ARCHAEOZOOLOGY OF THE NEAR EAST VI

Proceedings of the sixth international symposium on the archaeozoology of southwestern Asia and adjacent areas

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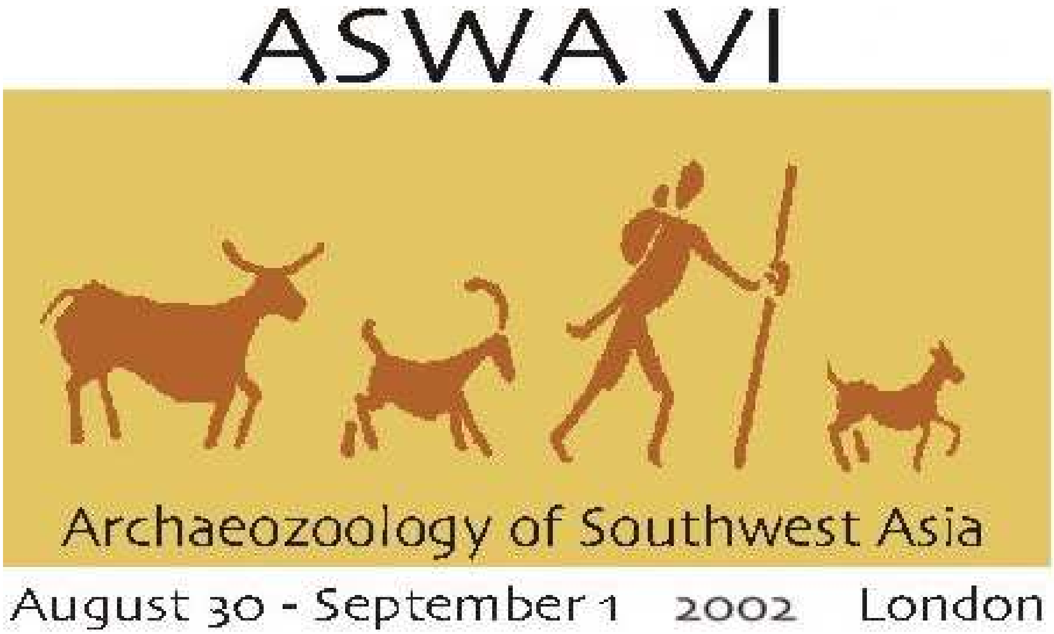

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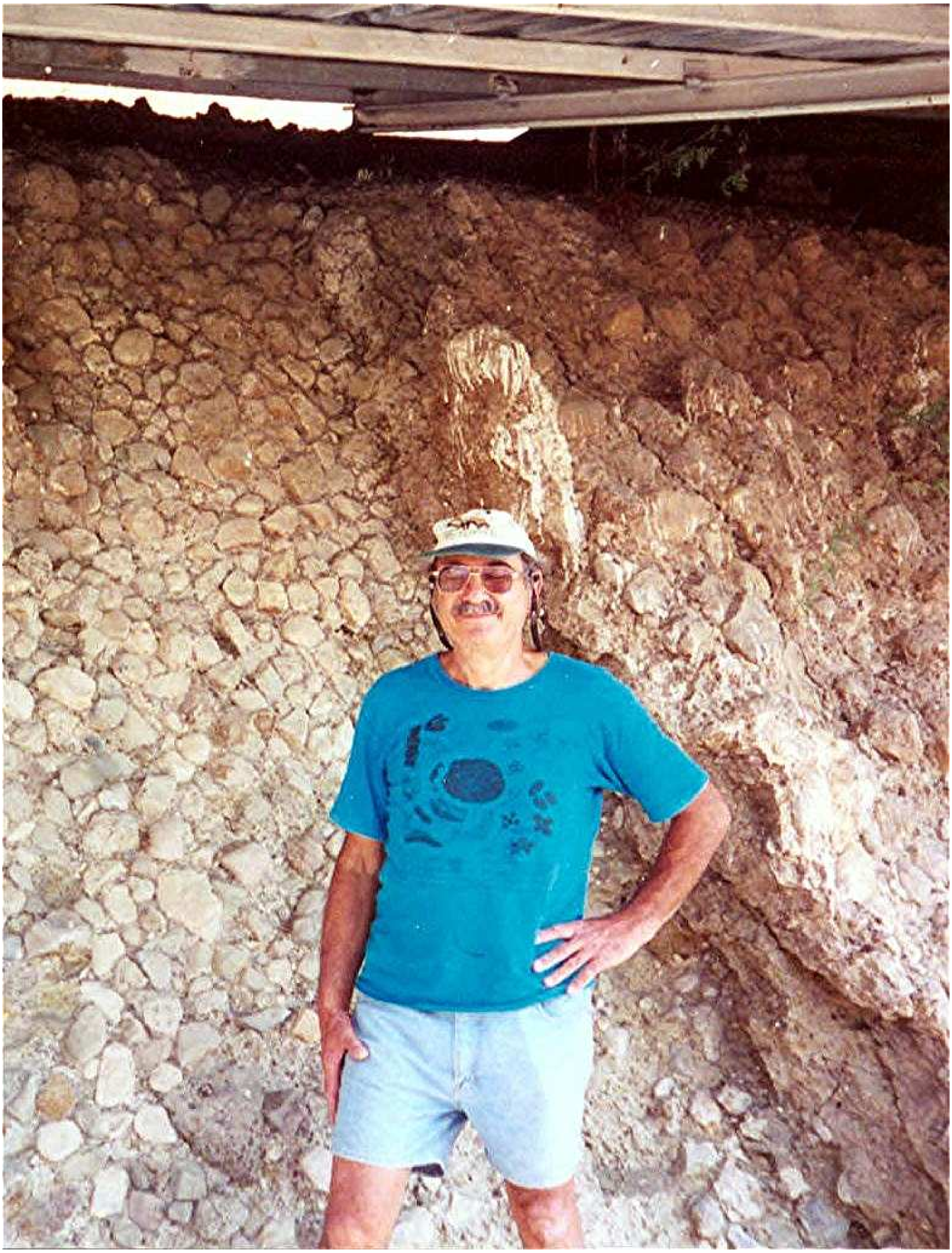

