

Michael P. Neeley
Department of Sociology & Anthropology
Montana State University
Bozeman, MT 59717 U.S.A.

Michael P. Neeley

The Late Epipaleolithic: The View from West-Central Jordan

Introduction

The Late Epipaleolithic of Jordan represents a crucial period in human history. These populations were the last in a long line of successful hunter-gatherers adapted to a variable range of environmental conditions. They also represent the first link in a series of new, revolutionary changes in subsistence and social organization that would come to characterize the subsequent Pre-Pottery Neolithic (Simmons 2007). This paper examines aspects of the Late Epipaleolithic world from the perspective of foragers in west-central Jordan. Prior research from the Wādī al-Ḥasā is augmented by recent work in the Wādī Juhayra that broadens our understanding of the Late Epipaleolithic in west-central Jordan. In addition to expanding the existing site database, particular emphasis is placed on issues of chronology and paleoenvironments — the importance of the latter has implications for Late Epipaleolithic settlement patterns.

The Late Epipaleolithic/Natufian

The Late Epipaleolithic or Natufian in the Levant dates between 12,500 and 10,200 years BP. (uncalibrated radiocarbon years). This period is traditionally divided into an early (12,500-11,000) and late (11,000-10,200) phase based on differences in the material record and the spatial distribution of these sites (Bar-Yosef 1998; Belfer-Cohen 1991). The significance of the Late Epipaleolithic lies in its relationship to the emergence of the first agricultural communities as many of the Neolithic developments have correlates in this time period.

The Early Natufian is characterized by a suite of cultural developments that are manifest in the archaeological record. These include increased sedentism, small villages, stone architecture, burials, ornamentation, and worked bone (Belfer-Cohen

1991). In addition, the chipped stone industry is characterized by crescent-shaped, backed micro-liths (lunates) that distinguish the Natufian from earlier periods. These lunates tend to exhibit greater frequencies of bifacial backing (known as Helwan backing) and are generally larger than their Late Natufian counterparts (Valla 1995: 181). Spatially, the Early Natufian occurs in the “core” area, defined by the prehistoric extent of Mediterranean plant communities in the southern Levant (Bar-Yosef 1998: 161). Traditionally, the core was confined to the northern portions of the southern Levant, however, the boundaries of the Natufian core have been pushed further south in Jordan with the discovery of additional Early Natufian sites (Bar-Yosef 1998: 160). There is some debate, however, as to whether this expanded core area is really represented by Mediterranean plant communities or whether it constitutes a more open, steppe-like environment (Olszewski 2004: 191). If this is the case, then it should come as no surprise if we observe variation in the organizational and subsistence properties of Early Natufian sites (Olszewski 2004: 191).

In contrast to the Early Natufian, the Late Natufian has been interpreted as a less elaborate cultural manifestation. This is evidenced by the general increase in residential mobility along with fewer examples of substantial architecture, less elaborate artistic representations, and fewer burials. The Late Natufian lithic technology is characterized by a decline in Helwan backing of lunates in favor of abrupt or bipolar techniques (Belfer-Cohen 1991: 172). Geographically, Late Natufian sites are more widely dispersed and occur in presently arid environments (e.g., the Negev and Eastern Desert).

This division between the early and late Natufian coincides roughly with the onset of the Younger Dryas (ca. 11,000 BP). The Younger Dryas is a cli-

matic event that resulted in cooler, drier conditions that limited the extent of the Mediterranean forest/ woodland environments and presumably initiated stress on the more sedentary, early Natufian populations (Bar-Yosef 1998: 168). At the end of the Younger Dryas, when climates became more favorable, we see the emergence of early agricultural communities.

