another.

**Wall sharing:** Where two neighbouring rooms or buildings, usually at two different levels, share the same wall without an interconnecting passage. An example: Two-storey housing in Ba'ja, Area B-North

the territorial neighbourhood of settlements were new sorts of conflicts.

The changing understanding of space included not only the material space; immaterial spaces — social spaces defined by new forms of conflict management or production hierarchies, new values in property definition and prestige goods, and ritual and symbolic spaces, like the intramural "domestication" of otherworldly powers or of the dead — became subjects of a hitherto unknown agglomeration. There are indications that the ritual and material space were not as differentiated in the early Neolithic as they are in modern times.

Sedentary space is limited by immediate neighbourhoods. Social space is restricted by both physical and social boundaries, and stress is therefore created when there is a need for growth and expansion. The resulting spatial pressures can be managed for a while by the adoption of new corporate structures and by adding to the horizontal space through the use of the third dimension. The use of vertical space again increased spatial pressure by allowing a higher population density within LPPNB settlements.

Space is both a material and an immaterial subject of domestication. The domestication of space resulted in agglomeration, and spatial agglomeration intensified the further domestication of space. The use of vertical space is an expression of this intensified domestication.

### Vertical Space and Regional Architectural Development

The beginnings of multi-room LPPNB architecture of southern Jordan[1] extend to an architectural history of just half a millennium in the region. The round houses of the Middle PPNB seem to have been the first solid architecture in the southern Jordanian Highlands. Earlier solid architecture should be expected along the rift's fringes and its major eastern confluents. New evidence from the round-house MPPNB at Shaqarat Mazyad[2] demonstrates at least the use of roofs and thus the beginning of exploiting the vertical space. Staircases leading up in the interior of a MPPNB round house must not have led to a second storey, but at least can be

**Figure 3: Basta, Area B, Square 84; View of the NE Wall of Room 2 of Building Unit B VIII (photo: Basta J.A.P., Y. Zu'bi)**

*The use of right angles in LPPNB architecture seems to have triggered the introduction of substructures, artificial terracing, or platforms without substructures.*

1. According to Gary Rollefson (pers. comm.), 'Ain Ghazal provides clear indications of both two-storey and split-level LPPNB structures. The best evidence is from a single building that shows both aspects: "The building was a large residential building in the North Field. The reasons for claiming that at least the western part of the building had two storeys is that the fill of the ground floor included thick red-painted plaster flooring that could only have come from an upper storey; the western wall of the structure shows clearly that there was no split-level part of the building farther up the hill."

2. In the course of our architectural investigations at Ba'ja and Basta, as well as exploring the recent traditional terraced housing in southern Jordan, it became obvious that identification of a real second storey (closed rooms with two ceilings built above each other) is not as easy as we anticipated and that the evidence sometimes is difficult to distinguish from other sorts of shared-wall architecture (e.g. split-level structures or rising-floor structures). The investment of the Ba'ja team in discussing the architectural and stratigraphic morphodynamics of storeys has been considerable, and we now feel able to identify archaeologically what is coming mostly as a statement from other (mega-) sites: that second storeys did exist. This discussion might soon require expansion : Recent discovery of staircases leading up in a MPPNB round house at Shakarat Mazyad (north of Ba'ja), together with staircases leading down into the same building, may indicate an earlier use of the vertical space in the MPPNB, whatever this space may have looked like (Hermansen et al. n.d.). So far, this isolated discovery does not conclusively expand the second-storey discussion to the round houses of the MPPNB.

We are conservative in our view that secure evidence for second storeys so far comes only from the LPPNB. The suggested examples of second storeys from the MPPNB (the pier-houses from Beidha: Byrd 2005; Byrd and Banning 1988; the architectuure of Ghwair I: Simmons and Najjar 1998, 1999, 2000) still appear doubtful. Despite its MPPNB radiocarbon dates, the Ghwair findings fully correspond to the character of a LPPNB culture and little is said about its MPPNB cultural affinities; if Ghwair is MPPNB, it should be explained why or how its LPPNB features came to exist isolated in an MPPNB context. For the pier-houses of Beidha: even Byrd (2005) notes that the question wasn't solved how they relate to similar PPNC groundplans known from 'Ain Ghazal; it also appears archaeologically insufficient to argue that thick walls must have carried a another storey. However, the pier-houses of Beidha might become a potential candidate for discussing second-storey buildings already in the MPPNB.

**Figure 4: Ba'ja 2003; Aerial view of excavation areas, from SW. ( photo: Ba'ja N.P., K. Traulsen).**

evidence for use of the roof. Staircases may have existed in places were the dense honeycombed arrangement of the round houses did not have space for installations that allowed inhabitants to reach the roof from outside. However, new evidence for PPNB architecture continuously surprises us, and it would not be unlikely to find evidence of early MPPNB round "towers" with second storeys and flat roofs.

It is not clear at all if southern Jordan witnessed an indigenous development from round to rectangular groundplans. It could well be that such a stage of development does not exist but that rectangular architecture was introduced from the north with the new social paradigm that accompanied the mega-site expansion (Fig. 1; Gebel 2004).[3] The LPPNB mega-site architecture strongly hints at the existence of social units larger than nuclear families (possibly kin groups or lineages) as the standard social unit (cf. Garfinkel, this volume). Given the limited resources of the PPNB environment in southern Jordan, corporate exploitation and consumption would have offered advantages over smaller MPPNB (nuclear) family units. The large, corporate family structures that followed allowed their members to reduce competion and, thus, conflict levels. They started to use rectangular, multi-roomed groundplans and, after a while, houses expanded vertically (Figs. 2, 5).

It is worthwhile to consider the possibility of a developmental relation between round houses and right-angled groundplans on slopes with substructures. The use of right angles in LPPNB architecture seems to have triggered the introduction of substructures, artificial terracing, or platforms without substructures. The introduction of right-angled groundplans could have facilitated second storeys, since they provided more solid structural support.

Basta seems to indicate that regional architectural variability was substantial in the LPPNB of southern Jordan. There is little secure evidence for two-storey structures in Basta, although some evidence clearly hints at split-level architecture (Kinzel 2003; 2004). One may speak of an optional second-storey architecture in Basta (cf. below). Kuijt's (2000) reconstruction of the Basta House might be correct in principle, but we cannot be at all sure that the houses of the LPPNB Basta village were two-storeyed throughout. Rising-floor structures (see below) are virtually absent in Basta but seem to be characteristic of steep-sloped Ba'ja, where vertical rock formations and gorges limited horizontal settlement growth. The LPPNB occupation of Basta, mainly resting on fairly slight slopes, shows architecture built on artificial terraces of dry-stone masonry with grill-type substructures. The height differences among the various terraces is not very significant (Nissen, forthcoming), and the buildings in Areas A and B show little maintenance or alteration as compared with the steep-sloped sites ('Ain Jammam, Ghwair I, Ba'ja, al-Basît).

Large, presumably central, rooms surrounded by rows of smaller rooms appear to be characteristic of the LPPNB in southern Jordan. Various publications (e.g., Kuijt 2000; Gebel

3. If the pier houses of Beidha C were two-storey (Byrd 1994; 2005: 132; Byrd and Banning 1988, but questioned by B. Finlayson during experimental reconstruction in 2005, pers. comm.) and are indeed of MPPNB date (see fn 1), they would represent the earliest two-storey architecture of the region. Archaeologically, for now they should be considered as doubtful evidence for two-storey houses

2002) describe this groundplan type as t e "Basta House", since its regular and rectangular layout (which in Basta was not affected by the topographic constraints of a very steep slope and was much helped by building terraces created by substructures) was first identified there (Nissen, Muheisen, and Gebel et al. 1987). The principle of the Basta House groundplan with its central room was further identified in 'Ain Jammam, Ba'ja, as-Sifiya, and Ghwair I (Simmons and Najjar 1998: Fig. 1). In the steep-slope settlements, this ideal groundplan is difficult to recognize because the layout had to be adapted to topographical conditions (e.g., Fig. 6), leading to the use of triangular or polygonal rooms attached to an irregular central space. In these cases, rooms of the same building frequently rest on different levels, especially in sites or at spots where substructures to create an even building lot were not in use.

A very basic, yet unsolved, question is whether the large central room or central space of a Basta House belongs only to the ground floor, with no second storey above it, or if it represents the central room of an upper storey, as outlined below for the recent finding in Ba'ja.[4] The wall thicknesses, other static elements, like inserted buttresses or wall ledges and wall gaps, and the good preservation of walls (resulting from a rapid filling of rooms by material that must have arrived from an upper level) all support the argument that the central space once belonged to a basement or groundfloor. It has been suggested (Gebel and Hermansen 2001; 2004) that in Ba'ja all groundplans represent basements, whose considerable heights were preserved by the mass of material from an upper storey eroding into the rooms,[5] but the evidence does not really contradict the possibility that they belong to groundfloors.

Another concern is that Basta Area B, itself, seems to lack secure and direct evidence for second storeys,[6] except, possibly, in Room 2 of Building Unit B VIII (Fig. 3) and the abutting buttresses found in Building Unit I in Area B. The NE wall of Building Unit I in Area B has a ledge that could have supported a ceiling's beams, a buttress reaching a


**Figure 5: LPPNB Ba´ja reconstructed as a two-storyed settlement, from SW. (reconstruction: M. Kinzel)**

4. Our discussions excluded the possibility that the adjusted wall heights in B22 and the ceiling material on Wall 34 represent just a leveled building ground, which cleared the area for just another single-storey building. The position and levels of the beam supports and of the staircase and Threshold 56 argue for a connection between two storeys, and against the idea that the space between the abutting Buttresses 33 and 55 had nothing to do with the altered concept of the lower stratification (Rooms 2, 4, 5, and 6).

5. Of course, rising-floor structures with intentional room fill are another reason for the excellent preseva-tion tion of wall heights.

6. It has to be stressed that the impressive groundplan of a Basta House should not rule our understanding of the LPPNB architecture of southern Jordan. There must have been considerable diversity in domestic building, and even non-domestic structures is as witnessed in the part of the settlement uncovered in Basta Area A (Nissen, forthcoming).

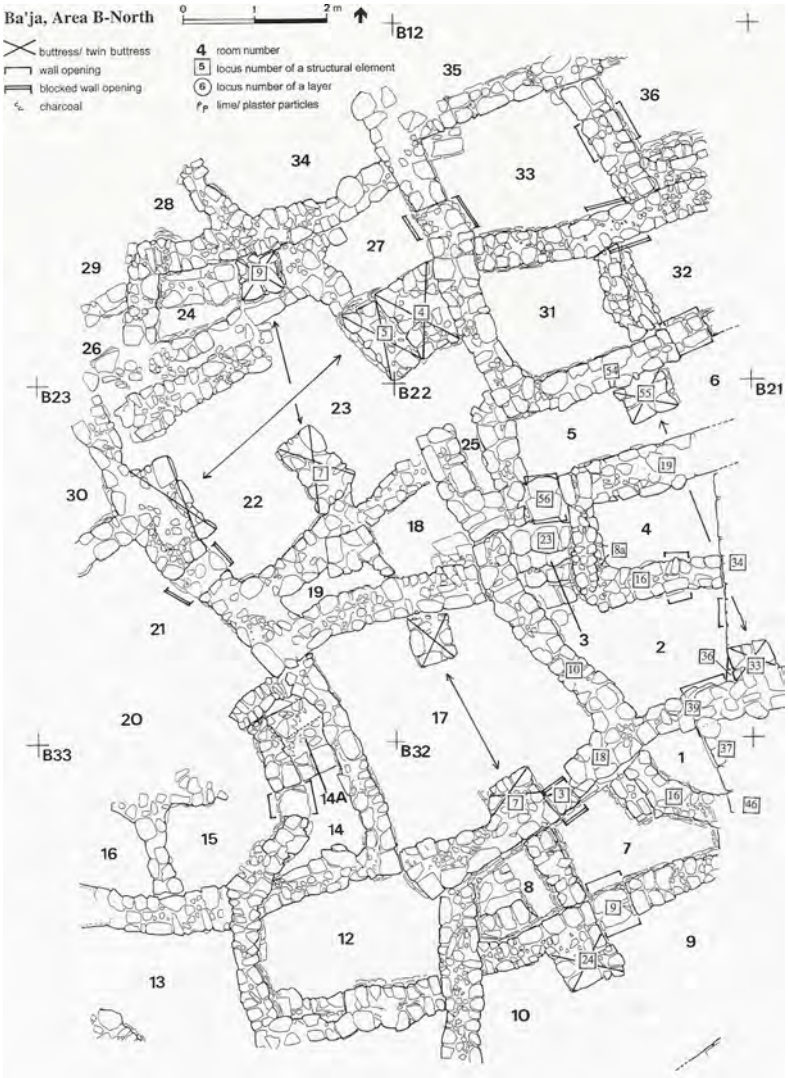
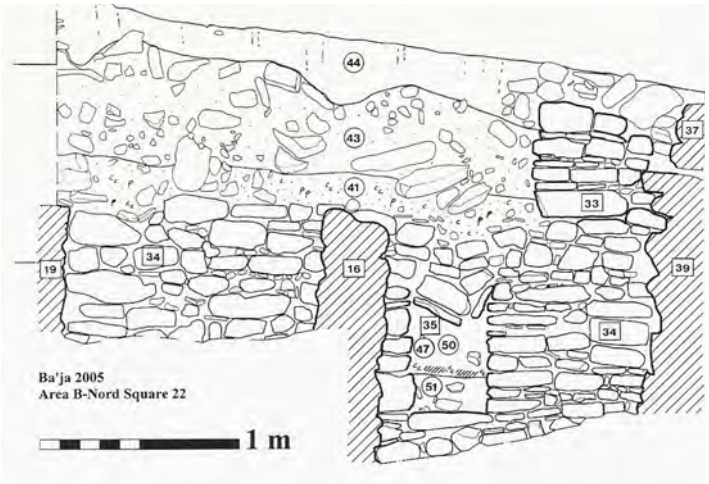



**Figure 6 (above): Ba'ja, Area B-North; Groundplan of domestic, steep-slope architecture.**
**Figure 7 (below): Ba'ja, Area B-North: Part of the eastern sections of B22/32, with evidence for leveled wall heights (Wall 34) and in situ floor/ceiling remains (Layer 41)**

similar height, and an intact room height of ca. 2.1 m (Gebel, Muheisen, Nissen, and Qadi et al. 2004: Fig. 4; Nissen, forthcoming: Fig. 22). Decorated plaster at various heights in the room fill indicates that the material originated in an upper storey. It is not easy to understand why Basta would have single-storey houses while closely similar groundplans at other sites provide more direct evidence for second storeys.




Could it be that the generally larger space occupied by a house in Basta made second storeys unnecessary, or is it simply a matter of shorter house lives in Basta's Area B, of wall preservation, or of room-fill observation during excavation?

## Architectural and Sedimentary Morphodynamics and Definitions

Discussing the complex structural framework in which second storeys were established requires us to consider the following occupational morphodynamics and characteristics of a southern Jordanian LPPNB settlement. These morphodynamics have been studied in detail in Ba'ja but their features are fully or partly present in all other excavated LPPNB sites in southern Jordan.

a. The level of floors (of a basement or ground floor) rose during habitation and led to a building up of the walls, either for specific rooms or for entire room-groups. This could create different (basement or ground-floor) levels within a single house, with ceilings moving upwards and ceiling materials deposited on floors. The different levels were connected by inserted stairs or stairwells.

b. This process in turn affected existing or newly established upper storeys, for which roofs would have been gradually raised, too.

c. At some locations, complete rooms or parts of basements were filled with rubble (or, in cases of groundplan alterations, with selected material from demolished walls). In such cases, traces can be found indicating that a former upper storey was transformed into a basement (see below). An overall rearrangement of the groundplan, namely the insertion of small rooms, accompanied this shift, and often required the blockage of former doors and wall openings or the insertion of new ones.

d. Intra-and extra-mural spaces may have served as dumping areas for wall rubble from which dressed wall stones had been removed. Raised levels of open spaces in the settlement seem to have resulted in shorter doors or blocked doors.

e. Processes a.-d. are jointly responsible for the excellent preservation of the walls' heights in settlements (up to 4.5 m in Ba'ja).

**Figure 8:**
**Ba'ja, Area B-North, Square B22; Girder grillage of Walls 16 and 19, Buttresses 33 and 55, staircase Room 3, and cut-down Wall 34 with *in situ* ceiling Layer 41, from southwest (photo: M. Kinzel)**

Full evidence of true, two-storey LPPNB architecture was recently traced in Ba'ja, Area B-North, Squares B22/32 (Figs. 6-9; Gebel, Hermansen, and Kinzel, in press). Here, a larger, presumably central room[7] of an upper storey was built on top of the leveled room walls of an earlier storey, which itsself appears to have previously been an upper storey that was transformed by this action into a basement. The new, partly eroded, upper room must have rested over Rooms 2, 4, 5, and 6, and unexcavated areas in B21. This storey-shifting shows one of the major building principles attested in Ba'ja (Gebel and Hermansen 2001: 19; see also Cameron 1996a; 1996b; Kidder 1958: 122-124).