Prof.Dr. Eitan Tchernov

This volume is dedicated to the memory of Prof. Dr. Eitan Tchernov, in fond memory of his enthusiasm and support to many in the field of archaeozoology**.**

Preface

The ASWA VI meeting was held at the Institute of Archaeology, University College London, from 30th August-1st September 2002, timetabled to follow on the heels of the ICAZ meeting in Durham, UK. Over 55 participants attended the meeting, travelling from 13 countries, bringing the latest research results from our field. As usual, it was a pleasure to see so many doctoral students presenting their research – a sign for a very healthy future for zooarchaeology in south west Asia. It is still unfortunate, however, that colleagues from some Middle Eastern countries were unable to attend due to financial and political constraints.

Presentations were organized into the following six themes, which highlight the scope of the ASWA membership: Animals in Palaeolithic and Epipalaeolithic Levant; Neolithic Patterns of Animal Use; Animals in Neolithic Anatolia; Animals in the Chalcolithic and Bronze Ages; Iron Age, Nabatean and Roman Patterns of Animal Use; Animals in Ancient Egypt. There was also a poster session, and contributors were invited to submit papers to this volume.

As always with the ASWA forum, the meeting served to welcome new scholars to the group, but was also very much a reunion of old friends and colleagues who have been sharing new information and discussing issues of joint interest for many years now. In this vein, it is a great sadness that ASWA VI was the last international meeting attended by Prof. Eitan Tchernov, an original founder of the group and mentor and inspiration to so many. For many of us, it was the last time we saw Eitan, and experienced his usual incisive comment, unstoppable enthusiasm for the subject, and warm friendship. He will be greatly missed.

ASWA VI was supported by the Institute of Archaeology, UCL, who provided facilities and financial and administrative help. In particular, the organizing team was aided greatly by the administrative assistance of Jo Dullaghan at the Institute. ARC bv (Archaeological Research and Consultancy, Groningen, The Netherlands) once again shouldered the finances of the publication of the proceedings, and we are extremely grateful for their continuing support. Many thanks are also due to the postgraduate student helpers from the Institute of Archaeology who made the meeting run so smoothly: Banu Aydinoğlugil, Jenny Bredenberg, Chiori Kitagawa, Peter Popkin, and Chris Mosseri-Marlio (who also produced the logo reproduced on the frontispiece of this volume).

Many thanks to all the participants for making the meeting such a success!

Louise Martin
London 2005

Participants of the 6th ASWA Conference, held at the Institute of Archaeology, University College London.

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SHIFTS IN EPIPALEOLITHIC FAUNAL EXPLOITATION AT WADI MATAHA 2, SOUTHERN JORDAN

Joel C. Janetski [1] and Aubrey Baadsgaard [2]

Abstract

Faunal data from Wadi Mataha, a multicomponent Epipaleolithic site in southern Jordan, strengthens evidence of increasing importance of goats through time. The data also suggest similarities in Geometric Kebaran and Late Natufian strategies, perhaps representing a return to a more mobile strategy in the latter period. Finally, the data argue for a broadening of the diet through time, although arguments for resource intensification must include a consideration of demographic and strategy shifts.

Résumé

Les données sur la faune de Wadi Mataha, un site épipaléolithique à composante multiple du sud de la Jordanie renforce le fait d'augmentation importante des chèvres à travers le temps. Les données suggèrent aussi les ressemblances de Kebaraen géométrique et du Natoufien récent, représentant peut être un retour à une stratégie de vie plus mobile aux périodes plus tardives. Enfin, les données plaident pour un élargissement du spectre de l'alimentation à travers le temps, bien que les preuves de l'intensification des ressources doit considérer en amont des changements démographiques et stratégiques

Keywords: archaeofauna, resource intensification, Natufian, Jordan.

Mots Clés: archéofauna, intensification des ressource , Natufien, Jordanie.