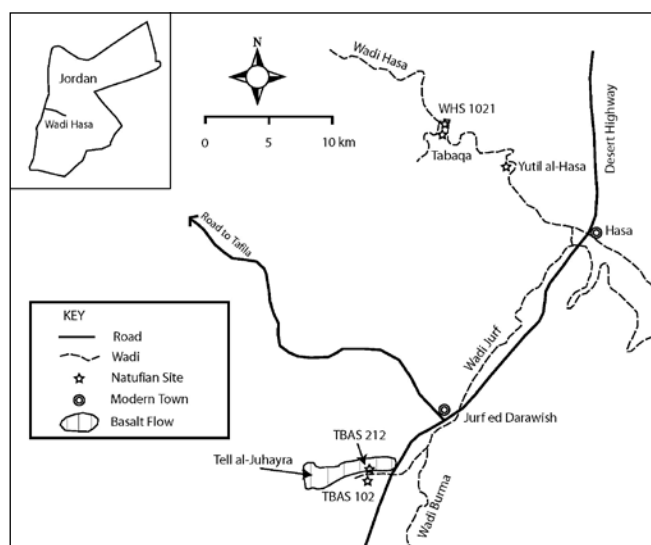
West-Central Jordan

Research in west-central Jordan has generally lagged behind that of the traditional core area for two reasons. First, the environmental setting of west-central Jordan is largely steppe-desert, making it peripheral to the more heavily researched Mediterranean environment of the core area. However, the Pleistocene environments of west-central Jordan were much different in the past as indicated by localized marsh and lake environments. Second, the history of archaeological research in west-central Jordan is relatively recent in comparison to the Mediterranean core region. Only through regional survey and excavation programs in the past 25 years have we acquired systematic information about the prehistory of west-central Jordan.

Perhaps the most interesting indicators of past environmental and ecological conditions in west-central Jordan are the aforementioned marsh and lake settings. These have been documented in the form of marl deposits both in the Wādī al-Ḥasā as well as farther south near Jurf ad-Darāwīsh (Moumani *et al.* 2003; Schuldenrein and Clark 1994). Archaeological surveys along the edges of these Pleistocene deposits have yielded numerous Paleolithic sites, indicating the long-lived nature of these landscape features (Clark *et al.* 1992, 1994; MacDonald 1988; MacDonald *et al.* 2004).

The Wādī al-Ḥasā

In the Wādī al-Ḥasā, Natufian sites are relatively rare (particularly when compared to the Middle and Upper Paleolithic periods) (FIG. 1). Three sites, all in the eastern portion of the Wādī al-Ḥasā, have been identified as Natufian in age (Byrd and College 1991; Olszewski and Hill 1997; Olszewski *et al.* 1994). Yutil al-Ḥasā and WHS 1021 are considered to be task specific camps (short-term occupations) while aṭ-Ṭabaqa with its extensive deposits and ground stone artifacts is classified as a base camp. Only aṭ-Ṭabaqa and Yutil al-Ḥasā have been subject to excavation whereas WHS 1021 is known



1. Location of Natufian Sites in West-Central Jordan.

only from surface collected materials. All three of these sites have been assigned an Early Natufian age based on the frequency of Helwan backed lunates in these assemblages.

The local environmental setting for the Early Natufian in the Wādī al-Ḥasā is characterized by springs and marshes rather than extensive lake systems. The deposits at aṭ-Ṭabaqa suggest the presence of an oxbow lake, probably consisting of a marsh environment in proximity to the site (Hill 2006: 76; Olszewski and Hill 1997: 12). Similarly, spring deposits near Yutil al-Ḥasā may also have fed marsh deposits in this area as well (Olszewski *et al.* 1998). These examples present a picture of the Early Natufian in which water tables were relatively high, probably corresponding to higher levels of precipitation. This pattern coincides with the sort of climate expected for the period immediately prior to the Younger Dryas (12,500-11,000 b.p.) (Bar-Yosef 1998: 161).

The Wādī Juhayra

In the Wādī Juhayra, archaeological survey recorded ten Late Epipaleolithic/Natufian sites with surface densities varying from light to very dense (Neeley 2004). Interpretation of the surface remains suggested site types ranging from base camps to task oriented locations. The distribution of sites along the Wādī Juhayra is somewhat unusual as Natufian sites rarely occur in clusters (Sellars 1998: 87). This pattern of site location suggests that key resources (e.g., water) were regular and stable features of the landscape — possibly allowing Natufian populations to maintain an increasingly seden-

tary lifestyle.