The B22/32 finds show that the new upper storey or room was established by cutting back the wall heights underneath the same level, and by inserting or modifying other walls to that level.[4] In the example presented here, the walls were levelled to an altitude of 1167.3 m ASL (Walls 19, 34, and 16 of B22). These walls became load-bearing walls, forming a kind of "girder grillage" for the new floor. Two supports for the new floor's beams could be identified at elevations of 1167.2 m (Locus 8a, running out of Wall 8) and 11167.24 m (Locus 36, below Buttress 33). An additional measure adapting the domestic structure to the new storey was the erection or modification of the stairwell between Walls 8 and 10 (Room 3). Four steps were identified, crossing a height of some 80 cm. The uppermost Step 23 ends at 1166.71 m in front of Wall 19, at a place where Threshold 56 (at 1167,32) occurs. Staircases ending blind in front of a wall are quite common in the terraced steep-slope architecture of the LPPNB, not only in Ba'ja. The evidence we have here suggests that the greater depth of the upper Step 23 helped to create a landing where another small step or ladder would lead up to Threshold 56, crossing the remaining height of some 60 cm.

Thus, the staircases, the supposed small step or ladder of perishable material on Step 23, and Threshold 56 allowed

7. In as-Sifiya, Area C, Squares 9-10, a "central room" surrounded by smaller rooms was discovered in 1997-98. The excavator describes hints of a second storey in a way similar to ours, but seems not to have identified ceiling or roof materials: "There are two small walls projected into the room and intersected with the north wall of this room. Two limestone slabs (two steps) were discovered and located between these two walls, they probably represent part of a stairway leading to the second storey built on top of this central room. Also this central room has a buttress attached to the southern wall and built to support the roof beams." (H. Mahasneh, pers. comm; see also Mahasneh 2003).


**Figure 9: Ba'ja, Area B North, Square B22; Staircase in Room 3, from south (photo: M. Kinzel)**

access to the floor of the upper new room, located between Walls 39, 10, 8, 7, and 54, or between the twin buttresses, 33 and 55, respectively. Further excavations will hopefully clarify whether the stairwell was built before erecting the new upper storey, and previously led to the roof or a roofment of the building, or was attached west of Wall 8 during erection of the new upper floor.

Room 17 (ca. 8-9 $m^2$), with its twin buttresses, may well represent the remains of a yet unexcavated larger room of the last storey that existed in this domestic area. Most likely, a "girder grillage" of leveled walls like those mentioned above will show up in its lower stratification. Like the new upper room between buttresses Loci 33 and 55, it had a stairwell to its west (Room 3). Room 17 also had a stairwell (Room 14a) to the west.

*Reconsideration of the architecture in Area B-North proves the existence of at least three storey transformations in perhaps three buildings.*

Reconsideration of the architecture in Area B-North proves the existence of at least three such storey transformations in perhaps three buildings. The other example appears to exist in Rooms 22/23, where we find a system of altered twin buttresses (Loci 7 and 9, Loci 4/5, and the opposed one in B23).

Buttresses are a common feature in the LPPNB architecture of southern Jordan, as are walls that extended at right angles into the interior of rooms (e.g., Wall 7 in B23). Buttresses do not necessarily have the function of supporting a ceiling's beams (Kinzel, forthcoming). They could simply represent strengthening of long walls or means for subdividing room space. Such wall strengthenings, especially if not executed in the original building plan ("retrofitted buttresses", as Bill Finlayson calls them), are most likely additions to walls that later had to carry the load of another storey. Wherever they appear in pairs in opposed locations, however, we may expect that they were erected to carry the main or central beam of the beam network of a ceiling or floor. At least four such twin-buttress pairs can be identified in Area B-North (marked by arrows in Fig. 6). Buttress 24 in B32 may have had the function of a strengthening buttress, but it may also have served to reduce the span, for which available beams were not long enough to bridge. There do not appear to be any minimum or maximum standard distances between such main beam supports, since these were influenced by available beam lengths (juniper, stone oak, and pistachio were probably available), room sizes, and other spatial and topographical conditions.

LPPNB buttresses usually abut the walls; rarely are they bonded with them. This must be an indication of their secondary or subsequent structural purpose, caused by later static needs (strengthening buttresses), the need for beam supports when erecting a new storey (support buttresses), or both. Some buttresses extend through the storeys, while others were erected when building a new storey (e.g., abutted Buttresses 33 and 55 were founded on top of leveled Wall 34, witnessing their secondary need as a beam supports for the upper storey, Fig. 7).

The distance between Buttresses 33 and 55 (3.4 m) does not lead us to expect that a single beam spanned the supposed large room of the latest upper storey. Possibly we can expect that a central pillar helped shorter beams to span the distance.

Ceiling Layer 41 (Fig. 7) rests on the leveled Wall 34, and is 20-30 cm thick. The height of its base corresponds to the height of the beam supports Loci 8a and 36, the height of a support gap (Locus 40) in Wall 39, and the leveled tops of Walls 16 and 19. Not only the corresponding heights, but also its material let us interpret this Layer 41 as the *in situ* remains of a floor/ceiling between the upper large room with the

twin Buttresses 55 and 33, and Rooms 2, 4, 5, and 6 underneath. The clayish-silty material is a compact and dense mixture of finer sediment with a high content of lime, recycled plaster, and charcoal.

## Summary

If we generalize the evidence from Area B-North in Ba'ja, and consider all information from the other LPPNB sites in southern Jordan, we may hypothesize that the following measures took place whenever a new storey or room association was established in LPPNB steep-slope housing:

1) Cutting back the walls of an existing groundplan (upper storey or ground floor) to a similar height in the area above which the floor(s) of the new storey would be located. The previous groundplan would now represent a basement or groundfloor.

2) Possible insertion of further rooms or walls, creating a cellular layout of this basement that functioned as a girder grillage for the new floor of the new upper storey (or ceiling of the new basement, respectively).

3) Insertion, reuse, or modification of buttresses in the basement or groundfloor to strengthen the walls so that they could support another storey.

4) Building or extension of buttresses in or into the upper storey to support the main beams of the ceiling or strengthen the walls there.

5) Modification of walls in the girder grillage of the ground floor to create beam supports, where necessary (gap supports, wall supports).

6) Insertion or modification of staircases, stairwells, or ladder spaces to provide access between the storeys or to the roof.

7) Reorganization of room connections by blocking (or inserting?) wall openings (passages, window-like openings) in the new basement or groundfloor.

Observations in Ba'ja also hint that LPPNB basements or groundfloors were intentionally filled, and that the former upper storey became a basement by adding a new storey above it. At this time, another episode of groundplan alterations included insertions of stairs, walls, windows, buttresses to support planned upper storey features, and closing of windows and passages. The complexity of architectural events in this process results from the fact that the various building measures could happen in one building at different levels or on terraces. If we assume that the latest upper storey is always eroded away, steep-slope stratigraphies like those in Ba'ja should contain mainly superimposed basements and only rarely fragments of upper storeys.

*Observations in Ba'ja also hint that LPPNB basements or groundfloors were intentionally filled, and that the former upper storey became a basement by adding a new storey above it.*

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# *Megasites in the Jordanian Pre-Pottery Neolithic B Evidence for 'Proto-Urbanism'?*

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In recent years, the phenomenon of "megasites" in the Late Pre-Pottery Neolithic B (PPNB ca. 7500-7000 cal BC) in Jordan has received considerable attention from prehistorians (e.g., Bienert 2001; Gebel 1997; Hole 2000; Kuijt 2000; Rollefson 1998; Simmons 2000).[1] Megasites are large sites, up to 12 ha, predominantly located in the mountainous area east of the Jordan rift valley. From north to south the megasites are (fig. 1): Beisamoun (in Israel: Lechevallier 1978), Abu Suwwan (Simmons et al. 1988), Wadi Shu'aib (Simmons et al. 2001), Kharaysin (Edwards and Thorpe 1986), 'Ain Ghazal (Rollefson 1997; Rollefson et al. 1992), es-Sifiya (Mahashneh 1997), al-Baseet (Fino, 1998), Basta (Nissen 1990) and 'Ain Jammam (Waheeb and Fino 1997).

Simmons (1995: 119-120; 2000: 215-216) has noted the following general characteristics of megasites:

1. They are all large, mostly > 9 ha.
2. Many of the sites are located in or adjacent to relatively marginal ecological zones (desert edges).
3. The sites became established in most of the major wadi systems, often near springs.
4. The cultural deposits are generally not as thick as at tells.
5. Pre-Pottery Neolithic A occupation seems to be absent, and the PPNB deposits date from the middle to late range of that period.
6. They appear to have been abandoned after the PPNB period.

Megasites played an important role in some of the discussions at the Domesticating Space conference. In this contribution I shall address the problematic nature of many current interpretations with regard to these large and intriguing sites.[2]

## Site and excavation areas

Table 1 shows that the megasites generally range in size from 7 to 12 ha. It furthermore appears that relatively very small portions of the megasites have been excavated, ranging from around 2% at 'Ain Ghazal to only 0.037% of the total surface area at Wadi Shu'aib and al-Baseet. It follows that at least 98% of the various megasites remains unexcavated.

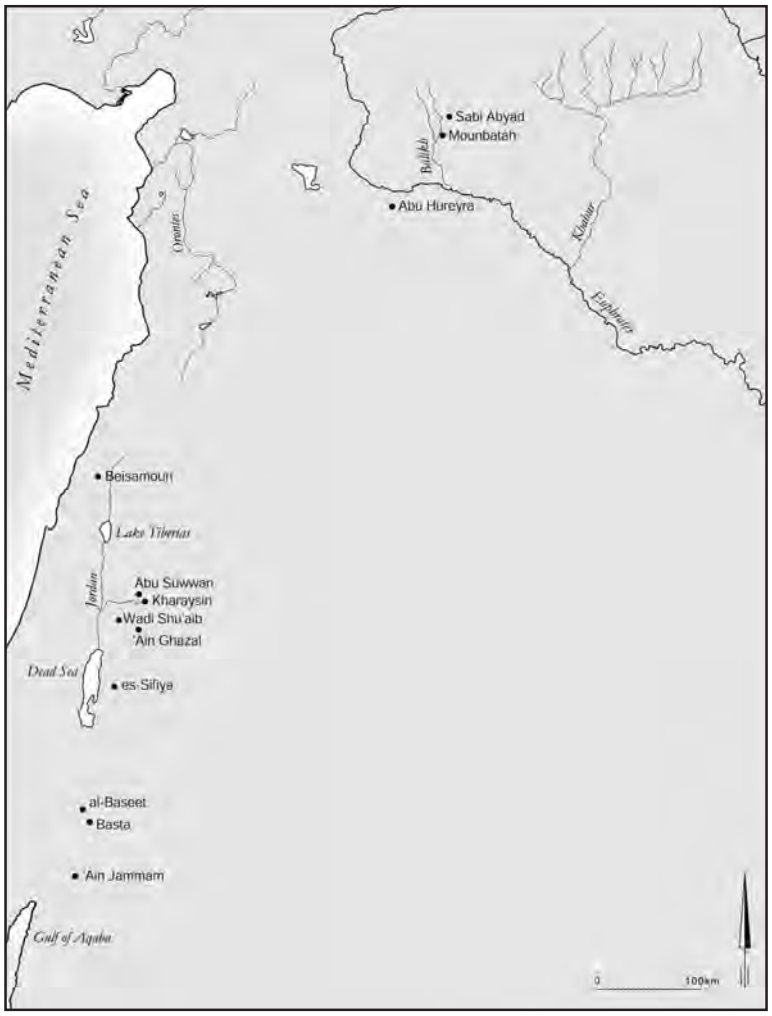


**Figure 1: Location of Neolithic sites mentioned in the text**

## Population estimates

Megasites have figured prominently in many articles dealing with, among other things, Late PPNB population numbers.

1. See also *Neolithics* 2/97, an issue devoted to the symposium *Central Settlements in Neolithic Jordan*.
2. This article focuses on the Jordanian megasites, but it is also relevant for the interpretation of other large sites, such as PPNB Abu Hureyra (approximately 12 ha) in Syria (Moore et al. 2000).

*It can be argued that, instead of constant occupation density in all areas of the site, occupation shifted from one area to another in the course of time. Ultimately, this resulted in a large occupied area, a megasite.*

| Megasite | Surface area (ha) | Excavated area (m²) | Excavated area (%) |
|---|---|---|---|
| Beisamoun[3] | 10 | 576 | 0.57 |
| Abu Suwwan[4] | ? | ? | ? |
| Wadi Shu'aib | 9 | 34 | 0.037 |
| Kharaysin[5] | 36 | 0 | 0 |
| 'Ain Ghazal | 12 | 2355 | 1.96 |
| es-Sifiya | 7 | 140 | 0.2 |
| al-Baseet | 7.5 | 28 | 0.037 |
| Basta | 10 | 1000 | 1 |
| 'Ain Jammam[6] | 7 | 400 | 0.57? |

**Table 1. Estimated surface areas and excavation areas of megasites.[7]**

3. At Beisamoun many structures (walls) were visible at the surface: the figure of 576 m² represents the area of detailed surface mapping: sections a and b in 'bassin' 10, and sections c and d in 'bassin' 2. Within these sections only very small portions have been excavated (Lechevallier 1978: 125-145).
4. It is reported that Abu Suwwan is a major and large site, but its actual size is not mentioned. In 1955 Kirkbride excavated a small sounding to a depth of around 1.5 m at the site (Simmons 1995; Simmons et al. 1988).
5. Most likely the 36 ha distribution of artefacts at Kharaysin reflects erosion and deflation (Edwards & Thorpe 1986).
6. As yet, no plans have been published of 'Ain Jammam.
7. The estimated areas are based on Bar-Yosef and Belfer-Cohen 1989; Edwards and Thorpe 1986; Fino 1998; Kuijt 2000; Lechevallier 1978; Mahasneh 1997; Nissen 1990; Nissen et al. 1987, 1988; Rollefson pers. comm.; Simmons et al, 1988; Simmons et al. 2001; Waheeb and Fino 1997.

Generally, large aggregations and high densities of people are assumed (e.g., Banning 1998; Bar-Yosef and Belfer-Cohen 1989; Bienert 2001; Kuijt 2000; Rollefson and Rollefson 1989; Simmons 2000). For instance, for 'Ain Ghazal, maximum population levels of 3528 (Kuijt 2000: 81) and 3775 (Rollefson and Rollefson 1989: 76) have been estimated. For Basta a number of 4116 is suggested (Kuijt 2000: 81). Generally, scholars speak of thousands of people, hence use of the term 'proto-urbanism' (e.g., Bienert 2001; Gebel 1997). The population estimates in these studies seem to be based on site size, relying on three critical assumptions (e.g., Kuijt 2000: 81):

1. The type and density of the structures (houses?) in excavated areas are representative of the site as a whole.
2. The horizontal extent of cultural materials for each site is representative of the actual extent of the site while occupied.
3. The occupation density is constant in all areas of the site.

## Problems of population estimates

In the following, I will argue that the above assumptions are quite problematic, focussing on three main problems.[8]

### Representativity of excavations

The various excavations, especially those at 'Ain Ghazal, have had important results and have considerably expanded our knowledge of PPNB society, economy and technology. As indicated by the basic figures presented in table 1, however, these excavations cannot be held to be representative of the entire megasite. For one thing, this leads to an underestimation of open areas.

### Occupation density

It can be argued that, instead of constant occupation density in all areas of the site, occupation shifted from one area to another in the course of time. Ultimately, this resulted in a large occupied area, a megasite. Thus, the site as we see it today may never have been entirely covered with architecture and populated at one point in time.

Using evidence from an area with which I am well-acquainted, the pattern of shifting occupation seems to hold for many Neolithic tells in the Balikh valley in northern Syria. Today the Neolithic tells of Sabi Abyad I and Mounbatah, for instance, appear as sites of 4 ha and 30 ha respectively. Detailed survey at Mounbatah (Akkermans 1993: 151-153) and excavations at Sabi Abyad I (Verhoeven and Kranendonk 1996), however, have revealed that occupation shifted from one area to another in the course of time. Each of these sites originally consisted of a number of smaller settlements that, through processes of tell formation and erosion, have merged

in the course of time. Archaeologists, therefore, should make a clear distinction between *site* and *settlement*.

### Year-round occupation

Neolithic settlements were not necessarily occupied all year round, as seems to be assumed in most discussions of megasites. With respect to this, I would like to present some more data from the Balikh valley. On the basis of a detailed study of the function and distribution of hundreds of clay sealings at Sabi Abyad I, Akkermans and Duistermaat (1997) have suggested that the population at the site was not composed entirely of permanent residents, but had a considerable mobile or transhumant component, which made use of the site for specific purposes at specific times. Most likely, these 'nomads' comprised entire families since, as noted above, we seem to be dealing with particular social groups. These non-residential groups mainly relied on a pastoralist mode of subsistence in the Balikh valley and neighbouring areas. At the same time, they must have been closely associated with the sedentary populations at the various sites, which relied on cultivation. The dichotomy between nomads and residents was probably weak, and both groups may have changed places easily (Verhoeven 1999).