Introduction

Several scholars (Bar-Yosef and Meadow 1995; Tchernov 1994; Stiner 2001; Stiner *et al* 2000; Munro 2001) have recently revisited the issue of resource intensification during the Epipaleolithic, a concept reminiscent of the Broad Spectrum Revolution discussed by Binford (1968) and Flannery 1969) in the 1960s. Stiner's (2001) recent consideration of this issue draws attention to the shifts in human relations to large and small prey over the last 200k years. Faunal data from Wadi Mataha 2, an Epipaleolithic site in southern Jordan supports in a general way the notion of a Broad Spectrum Revolution and, more specifically, argues that shifts in Natufian strategy documented in the core area by Munro (2001) occurred in southern Jordan as well.

Site Description

Wadi Mataha 2 is a multi-component, Epipaleolithic site in the northern portion of the Petra Basin (Figs. 1 and 2). Human occupation lies at the top of and down a steep talus slope at the south edge of Maghur al Mataha, a large sandstone monolith. Elevation is about 950 m. The landscape is rough, broken terrain intermediate between the city of Petra and gentler, hilly uplands that still contain vestiges of oak - pistachio woodlands. The site slope is littered with sandstone rubble, chipped stone debris and tools, and occasional bone eroding into a secondary drainage of the site's namesake 2, a major drainage flowing into Petra 1.2 km to the south. Initial estimates of site size were modest given the possibility that cultural material may have simply eroded down slope; however, excavations have demonstrated that features and buried deposits are present from the upper to the lower slope. (Fig. 3).

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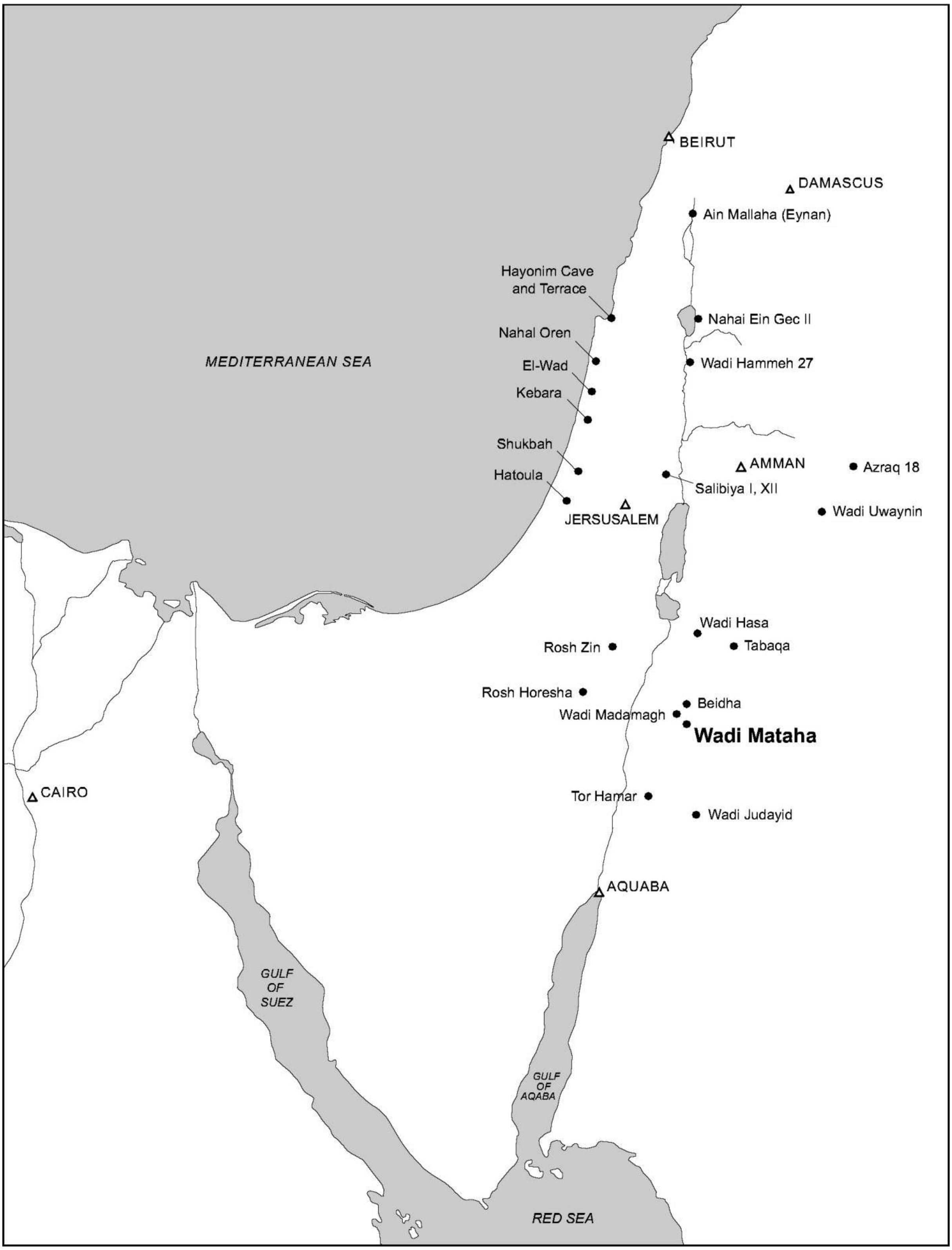

Fig. 1. Selected Epipalaeolithic sites in the Near East showing the location of Wadi Mataha.