Two of these sites, TBAS 102 and 212, were selected for test excavation in 2006 as part of a research project focused on the transition from foraging to farming (Neeley and Peterson 2007). Both sites appeared to contain high surface artifact densities, single components (no pottery), and had yielded examples of lunates and small microlithic cores from surface contexts indicative of a Natufian occupation.

Site 102 is a small, but dense scatter of lithic material on the south side of the Wādī Juhayra. The site measures approximately 15 by 20m. On the north side of the site is a rock alignment (roughly E-W) that extends for approximately 17m. Excavations yielded cultural materials to a depth of 35cm below the surface.

Site 212 is located on the north side of the wadi approximately 180m from Site 102. The site is much larger with surface materials paralleling the wadi for 100m and extending 50m to the north of the wadi. The site also abuts the basalt flow from Tall Juhayra that marks the north side of the wadi. Excavation reached a depth of 50cm below the surface without reaching culturally sterile deposits.

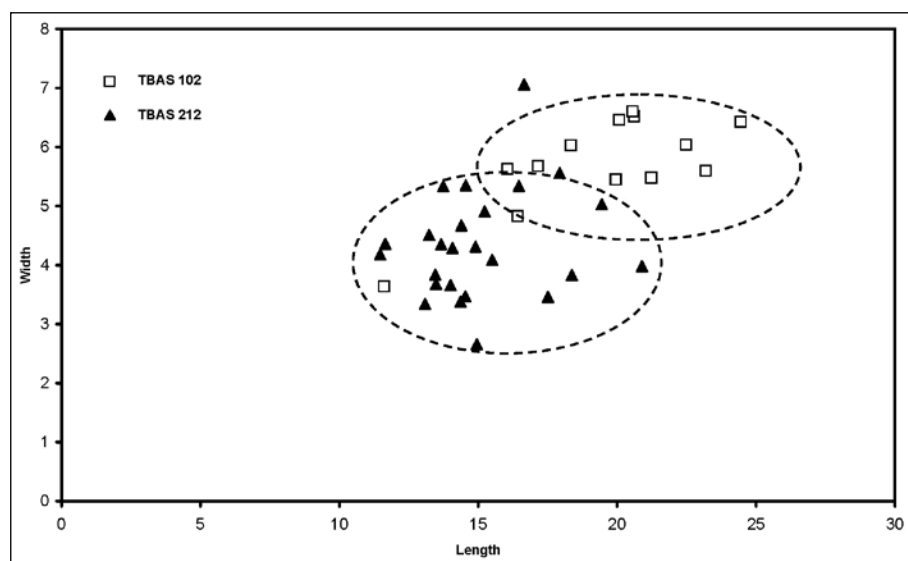
The analysis of materials from the 2006 season is on-going and much of what we have is preliminary in nature. Materially, the excavations at Sites 102 and 212 were quite successful. While the surface of both sites was littered with chipped stone, the subsurface deposits were equally rich. In addition to the chipped stone, the sites yielded ground stone, faunal remains, shell ornaments, and samples suit-

able for dating. The following is a brief overview of the lithics, radiocarbon dates, shell, architecture, and geomorphology.

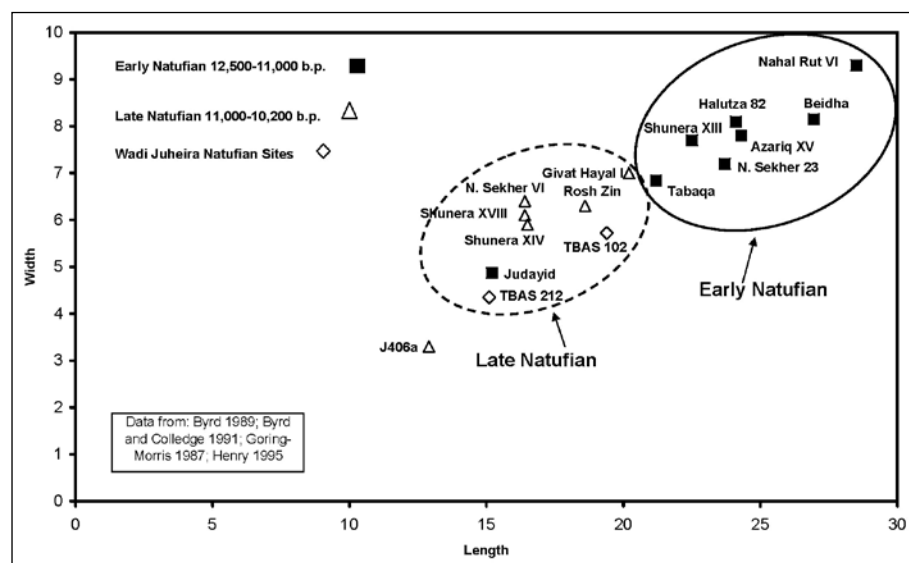
Lithics artifacts were numerous with more than 10,000 artifacts from the excavation of 6m² and the surface collection of 30m². Given the quantity of debitage, debris, and cores, it appears that primary and secondary reduction activities occurred at both locations. Raw materials are similar at both sites and focus on small nodules of high quality flint. Both sites are characterized by the production of flakes, blades, and bladelets from small bladelet cores. The characteristic element of the Natufian, the lunate, occurs at both locations and the emphasis on microlith production is also represented by numerous microburins in the assemblages.