There are also a number of ethnographic observations regarding seasonality of occupation in the Near East. Köhler-Rollefson (1987) has observed that the Marrai'e of the Huweitat tribe in Jordan, who combined pastoral and agricultural subsistence activities, had three main patterns of residence, which were directly related to subsistence modes. First, there are people who have permanent houses in villages. Second, other families only live in the village for part of the year. These families keep medium-sized herds of sheep and goats, and usually stay in the village in spring, when grazing is possible on the fallow fields. Third, there are the families who own large herds and who live in tents throughout the year. About every month tents are relocated. Virtually the entire family is engaged in herding and related activities. Köhler-Rollefson (1987: 526) has noted that "Although these families are permanent tent dwellers, many of them own houses in the village simply to use these for storage (of grain, animal food, wool, tools) or to get access to tap water". In fact, about 40% of the buildings in the village of Suweimrah are owned by these year-round nomads. These structures are never inhabited, and are used for storage only. Circa 20% of the houses are only occupied during certain times of the year, mainly in the summer. The remaining 40% of the buildings are occupied throughout the year, but near many of these houses tents are set up, which are primarily used for relaxation and entertaining the men.

As Bar-Yosef and Belfer-Cohen (1989: 60) note, "... the range between fully nomadic and fully sedentary lifestyles includes many different forms and combinations, and it is the archaeologist's task to demonstrate for each case studied the way of life that was practiced by that society at a given archaeological period".

## Building a house of cards?

It thus seems that the population estimates related to megasites are founded on a rather weak basis. Yet, these estimates figure prominently in important topics regarding Late PPNB society, which have been listed below. The most important of these issues are related to 'proto-urbanism'.

*It thus seems that population estimates related to megasites are founded on a rather weak basis. Yet these estimates figure prominently in basic models and hypotheses regarding Late PPNB society. The most important of these are related to 'proto-urbanism'.*

### Centre-periphery models

The existence of very large sites on the one hand and smaller sites on the other hand suggests dependent relationships. Perhaps some sort of centralized redistribution based on trade goods and economic surplus was developed. However, since small sites are rarely investigated, the Neolithic human geography of Jordan is as yet obscure (Rollefson 1998: 114; Simmons 2001: 145). Hole (2000) concludes that, to date, despite gross differences in size and construction, there is no convincing evidence that any PPNB site served as a political or economic centre.[9]

### Population aggregation, social crowding and architecture

Kuijt (2000), among others, argues that the megasite communities of several thousand people lived in densely packed residential structures covering areas between 10 and 14 ha. According to Kuijt (2000: 87-88), two strategies

8. Although I am critical of many interpretations related to large population numbers at PPNB megasites, I would like to stress that I regard the various contributions used here (especially those of Kuijt, Rollefson, Simmons and Gebel) as pioneering, innovative and valuable!

*However elegant and logical some of these models may appear, they are mainly based on quite speculative population estimates. It is beyond doubt that there were very large sites in the Late PPNB, but as yet it is not clear whether these megasites were occupied over their entire surfaces.*

adopted in response to increased population levels and control of food resources were the development of two-storey structures and the compartmentalization of buildings.

### Social differentiation

In view of the postulated large population numbers, one would expect some degree of social segmentation, a hierarchical division of power and authority. So far there is no evidence for this. Instead, the megasite community members seemed to have displayed limited social differentiation in mortuary practices and residential architecture (Kuijt 2000; Simmons 2000).

### Ritual

It is generally assumed that marked evidence for symbolism in the Middle and Late PPNB, such as 'temples', deposits of plastered human skulls and large plastered anthropomorphic statues (Verhoeven 2002), is indicative of rituals that mainly served to create community cohesion in order to counterbalance social stress due to living in large aggregations (see the various contributions in Kuijt, ed., 2000).

### Depletion of natural resources

A number of scholars, most notably Rollefson and Rollefson (1989) and Simmons (1997, 2000), have argued for human-induced ecological degradation in the Late PPNB (but see Gebel 2002). In their view, the large Jordanian sites, located in ecologically fragile zones, were initially adaptive in population increase and pooling of scarce resources, but eventually depleted the environment. For instance, with regard to 'Ain Ghazal, Rollefson and Rollefson (1989: 79) estimate that consumption for construction eventually stripped more than 2000 ha around the site of trees. It is thought that these developments occurred against the back-drop of a steadily deteriorating climate.

### Site desertion and nomadic pastoralism

In the end, the failure to establish a social hierarchy in the face of rapid changes in economic systems, increasing aggregation of people into communities and environmental degradation resulted in the collapse of the megasite communities, the abandonment of the sites, and an increase in pastoral activity (e.g., Kuijt 2000: 98; Simmons 1997: 312).

## Conclusion

The various models and hypotheses just presented deal with crucial issues of Late PPNB society. These contributions are both important and influential. However elegant and logical some of these models may appear, they are mainly based on quite speculative population estimates. It is beyond doubt that there were very large sites in the Late PPNB, but as yet it is not clear whether these megasites were occupied over their entire surfaces. As a result, we should not assume at the moment that the megasites were the homes of thousands of people, who lived there on a year-round basis. Archaeologists should make a clear distinction between *sites* and *settlements*. Much more work needs to be done in order to create a sound empirical basis with regard to 'proto-urbanism'. Evidently, full-scale excavation of megasites sites is virtually impossible. However, they might be more thoroughly investigated by a combination of techniques, such as:

1. detailed contour mapping of artefact distributions;
2. geophysical survey;
3. small-scale but extensive excavation probes;
4. large-scale excavations of contiguous areas.

These approaches may be a first means to come to grips with the chronological and architectural relationships, and eventually the people inhabiting the intriguing megasites.

## Acknowledgements

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9. See also various contributions in Neo-Lithics 2/97 and Hole 2003.

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# *Domestic Activities at the Neolithic Site, 'Ain Ghazal*

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As the largest Neolithic site excavated in the Near East, 'Ain Ghazal provides a wealth of evidence for the spatial organization of activities from the Middle PPNB to the Yarmoukian period. Since 1982, an international team of archaeologists has conducted 12 seasons of excavations at the site. These show that the site began as a small hamlet about 8200 cal BC, then grew steadily and rapidly for some two millennia. This paper will present evidence for the domestic activities that took place in both closed and open areas, and possible implications of changes in the spatial distribution of activities for our understanding of social organization among 'Ain Ghazal's inhabitants.

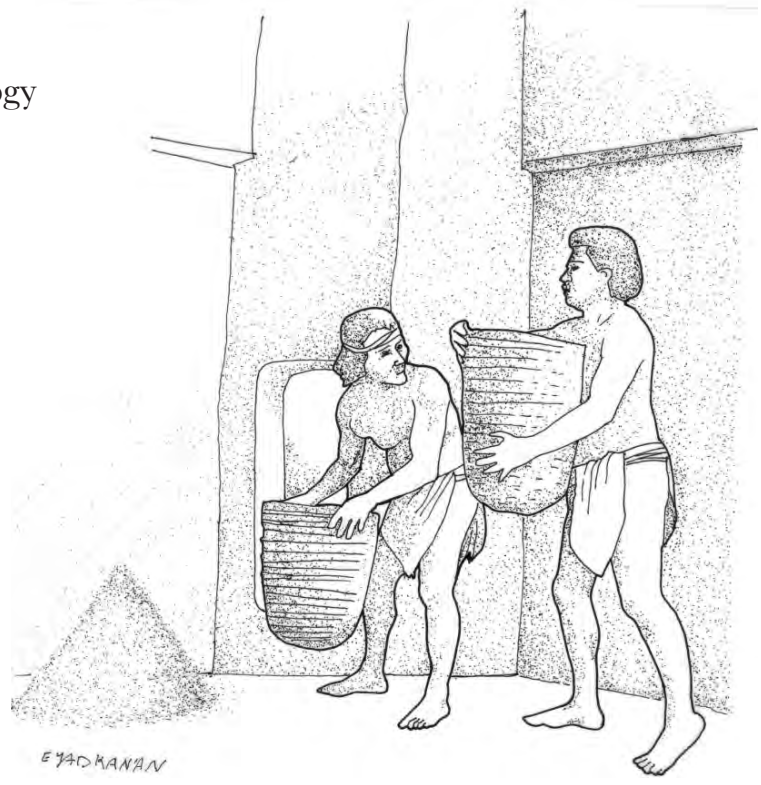


**Figure 1:**
**Large quantities of peas, lentils and smaller amounts of barley were presumably stored in baskets or bags**

## Introduction

The Neolithic witnessed one of the most significant transformations in human history: the beginning and spread of agriculture, and the establishment of permanent settlements with solid structures, construction of ritual buildings, production of human statues and figurines of both humans and animals, development of new burial customs, long-distance exchange in raw materials, and the invention of plaster and pottery. These changes took place over a span of some four thousand years, and provide numerous opportunities for studying some of the less substantial aspects of human life in this period. In this paper, I examine the domestic activities associated with these changes, and their distribution among indoor and outdoor spaces, at the Neolithic site of 'Ain Ghazal in Jordan.

Why 'Ain Ghazal? The answer is that this site served as a central place for more than 2,500 years and its excavated material culture reflects many human activities and practices.

The excavated Middle PPNB levels at 'Ain Ghazal show that most, if not all, domestic activities were carried out indoors. Each house consisted of a single room that measured about 5 m x 5 m, suggests very small coresidential groups.

It also appearss that people did not feel secure to leave their property outside their houses. The MPPNB houses were erected next to one another on terraces and there were no courtyard walls separating one family's property or domestic area from that of its neighbours. As we will see, there was a shift over time toward conducting more and more activities outdoors. To construct their houses, the Yarmoukians of 'Ain Ghazal maintained the terrace system originally started in the Middle PPNB. On each terrace there were open areas in which several activities were practiced. There were also walls and courtyards that appear to have separated the activities of different households.

*During the earliest period of occupation at 'Ain Ghazal, the inhabitants dwelt in a single room and the storage facilities were limited.*

## Basic Domestic Tasks

### Storage

During the earliest period of occupation at 'Ain Ghazal — the Middle PPNB (ca. 8000 to 7500 cal BC) — its inhabitants occupied single room houses and storage facilities were limited. Archaeological excavations in the MPPNB levels did not expose any exterior storage pits (Rollefson 1997: 288). However, a storage pit was excavated in the corner of one of the rooms (Rollefson and Simmons 1986: figure 11). Moreover,

*During the LPPNB, the exposed domestic architectural remains showed that the houses were two-floor buildings built on terraces.*

large quantities of peas, lentils, and smaller amounts of barley were found, perhaps originally stored in baskets or bags, in the corner of one room (figure 1) that had been separated from the rest by a line of stones (Rollefson and Simmons 1986: 152, figure 9).

During the Late PPNB (ca. 7500-7000 cal BC), the exposed domestic architectural remains show that houses were two-story buildings built on terraces. In the North Field of 'Ain Ghazal, houses of two floors had several small rooms, which may have reached 12 in number on the ground floor alone (figure 2). Some of these rooms were used for storage purposes. In one of the rooms, thousands of lentils and peas, in addition to 13 gazelle horns, were found (figures 3a and 3b). These may have been in a storeroom on the upper floor before a fire destroyed the building, causing the charred seeds to fall into the room below.

Another type of indoor storage facility was a curved structure annexed to the Late PPNB building excavated in the East Field (figure 4a). Such structures are first found at 'Ain Ghazal during the Late PPNB and continued through the Yarmoukian. In the Late PPNB, a semi-subterranean feature was attached to the southeastern side of one of the ritual buildings in the East Field (figure 4b). This installation is elliptical in shape, measures about 2 m x 1.5 m, and was dug into basal clay. Rollefson (1997: 298) argues that the fill from this feature may have been used to cover a river-cobble pavement on the floor of the eastern room of the "temple." In my view, the location and the way the elliptical installation was constructed suggest

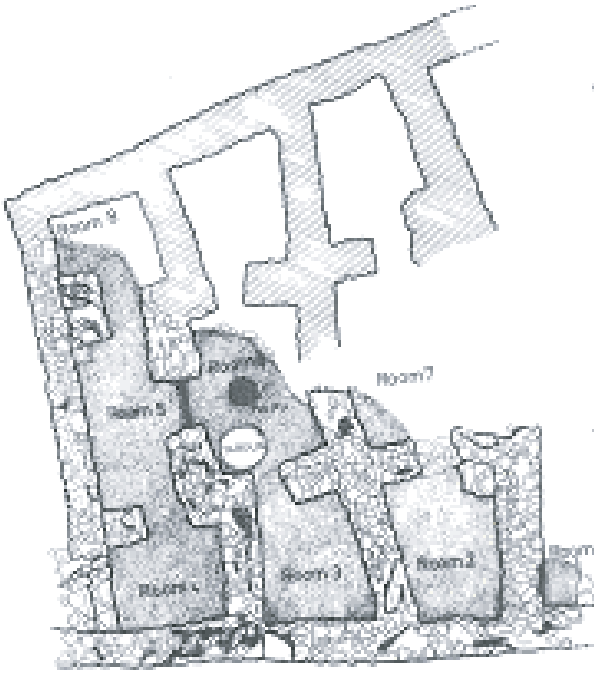


**Figure 2: Late PPNB two-storey building in north field of 'Ain Ghazal**

that it may have also been used for storage purposes. This type of construction, annexed to the outer wall of another building, was also practiced during the Yarmoukian phase at the site. A good example is the three-room house, where a curved wall was added to the southern side of the building (figure 5).

Also in the North Field, and outside the southwest corner of the large terraced Late PPNB house, was a lime-plastered surface that sloped towards a lime-plastered, cylindrical basin that was about a half-metre deep and some 40 cm in diameter (Rollefson and Kafafi 1996: 14; figure 4). This feature may have been made to collect and store drinking water.

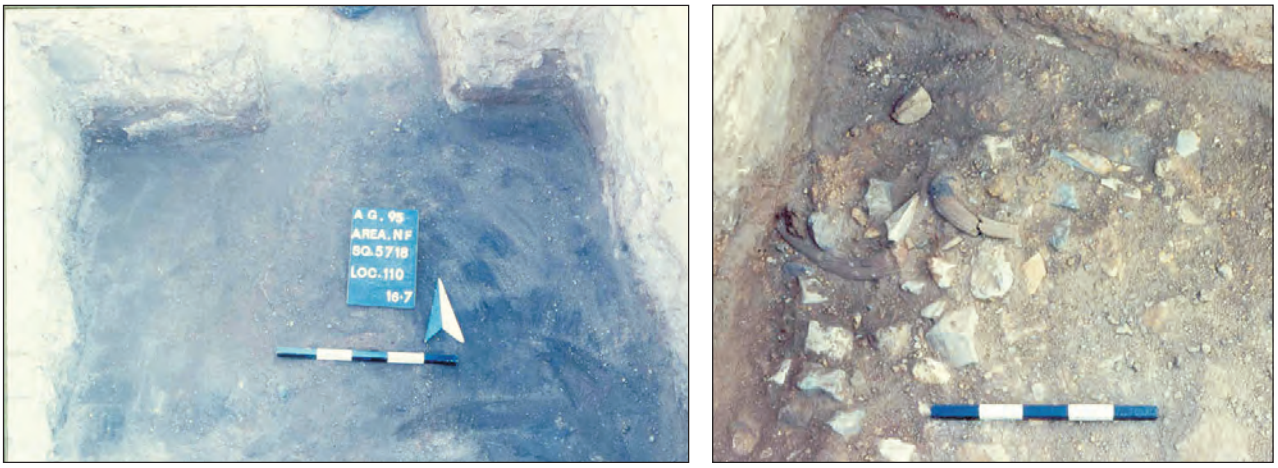


**Figure 3a, 3b : Gazelle horns and other debris fallen into the lower room of the two-storey building.**

**Figure 4a: Curvilinear torage feature in LPPNB building in the East Field**

**Figure 4b: A LPPNB ritual building in the East Field**

During the PPNC (ca. 7000-6600 cal BC), the inhabitants of 'Ain Ghazal constructed several types of storage facilities. First, people who lived in two-storey corridor houses, like the one in the South Field, may have stored their crops or products in small cells on the ground floor. Second, several pits dug in PPNC levels in the Central Field may have been used for storage. However, no traces of stored material were found inside those pits.

To store goods, the Yarmoukians at 'Ain Ghazal built spaces adjacent to their houses, dug pits, and perhaps used ceramic jars. As noted already above, the three-room building in Central Field has a semi-circular addition that may be a storage feature. A platform area associated with Yarmoukian food preparation in the Central Field contained what appears to be a large storage jar. Another large jar that was found largely intact in Yarmoukian levels in square 4452 of the South Field in 1984 may also have been for storage.

**Figure 5: Yarmoukian three-room house in the Central Field**

### Food Preparation

Grinding implements provide the main evidence for aspects of food preparation that preceded cooking. Considering the volume of the excavated areas at the site of 'Ain Ghazal, the number of grinding stones is somewhat low as compared, for example, with Beidha or Basta. However, the pounding and grinding implements found at the site, such as mullers, querns, pestles, and rubbing stones, indicate that the processing of cereal grains continued to be an important part of the daily routine throughout the PPNB and Yarmoukain periods (Rollefson et al. 1989: table 7).