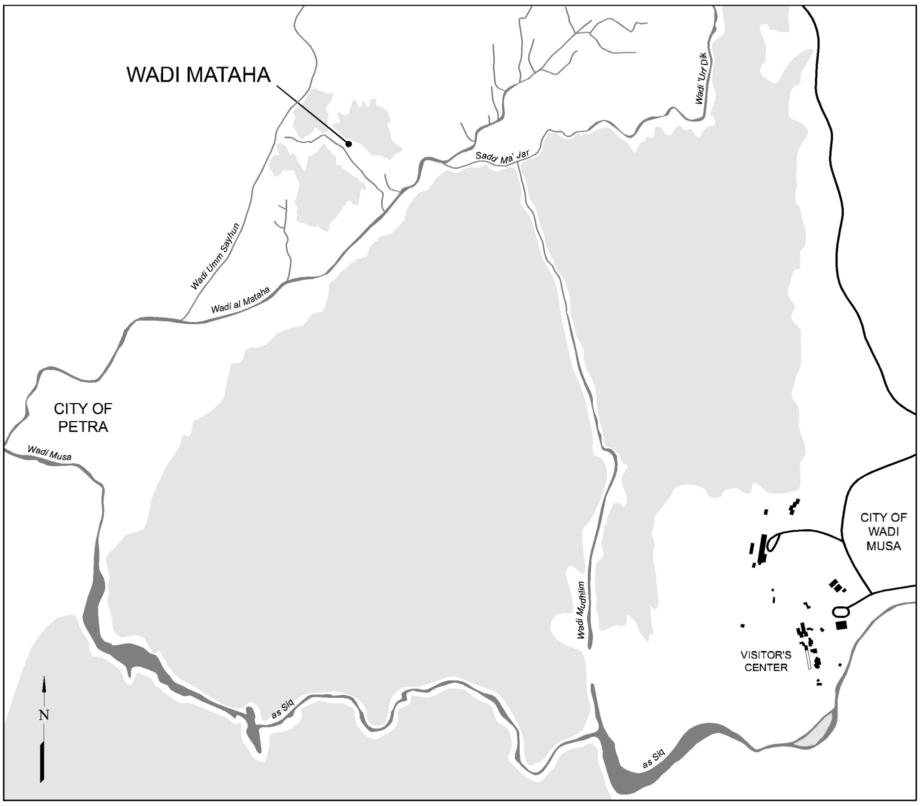

Fig. 2. Petra Basin showing relationship of Wadi Mataha to Petra.

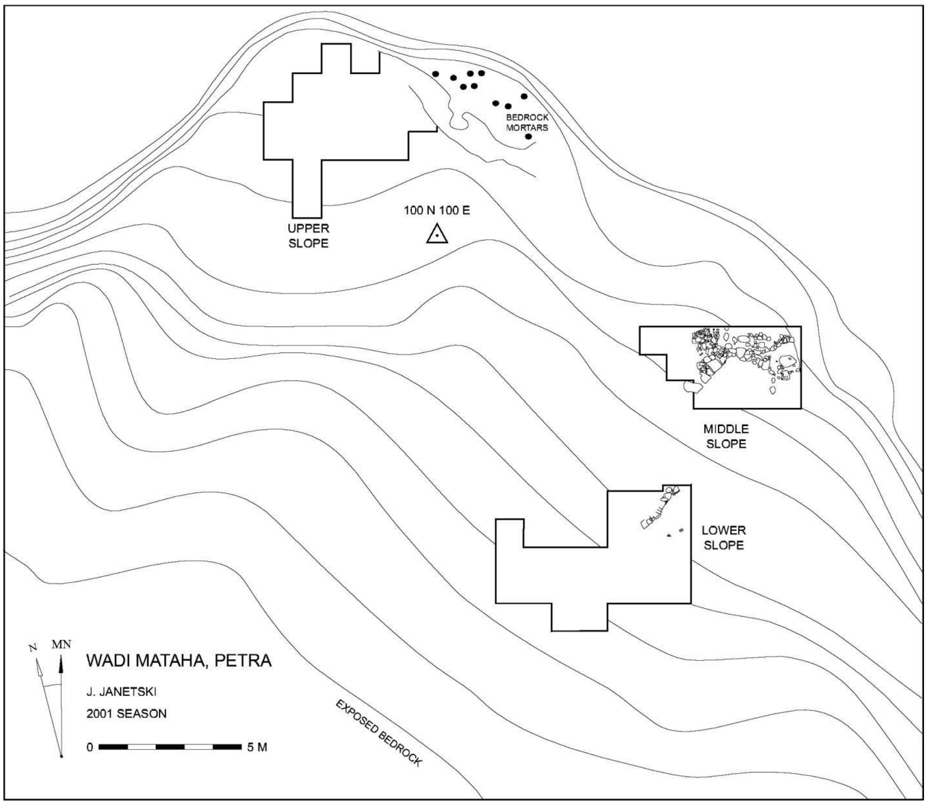

Fig. 3. Wadi Mataha showing areas of excavation as of Field Year 2001. Contours are estimates only.