A comparison of the complete lunates from the two sites indicates that the lunates at Site 102 are larger than those from Site 212 (FIG. 2). When the average size is compared to other Levantine assemblages, the Wādī Juhayra sites tend to be on the small end and cluster with those that are Late Natufian in age (FIG. 3). In addition, the backing on the Wādī Juhayra lunates (and other microliths) consists almost entirely of abrupt or bipolar backing. Helwan or bifacial backing, indicative of the Early Natufian, is absent suggesting affinities with the Late Natufian.

Aside from techno-typological comparisons, two radiocarbon dates were obtained from Site 102 (TABLE 1). These dates suggest an occupation at the very end of the Early Natufian just prior to the onset of the Younger Dryas at about 11,000 BP



2. Scatterplot of Lunate Size (in mm) from TBAS 102 and TBAS 212.



3. Comparison of Average Lunate Size (in mm) from selected Early and Late Natufian Sites in the Levant.

TABLE 1. Radiocarbon Dates from TBAS 102.

Sample No.	Unit/Level	Conventional Age	Two Sigma Calibrated Results
Beta 221179	3/3	11,170±70 BP	13,410-12,980 BP and 12,940-12,910 BP
Beta 229411	4/2	11,040±60 BP	13,100-12,860 BP

(uncalibrated). Given the discrepancy between the techno-typological markers and the radiocarbon dates, it is suggested that the characteristics used to distinguish the early and late Natufian are less useful near the “transition”.

A total of 460 shells and shell fragments were recovered from these two sites (TABLE 2). Most of these were freshwater shells (96%) with marine shell comprising 3% of the sample. Most prominent among the marine shell sample were *Den-*

talium shell which are found in both the Red Sea and Mediterranean Sea. However, other shells (*Nassarius gibbosulus* and *Euplica turturina*) have sources in the Mediterranean and Red Seas respectively. These suggest contact, probably in the form of trade networks, with Natufian populations both to the west and the south.

There was also a stone alignment at Site 102, which remains somewhat enigmatic (FIG. 4). Functionally, it might have served as a windbreak

TABLE 2. Shell Species and Counts from TBAS 102 and 212.

Species	Origin	TBAS 102	TBAS 212
<i>Melanoides tuberculata</i>	Freshwater	424	1
<i>Melanopsis buccinoidea</i>	Freshwater	13	6
<i>Bulinus truncates</i>	Freshwater	1	-
<i>Xerocrassa</i> sp.	Land	2	-
<i>Nassarius gibbosulus</i>	Mediterranean Sea	2	-
<i>Euplica turturina</i>	Red Sea	-	1
<i>Dentalium</i> shells	Mediterranean and Red Sea	9	1
Total		451	9



4. Stone Alignment from TBAS 102. View to the south.

however, assigning its construction to the Natufian is tenuous. Natufian artifacts are found both up and down slope of the feature as well as in the adjacent subsurface deposits. Prior or subsequent periods of occupation are absent from the site, especially ceramics. But the question remains, is this enough to unequivocally assign this to the Natufian occupation of the site?