In the 1982 season, a work area was found in a semi-circular, walled area just outside the doorway of a MPPNB house

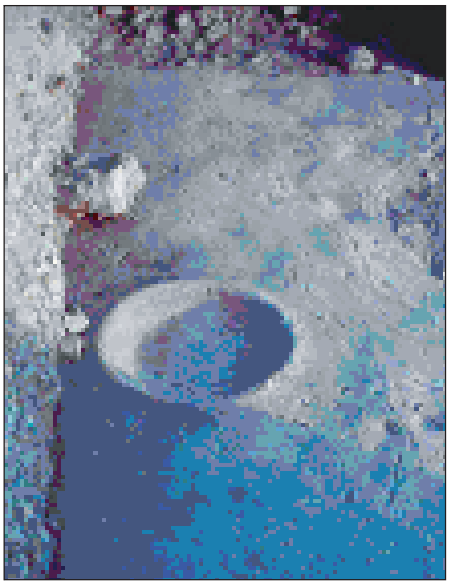

**Figure 6: Raised hearth on the plaster floor of a MPPNB building**

*To construct their houses, the Yarmoukians of 'Ain Ghazal maintained the terrace system originally started in the Middle PPNB period, and on each terraces there were open areas in which several activities were practiced.*


**Figure 7: Stone-lined Yarmoukian feature that perhaps served to segregate young livestock**

in Square 3083. Here several milling stones were found abandoned on the floor, suggesting that someone had been using the well-lit area in the doorway to grind some cereals (Banning and Byrd 1987: 305).

In the 1993 and 1994 seasons, four sub-rectangular, platform-like features were excavated in Yarmoukian levels in the Central Field. Each measures approximately 2 m x 1.5 and they may have been used for food preparation, including both grinding of grain and cooking. One of them (figure 7) was elliptical in shape and its interior contained a large storage jar, two grinding slabs, and an area set as a hearth (Kafafi and Rollefson 1995: 16). These platforms were built in open areas outside the houses.

### Cooking

Fireplaces and hearths are the principal evidence for cooking at 'Ain Ghazal.

During the Middle PPNB, hearths were built in the centre of the single-room houses (figure 6). These hearths may have been used for cooking, although most show no traces of fire. Some, like a hearth in Square 3083, were filled with fine ash, but combustion had been too thorough to leave any carbonized food remains.

Hearths built in the floors of the two-story building in the North Field were close to a tabûn, providing two sources of evidence for cooking as one of the indoor activities of the site's Late PPNB inhabitants. In the Central Field, a single-room house attributed to the PPNC was connected by a doorway, with a small courtyard that contained fireplaces and milling areas.

### Heating

Hearths and fireplaces were encountered in almost all levels at 'Ain Ghazal. In addition to their possible use in cooking, the indoor hearths presumably contributed heating during the cold, damp winter months.

During the Middle PPNB, hearths were built up in plaster in the centre of house floors (figure 6; Banning and Byrd 1987: 310, 314) but no traces of outdoor hearths or fireplaces have been found on surfaces dated to this period. In one case in the Central Field, a renovation to a house left the hearth in a niche against the west wall, which probably constituted a fireplace with chimney (Banning and Byrd 1987: 318).

In the step trench excavated in the East Field, one thin wall in a Late PPNB courtyard was exposed. It appears to have served as a screen to protect several outdoor hearths from wind (Rollefson and Kafafi 1996).The excavated PPNC levels in the North Field have yielded fireplaces built into the floors of open places.

### Keeping Livestock

Flimsy circular structures dated to the latest phase of the Yarmoukian, and perhaps built by people who lived temporarily at 'Ain Ghazal, have been found. A feature 4.5 m in diameter that was excavated in 1993 (Rollefson and Kafafi 1994: figure 7) was built of one row of small stones that may have constituted the foundations of a tent or a pen to enclose animals. Unfortunately, we have no associated evidence that might have shown what activities took place here.

## Industrial Activities

Industrial activities at 'Ain Ghazal, in all periods, were closely associated with domestic structures, suggesting that they

were domestic crafts. However, they varied over time in their association with the interior or exterior of houses.

### Plaster Production

As is well known, Middle and Late PPNB houses routinely had plastered floors. Several scholars (Gourdin and Kingery 1975; Rollefson and Kohler-Rollefson 1989) have discussed the manufacture of plaster floors. Lime plaster was the dominant material used during the Middle and Late PPNB in the southern Levant, while the Yarmoukians used *huwwar* (which contains both lime and clay) during the seventh millennium cal BC.

In Square 3081 of the Central Field, a probable lime kiln was exavated in 1983. This consisted of a pit about a metre in diameter, filled with ash, bits of charcoal, lime, and burned chunks of limestone, connected to a shallow trench toward the north that probably served to allow fuel and air to feed the fire (Banning pers. comm.)

A number of Late PPNB fire pits in the North Field are of uncertain function, but could be associated with plaster production (see below).

During the 1989 season of excavations in the Central Field, three round installations were exposed in the PPNC levels. These were made of stones and, like the pit just mentioned, contained lime powder, while the area surrounding them was full of ash. This suggests that burning limestone for plaster production took place on a small scale in open areas between houses during the PPNC.

### Flintknapping

Quintero (1996: 233-242) has discussed the first Jordanian Neolithic mine discovered near the site of 'Ain Ghazal. She claims that this flint quarry was the source of the mysterious pink-purple flint that PPNB knappers used for naviform-core production. She adds that the data support the existence of craft specialization and the local production of tools at 'Ain Ghazal. In fact, there is some evidence for knapping areas at 'Ain Ghazal.

A knapping place in the East Field is dated to the Late PPNB. A concentration of adzes and burin spalls on an outdoor surface just outside a Yarmoukian house in the South Field, excavated in 1988, quite likely represents a knapping area for one or more tool-makers who specialized in production of adzes and burins (Banning pers. comm.).

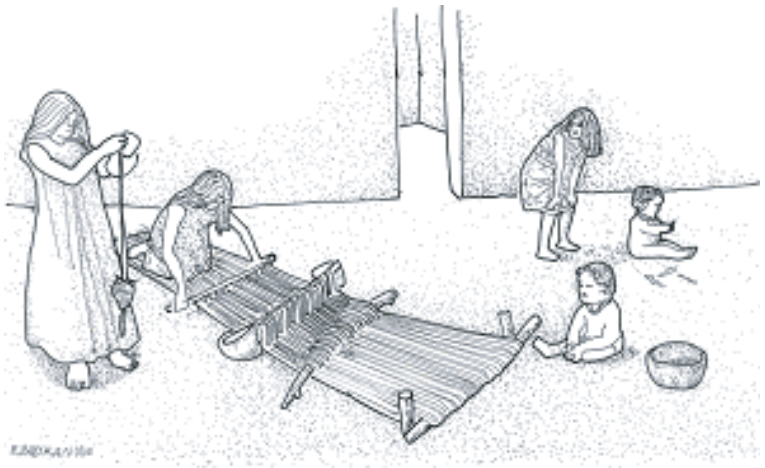

**Figure 8a: Reconstruction of spinning and weaving on a loom**


**Figure 8b: Grinding stones and perforated disks, probably spindle whorls in a Yarmoukian building in the South Field**

### Spinning and Weaving

Textile production was undoubtedly an important domestic industry at 'Ain Ghazal. Spinning and weaving were probably practiced as early as the first occupation.

Stone whorl-like objects, about 5 cm in diameter, that could easily have been mounted on spindles for spinning, and heavy, perforated pieces that could be weights for looms, have been found in a variety of contexts (Rollefson et al. 1989: 15; tables 10-11).

In the South Field, a Yarmoukian rectangular building consisting of two rooms or a room and a courtyard was built directly over a PPNC corridor building. Directly on the floor of the eastern room or courtyard were several apparent spindle whorls and grinding stones, likely associated with textile production (figure 8b).


**Figure 9: A Late PPNB, stone-lined fire pit in the North Field**

In the western part of the building, a rectangular platform or bench some 35 cm high and 80 cm wide (Rollefson et al. 1989) is of uncertain function, but could also have been associated with this activity. Basketry must have been made by the people of 'Ain Ghazal, although we have no evidence for the location of this craft at the site.

### Other Industrial Installations

At 'Ain Ghazal, several large areas exposed over most of the site have shown that they might have been used for industrial activities of some kind. Apart from those plausibly associated with production of plaster, textiles, or stone tools, a number are of quite uncertain function.

In the North Field, numerous large Late PPNB fire pits (figure 9) were built of stones inside a walled courtyard that was characterized by a dense distribution of fire-cracked rocks, as well as large flakes and shatter of limestone, and chert of poor quality (Kafafi and Rollefson 1995). The excavators have raised the question of what was being burned or treated inside those pits, but the absence of other burned material has frustrated attempts at an answer. However, this courtyard is near the cellular house and curvilinear ritual structure, and it is important to note that a huge amount of shattered limestone was encountered within the latter structure. It could thus be argued that the pits were for plaster production (see above), keeping in mind that the floor of this likely ritual building was replastered at least eight times. Alternatively, the large quantity of fire-cracked rock could have resulted from food preparation by stone-boiling (Banning pers. comm.) on a large scale, again, perhaps in association with ritual activities in the nearby curvilinear structure.

## Leisure Activities

Aside from hearths, that probably served in part as foci for social and leisure activities throughout 'Ain Ghazal's occupation, a number of features suggest that people took their leisure inside or outside houses.

Courtyards were evidently common during the Yarmoukian period at 'Ain Ghazal (see also Garfinkel, this volume). Within these areas, the presence of regularly-spaced postholes indicates the use of a ramada-like shade structure (*arisha* in Arabic)(Kafafi and Rollefson 1995: 16; Kafafi et al. 1990: 14). Although we cannot by any means be certain of the function of this place, we can propose that, during free times and especially in summer, people used to gather under this shade structure to converse and, perhaps, to play an early version of the game, *Manqala*. A limestone game board (figure 10) with several cup-holes in an arrangement closely similar to that of modern *Manqala* was found in the PPNC levels in the South Field (Kafafi et al. 1990: 23).

## Other Activities

Undoubtedly other domestic activities were practiced at 'Ain Ghazal for which we as yet have no direct evidence. However, the production and use of art objects, such as statues and figurines, deserve specific mention and provide some evidence for possible ritual or ideological activities (cf. Garfinkel and Miller 2002). For the present, no evidence is available to show that these objects were made on-site, in contrast to the evidence that Middle and Late PPNB inhabitants of 'Ain Ghazal painted the floors and sometimes the walls of their houses with red-brown colours and patterns. Before applying these paints, they would have had to prepare them somewhere, either indoors or outdoors (figure 11) but, unfortunately, the excavated evidence does not help us envisage the place of this activity. The plaster statues and busts from the site have been found in caches, not in their use-contexts, but their size suggests that they might have been used in outdoor, public contexts in the Middle PPNB (Schmandt-Besserat

**Figure 10: Reconstruction of a game similar to Manqala in the PPNC levels of the South Field**

1998). The much smaller figurines of people and animals have been found in a variety of domestic contexts, both indoors and outdoors. Comparable figurines of the Yarmoukian period at Sha'ar Hagolan were frequently concentrated in domestic courtyards, suggesting an outdoor, but still family-centred, use. McAdam (1997) has suggested that figurines at 'Ain Ghazal might have been used in domestic magic practices that often included the "killing" of the figurine.

## Discussion

Tangible evidence for human activities allows us to explore changes in social organization at different scales. In fact, it is only during the past two decades that archaeologists have begun to shed light on the social context of Neolithic life in the Near East. These studies mainly focus on households, economy, and social life (e.g., Byrd 1999: 63-92; Kuijt 1999: 311) and follow on efforts that had concentrated on understanding the origin of agriculture and the economic changes from one sub-period of the Neolithic to another. More recently, scholars have tried to envision the social practices that highlight elements of social differentiation and egalitarianism in Neolithic communities, and the distribution of activities in space provides one source of evidence for these changing practices.

'Ain Ghazal provides an excellent example with which to study and understand these changes. It was occupied for more than 2000 years and has yielded a large volume of information that allows us to envisage social changes there. Among these aspects are indoor and outdoor activities of the site's inhabitants. In my view, we may combine the activities discussed above with evidence for the architectural, economic, and technological changes to draw a clear picture of the social structure found at this site from around 8000 to 6000 cal BC. We might summarize these changes as follows.

1) During the Middle PPNB, there is much evidence for the practice of all kinds of activities indoors. People stored, cooked, spun, and buried their dead inside their houses. Houses were tightly packed with no large outdoor spaces to separate them (Banning and Byrd 1987; Byrd and Banning 1988). However, this does not exclude the possibility that the Middle PPNB people practiced some activities outdoors. For example, preparing plaster for the floors has to take place outside and, as Verhoeven notes (this volume), limited excavations at Neolithic sites have probably missed considerable open areas.

Does such a pattern of activity organization, with most activities apparently taking place indoors, indicate that nuclear families were the predominant social unit, as Flannery (1972) proposed? Control over storage and consumption of foods within small households would be consistent with this hypothesis.

2) In the following period, the Late PPNB, several activities regularly took place outside houses. Outdoor activities are evident in the fireplaces in the step trench in the East Field and pit for production of lime plaster in the North and Central Fields. In addition, some indoor activities such as storage continued to be practiced inside the houses or in special places built for this purpose. The storage facilities are also larger in area than before. Furthermore, houses were more compartmentalized, allowing inhabitants to separate activities from one another more easily (Hunter-Anderson 1977; Kuijt 200; Banning 2003).

Do these changes mean that Late PPNB families were larger than during the Middle PPNB? Can we infer from the knapping place in the East Field and the firing pits for plaster production that individuals in each family had their own daily assignments or their own specialized crafts?

It has already been suggested that the Late PPNB inhabitants of 'Ain Ghazal built several types of ritual buildings, like the rounded structures in the North Field and the rectangular ones in the East Field. Does this variation in the

*The production and use of art objects, such as statues and figurines, provide some evidence for possible ritual or ideological activities.*

*A well-organized society that has different social levels that practiced different activties should have had authorities who gave orders and arranged things in the community.*

form and distribution of ritual architecture mean that there were several tribes or clans at the site during this period, each with its own ritual structure? Are we allowed to conjecture that there were priests who took care of these buildings and led the inhabitants in their ritual practices? I might suggest that the evidence for activities at 'Ain Ghazal during this period is consistent with the coexistence of hierarchical and egalitarian dimensions in society.

3) During the PPNC, the people of 'Ain Ghazal made plaster, cooked, buried the dead, and carried out several other activities in open areas between the houses or in courtyards. Sometimes they built a ramada-like structure to shade them while they sat on these outdor floors.

4) The Yarmoukians who lived at 'Ain Ghazal continued to live much like their predecessors but added some new behaviours. The production of pottery utensils. started during this period. Yet the Yarmoukians continued to cook, make fire, and manufacture things, no doubt including pottery, outside their houses. In addition, the excavated PPNC and Yarmoukian levels produced only very few objects associated with art and ritual practices. It seems that people became busier with other things.

Over the long course of its occupation, 'Ain Ghazal flourished and expanded. It had a larger number of people occupying a larger area than before (but see Verhoeven, this volume). This invites us to raise the following questions. Can we infer the appearance of extended families over these periods (cf. Garfinkel, this volume)? Does it make sense to speak of the appearance of social differentiation at 'Ain 'Ghazal? Can we suggest the emergence of power and authority at some time during its occupation? The presence of someone with the authority to give orders, resolve disputes, and arrange things of communal interest might have facilitated a shift toward a more outward distribution of activities than that found when the site was first occupied.

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# *Traditional architecture and social organisation The agglomerated buildings of Aşıklı Höyük and Çatalhöyük in Neolithic Central Anatolia*

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This paper explores the relationship between the use of architectural space and social organisation at the two Central Anatolian neolithic sites of Aşıklı Höyük and Çatalhöyük, where architectural traditions apparently changed very little over several centuries of continuous occupation. Data from both sites suggest that interpreting the relationship between social organisation and domestic architecture is particularly complex when architecture is agglomerated. The factors that may bring about the kind of social change that causes traditional architecture to vary include opportunity to accumulate wealth. Changes in patterns of animal exploitation may have precipitated the abandonment of agglomerated architecture at both Aşıklı Höyük and Çatalhöyük.

## Introduction

The word 'architecture' has many meanings and associations that range from the functional to the aesthetic. It is used not only to refer to 'four walls and a roof,' but also to the total effect, both physical and aesthetic, that a structure may have on both its inhabitants and its neighbours. Thus the nature of the spaces within walls or between buildings becomes at least as important as, and probably more important than, the form of the vertical walls alone because it is within these spaces that people carry out their daily activities. Vernacular buildings, following traditional forms rather than being architect-designed, usually have a more direct relationship to the functional needs, social organisation or cultural-symbolic customs of the people who built them and for whom they were built (Cutting forthcoming; Golany 1980 and Aran 2000). It is not surprising that, in the Near East, where so much mud-brick architecture survives in the archaeological record, household and settlement spatial configuration have been widely used to study social organisation (e.g., Banning and Byrd 1987; Byrd 1994; 2005; Flannery 2002; Kuijt 2000 and Rollefson 1997).