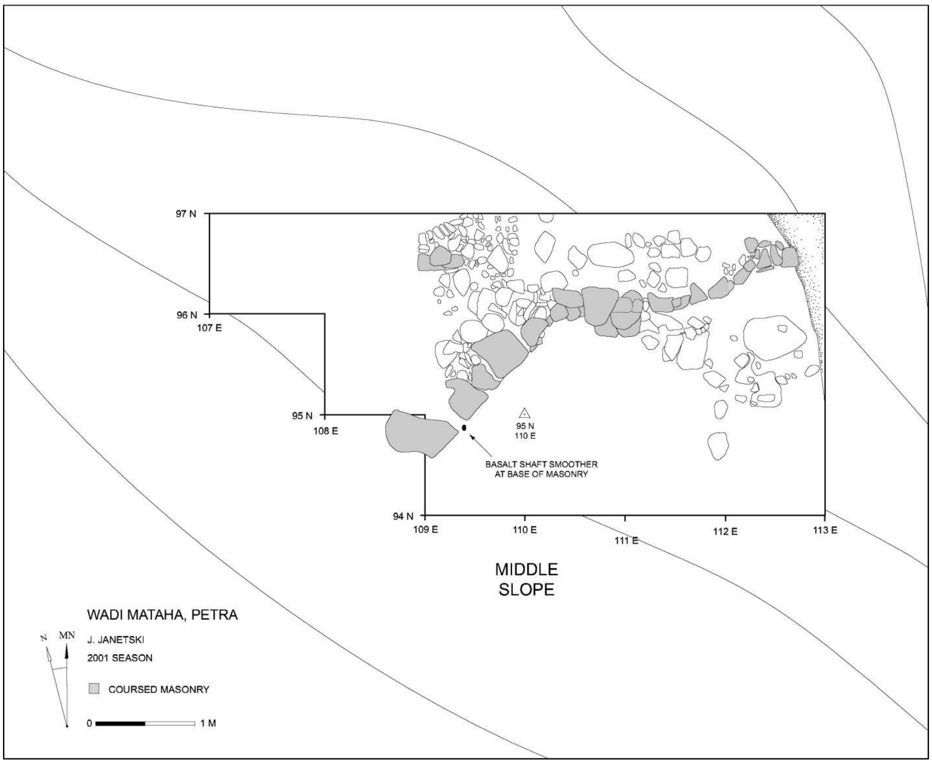

Fig. 4. Plan view of Early Natufian stone wall in Middle Slope excavation.

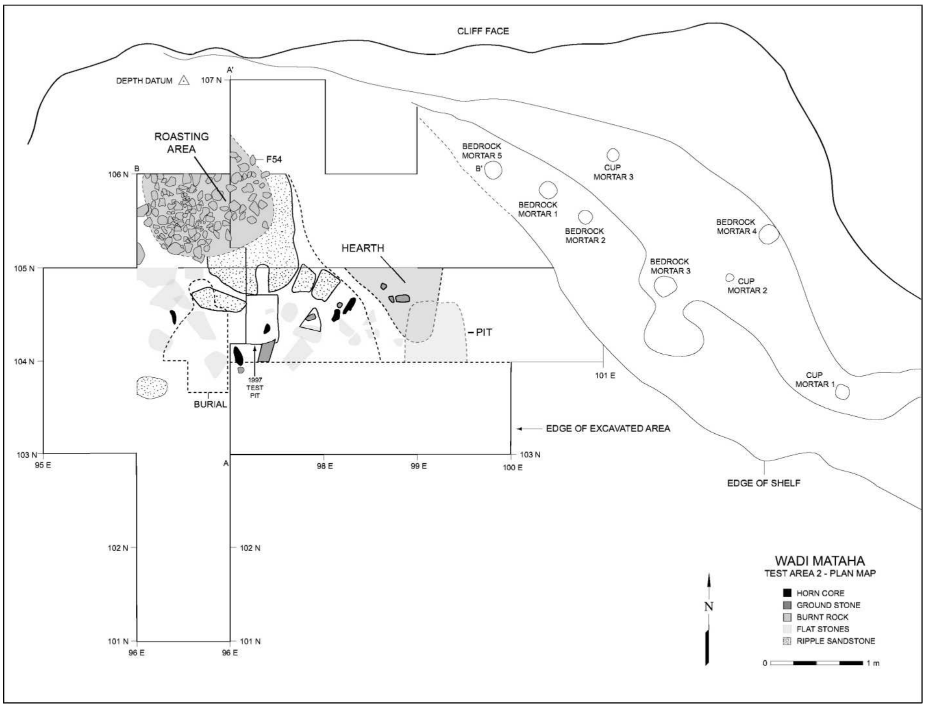

Fig. 5. Plan of upper area showing roasting area as well as Late Natufian hearth areas and bed-rock mortars.

Site Age

Absolute dates have been elusive at Wadi Mataha 2 as charcoal has been non-existent and bone collagen is present in only very minute quantities. However, two AMS dates on humic acids from burned animal bone from the Upper Slope place a Geometric Kebaran occupation at 14.1 ^{14}C kyr B.P. and the Late Natufian at 11.2 ^{14}C kyr B.P . The later date places the Late Natufian occupation at the onset of the Younger Dryas (Hughen *et al* 2000).