The picture of the environmental setting in the Wādī Juhayra is beginning to emerge through an increased understanding of the local geomorphology. Marl deposits, which are associated with standing bodies of water both there and in the Wādī al-Ḥasā, suggest the presence of marsh or wetlands rather than a lake. In the Wādī Juhayra, marl deposits were less extensive than expected and their uneven distribution suggests a wetland type of environment. Several areas upstream from the sites were identified as potential tufa or ancient springhead deposits that may have fed the marsh/wetland. Support for local springs is found in the presence of numerous freshwater shells recovered from archaeological contexts at both sites. The big question is when did this marsh/wetland environment disappear? Did it persist throughout the Natufian or did the onset of the Younger Dryas at 11,000 BP signal the end of this environment? It seems that dating is crucial here, for if the region were occupied into the Late Natufian, then we might argue for the impact of the Younger Dryas to be abated for this area. However, if all the sites in the Wādī Juhayra date to the Early Natufian or the “transition”, then the abandonment

of the Wādī Juhayra would coincide with the climatic and environmental changes of the Younger Dryas.

Conclusions

So what is the view of the Late Epipaleolithic in west-central Jordan? It appears that a range of site types, both base camps and specialized activity camps, can be found in this area (Olszewski 2000: 239). This is encouraging for it suggests that foraging societies were engaged in a broad range of settlement and subsistence activities. It is also apparent that settlement in west-central Jordan is closely tied to marsh/wetland resources areas; however these areas might be seasonally productive, resulting in repeated short-term occupation rather than full-blown sedentism. In addition, research to date has not yielded architecturally complex sites like those found in the traditional Mediterranean core area. This raises some interesting, and unanswered questions. Is west-central Jordan a cultural backwater relative to the Mediterranean core? Might other factors account for this absence of material complexity? Or is this a reflection of the research history of the area? There also remains the question of an unequivocal Late Natufian occupation in west-central Jordan. At present, no evidence exists for a Late Natufian occupation in the Wādī al-Ḥasā. The assemblages in the Wādī Juhayra appear to be typologically Late Natufian, but radiocarbon dates put these sites at the very end of the Early Natufian. A Late Natufian presence in west-central Jordan would be significant for addressing potential local influences on the development of agricultural communities. Clearly, more work remains to be done to resolve these issues and enhance our understanding of the Late Epipaleolithic/Natufian in west-central Jordan.

Acknowledgements

This research was funded by grants from Montana State University, Marquette University, and the University of Minnesota-Duluth. I would like to thank Jane Peterson, Brett Hill, Jennifer Jones, Jordan Knudsen, and Mr. Abudullah Rawashdeh (Department of Antiquities, Tafila Office) for their efforts in the field. Aldona Kurzawska (Polish Academy of Sciences) analyzed the shell materials and Loni Waters (Montana State University) measured the lunates. Finally, I would like to thank the organizers of the SHAJ conference and

the Jordanian Department of Antiquities and its Director General Dr. Fawwaz Al-Khraysheh.