Underpinning the majority of these studies are two interconnected hypotheses. The first is that a change in social organisation that involves a shift in the importance of the individual household unit vis à vis the wider community will be associated with architectural change. Thus the transition from simple, small houses to larger, more ornate ones within a settlement signals a rise in the importance of particular households. This in turn indicates the development of kinship-dominance and a tendency for society to move from co-operative to hierarchical organisation.

The second hypothesis, a variant on the first, suggests that societies that perpetuate their traditional use of built space over time are necessarily 'conservative', at least in terms of social organisation.

Taken together, these hypotheses have encouraged some to suggest that Aşıklı Höyük, with its repetitive architecture, may have been a backward and inward-looking society, ill-adapted to change, while Çatalhöyük, with its changes in settlement layout, was more likely to be a forward-looking, creative, and dynamic society (Thissen 2002: 17-19; Gérard 2002: 109) . The discussion that follows suggests that neither hypothesis is appropriate when it comes to interpreting the social dynamics of people who constructed their buildings so closely together that entrance by ground level was impossible.

This discussion is divided into three parts. The first describes the two sites of Aşıklı Höyük and Çatalhöyük and uses quantitative data to compare their household and settlement architecture and to assess evidence for architectural continuity over time. The second identifies differences between the two sites in architecture and social organisation and discusses the importance of accumulated wealth, inheritance and social hierarchy. The third

*Vernacular buildings, following traditional forms rather than being architect-designed, usually have a more direct relationship to the functional needs, social organisation or cultural-symbolic customs of the people who built them and for whom they were built.*

explores the relationship between vernacular tradition and social change and suggests why these two early farming communities may finally have abandoned their tradition of agglomerated architecture.

### Aşıklı Höyük and Çatalhöyük

Aşıklı Höyük and Çatalhöyük provide a remarkable architectural record of the first two millennia of early agricultural settlement in Central Anatolia. Each site was occupied continuously for nearly a millennium, with the foundation of Çatalhöyük following closely the demise of Aşıklı Höyük[1]. The settlements were located at similar altitudes, Aşıklı Höyük at 1119 m and Çatalhöyük at 980 m, little more than 130 km apart, in the Cappadocian highlands and the Konya Plain, which are usually grouped together on topographic grounds into the region of Central Anatolia (Özdoğan in Gérard and Thissen 2002: 85). Despite these similarities, there are also striking differences.

*Although the inhabitants of both settlements built their mud-brick domestic buildings so closely together that entrance at ground level was usually impossible, they configured and decorated their domestic space very differently*

Although the inhabitants of both sites cultivated cereals (van Zeist and de Roller 1995, 2003; Asouti and Fairbairn 2002; Helbaek 1964; Fairbairn et al. 2004), their use of animals differed considerably. The inhabitants of the main area of domestic architecture at Aşıklı Höyük (see below) depended on wild animal resources, perhaps in part managing the wild sheep and goat whose copious remains were found within the deep middens at the site (Buitenhuis 1997: 660). At Çatalhöyük East, by contrast, the remains of domesticated sheep/goat consumption were found within the buildings throughout its main occupation levels. The cattle probably remained wild (Martin, Russell and Carruthers 2002). The architecture also differed. Although the inhabitants of both settlements built their mud-brick domestic buildings so closely together that entrance at ground level was usually impossible, they configured and decorated their domestic space very differently (see below). This makes a comparison between Aşıklı Höyük and Çatalhöyük of particular interest to archaeologists who wish to study the relationship between the use of space, subsistence and social organisation in early farming communities.

1. Aşıklı Höyük was occupied between about 8500 (or earlier) and 7400 cal BC (Thissen 2002a: 324). The main mound at Çatalhöyük (Çatalhöyük East) was inhabited between about 7300/7100 and 6100 cal BC (Cessford 2002: 29) and the smaller neighbouring mound (Çatalhöyük West) at about 6000 cal BC (www.canew.org).

2. Esin and Harmankaya suggest that the central and southwestern areas of the site were broadly contemporary (Esin and Harmankaya 1999 Vol. 1: 129). However, the agglomerated more obviously domestic buildings differ in terms of size, configuration, construction and the distribution of hearths from the architecture in the northeast and southwest of the site (Cutting 2005). Building T in the southwest corner of Aşıklı appears similar to the large Building A at the adjoining site of Musular (dated to about 7600 cal BC, Özbaşaran 2000, Thissen 2002: 324-5). It has been suggested that both buildings may have been associated with ceremonies to do with cattle hunting (Duru and Özbaşaran 2005)

### The architecture at Aşıklı Höyük and Çatalhöyük

The plan of Aşıklı Höyük's large horizontal exposure reveals a large block of agglomerated mud-brick architecture (marked with a dotted line in Figure 1) with more dispersed mud-brick and stone buildings in the northeast and a cluster of smaller buildings grouped around two larger buildings in the southwest. The River Melendiz has severely eroded the mound on its northern, western and southern flanks and it is clear from its current shape that the agglomerated architecture once continued considerably further to the northwest and west. This central block of agglomerated architecture differs from that found elsewhere on the site and, although associated with the unusual and apparently non-domestic buildings in the the southwest. appears to predate the mud-brick and stone architecture in the northeast[2]. For these reasons, the data used here to compare Aşıklı Höyük with Çatalhöyük have been collected only from the buildings within this central block. Level VIB has been chosen to represent the architecture of Çatalhöyük (East) because it contains more buildings than the other (eleven) levels excavated during the early 1960s (Mellaart 1962; 1963; 1964; 1966; 1967).

### The architecture: occupation and continuity

In order to use household and settlement architectural characteristics to tease out ideas about social organisation, it is essential to identify an architectural 'snapshot in time'. This is because such ideas depend upon relationships – relationships between rooms within buildings, between one building and another, and between groups of buildings and the settlement as a whole. We can only infer these relationships from buildings that were used contemporaneously.

However, it is notoriously difficult on tel sites to establish whether or not an occupation floor within one building was

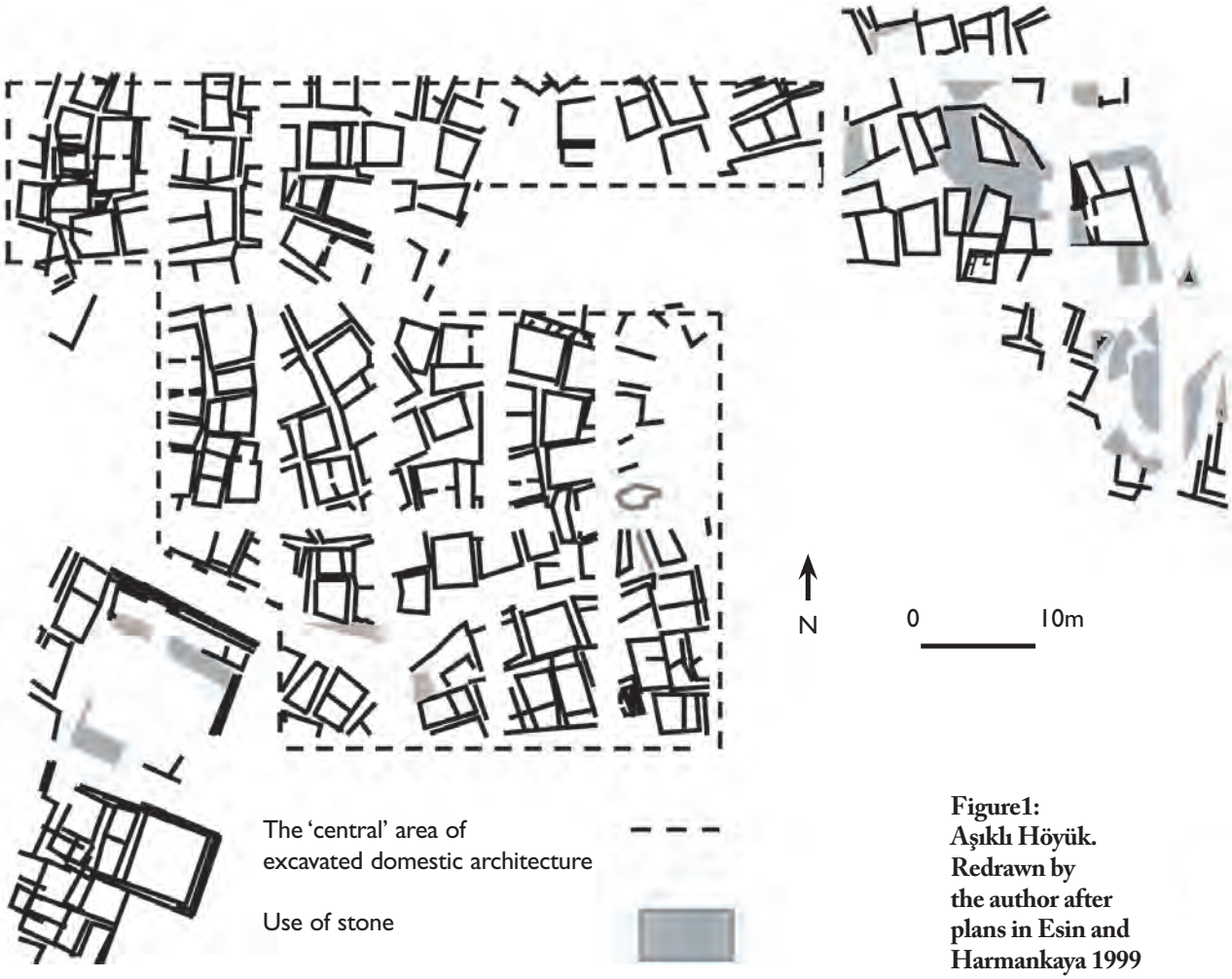


**Figure1: Aşıklı Höyük. Redrawn by the author after plans in Esin and Harmankaya 1999 Plate: 90**

in use at the same time as that in another (Rosen 1986). Furthermore, recent excavations at Çatalhöyük have shown that many changes took place inside buildings over time, making it even more difficult to synchronise room and hearth/oven arrangements (Cessford in press). It is not surprising, therefore, that there are doubts about the chronological integrity of the central block of agglomerated architecture at Aşıklı Höyük and of Level VIB (and the other levels) at Çatalhöyük. Despite phasing ambiguities, however, this architecture can be used to represent architectural snapshots in time because of the marked pattern of repetitive architecture over time at both sites.

Wherever successive phases of occupation were exposed at Aşıklı Höyük, it became clear that the vernacular agglomerated architecture had remained essentially unchanged over several centuries[3]. The deep northern section, for example, showed that new walls and hearths were built directly above the old during eight phases of occupation (Esin and Harmankaya 1999 Vol. 2: 93). In the same area, eight phases of a small horizontal excavation revealed only minor adjustments over time. These included a changed internal partition, an alteration in hearth arrangements, and a minor building enlargement using a small piece of space left between buildings (Esin and Harmankaya 1999 Vol. 2: 94-5, Cutting 2005) . The same degree of continuity in vernacular architectural tradition was found at Çatalhöyük, where the alignment of individual buildings changed very little from one level to another in the areas excavated. Although buildings changed over time in their decoration, internal partitioning, and oven and hearth positions, their external walls remained the same to a remarkable degree between Levels VIII and IV.[4] On the very rare occasions when people enlarged their buildings, they did so by encroaching onto the small areas of open space left

3. Excavations at Aşıklı Höyük concentrated on producing a large horizontal exposure. Successive phases of occupation were recorded on the western edges of the tell, in a small area of the central part and, particularly, in a deep section on the northern eroded edge.

4. When the architecture of one level is correctly aligned above or below that of another to take account of the fact that Mellaart's excavation area moved towards the west as it deepened, building outlines show remarkable continuity between at least Levels VIII to IV (Cutting 2003, 2005, 2006).


**Figure 2 :**
**Çatalhöyük Level VIB**
**Redrawn by the author**
**after Mellaart 1962-1967**
**and Ritchey 1996**

between buildings. At Çatalhöyük, as at Aşıklı Höyük, buildings became even more crowded together over time as every small area of open space was used up.

In short, the excavation evidence demonstrates remarkable architectural continuity through several hundred years of occupation at both Aşıklı Höyük and Çatalhöyük. This means that the block of agglomerated architecture exposed in the central site area at Aşıklı Höyük and the buildings in Level VIB at Çatalhöyük can each be treated as if they were architectural 'snapshots in time' and their data used to detect real differences in architectural tradition. Using these data, comparisons can be made between the two sites in terms of building construction, decoration, size and configuration, and the presence or absence of hearths/ovens at each site. These aspects are considered in turn below in order to provide the basis for investigating social organisation.

## Building construction and decoration at Aşıklı Höyük and Çatalhöyük

The approximately rectangular or trapezoidal Aşıklı Höyük buildings were less substantially built than the more regularly rectangular structures of Çatalhöyük and appear incapable of supporting even a partial upper storey (Berker et al 1991: 153). Çatalhöyük buildings usually had sturdy outer walls and would have been strong enough to support a partial or full upper storey (Cutting 2005). At both sites, buildings were built so closely together that entry would have had to be from roof level.

Not all buildings at Çatalhöyük contained the wall paintings, mouldings and stylised bulcrania for which the site is so well known, and which led Mellaart to designate some buildings as 'shrines' (Mellaart 1967: 65). However, nearly all buildings conformed sufficiently to a standard pattern of platforms, benches, pillars, ovens or hearths, and storage areas to make a 'Çatalhöyük building'

instantly recognisable as such.

At Aşıklı Höyük, the situation was very different. The buildings there were simpler, or at least lacked the kind of solid ornamentation that would survive in the archaeological record. There were few internal features. Nevertheless, although only a few walls or floors revealed hints of coloured plaster, their surfaces were renewed frequently, and traces of rush matting remained on some of the floors. In short, considerable care was taken to maintain the buildings at Aşıklı Höyük even though they may have lacked the elaborate ornamentation that was such a notable feature at Çatalhöyük.

### Building size and configuration at Aşıklı Höyük and Çatalhöyük

Quantitative data are available for two units of architecture, buildings and rooms. A 'building' was defined as 'all spaces that are beneath one roof' (Düring 2001: 5), while a 'room' was defined as an internal space bounded by at least three walls or partitions and with an area of at least a square metre. Measurements were recorded only for 'complete' buildings and rooms, defined as having at least three-quarters of their internal ground area clearly and unambiguously recorded on the site plans. Each complete room was recorded, even when it might be part of an incompletely excavated, and thus unrecorded, building, and its usable floor space measured. Hearths and ovens were recorded as present or absent.

Applying these methods, it was possible to identify 26 buildings and 80 rooms, many of which were part of incompletely excavated, and therefore unrecorded, buildings, within the agglomerated architecture in the central site area of Aşıklı Höyük, and 39 buildings and 93 rooms in Level VIB at Çatalhöyük. Aşıklı Höyük's buildings and rooms were much smaller than those of Çatalhöyük (Figures 3a and 3b). At Aşıklı Höyük, over half the complete buildings (53%) had internal floor areas no greater than 9 $m^2$ and nearly a quarter had floors measuring no greater than 6 $m^2$. Only two of the remaining buildings approached the average size of Çatalhöyük buildings (Figure 4a). By contrast, the Çatalhöyük buildings had an average internal floor area of 19 $m^2$ and varied more widely in size (Figure 4b). Rooms were also generally much smaller at Aşıklı Höyük, with an average internal floor area of 7 $m^2$, than at Çatalhöyük, at 10 $m^2$ (Figures 5a and 5b).

Building configuration also differed dramatically between the two sites, with buildings at Çatalhöyük more elaborately sub-divided than those at Aşıklı Höyük. At Aşıklı Höyük, 67% of the complete buildings consisted of one room only, and less than 7% had more than two rooms. At Çatalhöyük, by contrast, the subdivision of buildings into two or more rooms was far more common. Only 40% had only one room and nearly a quarter of all buildings had three or more. Given the additional 'furniture' (columns, niches and platforms) typically found at Çatalhöyük but not at Aşıklı Höyük, the buildings at the former site were clearly far more architecturally elaborate than those at the latter. However, despite their relative simplicity, there seems little justification for describing the Aşıklı Höyük buildings as "mud-brick 'tents" rather than 'homes'"(Thissen 2002: 25).

### Hearths and ovens at Aşıklı Höyük and Çatalhöyük

The agglomerated buildings in the central area of Aşıklı Höyük contained rectangular hearths that showed no special distribution pattern or standard orientation (Özbaşaran 1998: 556). The data analysis, which shows that the internal floor areas within those buildings containing hearths (57% of total buildings) ranged between 5 and 17 $m^2$, confirms this, while nearly half the buildings containing hearths were small (i.e., with internal floor areas below 8 $m^2$). At Çatalhöyük, ovens and hearths were distributed quite differently. Nearly three-quarters of the ovens recorded, and nearly all the hearths, were situated in the large main living area and only one was found in a room with an internal floor area less than 9 $m^2$.