Geometric Kebaran

Kebaran deposits are restricted to the upper slope where they underlie Late Natufian occupations. Geometric Kebaran features were limited to a burial of a male with breached stone bowl and (possibly) a large serrated blade. Diagnostics consist of abrupt backed bladelets and exotic cherts.

Early Natufian

Early Natufian diagnostics dominate the mid and lower slopes and are present, albeit sparsely, in the upper slope. Excavations in the mid slope revealed a sinuous masonry wall that angles up and across the slope for ~4 m eventually connecting with a sandstone cliff (Fig. 4). The poorly defined floor associated with the wall yielded a fragmented basalt shaft straightener decorated with a meander pattern similar to those found on Early Natufian artifacts from sites such as Mallaha, Nahal Oren, and Shukba Cave (Bar-Yosef and Belfer-Cohen 1998; Noy 1991).

An additional masonry alignment was discovered slightly down slope, but remains to be fully explored. Milling equipment and dark midden are so far absent in the mid and lower slopes.

Late Natufian

The Late Natufian occupation seems limited to Test Area 2 (Fig. 5) The darkly stained sediments here are in decided contrast with the Early Natufian deposits, although both are artifactually rich. Diagnostics stone tools are small, steeply backed lunates with bipolar retouch.

Late Natufian features include a roasting area with dark midden and abundant small cobbles. Stratigraphically below (but still Late Natufian) and slightly down slope from the roasting feature was a patchy surface of flat stones upon which lay several *C. ibex* horn cores and domestic items including pestles and chipped stone tools.

Several bedrock mortars are present on a sandstone ledge abutting Test Area 2 on the east. The deepest mortars (up to 72 cm) are grooved from heavy use. The shape of the grooves matches that of pestles found in situ on the patchy stone surface, which argues for a Late Natufian age for the mortars.

Results of Faunal Analysis

Baadsgaard's (2001) analysis of the archaeofauna identified a range of faunal species closely resembling assemblages from Epipaleolithic sites located in the semi-arid, steppic strip east of the Dead Sea, such as Beidha and Wadi Judayid 2 (Byrd 1990) (Table 1). Caprines, including both wild goat (*Capra aegagrus*), Nubian ibex (*Capra ibex*), and possibly wild sheep (*Ovis orientalis*) dominate the assemblages from all occupations, with gazelle (*Gazella gazella*), cattle (*Bos primigenius*), equids (*Equus hemionus* and *Equus africanus*) also commonly represented. The large mammal component from the Early Natufian sample closely resembles that found at Beidha, although cattle are slightly more abundant at Beidha (Hecker 1989). Caprines also outnumber other ungulates including gazelles at other epipaleolithic sites in southern Jordan such as Wadi Judayid 2 (Henry *et al* 1985) and Wadi Faynan 16 (Carruthers, 2000), which is evidence that, in contrast with more northerly epipaleolithic sites (see Munro 2001: 340 for summaries) where gazelles are more common than caprines, goats were the preferred prey in this region. An exception to this pattern is Tor Hamar (all levels) where gazelles outnumbered caprines 2 to 1 in all epipaleolithic levels (Klein 1995).

Tabel 1. Faunal NISP by time period at Wadi Mataha.

	Test Area 2	Test Area 1	Test Area 2	Total
Time period	Geometric Kebaran	Early Natufian	Late Natufian	
Taxa:				
Equus sp.	3	2	3	8
Bos primigenius	1	-	11	12
Caprine	88	143	183	414
Ovis orientalis	-	3	2	5
Gazella gazella	72	54	93	219
Dama mesopotamica	-	-	2	2
Canis sp.	3	2	-	5
Felis sp.	1	-	-	1
Vulpes sp.	1	5	10	16
Vormela peregusna	-	-	2	2
Lepus capensis	9	7	16	32
Identified rodents	9	3	24	36
unidentified rodents	2	1	5	8
snakes/lizards	3	-	8	11
Testuda graeca	128	17	138	283
Unidentified galliformes	-	-	3	3
Alectoris chukar	19	7	47	73
Unidentified falconiformes	2	3	6	11
Identified raptors	10	4	16	30
Unidentified passeriformes	-	-	2	2
Corvus monedula	1	-	-	1
Sturgis vulgaris	-	-	1	1
Unidentified Aves	19	6	45	70
Total	371	257	617	1245

Do the Archaeofaunas at Wadi Mataha 2 represent resource intensification ?