Bibliography

- Bar-Yosef, O. 1998. The Natufian Culture in the Levant, Threshold to the Origins of Agriculture. *Evolutionary Anthropology* 6: 159-177.
- Belfer-Cohen, A. 1991. The Natufian in the Levant. *Annual Review of Anthropology* 20: 167-186.
- Byrd, B.F. 1989. *The Natufian Encampment at Beidha: Late Pleistocene Adaptation in the Southern Levant*. Aarhus: Aarhus University Press.
- Byrd, B.F. and Colledge, S. 1991. Early Natufian Occupation along the Edge of the Southern Jordanian Steppe. Pp. 265-276 in O. Bar-Yosef and F. Valla (eds.), *The Natufian Culture in the Levant*. Ann Arbor: International Monographs in Prehistory.
- Clark, G.A., Neeley, M., MacDonald, B., Schuldenrein, J. and 'Amr, K. 1992. Wadi al-Hasa Paleolithic Project 1992: Preliminary Report. *ADAJ* 36: 13-23.
- Clark, G.A., Olszewski, D., Schuldenrein, J., Rida, N. and Eighmey, J. 1994. Survey and Excavation in the Wadi al-Hasa: A Preliminary Report of the 1993 Field Season. *ADAJ* 38: 41-55.
- Goring-Morris, A.N. 1987. *At the Edge: Terminal Pleistocene Hunter-Gatherers in the Negev and Sinai*. BAR International Series 361. Oxford: BAR.
- Henry, D.O. 1995. *Prehistoric Cultural Ecology and Evolution: Insights from Southern Jordan*. New York: Plenum Press.
- Hill, J.B. 2006. *Human Ecology in the Wadi al-Hasa: Land Use and Abandonment through the Holocene*. Tucson: University of Arizona Press.
- MacDonald, B. 1988. *The Wadi el-Hasa Archaeological Survey, 1979-1983, West-Central Jordan*. Waterloo: Wilfred Laurier University Press.
- MacDonald, B., Herr, L.G., Neeley, M.P., Gagos, T., Moumani, K. and Rockman, M. 2004. *The Tafila-Busayra Archaeological Survey 1999-2001, West-Central Jordan*. ASOR Archaeological Reports No. 9. Boston: American Schools of Oriental Research.
- Moumani, K., Alexander, J. and Bateman, M.D. 2003. Sedimentology of the Late Quaternary Wadi Hasa Marl Formation of Central Jordan. A Record of Climate Variability. *Palaeogeography, Palaeoclimatology, Palaeoecology* 191: 221-242.
- Neeley, M.P. 2004. Late Epipaleolithic Settlement in the Wadi Juheira, West-Central Jordan. Pp. 39-54 in C. Delage (ed.), *The Last Hunter-Gatherers in the Near East*. BAR International Series 1320. Oxford: John and Erica Hedges.
- Neeley, M.P. and Peterson, J.D. 2007. Crossing the Boundary to Domestication Economies: A Case Study from West-Central Jordan. Pp. 203-210 in T.E. Levy, P.M.M. Daviau, R.W. Younker and M. Shaer (eds.), *Crossing Jordan: North American Contributions to the Archaeology of Jordan*. London: Equinox Publishing Ltd.
- Olszewski, D.I. 2000. The Epipaleolithic in the Wadi al-Hasa: An Overview. Pp. 227-243 in N.R. Coinman (ed.), *The Archaeology of the Wadi al-Hasa, West-Central Jordan, Volume 2: Excavations at Middle, Upper and Epipaleolithic Sites*. Arizona State University Anthropological Research Papers No. 52. Tempe: Arizona State University.
- 2004. Plant Food Subsistence Issues and Scientific Inquiry in the Early Natufian. Pp. 189-209 in C. Delage (ed.), *The Last Hunter-Gatherers in the Near East*. BAR International Series 1320. Oxford: John and Erica Hedges.
- Olszewski, D.I., Cooper, J.B. and Richey, E. 1998. The Third Season at Yutil al-Hasa (WHS 784), the Epipaleolithic Components. *Neo-Lithics* 2/98: 5-7.
- Olszewski, D.I. and Hill, J.B. 1997. Renewed Excavations at Tabaqa (WHS 895), an Early Natufian Site in the Wadi al-Hasa, Jordan. *Neo-Lithics* 3/97: 11-12.
- Olszewski, D.I., Stevens, M., Glass, M., Beck, R., Cooper, J. and Clark, G.A. 1994. The 1993 Excavations at Yutil al-Hasa (WHS 784), an Upper/Epipaleolithic Site in West-Central Jordan. *Paléorient* 20: 129-141.
- Schuldenrein, J. and Clark, G.A. 1994. Landscape and Prehistoric Chronology of West-Central Jordan. *Geoarchaeology* 9: 31-55.
- Sellars, J.R. 1998. The Natufian of Jordan. Pp. 83-101 in D.O. Henry (ed.), *The Prehistoric Archaeology of Jordan*. BAR International Series 705. Oxford: Archaeopress.
- Simmons, A.H. 2007. *The Neolithic Revolution in the Near East*. Tucson: University of Arizona Press.
- Valla, F. 1995. The First Settled Societies—Natufian (12,500-10,200 BP). Pp. 169-187 in T.E. Levy (ed.), *The Archaeology of Society in the Holy Land*. London: Leicester University Press.