### Social organisation at Aşıklı Höyük and Çatalhöyük

#### Buildings and households at Aşıklı Höyük and Çatalhöyük

The data presented above reveal some striking differences between the vernacular domestic architecture of Aşıklı Höyük and Çatalhöyük. These differences suggest that the inhabitants of each site arranged their routine daily living activities very differently and that their social organisation differed considerably. In order to tease

*Using the architectural data, comparisons can be made between the two sites in terms of building construction, decoration, size and configuration, and the presence or absence of hearths or ovens at each site. These aspects are considered in turn to provide the basis for investigating social organisation.*

out the relationship between architecture, daily living activities and social organisation, it is best to start with the later site, Çatalhöyük, where buildings are more easily recognised as household centres.

At Çatalhöyük, buildings typically contained a full suite of 'domestic' architectural furniture – one large room and one or more small rooms, benches, platforms, ovens, hearths and some decoration – and were large enough to have housed all the basic living needs of a household group. It is easy enough to envisage these structures as providing a place for a family group to rest, cook, eat, sleep and work[5]. People clearly invested considerable energy and time in these buildings and it is difficult not to believe that individual structures played an important role in establishing or reinforcing household identity.

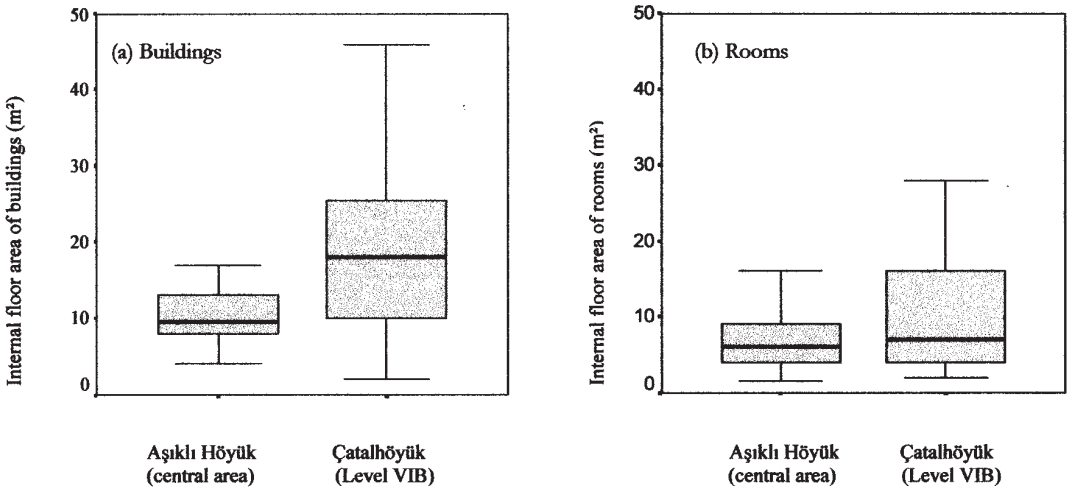


**Figure 3: Internal floor areas of buildings and rooms at Aşıklı Höyük and Çatalhöyük**

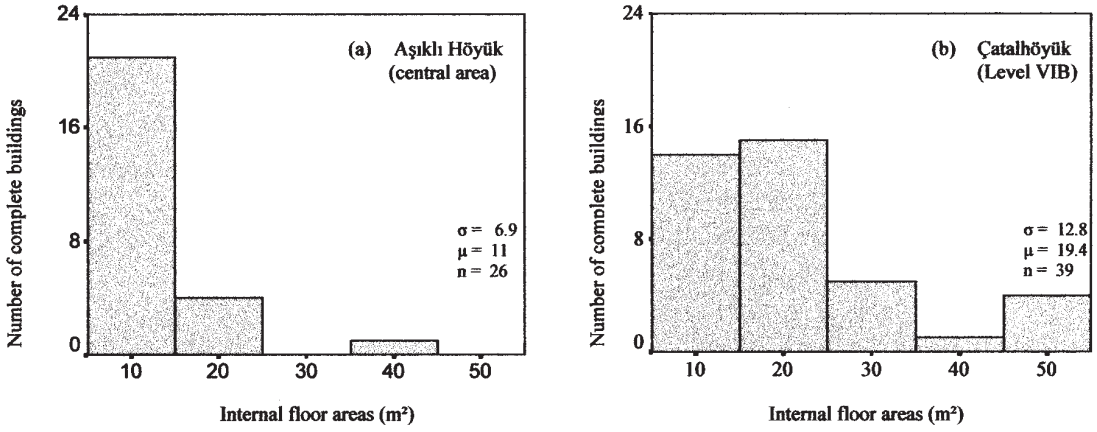


**Figure 4: Building distribution by floor area at Aşıklı Höyük and Çatalhöyük**

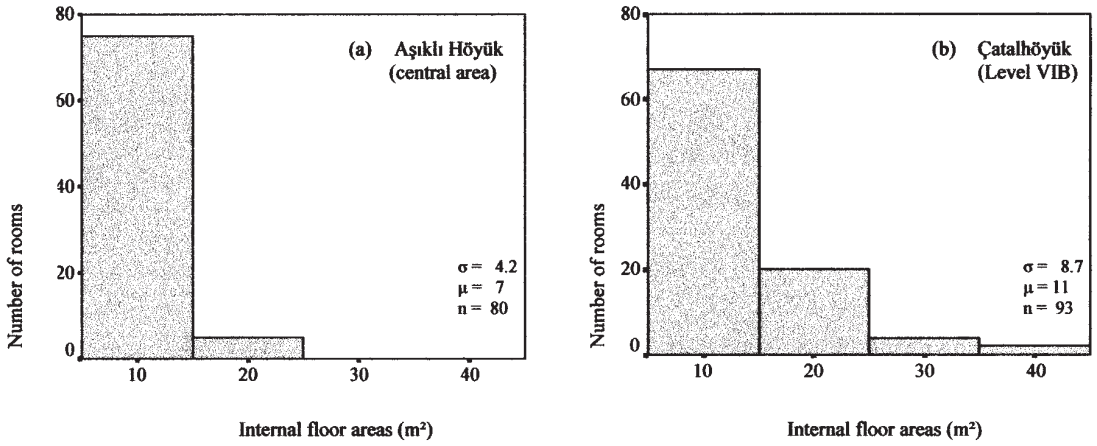


**Figure 5: Room distribution by floor area at Aşıklı Höyük and Çatalhöyük**

The arrangement of domestic space at Çatalhöyük suggests a society organised around individual household units that were closely associated with particular buildings. Variations in building size, in the richness of interior decoration, or in both suggest the existence of differences in household wealth or status. The repetition of these spatial arrangements and the persistence of size variations over time, furthermore, suggest that their occupancy passed from one generation to another. In short, the architectural indicators signal the existence of inherited inequalities of wealth among different households (Cutting 2006).

Few if any of these indicators are apparent in the agglomerated architecture of Aşıklı Höyük. There, the presence of so many buildings too small to have housed even a modest nuclear family[6] suggests that different buildings had different functions. This suggestion is supported by the fact that hearths occupied some buildings so small that they would, when lit, have produced sufficient heat to convert whole buildings into oven-like areas[7]. If small buildings had specialized functions, and the larger buildings were only large enough to have sheltered a few people, then it seems likely that any one group of people would have needed to use more than one building to meet their routine daily needs. This arrangement of living space is entirely different from that found at Çatalhöyük. There is no clear association between individual buildings and individual households and signs of differential household wealth or status are lacking. Although the repetition of spatial arrangements over time suggests an inherited occupation of buildings and a developed sense of community with accepted ways of organising and ordering household and settlement space, there are no architectural indicators to signal the existence of inherited inequalities of wealth among households.

### Differences in socio-economic organisation between Aşıklı Höyük and Çatalhöyük

The architectural indicators at Aşıklı Höyük and Çatalhöyük suggest the presence of two different models of socio-economic organisation and it is tempting to try to fit these models within the framework of socio-political development that has already been proposed for a number of early farming communities in the Levant. In this framework, Aşıklı Höyük might exemplify a co-operative egalitarianism similar to the small-scale household stage that Byrd (1994) envisages at Beidha or the 'micro-kinship' system that Rollefson (1997) suggests pertained at 'Ain Ghazal. Çatalhöyük might mark the development of a corporate kinship system leading to the rise of lineage authority similar to that identified at Beidha or at 'Ain Ghazal (the 'extended family experiment' or even the 'higher hierarchical kinship' phase).

However, interpretations of this kind risk being too simplistic. The data presented above show unambiguously that the substantial, elaborately decorated and configured houses of Çatalhöyük were established household centres in a way that the smaller and simpler structures of Aşıklı Höyük could not be. However, to infer from this that Aşıklı Höyük was necessarily a less structured or more egalitarian society and Çatalhöyük a more structured, hierarchical one would be unsafe on at least three grounds. First, the strength of the relationship between spatial structure and social organisation varies from one society to another (Levi-Strauss 1963: 292) . This relationship may be particularly difficult to establish at Aşıklı Höyük and Çatalhöyük given that their agglomerated architecture is unlikely to have been as responsive to changes in social organisation as are buildings arranged around open passageways or communal areas. Second, archaeological socio-political interpretation is often based upon observations derived from societies thought to be similar, but ethnographic analogies for these early communities are almost certainly lacking. Labels such as egalitarianism, hierarchy, corporate kinship and social complexity become little more than the constructs of modern researchers. "Any reference to 'later prehistoric' or historic contexts is bound to distort our perception of these societies, and reduce them, illegitimately, to the more familiar and far more constrained peasantry derived from yet another millenni[um] of history " (Pèrles 2001: 305). Third, the problems that this lack of suitable ethnographic

*Striking differences between the vernacular domestic architecture of Aşıklı Höyük and Çatalhöyük suggest that the inhabitants of each site arranged their routine daily living activities very differently and that their social organisation differed considerably.*

5. However, it would have been difficult to carry out routine domestic activities when sub-floor graves were re-opened to bury the dead or during the construction of the large bucrania that at times adorned the walls.

6. Byrd suggests a minimum floor space of 8 $m^2$ per individual (Byrd 2000: 82).

7. Similar oven buildings have been found in the village of Kızılkaya, adjacent to Aşıklı Höyük (Ertüğ-Yaras 1997: Plates 16 and 17).

data presents are compounded by the fact that such data as do exist demonstrate that the relationships between economic practice, the distribution of wealth, political structure, and socio-cultural values are both complex and variable (Salzman 1999, 2001, and responses to his work in *Current Anthropology* 42).

*The architectural indicators at Aşıklı Höyük and Çatalhöyük suggest the presence of two different models of socio-economic organisation and it is tempting to try to fit these models within the framework of socio-political development that has already been proposed for a number of early farming communities in the Levant.*

### Accumulated wealth, inheritance and social hierarchy

Despite the difficulties in unravelling complex socio-economic relationships, a common theme running through many ethnographic studies is that inequalities of wealth, in pastoral societies at least, are more likely to be associated with the rise of socio-political hierarchies when wealth is permanent. Wealth is 'permanent' when it can be accumulated over time and is transferable between generations (i.e., through inheritance) rather than when it is volatile or routinely re-distributed among households (Casimir, Rao and Bollig 1999: 46; Young 1999: 55). This observation has important implications for both Aşıklı Höyük and Çatalhöyük. It has already been suggested that architectural indicators for intergenerationally inherited wealth appear at Çatalhöyük but not at Aşıklı Höyük. If this is so, then the indications are that Çatalhöyük was more likely to have been a hierarchical society organised around differentially wealthy households than was Aşıklı Höyük.

An interpretation of this kind inevitably places considerable emphasis on the accumulation of wealth and it is worth considering why the inhabitants of Çatalhöyük might have had opportunities for accumulating wealth that were denied the earlier settlers of Aşıklı Höyük. Cereal cultivation was practised at both Aşıklı Höyük and Çatalhöyük, but only at Çatalhöyük do we have evidence for animal (sheep/goat) domestication. It is a pity that insufficient attention has been paid to the role that livestock played in shaping different socio-political systems (Little 1999: 51). However, it seems probable that major changes in the way animals were obtained for food would almost certainly have had profound effects upon social organisation.

The discontinuation of small-scale hunting in favour of the large-scale exploitation of wild cattle or a shift from managing wild sheep/goat to rearing cattle would have required new ways of organising labour that almost certainly led to shifts in the distribution of wealth or status within a community. Lee (1990) has argued that the ownership of animals lifts the 'ceiling of accumulation' beyond which an individual or household can rise, while Netting (1990: 254) writes, "Instead of shooting the animal and eating the meat, one brings the beast into the settlement and it sits there as property". Thus, an increasing reliance upon sheep/goat domesticates and, finally, upon cattle domesticates at Çatalhöyük might have precipitated disparities in wealth distribution as control of larger and larger herds by kin groups provided a route to obtaining differential wealth or status that was unavailable to the inhabitants of Aşıklı Höyük. As some groups became wealthier than others and invested more heavily in their buildings, art and ancestral ritual became more pronounced within their buildings, and the buildings more differentiated in richness of decoration over time. In short, the adoption of animal domesticates opened the way to the differential accumulation of wealth that, in turn, led to social inequality and, eventually, to the introduction of hierarchical systems of socio-political control.

### Conclusion

Vernacular architecture tends to be repetitive rather than dynamic in nature. It requires a strong impetus to change, such as the arrival of a new population with very different cultural traditions, the discovery of new building technologies, or a dramatic shift in the balance of wealth, status and power within a community. In the context of early farming communities such as Aşıklı Höyük or Çatalhöyük, changing subsistence patterns, particularly in the exploitation of animals for food, may well have provided such an impetus. Such changes would have encouraged a differential accumulation of wealth among individuals or households.

That differential accumulation of wealth would have required adjustments in inter-household relationships that would eventually be reflected in household and settlement architectural configuration as new buildings, more suited to the new socio-economic circumstances, gradually replaced old ones. Small buildings, for example, might give way over time to larger structures able to shelter larger households or extended families (cf. Garfinkel, this volume).

The spatial constraints imposed by agglutinative buildings, however, made this process of gradual replacement impossible

at sites with agglomerated architecture. At these sites, socio-economic change tended to precipitate the abandonment of the traditional architecture because changing the size, shape, or external design of one building could only be done at the expense of a neighbouring one. The architectural evidence at Çatalhöyük supports this hypothesis because the abandonment of traditional agglomerated architecture appears to have coincided with substantial changes in patterns of animal use. At Çatalhöyük East, the traditional agglomerated architecture of Levels VIII to IV was associated with the use of sheep and goat, but not cattle, domesticates (Martin, Russell and Curruthers 2002: 201). This traditional architecture was replaced by the larger buildings of Levels III and II, which are similar to those currently being excavated at Çatalhöyük West (Cutting 2006; Gibson et al. 2003) where cattle domesticates were present (Frame 2003:14). Evidence from Aşıklı Höyük, although less clear-cut, likewise suggests that a shift in patterns of animal exploitation may have occurred towards the end of its occupation, when the proportion of wild cattle to other sheep and goat non-domesticates appears to have increased (Buitenhuis 1997: 656). This increase, together with the discovery of the large-scale culling of wild cattle at nearby Musular and, by inference, at Aşıklı Höyük itself (Özbaşaran and Buitenhuis 2002: 70), suggests a substantial increase in the importance of wild cattle in the final years of the settlement. The decline of both Aşıklı Höyük and Çatalhöyük appears to coincide with changes in settlement patterns, with the emergence of three smaller settlements (Musular, Yelliben, and Gedikbaşı) near the former, and 14 smaller dispersed settlements close to the latter (Baird 2006).

In conclusion, both Aşıklı Höyük[8] and Çatalhöyük would without doubt have required strong and well-structured regulatory systems in order to survive and prosper over so many centuries. Braun (1990: 84-86) has argued that, when communities grow beyond a certain size, perhaps as small as six times the average household size, decision-making without a system of regulation starts to degenerate because decisions involve too many permutations. Identifying the distinguishing features of those systems from architectural remains will always be difficult, and never more so than amidst the agglomerated buildings of Aşıklı Höyük and Çatalhöyük. Nevertheless, it is possible to detect considerable differences between the domestic architecture of Aşıklı Höyük (small functionally specialised buildings with few signs of social differentiation) and the domestic structures of Çatalhöyük (substantial multi-purpose houses differing in size and richness of decoration). On the basis of these differences, it is possible to conclude that Çatalhöyük was more likely to have had a hierarchical society organised around differentially wealthy households than was Aşıklı Höyük. As subsistence strategies shifted, so opportunities for accumulating wealth changed and the communities of both Aşıklı Höyük and Çatalhöyük underwent profound socio-economic change on a scale that their tightly-packed domestic architecture eventually could not accommodate. Consequently, the long-established tradition of agglomerated architecture that so distinguished Aşıklı Höyük and Çatalhöyük from nearly all other contemporary settlements was abandoned in favour of more open settlement layouts.

*The adoption of animal domesticates opened the way to the differential accumulation of wealth and that, in turn, led to social inequality and, eventually, to the introduction of hierarchical systems of socio-political control.*

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8. Aşıklı Höyük may at some stage have been about two-thirds the size of Çatalhöyük (Cutting in press b).