As noted in the introductory remarks several have proposed an expanding diet in the Epipaleolithic characterized by the inclusion of lower ranked prey in the diet. A significant issue is the ranking process itself—that is, how were prey ranked by foragers? Some, including myself (Janetski 1997, but see also Broughton 1994, 1999), have assumed that size is a useful proxy measure for ranking: the larger the animal the higher the rank and vice versa. Stiner *et al* 2000; Stiner 2001; Munro 2001, on the other hand, have argued for ranking based more on pursuit costs: slower, easy to catch animals (tortoises) are ranked higher, even though they may be smaller, than fast, hard-to-catch, animals (hares and birds). Importantly, the slow animals tend to have lower reproductive rates than the faster taxa, therefore, the slow taxa are more prone to overexploitation. Based on the above, predictions for the faunal assemblage are expressed as follows:

Prediction 1. If size is a valid proxy measure of resource intensification and hunter-gatherer efficiency is decreasing through time, we should see larger animals (ungulates) decrease as a percent of NISP through time, and conversely, smaller animals (birds, hares, tortoises) increase as a percent of NISP

Prediction 2. If pursuit costs are a valid proxy measure, we would expect to see fewer slow, easily captured fauna (represented here by tortoises) and more fast, hard-to-capture fauna (birds and hares) in the assemblage through time. This expectation would be best tested through comparison of small fauna only.

Prediction 3. In either case, if diet breadth is increasing, we ought to see increased diversity or at least richness (i.e. increased numbers of taxa) in the diet through time.

Discussion

When trends in large versus small fauna are compared from Geometric Kebaran to Early Natufian at Wadi Mataha 2, expectations as stated in Prediction 1 are not met (Fig. 6, Table 2). Rather than decreasing, ungulates increase during the Early Natufian and small mammals decrease as a percentage of NISP. Ungulates decrease from Early Natufian levels to Late Natufian but not to the same levels as seen in the Geometric Kebaran. Nor are Prediction 2 expectations fully met. When we compare small fauna, we see that tortoises (as a percentage of small fauna NISP) decrease and hares and chukars increase as expected in the Early Natufian, but in the Late Natufian tortoises rebound, hares drop off, and chukars stay about that the same (Fig. 7). In fact, the pattern of Late Natufian small fauna exploitation resembles the Geometric Kebaran, which may suggest strategy similarities in the two periods.

These results are (in part) the opposite of expectations in both cases. Why would that be so? Interestingly, a similar trend in the shifting ratios of small fauna is reported by Munro (2001: 344) for Hayonim Cave. She offers a couple of explanations that seem reasonable. First, Munro (2001: 351-2) argues that the resurgence of tortoises in the Late Natufian may be due to a decrease in human populations in the Mediterranean zone. If so, stress on small, slow, and slow to reproduce species such as tortoises may have relaxed somewhat allowing numbers to grow. Second, strategy shifts from Geometric Kebaran to Early and Late Natufian could, in part, explain the faunal pattern seen at Wadi Mataha 2.

What about the possibility of increased diversity as stated in Prediction 3? When all species are considered, richness increases rather significantly through time at Wadi Mataha 2 (Table 3). And diversity as measured by Simpson's reciprocal ranks the Geometric Kebaran as the most diverse and Early Natufian as the least diverse based on fauna. A concern here is sample size effects; that is, is the greater richness and diversity may be due to excavating a larger sample. Baadsgaard (2000) has calculated excavated volumes for each of the excavated areas and those are represented in Table 3. This makes it clear that sample size is not affecting the results since the volume of Geometric Kebaran sediments excavated as of the end of the 1999 season is about one-third that of the either of the Natufian levels, yet richness for the earlier assemblage is high. Taxa richness in the Late Natufian (total taxa = 26) is nearly twice that found in the Early Natufian assemblage (total taxa = 15). The Late Natufian sample is a bit larger than Early Natufian, but the difference is not great and doesn't explain the dramatic increase in richness in the later period. On the other hand, differential preservation may be playing a role. The bone in the Early Natufian levels (located in Test Area 1 in the mid and lower slope) tends to be heavily encrusted with carbonates, whereas those in the Geometric Kebaran and Late Natufian levels (both located in Test Area 2 in the upper slope) are not. If preservation is an issue, we might expect that bone identifiability would be less in the Early Natufian levels. This appears to be true as percent identifiability is identical (9.8 percent) in Geometric Kebaran and Late Natufian levels but drops to 6.7 percent for the Early Natufian faunal assemblage. Differences in identifiability are, in fact, greatest in the small mammal area (Baadsgaard 2000: 91). These findings temper somewhat the conclusions reached in this paper, although the fact that the trends are similar to that found at Hayonim Cave (Munro 2001) argue that the preservation issue is not unduly biasing the data.

Table 2. Numbers of specimens in faunal categories by time period at Wadi Mataha.

Time Period	Ungulates	Carnivores	Rodents	*Lepus*	Reptiles	Chukars	Other Birds	Totals
Late Natufian	294 (48%)	12 (2%)	29 (5%)	16 (3%)	146 (24%)	47 (8%)	73 (12%)	617
Early Natufian	202 (79%)	7 (3%)	4 (2%)	7 (3%)	17 (7%)	7 (3%)	13 (5%)	257
Geometric Kebaran	164 (44%)	5 (1%)	11 (3%)	9 (2%)	131 (35%)	19 (5%)	32 (9%)	371
Totals	660	24	44	32	294	73	118	1245

Table 3. Taxa diversity through time at Wadi Mataha.

Time Period	all taxa	food taxa	Simpson's Reciprocal	volume of sediment	diversity rank
Late Natufian	26	10	3.35	3.71 m^3	2
Early Natufian	15	7	2.55	3.09 m^3	3
Geometric Kebaran	18	8	1.01	1.01 m^3	1

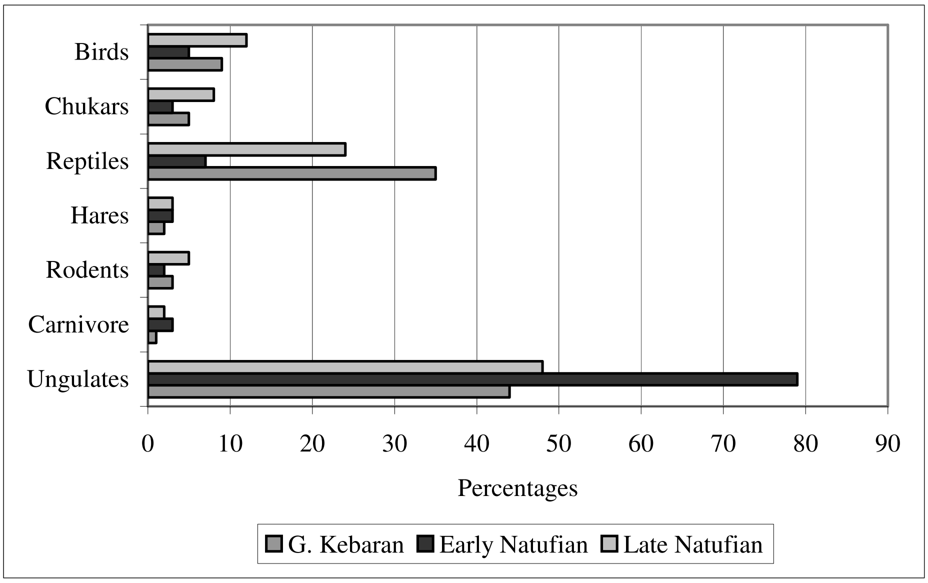

Fig. 6. Percentages of total identified taxa at Wadi Mataha.

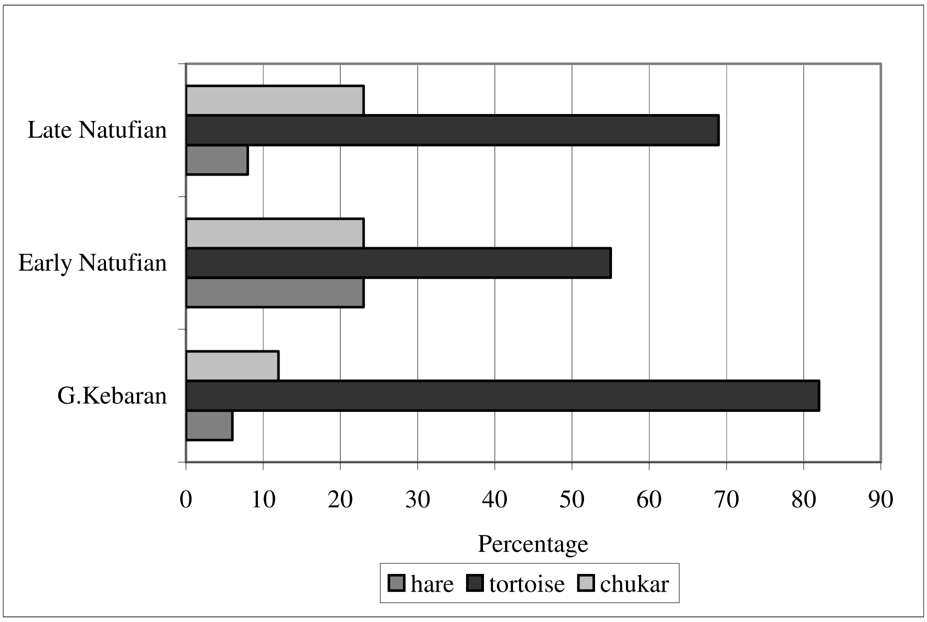

Fig. 7. Percent of hare, tortoise, and chukar by time period at Wadi Mataha.

Conclusion

To return to our question: Do the archaeofaunas at Wadi Mataha 2 represent resource intensification? The faunal data do suggest a broadening of the diet over the span of the period represented, but there is also intriguing variability within that period and that variability can't be explained by simple numbers of taxa represented; rather, shifts in strategy and demographics must be considered to understand the patterns (see also discussion of Epipaleolithic strategy shifts in Tchernov 1994: 92-94). Additionally, the presence of Late Natufian grinding facilities at Wadi Mataha 2 argues for either the increasing or continued importance of plants despite or as a consequence of the apparent strategy shift. The absence of identifiable macrobotanical remains at Wadi Mataha to date has frustrated attempts to determine the function of the pestles and mortars. We speculate that these mortars were used to process nuts as have others (Olzewski 1993). A particularly intriguing conclusion is that the shifting pattern of small prey preference from the Geometric Kebaran through the Late Natufian at Wadi Mataha 2 in southern Jordan seems to mirror that at Hayonim Cave. This suggests that changes, both climatic and cultural, were widespread in the Near East in the terminal Epilpaleolithic.

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