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# *The Social Organization at Neolithic Sha'ar Hagolan The Nuclear Family, the Extended Family & the Community*

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**Introduction**

The Pre-Pottery Neolithic B villages of the Near East were characterized by rectangular dwellings, usually 50-100 m$^2$ in size. These houses were sub-divided into a few rooms, usually between two and four. The houses were built some distance from one other, leaving space for open-air activities and movement of people across the settlement. Numerous examples of this type of settlement have been unearthed, such as at Jericho, Munhata, Yiftah'el, 'Ain Ghazal, Beidha, Tell Ramad, Tell Aswad, Ugarit, Abu Hureyra, Nevali Çori and Çayönü. This type of site has social implications at two levels: the (nuclear) family and the community. A more complex architecture, with larger buildings and a more complex sub-division of internal space, appeared towards the end of the Pre-Pottery Neolithic B in sites such as Basta and Bouqras. A further development is evident in the Pottery Neolithic site of Sha'ar Hagolan, discussed below. This site presents a new type of dwelling – courtyard structures – for the first time in the history of architecture. These houses, monumental in size, were likely used by extended families. They were constructed along formalized passageways, indicating a sophisticated settlement plan.

Sha'ar Hagolan, located in the central Jordan Valley, on the north bank of the Yarmuk River, ca. 1.5 km south of the Sea of Galilee, is at the junction of the frontiers of modern Israel, Jordan, and Syria. It is well known as the site where Moshe Stekelis (1951) first identified the Yarmukian Culture, a Pottery Neolithic culture that flourished in the Mediterranean areas of Israel, Jordan and Lebanon, during the 7th millennium cal BC (Garfinkel 1993). My point of departure is new fieldwork carried out for 11 seasons between 1989 and 2004 (Garfinkel and Miller 2002; Garfinkel 2004). In total, five excavation areas were tested (E, F, G, H, N.), and ca. 2,700 m$^2$ were opened (Fig. 1). In addition, Steklis excavated four areas (A-D) between 1949 and 1952, but no architecture was found in these limited excavations (1951, 1972).

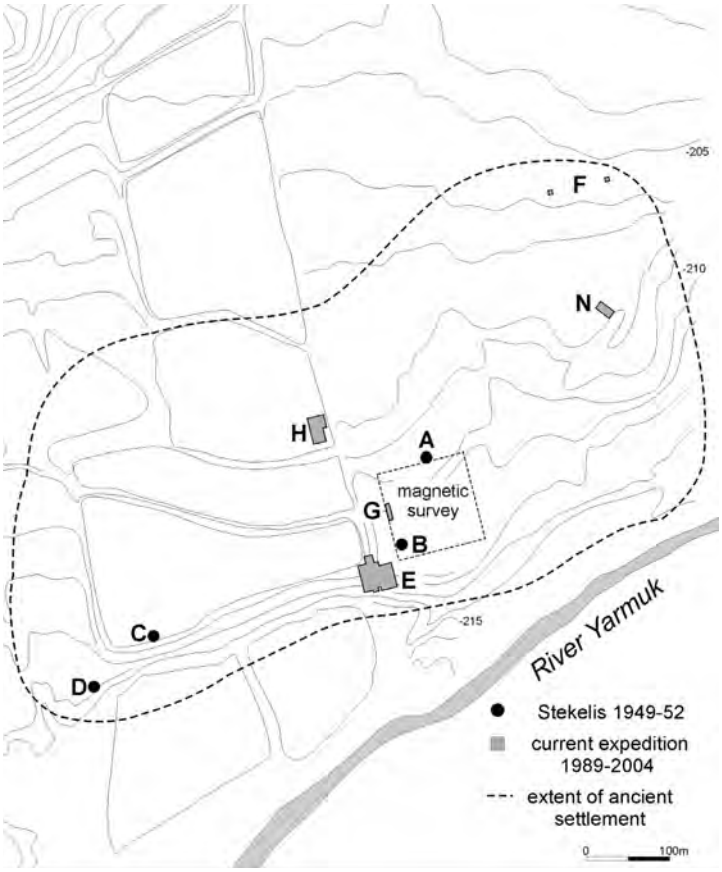



**Figure 1. The Early Neolithic site of Sha'ar Hagolan and the location of the various excavated areas**

In 1998, Michele Miller carried out a surface survey of the site and found that the ancient settlement was ca. 20 ha in area, making it one of the largest sites of its period. She established its size based on three lines of evidence (Miller 2002):

1. The location of the eight excavation areas, four dug by Stekelis and four by our expedition (at that time Area N was not yet excavated). These areas extend over about 1 km on the north-south axis and ca. 300 m on the east-west axis.
2. Test trenches dug in the western and northern parts of the site. In some of these trenches, remains of walls and

floors were observed and artefacts were found in the soil taken from them. No finds were made in trenches located further to the north.
3. The survey established the distribution of the artefacts scattered over the surface of the site.

## The Architectural Data

### Area E

This is a large horizontal exposure of nearly 1,700 m² (Fig. 2). Here, two complete courtyard buildings and two streets were uncovered and remains of at least three other buildings were exposed. This is a densely occupied area in the central part of the settlement near the river.

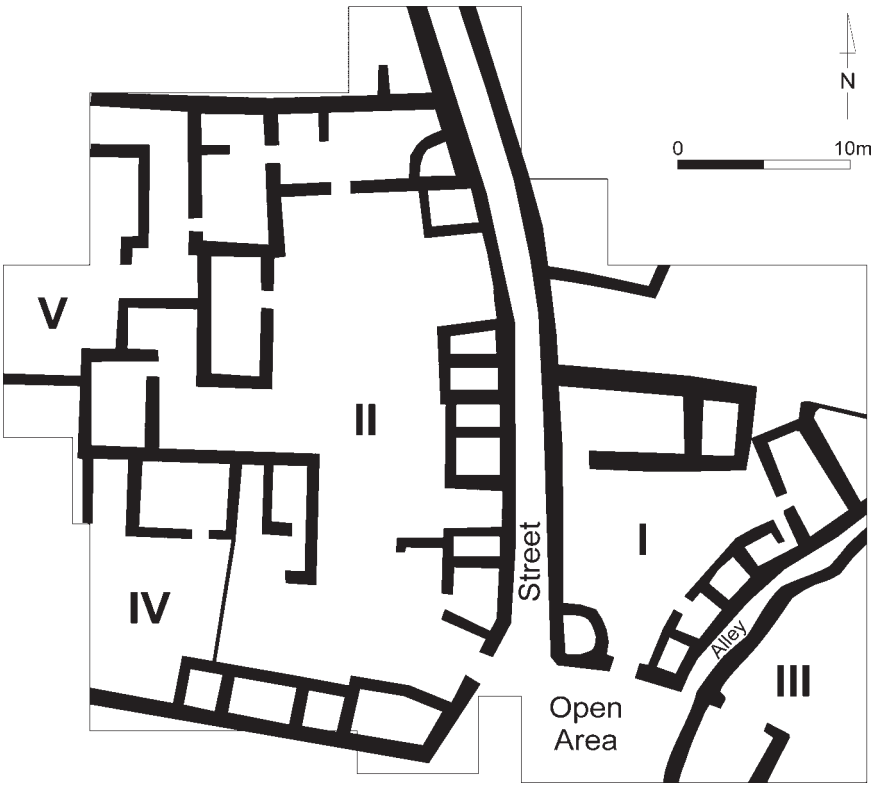
*The entrance has a threshold of large, flat stone slabs. Room B in the south-west corner is round, while all the other rooms are rectangular or square.*

### Building I

This building in the eastern part of Area E consists of a large, triangular courtyard surrounded by eight rooms and covers an area of ca. 225 m² (Fig. 3). The building method was simple: the walls have no foundation trenches and were laid directly on the ground. They consist of a foundation of rounded basalt pebbles and a superstructure of rounded mudbricks. The central courtyard was entered from the south through an open area between the buildings. The entrance has a threshold of large, flat, stone slabs. The room in the southwestern corner (B) is round, while all the other rooms are rectangular. Five of the rooms have floors of beaten earth, while three (D, G and I) are paved with closely fitting, flat basalt pebbles. No clearly defined entrance was found in any of the stone-paved rooms, and they were probably entered through a window-like opening that was higher than the preserved height of the walls. Since these rooms differed from the others in their paved floors and the lack of an entrance at floor level, they probably differed in function as well. The paving and the high entrance may have been for insulation purposes, perhaps as protection from insects, rodents or damp. Thus, these rooms probably served as storerooms.

Building I displays a modular arrangment with three units, each consisting of a room and a storeroom. A fourth unit in the northeastern corner (E) does not have a storeroom, but half of the room is occupied up by two stone-paved installations that could have been granaries. The large size and modular arrangement of Building I suggest that it was occupied by an extended family, consisting of four nuclear families. We will return to the social organisation of Sha'ar Hagolan below.

**Figure 2: Schematic plan of Area E**



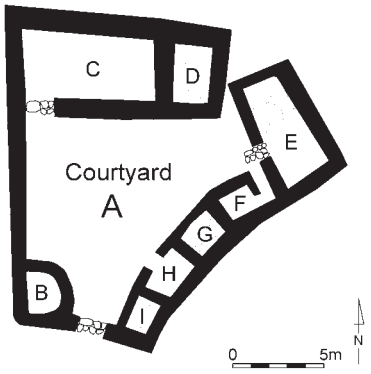



**Figure 3: Schematic plan of Building I**

### Building II

This building, in the western part of Area E, is ca. 35 m long from north to south and ca. 20 m wide from east to west, and covers an area of ca. 700 m$^2$ (Fig. 4). It is separated from the street bordering it on the east by a wall that runs from the southeast to the northeast corner. The building's entrance was apparently in the southern end of this wall. Along the wall a series of small flanking rooms are similar in size to the small rooms on the eastern side of Building I. Room G, paved with closely fitting basalt pebbles, was probably a storeroom.

The southern end of Building II is currently within the zone of the Yarmuk River; part of it has been destroyed by floods and the entire southwest corner is missing. The surviving remains suggest that here, too, there was a row of small rooms, one of which (K) was paved with basalt slabs.

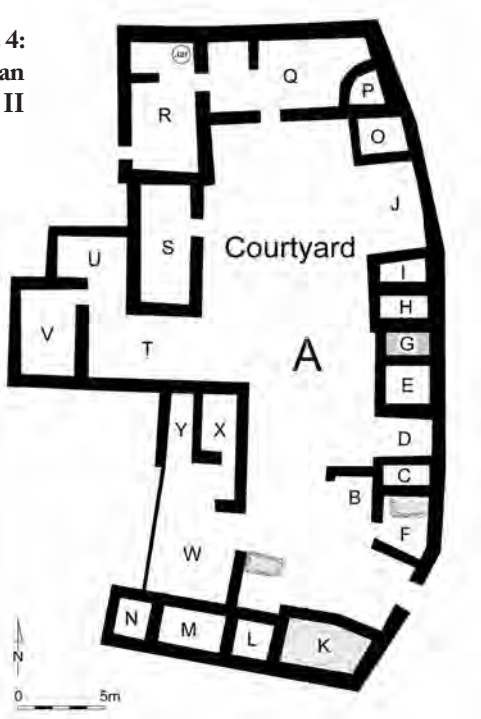



**Figure 4: Schematic plan of Building II**

On the north, the building is enclosed by a straight wall formed by the large main room (Q) and the corner room (R). Several figurines were discovered in Room Q, including a complete clay figurine decorated with a herringbone pattern and another figurine carved from a stone pebble. This room contained a curved wall that created a separate room (P). The northern part of Room R yielded an unusually large number of finds, including about 20 stone vessels and utensils (bowls, a grindstone, a pestle and hammerstones), a cooking pot, and a large granary jar that was set into the floor. This area is therefore clearly connected with food preparation.

Unlike the other three sides, the west side of Building II is not bounded by a straight wall. Instead, the building's edge is formed by the seven rooms on the western side of the courtyard. Building I has a similar layout: it is enclosed in a well-defined line on the east, south and west, but is bordered on the north by the combination of three spaces.

The open central courtyard of Building II contains several installations of various kinds (pits, stone paving, mud plaster paving, and four large mortars).

Building II is the largest structure from such an early period to have been uncovered in the Near East. It was clearly a courtyard house with rows of rooms on all four sides.

### Buildings III, IV and V

Parts of three other buildings were exposed in Area E. Building III is in the eastern part of the excavation area, to the east of an alley (Fig. 2). To date, only a small part of it has been uncovered, consisting of a large central courtyard and a room that extends into the unexcavated area to the south. In the western part of Area E, to the west of Building II, small parts of two additional buildings (IV and V) have been exposed.

### The street network

Buildings I and III are separated by a small alley (ca. 1 m wide), paved with beaten earth. It winds 15 m before disappearing into the unexcavated area. Between Buildings I and II there is a main street, (ca. 3 m wide), which we exposed for a length of over 50 m. The road is paved with layers of small pebbles mixed with mud plaster and its

*Along the wall are a series of small flanking rooms similar in size to the small rooms on the eastern side of Building I.*

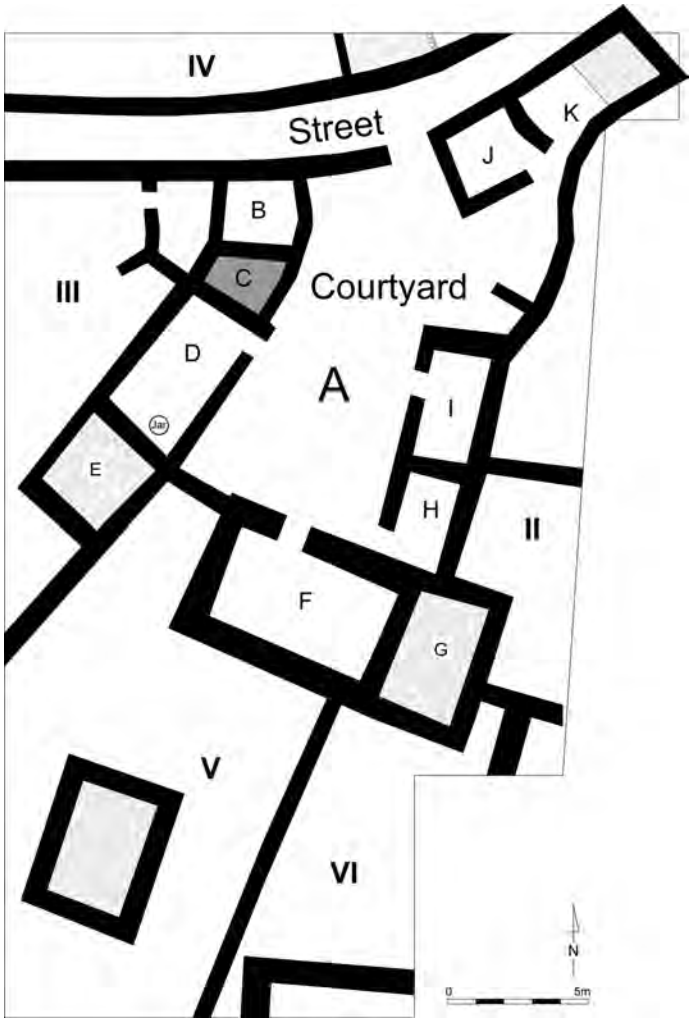



**Figure 5: Schematic plan of Area H**

surface was renewed from time to time, as evidenced by the finding of several layers. While the upkeep of the houses was undoubtedly the responsibility of their residents, the streets' maintenance must have required the cooperation of the entire community. This is the earliest street system discovered in Israel; it shows that Sha'ar Hagolan was a planned settlement, in which houses were not built randomly, but along streets.

The street and the alley lead from inside the settlement toward the water source, the Yarmuk River. Each family would have needed a daily supply of water for drinking and food preparation. One can imagine the Yarmukian women walking down the streets with jars on their heads to draw water from the river. Since the river is to the south of the settlement, the streets run roughly at right angles to it, from north to south and from northeast to southwest.

During winter the site would have been flooded. It is clear that in such cases the street system could have drained the rainwater by the shortest route, into the river.

### Area H

This area represents a part of the ancient settlement some distance from the river, ca. 300 m north of Area E. An excavated area of 700 m$^2$ contained the remains of at least five large courtyard buildings, one complete. The buildings, abutting one another, were built on both sides of a plastered street. Unearthing the east part of Area H was problematic, as a dirt road runs on what was the embankment of a modern fish pond, limiting our options on that side. Nevertheless, we excavated as far as possible to the east, removing a few meters of the embankment until we could reconstruct the complete plan of one building.

The basic architectural concept of the buildings in Area H is similar to that of the two buildings unearthed in Area E (Fig. 5). The completely excavated building here is composed of a large, open, central courtyard (A) surrounded by ten rooms. On the west is a row of four small rooms (B–E); one has a stone-paved floor (E) and another has a plastered floor (C). In the corner of Room D, a large granary jar was sunk into the floor. On the south is a large room (F) with a storeroom paved with small stones (G) attached to it. To the east of the courtyard, two additional rooms (H-I) border it. On the north, two rooms were found in the northeastern corner of the building (J–K). Room K is partly stone-paved and a basalt mortar was found on its floor.

In the north, the external closing wall of the building consists of a stone foundation topped by mudbricks. A flat, stony area in the wall is the threshold of an entrance to the building's courtyard. To the north, beyond the closing wall, a street (1–1.5 m in width) runs east-west, on which we found several layers of plaster to a total accumulation of nearly half a meter. A long, narrow depression runs for nearly 7 m along the western part of the street and continues into the unexcavated area. It is partly plastered and may have functioned as a drainage channel for rainwater. The orientation of the street in Area H is of interest: while the two streets in Area E run from north to south, from the settlement to the Yarmuk River, the street in Area H

runs perpendicular to them, suggesting a grid pattern of passageways at the site (Fig. 6).

Fragments of at least four additional buildings have been found in Area H. To the west of the completely excavated building we have uncovered one room and an open area that may be the courtyard of another building. To the east we have uncovered a few walls, indicating the existence of an adjacent structure. The southern part of Area H is close to the corner of a modern fish pond, at the junction of two large embankments. Here we have found fragments of walls that do not form a clear architectural picture (the construction work on the embankment probably dug into the Neolithic levels, causing serious damage). Beyond the street on the north, another building was partly excavated. Only a very small segment of it, including one room paved with large, flat stones, has been unearthed.

The picture obtained from Area H is that of a densely built-up settlement, characterized by large courtyard buildings built one against the other along paved streets.

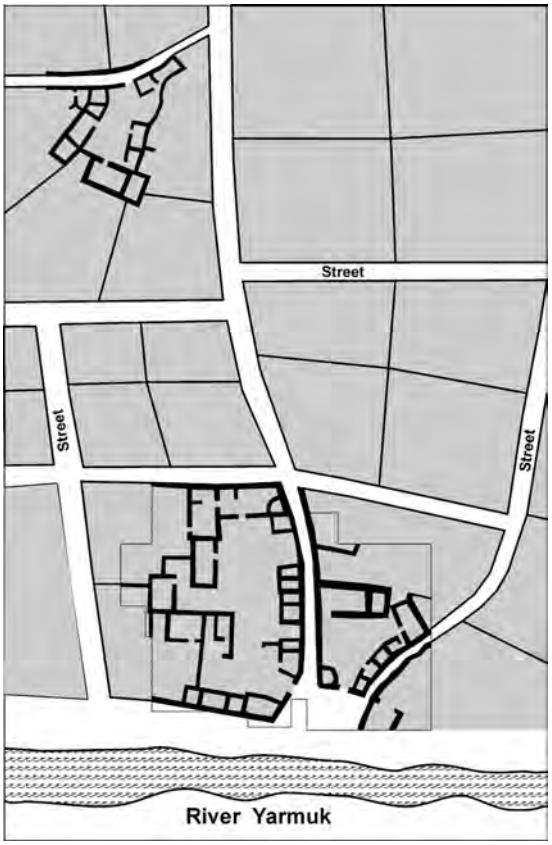



**Figure 6: Reconstructed plan of the ancient settlement of Sha'ar Hagolan**

### Area F

Area F is ca. 500 m northeast of Area E, in the fields of Kibbutz Masada. Deep ploughing carried out here in 1998 in preparation for the planting of banana trees brought potsherds, flint and stone vessels and utensils to the surface. In the short time at our disposal, we dug two small test pits consisting of half a square (2.5 m x 5 m), 30 m apart. Despite the small size of the pits, in each we uncovered massive stone walls similar to those of the courtyard buildings of Area E.

### Area G

In Area G, ca. 50 m northeast of Area E, we excavated a trial trench (5 m x 20 m), with the intention of digging down to the earliest phase of the settlement. The corner of a massive structure was found at the southern edge of the excavation. Most of the area functioned as an open space. At the bottom of Area G, in the open area, a water well was revealed.

### Area N

Area N (named after the Arabic name Tell Abu Nimel) is located in the eastern part of the ancient settlement, as detected by the site survey (Miller 2002), in the fields of Kibbutz Masada. This spot was chosen in order to determine whether the site indeed extends to this region. An area of 200 m$^2$ was opened in 2004 and excavated from topsoil to virgin soil. Large parts of Tell Abu Nimel have been damaged over the years by ancient and modern activities, including a Moslem cemetery, modern military fortifications and recent agriculture. Nevertheless, it became clear that the Neolithic settlement extended all the way to this location. Two Neolithic phases were recognized, with part of a building in the eastern edge of the area. Most of the area uncovered had functioned as an open area in the settlement, with various installations, and the debris were rich with flint, pottery, stone vessels and animal bones.

## Discussion

Data collected during 11 field seasons at the Neolithic settlement of Sha'ar Hagolan clearly indicate the following:

1.The site is 20 ha in area.

2. In each of the excavated areas (E, F, G, H, and N), architectural remains occur.

3. Dwellings consisted of courtyard structures. The three courtyard complexes

uncovered at Sha'ar Hagolan constitute the earliest appearance of this type of building, an architectural concept that is still prevalent in traditional societies of the Near East and in the vicinity of the Mediterranean Sea.

4. The courtyard buildings are monumental in size, ranging from 225 to 700 $m^2$.

5. The courtyard buildings were densely constructed, abutting one another. This was observed both in Area E, near the river, and in Area H, inside the settlement.

6. The courtyard buildings were built along streets.

7. The system of streets includes main roads and small alleys (Fig. 6). The streets were plastered from time to time. A plaza was found between three buildings in Area E.

8. Some of the streets are oriented on a north-south axis; the others on east-west axis.

9. Open areas were found in Areas G and N and are characterized by installations and rich debris.

The main point in order to understand the social organization of ancient Sha'ar Hagolan is the courtyard structures. Who lived in these monumental buildings? Were they used by nuclear or extended families? The focus of analysis is Building I, consisting of one triangular courtyard surrounded by eight rooms. There is a basic unit composed of two rooms, one with a beaten-earth floor and a doorway; and the other adjacent room without a doorway, but with carefully laid stone paving. Three such units surrounded the courtyard (C–D, F–G and H–I). Inside the room that lacks an adjacent storage room are two large paved installations that could have served for storage. This suggests that four nuclear families lived in this complex. Living in such proximity suggests a close kinship: probably an extended family.

*Most of the area uncovered had functioned as an open area in the settlement, with various installations, and the debris were rich with flint, pottery, stone vessels and animal bones.*

The observation that the phenomenon of extended families living together can be traced in the architecture of the Near East was suggested simultaneously, but independently, in 2002 by Flannery and the present author (Flannery 2002, Garfinkel 2002).[1]

Building II is also a courtyard complex. Although its ground plan differs from that of Building I, the architectural concept is clearly that of a courtyard building. It consists of 24 rooms, organized in groups, and at least seven clusters can be distinguished (CF, EGHI, QPOR, STUV, WYX, NM, LK). Thus, this complex was probably used by a large extended family, consisting of at least seven nuclear families.

The building in Area H also consists of a courtyard structure, with ten rooms around a large open courtyard. Some of the rooms have paved floors, three with flat river pebbles (E, G, K) and, in Room C, the floor was made of hard and compact mud plaster. The pattern of a storage room adjacent to a living area recurs here: four such units are clustered (B-C, D-E, F-G, J-K). In addition, two rooms (H, I) are different: each has an entrance and a regular beaten earth floor, but they do not have a storage room nearby.

The architecture exhibits a tripartite division of space at Neolithic Sha'ar Hagolan. This suggests three levels of social organization in the community, as follows (Fig. 7).

### The Individual Household (The Nuclear Family)

The domestic space of a nuclear family was quite limited (10-15 $m^2$). One might question whether this would have been adequate for the use of a nuclear family, but the size of other Pottery Neolithic structures, including those at Munhata (Garfinkel 1992, Figs. 3, 7), Jericho (Kenyon 1981, Fig. 228), Lod (Blockman 1997:6), and Jebel Abu Thawwab (Kafafi 2001, Pl. 7a) is quite similar: these sites contain small rounded structures, usually 2-3 m in diameter, their size not exceeding 15-20 $m^2$. Thus, it appears that nuclear families lived in quite a limited space in the Pottery Neolithic period.

As demonstrated by the analysis of Building I, each nuclear family had a dwelling room and an adjacent storage room. Storage facilities were found inside the small rooms, either as paved closed rooms or as large granary jars below the floors.

1.Ironically, an anonymous reviewer for a grant proposal I submitted to the Israel Science Foundation in 2001, wrote: "Others (e.g., Flannery), however, would argue that the smaller rooms were occupied by individuals". Yet, Flannery himself, after attending my lecture on the Sha'ar Hagolan architecture and its social significance, delivered at the University of Michigan, Ann Arbor, on 12th September 2002, wrote: "To whoever it was that told you that Kent would call Building I a residence for an "individual", you have our permission to tell him he is wrong! You have wonderful data for extended families" (letter dated 25th October 2002).

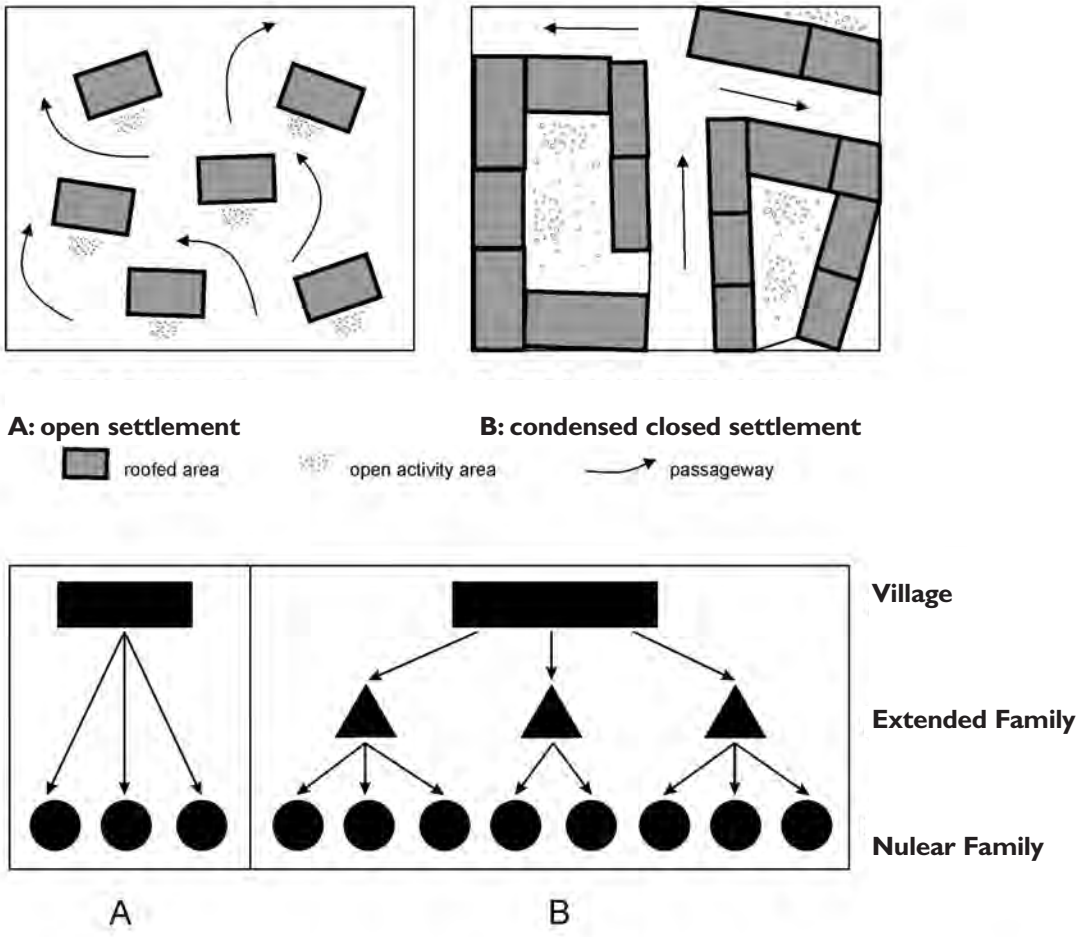



**Figure 7. Schematic table of village structure and its social organization.**

### The Extended Family

The open areas between the houses in Neolithic villages were generally used for cooking, storage in pits, and various other household activities. At Sha'ar Hagolan, however, the open area was integrated into the building as an enclosed courtyard. This placed the open area under tight control, limiting access to approved persons. To this day, personal belongings, wealth and women are protected in the enclosed courtyard in some parts of the Near East. In such traditional societies, women are barred from public areas, and their main activity areas are confined to closed courtyards. Most of the finds — pottery, flint, animal bones, stone vessels, and figurines — were found in the courtyard. Conjoinable flint items from the courtyard of Building I indicate flintknapping activity (Matskevich 2002). Pits and various installations were also found, including large basalt implements: mortars and grinding slabs. These were the common property of the entire extended family.

Families that produced more than they consumed may have begun to accumulate wealth and may have had bigger fields or flocks. In the material culture, such households might be indicated by the larger size of their dwellings, as well as the presence of exotic items such as obsidian, seashells, beads and alabaster vessels. Even regular commodities in such houses could be larger and more elaborate in shape and decoration. Indeed, a comparison between Buildings I and 2 exhibits such differences (size of structure, percentage of decorated pottery, figurines), suggesting differences in the wealth or social status of the extended families that lived there.

### The Community

The use of space by the community at Sha'ar Hagolan indicates site planning on a level unprecedented in the Neolithic period in the Levant:

a. Formalized passageways. Movement in the settlement occurred through formalized passageways. A hierarchical system of streets has been uncovered in the form of a wide straight street and a narrow

*The main point in order to understand the social organization of ancient Sha'ar Hagolan is the courtyard structures. Who lived in these monumental buildings? Were they used by nuclear or extended families?*

curving alley. The main street at Sha'ar Hagolan was resurfaced from time to time with small river pebbles and mud plaster. The street is clearly a communal place; thus, its maintenance reflects an organized communal effort. This phenomenon raises various questions concerning public decision-making: Who organized the work? How often were the streets repaired? Who carried out the work and who supervised it?

b.The river front. The street and alley end at an open piazza at the riverfront. This was an open area for the use of the entire community.

c. The well. This installation was found in an open area and not within one of the buildings' courtyards. It seems that the energy required to dig and maintain a well was too great for an extended family and required cooperation on a larger scale. Wells thus appear to have been public, rather than private, installations.

d. Public structures. In recent years it has become apparent that public structures were built in the Neolithic settlements of the Near East. Such examples have already been noted at Pre-Pottery Neolithic A sites such as the tower of Jericho (Kenyon 1981), and the rounded building in Jerf al-Ahmar (Stordeur et al. 2001), as well as in the Pre-Pottery Neolithic B public structures, including the skull building of Çayönü (Ozbeck 1988) and the plastered building at Nevali Çori (Hauptmann 1993). Such communal buildings were probably built at Sha'ar Hagolan as well. We hope that future excavations will locate and excavate such structures.

Large Neolithic structures, which could be the dwellings of extended families, were found at a number of sites dated to the later part of the Neolithic period (late Pre-Pottery Neolithic or Pottery Neolithic): Bouqras, Basta, Tell as-Sawwan, Zaghe, and Hassuna (Garfinkel and Ben-Shlomo 2002, Flannery 2002). Flannery has attributed these developments to the increasing economic complexity:

> married sons remain attached to the household of their father because the combination of two tasks – cereal agriculture and the grazing of herd animals – requires a division of labor beyond the capacity of a nuclear family. By 5500 B.C. many Near Eastern villages not only grew wheat, barley, lentils, and peas for food, but also raised flax for linen and had added cattle and pig to the herding of sheep and goats. A family of 15-20 simply had more manpower to perform all the disparate tasks in such an economy, which could include some kind of craft production as well (Flannery 2002:424).

In the context of the Pottery Neolithic period of the southern Levant, only the site of Sha'ar Hagolan presents such architecture. Mixed economy, as suggested by Flannery, appeared at all other sites as well, but they do not exhibit large courtyard buildings. On the contrary, many of them, such as Munhata, Hamadiya, Habashan Street, Jebel Abu Thawwab, Lod, Teluliyot Batashi, Jericho and Ghrubba (Garfinkel 1999:16-103) present only pits or small rounded huts of the type characterizing the very early stages of the Natufian and early Pre-Pottery Neolithic A (but see Kafafi, this volume). Thus, in this case, there is no direct link between the economy of a settlement and its physical and social structure.

It seems that the critical issue in this case is the size of Sha'ar Hagolan, which presents a unique example of a mega-settlement in the Pottery Neolithic period. How did this 20 ha densely inhabited community adapt to the demographic situation in which a few thousand people lived together? Ethnographic observations on human behavior under population pressure indicate that they can change various aspects of their behavior. Studies of population density have concluded that:

> scalar stress refers to the stresses inherent in large population aggregations, which must be reduced through strategies as diverse as increasingly hierarchical social organization, group fission, and increasing incidence of group ritual (Carneiro 1967; also Johnson 1982; Friesen 1999).

Construction of large modular houses for the use of extended families, as a direct response to population pressure, has also been observed among the Inuit tribes of North America during their aggregation period (Friesen 1999). The large courtyard buildings at Sha'ar Hagolan reflect a new method of adaptation to population pressure in the ancient Near East.

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## Early Near Eastern Production, Subsistence, and Environment

## Studies in Early Near Eastern Production, Subsistence, and Environment

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